

Hybrid & Electric
Mobility Solutions

Product Overview

PUT THE POWER ON THE ROAD

TE Connectivity (TE) provides a complete line of connectors, relays, harnesses, contactors and disconnects to safely connect and protect the flow of data and power around your hybrid or electric vehicle.

TE's automotive products have been proven in light and heavy-duty vehicles and our technologies leverage decades of experience with high-voltage generation, transmission and distribution. So you can depend on them to be safe and reliable in your application.



BATTERY TECHNOLOGIES

Protecting by design. Connection after connection. TE's innovative cell-to-cell, module-to-module, and battery-to-car solutions are addressing the big challenges of hybrid and electric vehicles.

With continuous research into new technologies, collaborative engineering with customers, and lower-mass off-the-shelf solutions, we're making a difference with your power-to-weight-ratio, time-to-recharge, and total range capabilities.

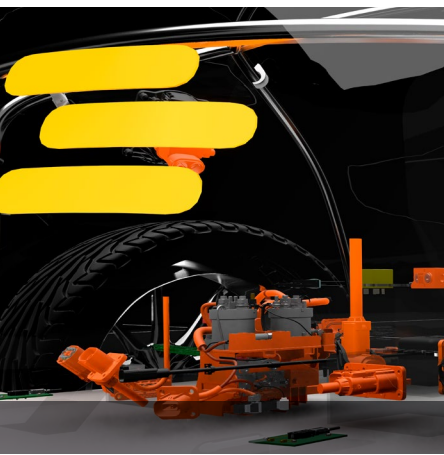
Our technologies leverage decades of experience with high-voltage generation, transmission and distribution and you can depend on them to be safe and reliable in your application.



CHARGING SOLUTIONS

Mobility simplified. One charge at a time. TE is helping enable electric mobility by creating safe, high-quality components for every part of the charging station - and making them affordable. Our experience with high-voltage energy distribution and Smart-Grid technology gives us insight into the needs of this important market segment. More than a complete charging solution.

A smart one. Smart charging solutions enable customers to meter their EV's electricity consumption, and communicate data via innovative smart charging cords and inlets. You supply the shell, we'll supply everything else. TE has everything it takes to create your charging solution, except the box it goes in. From cables to contactors, meters to card readers, screens to sockets, we've already solved how it all goes together.



IN-VEHICLE TECHNOLOGY

TE provides a complete line of connectors, relays, harnesses, contactors and disconnects to safely connect and protect the flow of data and power around your hybrid or electric vehicle. TE's automotive products have been proven in light and heavy-duty vehicles and our technologies leverage decades of experience with high-voltage generation, transmission and distribution.

So you can depend on them to be safe and reliable in your application. Our AMP+ line of cables, connectors, harnesses and terminals safely and reliably channel high- and low-voltage power in and around the battery and vehicle, to help you put the power to the road.



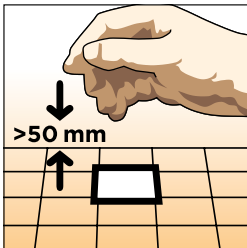

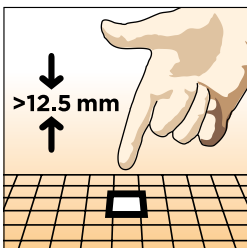
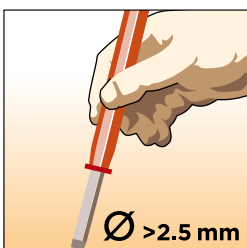
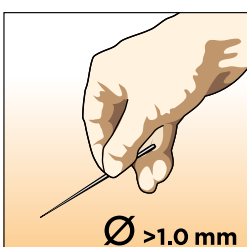



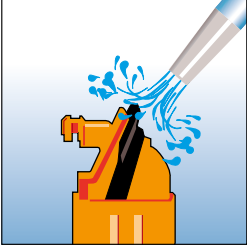

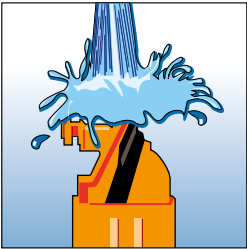
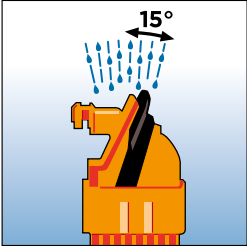
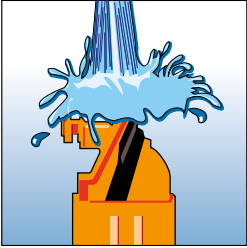
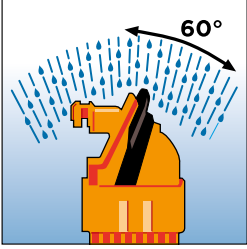
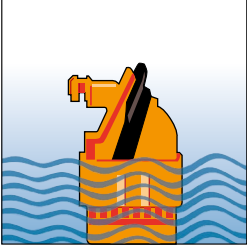
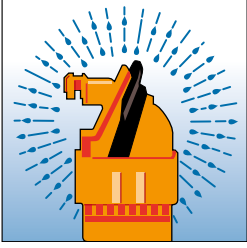
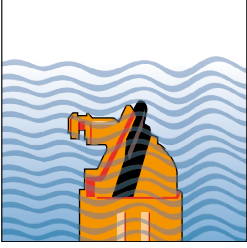
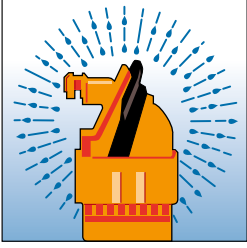

INFRASTRUCTURE SOLUTIONS

Completing the connections that power it all. More than 50 years of experience with high-voltage electricity separates us from automotive engineering companies in the hybrid and EV industry.

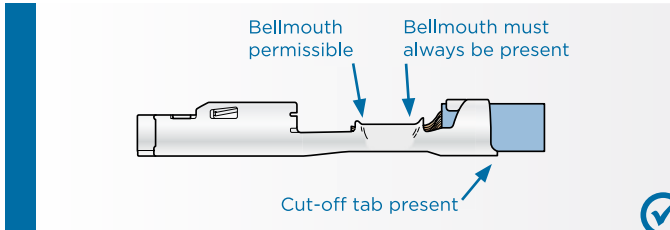
We're using that knowledge to help create smarter, better, easier ways to connect the grid to drivers - and give them the mobility they need. Before everyone can embrace driving hybrid and electric vehicles, we need a safe, reliable way to get the power from the grid to the chargers, and into the batteries.

TE's broad array of energy and industrial technologies have seen decades of real-world use connecting and protecting the flow of power around the world. So you can depend on them to be safe and reliable in your application, too.

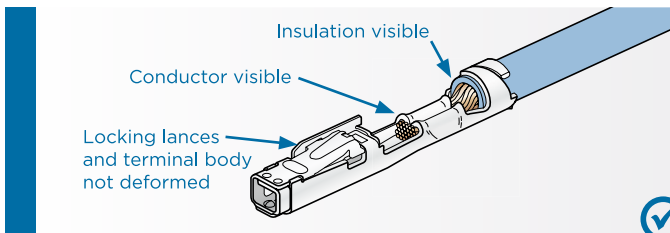
1st Digit Against Foreign Objects (incl. Dust)	1st Digit Against Foreign Objects (incl. Dust)
<p>0</p>  <p>Not protected.</p>	<p>5K</p>  <p>Dust protected.</p>
<p>1</p>  <p>Protected against solid objects greater than 50 mm (ex. back of hand).</p>	<p>6K</p>  <p>Dust tight.</p>
<p>2</p>  <p>Protected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

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>

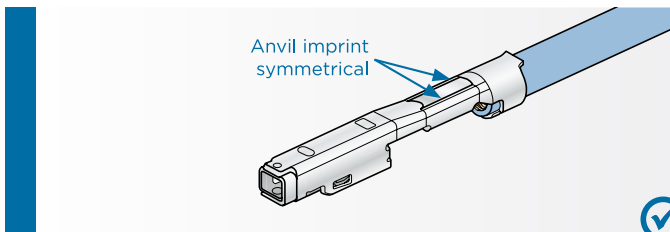
Good Crimp Quality



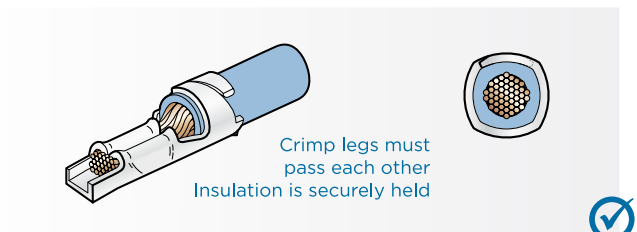
F-CRIMP



OVERLAP CRIMP



WRAP OVER CRIMP



Correct selection



of wire, terminal and applicator
Crimp barrel is closed, legs support each other, sufficient gap between legs and bottom of crimp, all strands are equally distributed and deformed



Test

WIRE CRIMP

Crimp heights and tolerances

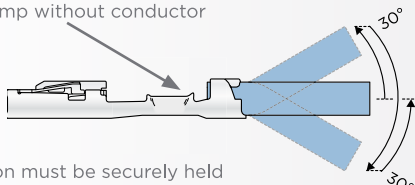
For crimp height tolerances for any given contact, please refer to the relevant application specification.

Examples

Contact	P/N	Wire Range	Tolerance	Spec.
JJPT	927775	0.50-1.00 mm ²	±0.05 mm	114-18050
JPT	927773	1.50-2.50 mm ²	±0.05 mm	114-18050
MQS	962885	0.20-0.50 mm ²	±0.03 mm	114-18025

INSULATION CRIMP

Wire crimp without conductor

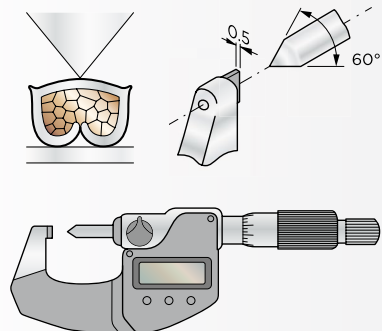


Insulation must be securely held after bend test (one bend cycle)

WIRE CRIMP

Digital crimp height micrometer

(0.001 mm increments) according to DIN ISO 9001
Part number: 547203-1



Incorrect Crimp Quality

<p>Terminal body damaged</p>	<p>F-CRIMP</p>	<p>Crimp legs are not closed</p> <p>Insulation is pierced</p>
<p>Single core crimped on terminal</p>	<p>INSULATION CRIMP OVERLAP CRIMP</p>	<p>Crimp legs do not overlap</p> <p>Insulation is pierced</p>
<p>Terminal twisted</p>	<p>WRAP OVER CRIMP</p>	<p>Insulation is not securely held</p> <p>Insulation is over crimped</p>
<p>Cut off tab too long</p>	<p>Conductor brush protrudes into terminal body</p> <p>Insulation inside the wire crimp</p>	
<p>Crimp barrel distorted</p>	<p>Wire bent</p>	
<p>Terminal bent</p>	<p>Terminal bent</p>	

Correct
Incorrect
Test

At TE Connectivity, we support your RoHS requirements. We've assessed more than 1.5 million end items/components for RoHS compliance, and issued new part numbers where any change was required to eliminate the restricted materials. Part numbers in this catalog are identified as:

RoHS Compliant

Part numbers in this catalog are RoHS Compliant, unless marked otherwise. These products comply with European Union Directive 2002/95/EC as amended 1 January 2006 that restricts the use of lead, mercury, cadmium, hexavalent chromium, PBB, and PBDE in certain electrical and electronic products sold into the EU as of 1 July 2006.

Note: For purposes of this Catalog, included within the definition of RoHS Compliant are products that are clearly "Out of Scope" of the RoHS Directive such as hand tools and other non-electrical accessories.

Non-RoHS Compliant

These part numbers are identified with a "t" symbol. These products do not comply with the material restrictions of the European Union Directive 2002/95/EC.

5 of 6 Compliant

A "l" symbol identifies these part numbers. These products do not fully comply with the European Union Directive 2002/95/EC because they contain lead in solderable interfaces (they do not contain any of the other five restricted substances above allowable limits). However, these products may be suitable for use in RoHS applications where there is an application-based exception for lead in solders, such as the server, storage, or networking infrastructure exemption.

Note: Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For latest compliance status, refer to our website referenced below. So whatever your questions when it comes to RoHS, we've got the answers at <http://www.TE.com/customer-support/rohssupportcenter/>

Getting the information you need

Our comprehensive on-line RoHS Customer Support Center provides a forum to answer your questions and support your RoHS needs. A RoHS FAQ (Frequently Asked Questions) is available with links to more detailed information. You can also submit RoHS questions and receive a response within 24 hours during a normal work week. The Support Center also provides:

- Cross-Reference from Non-compliant to Compliant Products
- Ability to browse RoHS Compliant Products in our on-line catalog:
www.TE.com/commerce/alt/RohsAltHome.do
- Downloadable Technical Data Customer Information Presentation
- More detailed information regarding the definitions used above

AWG Code	Diameter (Inch)	Diameter (mm)	F (mm ²)
000000	0.5800	14.733	170.0
00000	0.5165	13.13	135.0
0000	0.4600	11.684	103.8
000	0.4096	10.40	79.0
00	0.3648	9.27	67.5
0	0.3249	8.25	53.4
1	0.2893	7.34	42.2
2	0.2576	6.55	33.7
3	0.2294	5.82	26.6
4	0.2043	5.18	21.0
5	0.1819	4.62	16.9
6	0.1620	4.115	13.25
7	0.1443	3.66	10.25
8	0.1285	3.26	8.34
9	0.1144	2.90	6.6
10	0.1019	2.59	5.27
11	0.0907	2.30	4.15
12	0.0808	2.05	3.3
13	0.0720	1.83	2.63
14	0.0641	1.63	2.08
15	0.0571	1.45	1.65
16	0.0508	1.29	1.305
17	0.0453	1.14	1.01
18	0.0403	1.02	0.79
19	0.0359	0.91	0.65
20	0.0320	0.81	0.51
21	0.0285	0.72	0.407
22	0.0253	0.64	0.32
23	0.0226	0.57	0.255
24	0.0201	0.51	0.205
25	0.0179	0.455	0.162
26	0.0159	0.40	0.125
27	0.0142	0.36	0.102
28	0.0126	0.32	0.08
29	0.0113	0.287	0.0646
30	0.0100	0.254	0.0516
31	0.0089	0.226	0.04
32	0.0080	0.203	0.0324
33	0.0071	0.180	0.0255
34	0.0063	0.160	0.02
35	0.0056	0.142	0.0158
36	0.0050	0.127	0.0127
37	0.0045	0.114	0.01
38	0.0040	0.101	0.008
39	0.0035	0.089	0.0062
40	0.0031	0.079	0.0049
41	0.0028	0.071	0.00395
42	0.0025	0.064	0.00321
43	0.0022	0.056	0.00246
44	0.00198	0.050	0.00196
45	0.00176	0.045	
46	0.00157	0.040	
47	0.00140	0.036	
48	0.00124	0.031	
49	0.00110	0.028	
50	0.00099	0.025	

Most of the wire size ranges are mentioned in mm², as well as the insulation diameters which are in many cases only in mm's We therefore included the conversion tables on page X and page XI.

Please note that wire and insulation sizes are for guidance only. Consult the customer drawing for precise detail.

FLK and FLR

stand for German DIN (72551) abbreviations.

FLK means:

In German:

- Fahrzeug-Leitung Kunststoff

In English:

- Vehicle Cable Plastic

FLR means:

In German:

- Fahrzeug-Leitung reduziert

In English:

- Thin Walled Cable (reduced insulation thickness)

Remark: Starting from 0.03 mm² (AWG 32) a wire can be crimped.

Hybrid & Electric Mobility Solutions
Product Overview

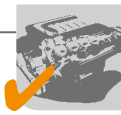
	Page	Powertrain Systems	Safety & Security Systems	Convenience	Driver Information	Body & Chassis Systems
AMP+ HVA 280	1 - 18					
Introduction	1					
2 phi - Plug	2	•	•			
XE - Plug (individually shielded cable)	3	•	•			
2 phm Shunted HVIL Plug (multi-core cable)	4	•	•			
2 phm Pass-Through HVIL Plug (multi-core cable)	5	•	•			
2 pxx Intelligent Plug (Single Click)	6	•	•			
2 phi - Plastic (discrete) Header 2phi/3pxi	7	•	•			
2 phx - Plastic (1-piece) Header	8	•	•			
2phi - Inline Cap	9	•	•			
2 phm - Inline Cap	10	•	•			
2phi/3pxi Multi-Bay Plastic (Discrete) Header	11	•	•			
3PXM - XE Plug	12	•	•			
3PXM - XE Plug (Single Click)	13	•	•			
2PHM Pass-Through Plug (Single Click)	14	•	•			
2PHM Shunted Plug (Single Click)	15	•	•			
2PHI XE Plug	16	•	•			
2P Header - Stitched	17	•	•			
Shipping Caps	18	•	•			
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AMP+ HVA 630 5-Position	23 - 26					
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5phm - Plug	24	•	•			
5phx - Header, 180° Tabs	25	•	•			
5phx - Header, 90° Tabs	26	•	•			

Hybrid & Electric Mobility Solutions Product Overview		Page	Powertrain Systems	Safety & Security Systems	Convenience	Driver Information	Body & Chassis Systems
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2phi XE Plug, 90°		29	•	•			
2phi XE Plug, 180°		30	•	•			
3phi XE Plug, 180°		31	•	•			
2phi Header		32	•	•			
3phi Header		33	•	•			
AMP+ HVP 1100		35 – 37					
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1phi XE Plug, 90°		36	•	•			
1phi XE Header		37	•	•			
AMP+ IPT		39 – 42					
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2pxi		41	•	•			
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AMP+ Charging Cables		43 – 46					
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Mode 2 Type 1 Japan		44	•	•			
Mode 2 Type 2 Europe		45	•	•			
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Type 1		48	•	•			
Type 2		49	•	•			
Type GB		50	•	•			

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Product Overview

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EVC 135 Contactor	57	•	•			
EVC 175 Main Contactor	58	•	•			
EVC 250 Main Contactor	59	•	•			
EVC 250-800 Main Contactor	60	•	•			
EVC 500 Main Contactor	61	•	•			
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POWERTRAIN SYSTEMS



SAFETY & SECURITY SYSTEMS



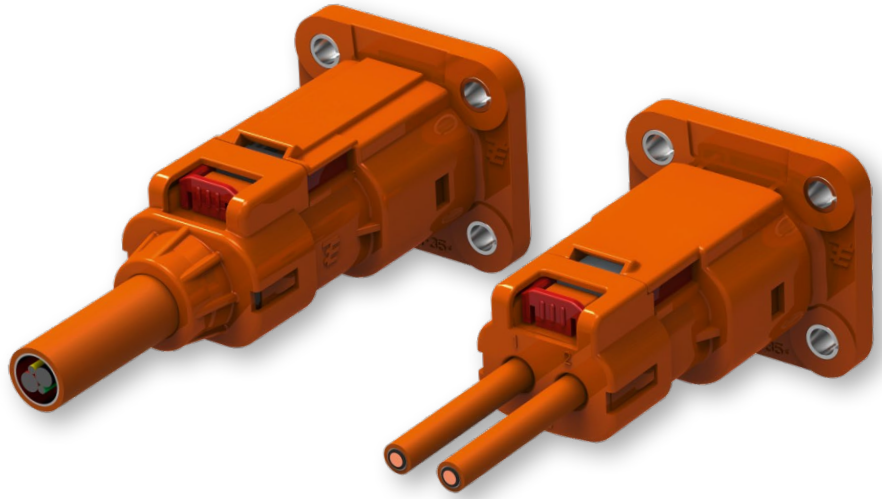
CONVENIENCE



DRIVER INFORMATION



BODY & CHASSIS SYSTEMS



AMP+ HVA 280

INTRODUCTION

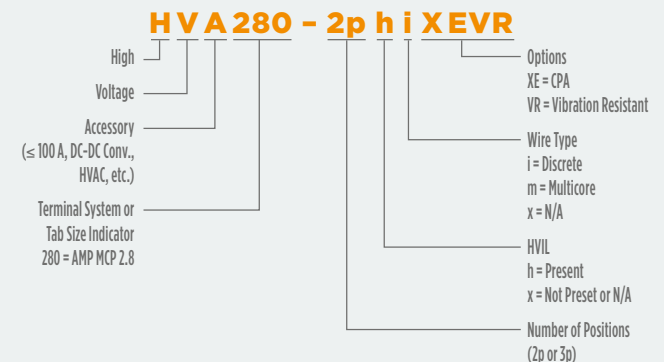
Unique design improves manufacturability and packaging. TE's AMP+ low-medium current connectors and headers HVA 280 are finger-proof, touch-safe 2- or 3-position connectors and headers, designed for great flexibility for hybrid and electric vehicle device applications.

The connector system provides multiple latching options and an integrated internal HVIL, allowing for package size optimization and routing flexibility.

In addition, the HVA 280 product family includes a discrete header design unique to the industry that improves packaging and manufacturing efficiency with a two-stage floating latch that creates safety in the system.

The HVA 280 family offers over 3,000 combination options providing solutions for a wide variety of device and wire harness applications like battery pack, DC/DC converter, on-board charger, electric heater, electric climate compressor, and high voltage power distribution.

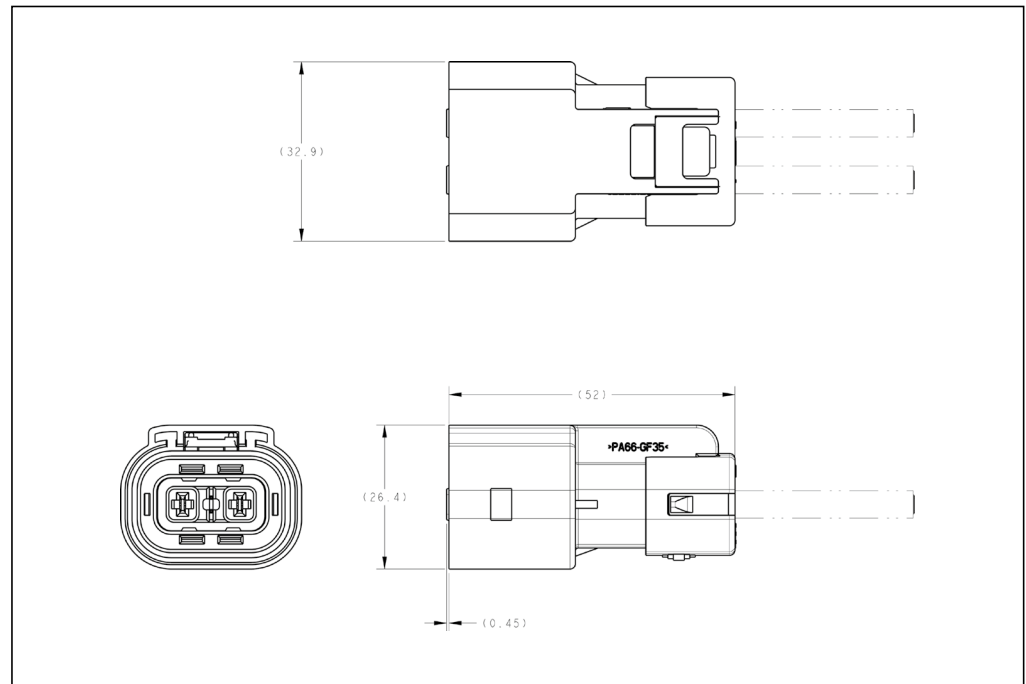
Naming Convention HVA 280 Connector Family



Applications

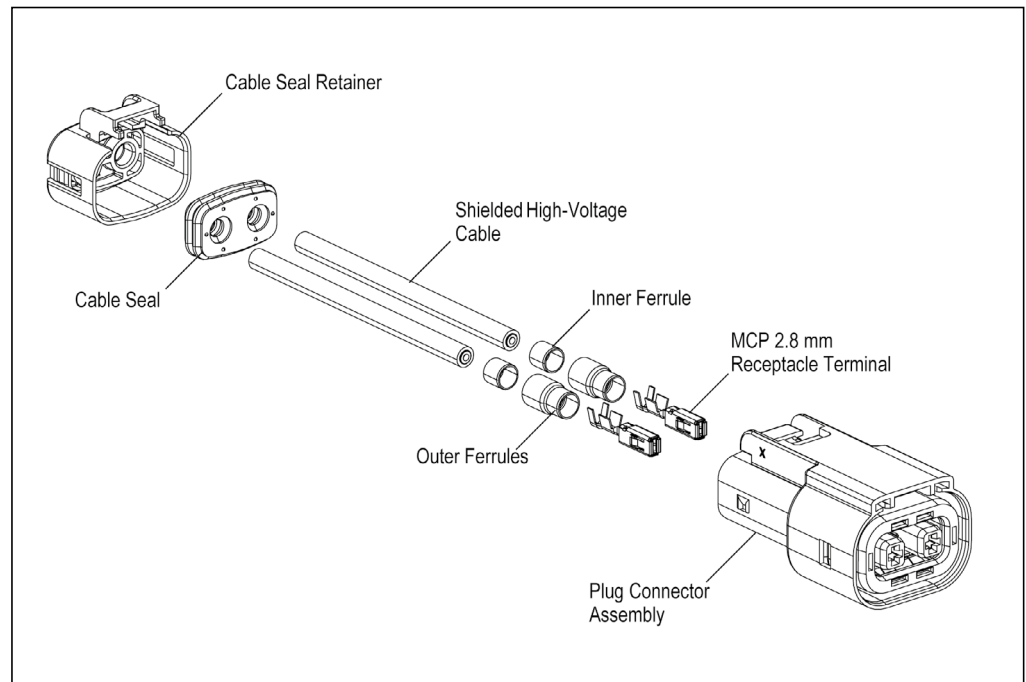
- Pin Number:**
2 (+2 HVIL)
- Contact System:**
2.8 mm AMP MCP
- Conductor Cross-Sections:**
3.0 mm² and 4.0 mm²,
individually shielded
- Voltage Range:**
600V DC
- Operation Temperature:**
-40 °C up to 125 °C
- Current Carrying Capacity:**
40 A at 85 °C
27 A @ 125 °C
- IP Rating:**
Plugged: IP67, IP6k9k
Unplugged: IP2XB
- HVIL:**
Integrated, internal
- Latch Access Type:**
Finger access
- CPA:**
No
- Fire Classification:**
HB
- Vibration Level**
V1

AMP+ HVA 280 2phi - Plug

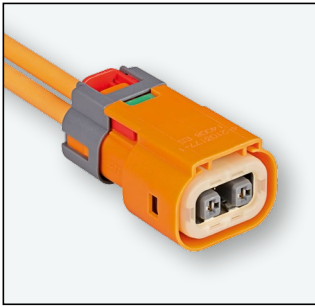


Drawing 2103339 *

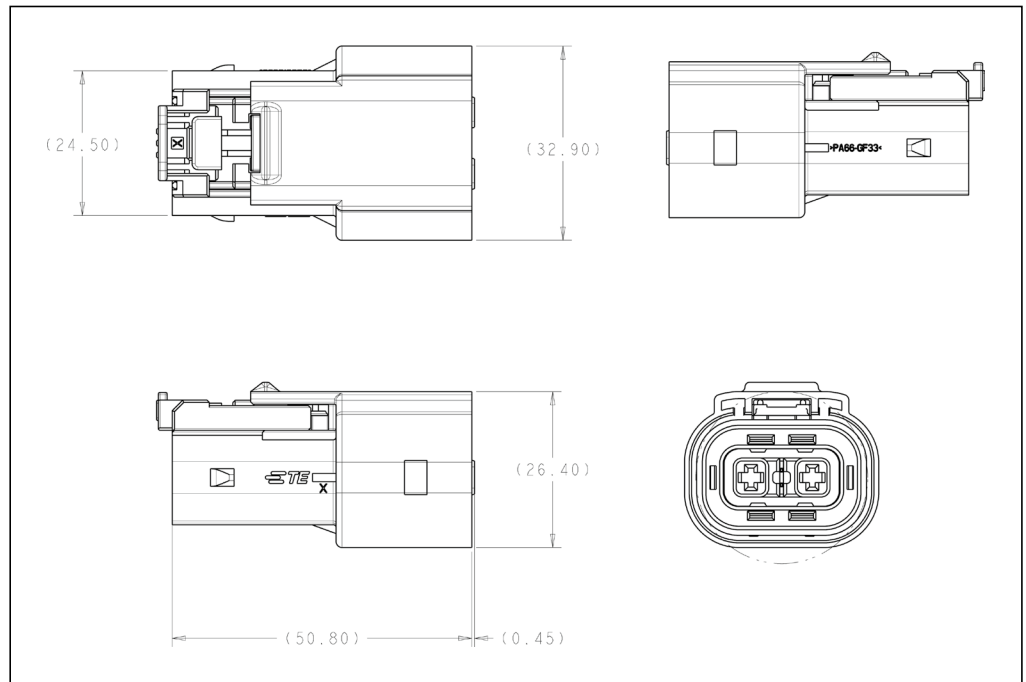
- Product Specification:**
108-2394
- Application Specification:**
114-13259



* Drawing Number is NOT the Order Number!



AMP+ HVA 280 XE - Plug (individually shielded cable)



Drawing 2103176 *

Technical Features

Pin number:

2 (+2 HVIL)

Contact System:

2.8 mm AMP MCP

Conductor Cross-Sections:

3.0 mm², 4.0 mm²
individually shielded

Voltage Range:

600V DC

Operation Temperature:

-40 °C up to 125 °C

Current Carrying Capacity:

40A at 85 °C

IP Rating:

Plugged: IP67, IP6k9k

Unplugged: IP2XB

HVIL:

Integrated, internal

Latch Access Type:

Finger and tool accessible

CPA:

With/Without

Fire Classification:

HB

Vibration Level:

V1

Shielding:

360 deg

Available Keys:

A, B, D, E, F, G

Product Specification:

108-2394

Application Specification:

114-13259

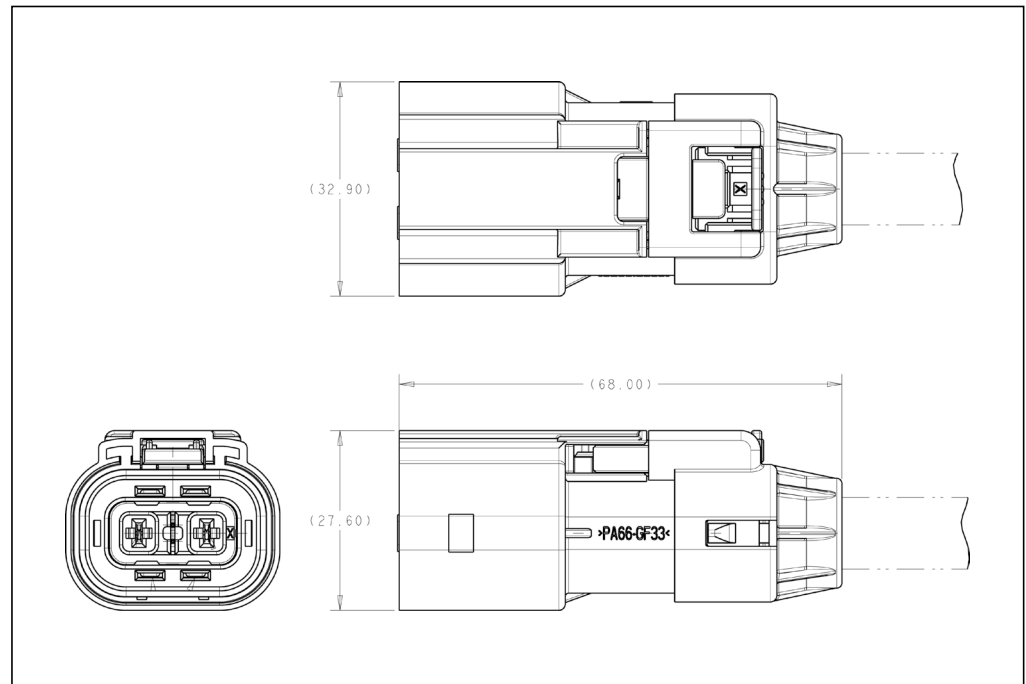
* Drawing Number is NOT the Order Number!

Technical Features

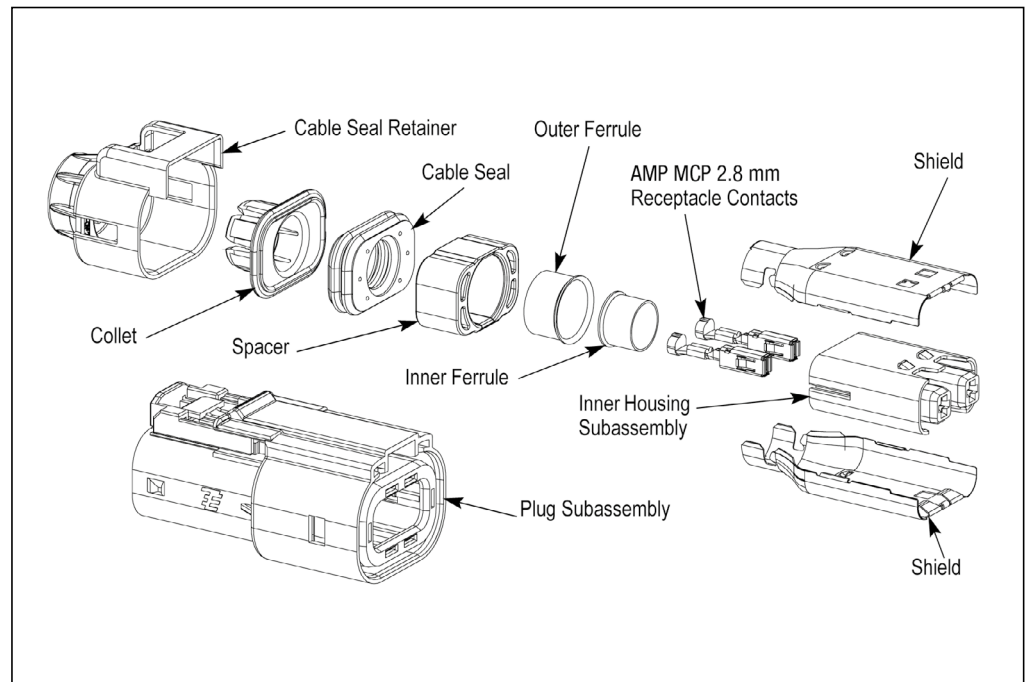
- Pin Number:**
2 (+2 HVIL)
- Contact System:**
2.8 mm AMP MCP
- Conductor Cross-Sections:**
2 x 4.0 mm², multi-core shielded
- Voltage Range:**
850 VDC
- Operation Temperature:**
-40 °C up to 140 °C
- Current Carrying Capacity:**
33A at 85 °C
- IP Rating:**
Plugged: IP67, IP6k9k
Unplugged: IP2XB
- HVIL:**
Integrated, internal
- Latch Access Type:**
Finger and tool accessible
- CPA:**
With

- Fire Classification:**
./.
- Vibration Level:**
AK Severity 2 (body-sealed)
- Shielding:**
360 deg
- Available Keys:**
A, B, D, E, F
- Product Specification:**
108-32020
- Application Specification:**
114-13305

AMP+ HVA 280 - 2 phm Shunted HVIL Plug (Multi-Core Cable)



Drawing 2103014 * and 2103437*



* Drawing Number is NOT the Order Number!



AMP+ HVA 280 - 2 phm - Pass Through HVIL Plug (Multi-Core Cable)

Technical Features

Pin Number:

2 (+2 HVIL)

Contact System:

2.8 mm AMP MCP

Conductor Cross-Sections:

2 x 4.0 mm² + 2 x 0.5 mm²,
 multi-core shielded

Voltage Range:

850V DC

Operation Temperature:

-40 °C up to 140 °C

Current Carrying Capacity:

33A at 85 °C

IP Rating:

Plugged: IP67, IP6k9k

Unplugged: IP2XB

HVIL:

Integrated, internal

Latch Access Type:

Finger and tool accessible

CPA:

With

Fire Classification:

./.

Vibration Level:

AK Severity 2 (body-sealed)

Shielding:

360 deg

Available Keys:

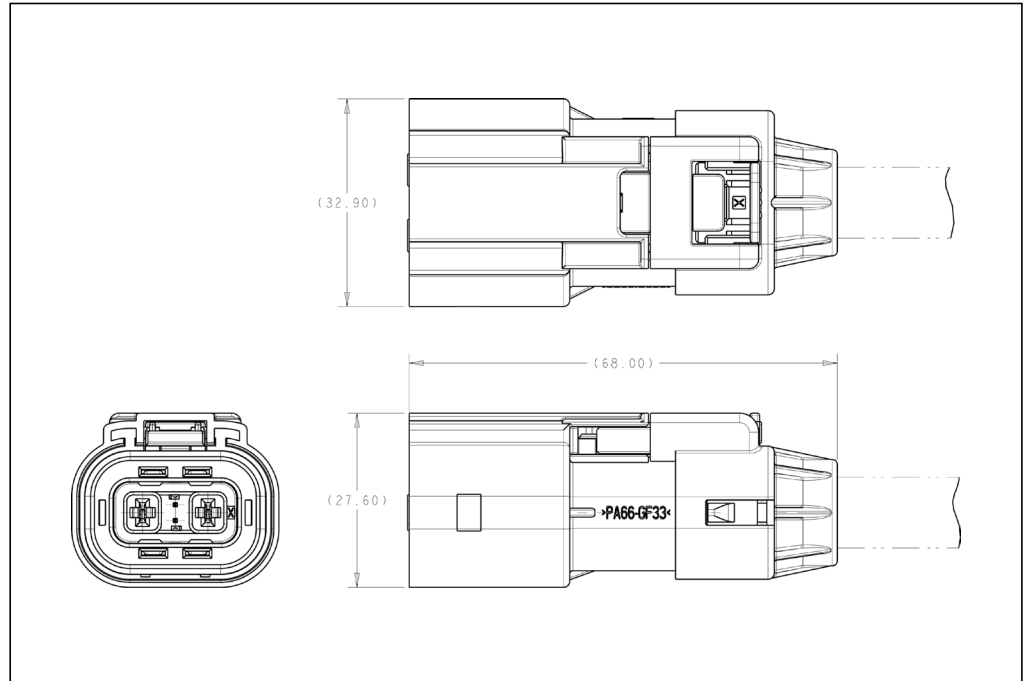
A, B, D, E, F

Product Specification:

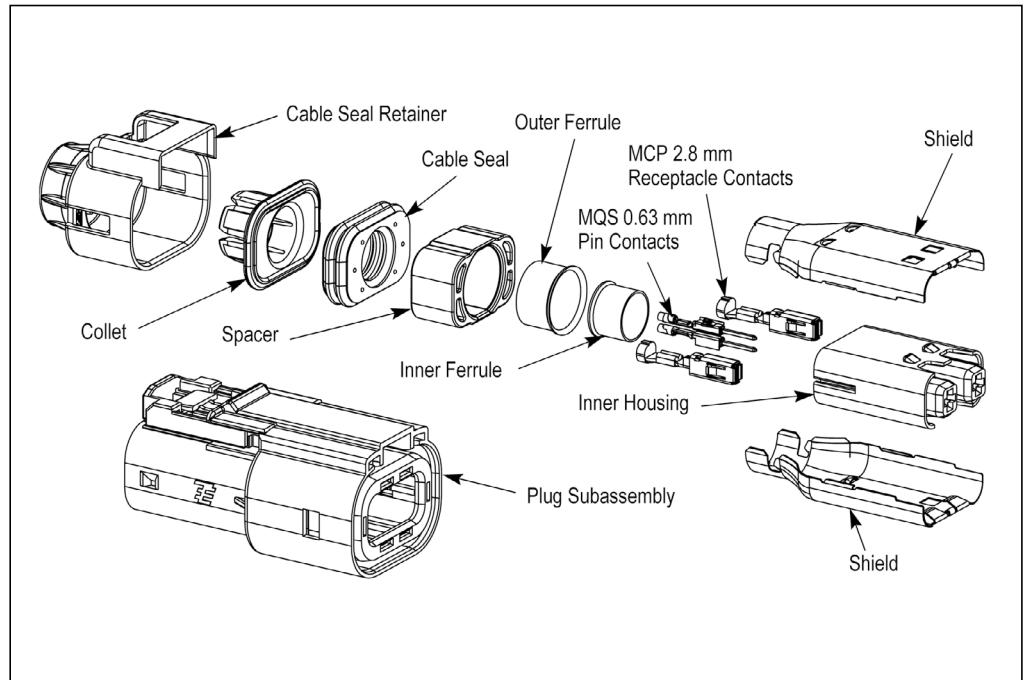
108-32020

Application Specification:

114-13310



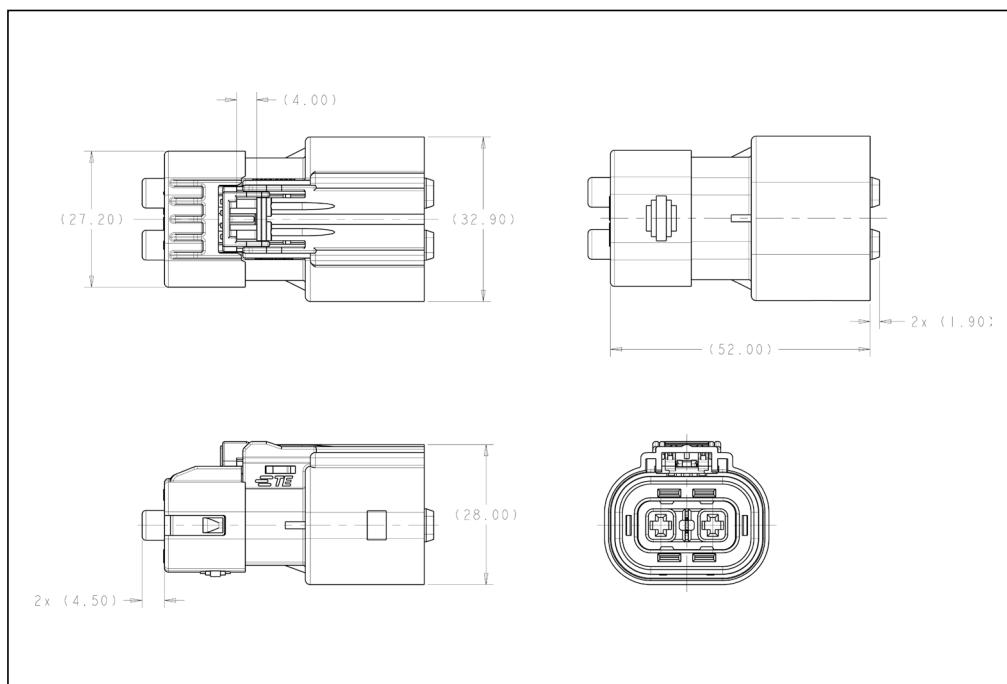
Drawing 2103163 * and 2103436*



* Drawing Number is NOT the Order Number!



AMP+ HVA 280 - 2 pxx Intelligent Plug (Single Click)



Drawing 2103744 *

Technical Features

Pin number:

2 HVIL only

Operation temperature:

-40 °C to 125 °C

IP rating:

Plugged: IP67, IP6k9k

Unplugged: IP2XB

HVIL:

Integrated, internal

Latch Access Type:

Finger accessible

CPA:

With

Fire classification:

HB

Vibration Level:

AK Severity 2 (body-sealed)

Shielding:

360 deg

Available Keys:

Z

Product Specification:

108-2394

Application Specification:

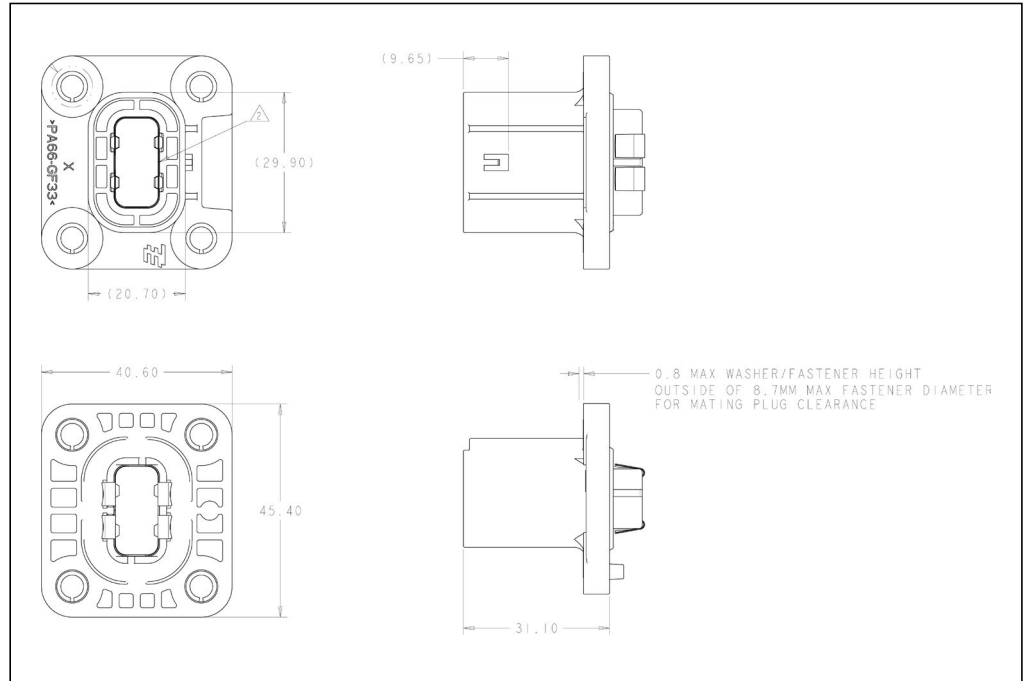
114-13259

* Drawing Number is NOT the Order Number!

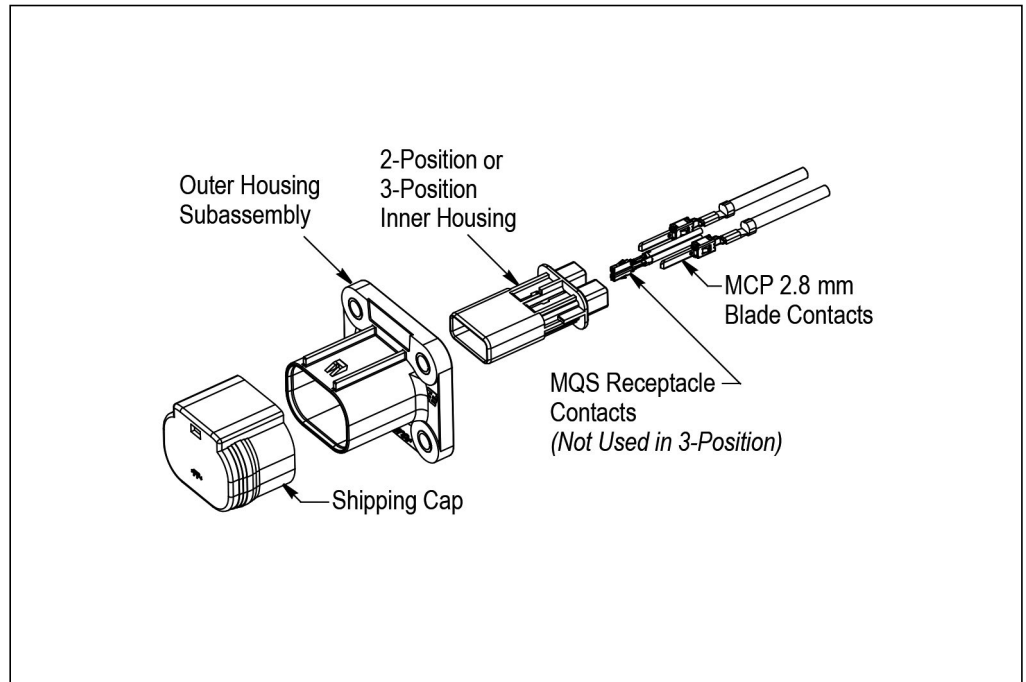
Technical Features

- Pin Number:**
2 (+2 HVIL) or 3
- Contact System:**
2.8 mm AMP MCP
- Voltage Range:**
up to 850V DC
(depends on the mating plug)
- Operation Temperature:**
-40 °C up to 140 °C
- Current Carrying Capacity:**
40 A at 85 °C
23 A at 85 °C for 3 positions
- IP Rating:**
Plugged: IP67, IP6k9k
Unplugged: IP2XB
- HVIL:**
. /.
- Fire Classification:**
HB
- Vibration Level:**
V1
- Shielding:**
360 deg
- Available Shielding:**
Tin/Silver
- Available Keys:**
A, B, D, E, F
- Product Specification:**
108-32045
- Instruction Sheet:**
408-32095

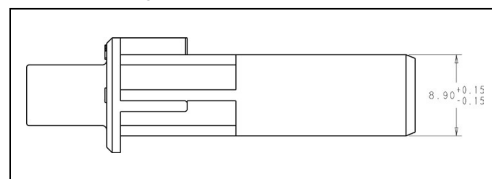
AMP+ HVA 280 - 2 phi - Plastic (Discrete) - Header 2phi /3pxi



Drawing 2103247 *

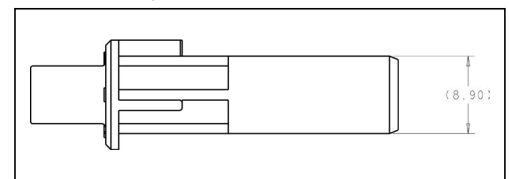


3P Inner Housing



Drawing 2103321 *

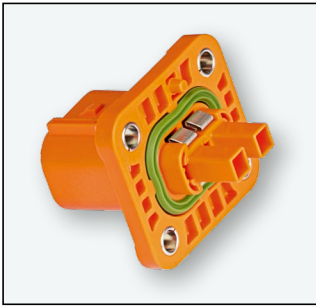
2P Inner Housing



Drawing 2103245 *

Mating Plugs	
2P Header	page 3, 4, 5, 6
3P Header	page 12, 13

* Drawing Number is NOT the Order Number!. For interface requirements please refer to product drawing.



AMP+ HVA 280 - 2 phx - Plastic (1-piece) - Header

Technical Features

Pin Number:

2 (+2 HVIL)

Contact System:

2.8 mm AMP MCP contact system

Voltage Range:

up to 850V DC
(depends on the mating plug)

Operation Temperature:

-40 °C up to 140 °C

Current Carrying Capacity:

40A at 85 °C

IP Rating:

Plugged: IP67, IP6k9k

Unplugged: IP2XB

HVIL:

Integrated, internal

Fire Classification:

HB

Vibration Level:

AK Severity 2 (Body-Sealed)

Shielding:

360 deg

Available Shielding:

Tin/Silver

Available Keys:

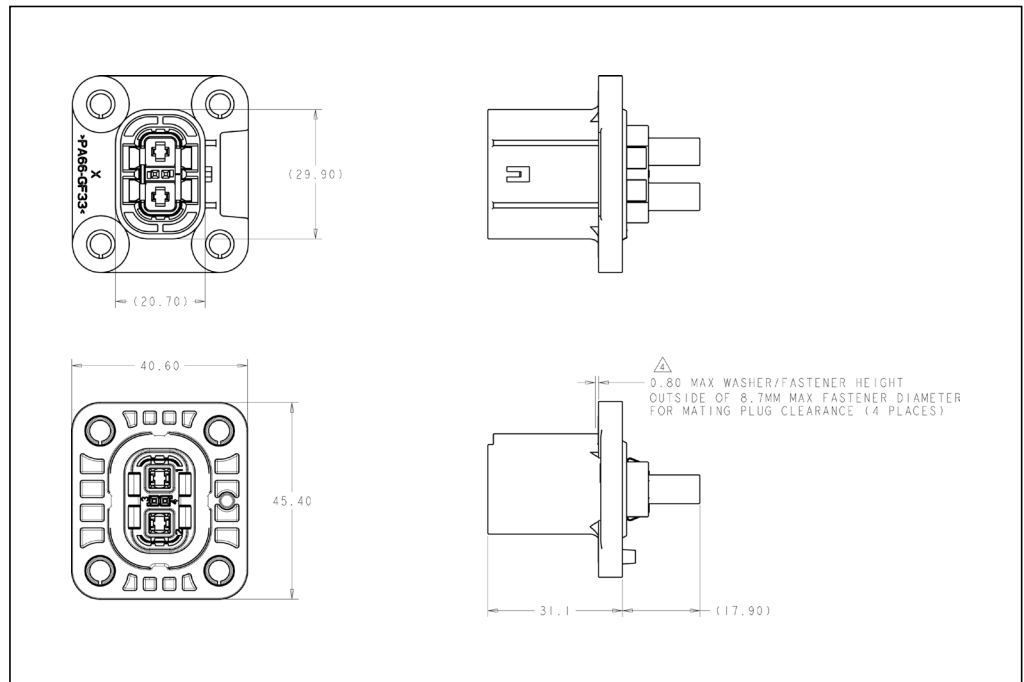
A,B,D,E,F

Product Specification:

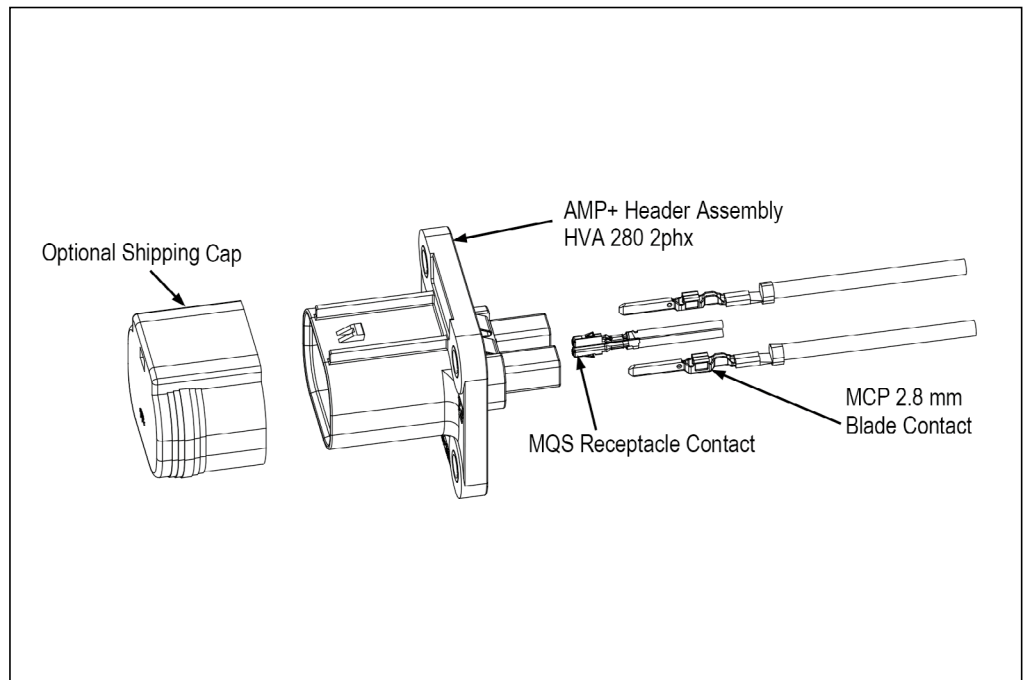
108-32020

Instruction Sheet:

408-10441



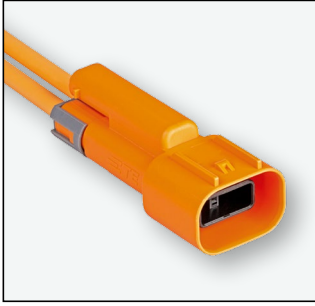
Drawing 2103124 *



Mating Plugs

page 3, 4, 5, 6

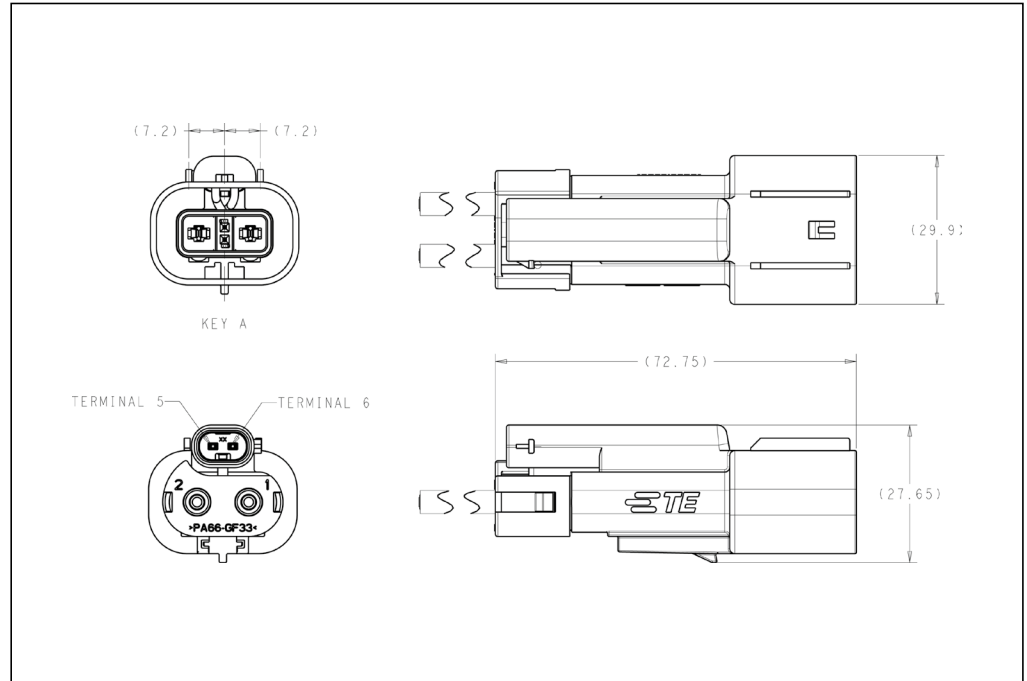
* Drawing Number is NOT the Order Number! For interface requirements please refer to product drawing.



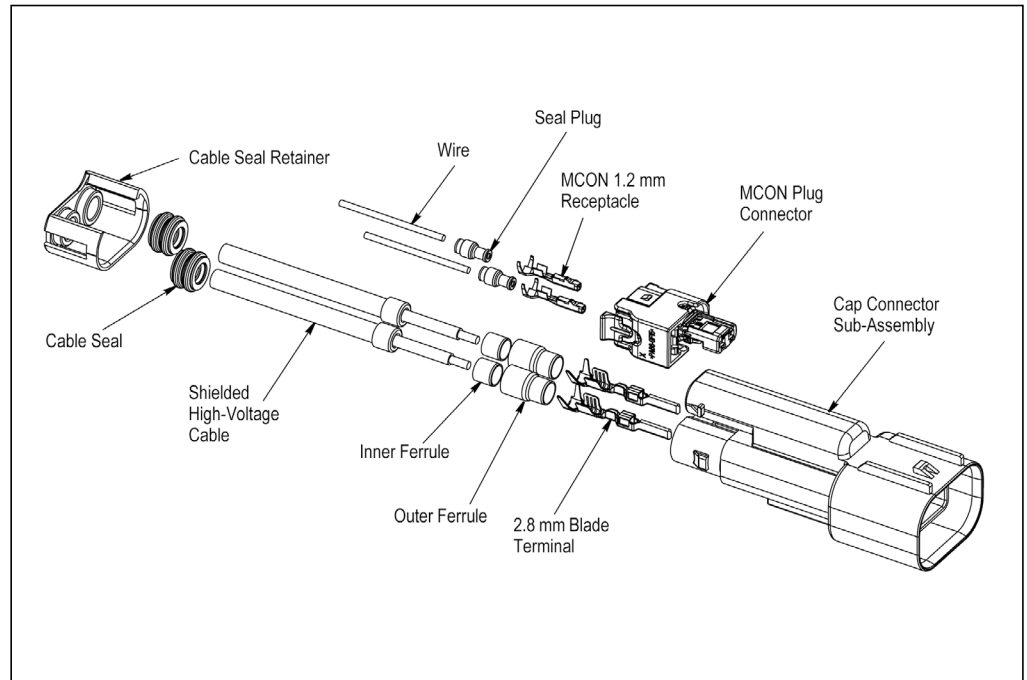
AMP+ HVA 280 - 2 phi - Inline Cap

Technical Features

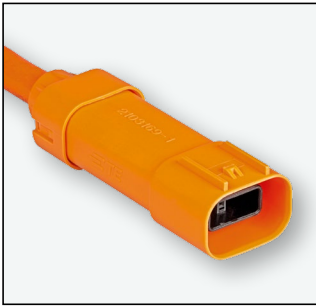
- Pin Number:**
2 (+2 HVIL)
- Contact System:**
2.8 mm AMP MCP contact system
- Conductor Cross-sections:**
2 x 3.0 mm² or 2 x 4.0 mm²
- Voltage Range:**
600 V
- Operation Temperature:**
-40 °C up to 125 °C
- Current Carrying Capacity:**
40A at 85 °C
- IP Rating:**
Plugged: IP67, IP6k9k
Unplugged: IP2XB
- HVIL:**
Integrated, external
- Fire Classification:**
HB
- Vibration Level:**
V1
- Shielding:**
360 deg
- Available Keys:**
A, B, D, E, F
- Product Specification:**
In progress
- Application Specification:**
114-32033



Drawing 2103220/2103221 *



* Drawing Number is NOT the Order Number!



AMP+ HVA 280 - 2 phm - Inline Cap

Technical Features

Pin Number:

2 (+2 HVIL)

Contact System:

2.8 mm AMP MCP contact system

Conductor Cross-sections:

2 x 4.0 mm² + 2 x 0.5 mm²,
multi-core shielded

Voltage Range:

850 VDC

Operation Temperature:

-40 °C up to 140 °C

Current Carrying Capacity:

33 A at 85°C

IP Rating:

Plugged: IP67, IP6k9k

Unplugged: IP2XB

HVIL:

Integrated, internal

Fire Classification:

HB

Vibration Level:

V1

Shielding:

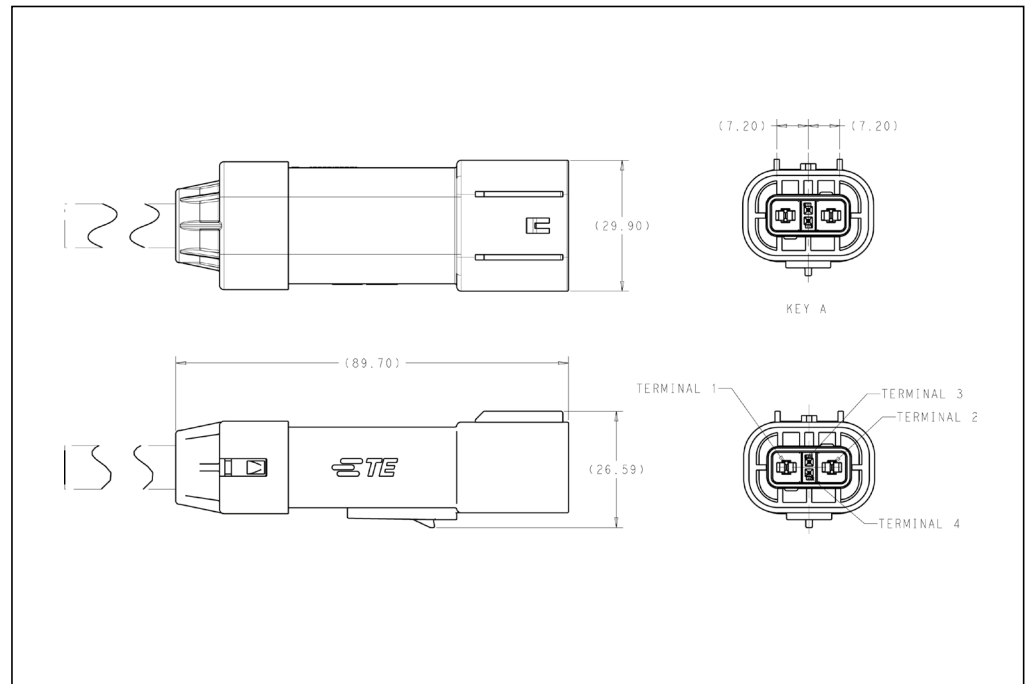
360 deg

Available Keys:

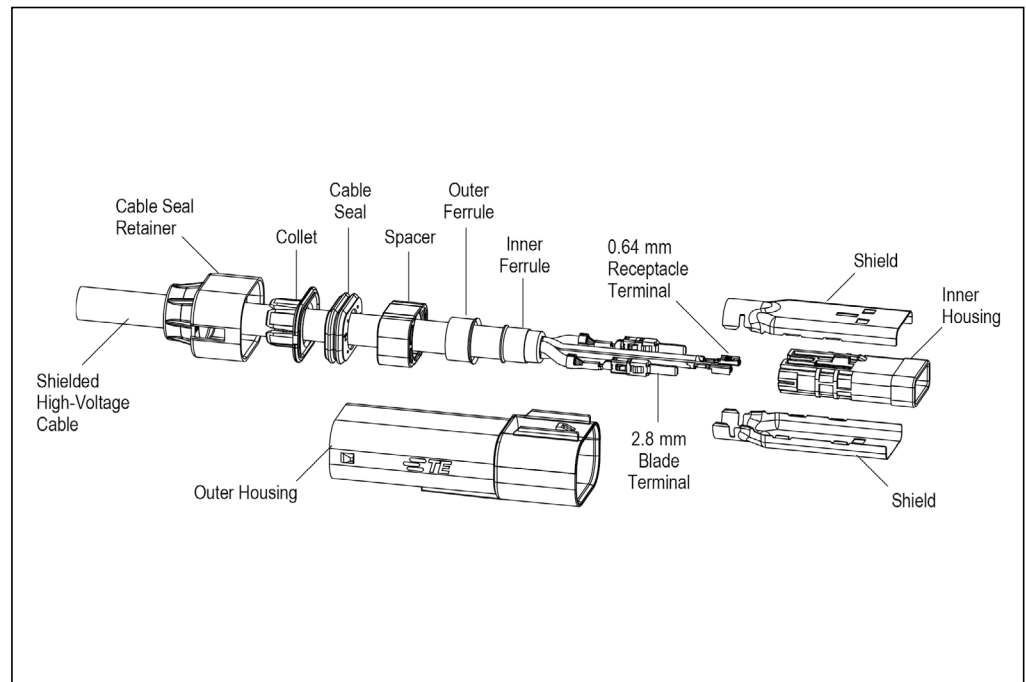
A, B, D, E, F

Application Specification:

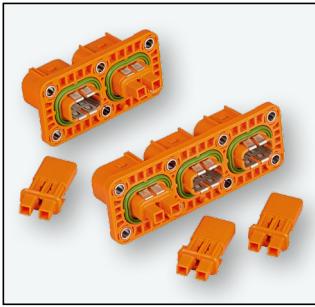
114-32034



Drawing 2103219 *



* Drawing Number is NOT the Order Number!



AMP+ HVA 280 – 2phi/3phi Multi-Bay Plastic (Discrete) Header

Technical Features

Pin Number:

For 2-bay header 2x (2+2 HVIL) or 6 (depends on selection of inner housing)
 For 3-bay header 3x (2+2 HVIL) or 9 (depends on selection of inner housing)

Contact System:

2.8 mm AMP MC

Conductor Cross-Sections:

4 mm²

Voltage Range:

up to 850V DC
 (depends on the mating plug)

Operation Temperature:

-40°C up to +125 °C

Current Carrying Capacity:

up to 40 A @ 85 °C
 (depends on the mating plug)

IP Rating:

Plugged: IP67, IP6k9k
 Unplugged: IP2XB

HVIL:

./.

Fire Classification:

HB

Vibration Level:

V1

Shielding:

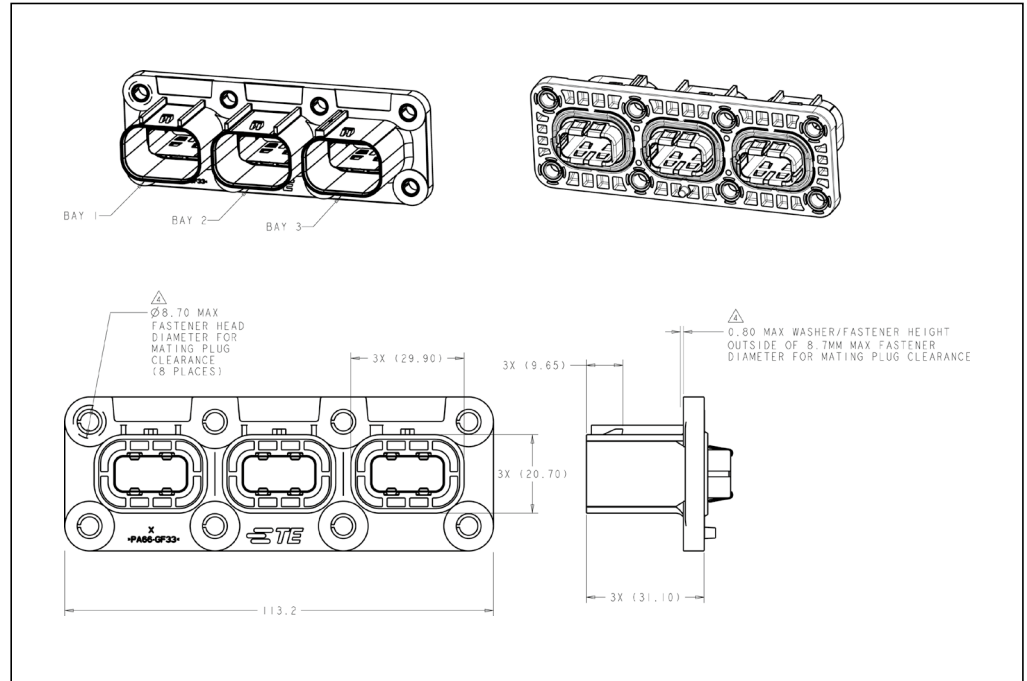
360 deg

Available Keys:

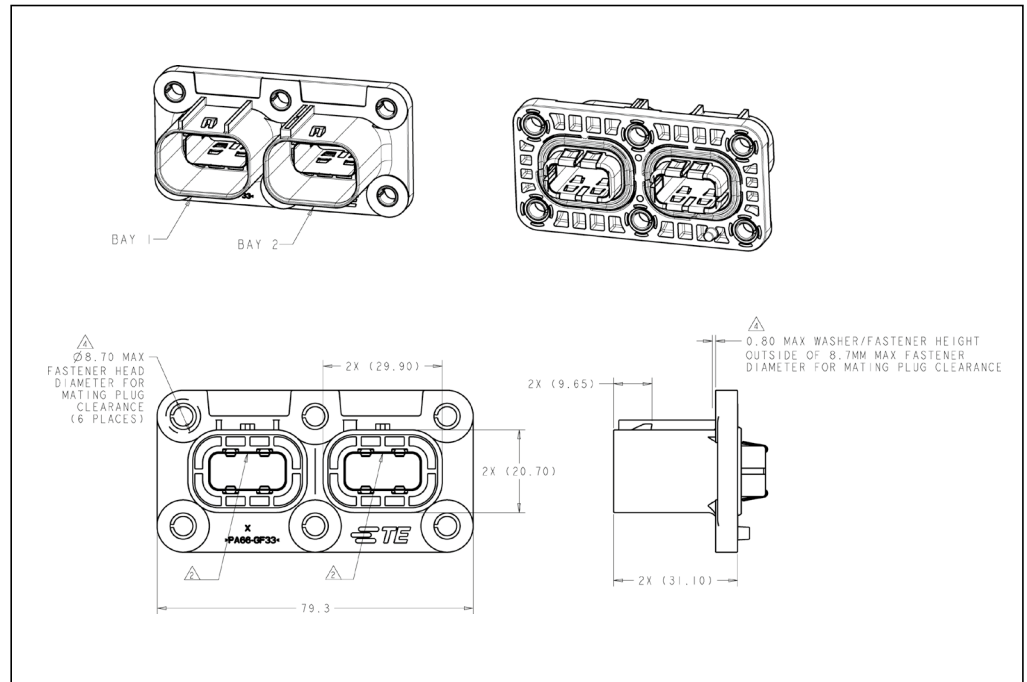
For 2 bay header
 Option 1 A, E
 Option 2 D, F
 For 3 bay header
 A, D, E

Inner Housing

For 2 positions 2103245-X
 For 3 positions 2103321-X



Drawing 2103340 *



Drawing 2103346 *

Mating Plugs

2P Header	page 3, 4, 5, 6
3P Header	page 12, 13

* Drawing Number is NOT the Order Number! For interface requirements please refer to product drawing.

Technical Features

Pin Number:
3

Contact System:
2.8 mm AMP MCP

Conductor Cross-Sections:
2 x 4.0 mm² + 3 x 2.5 mm²,
multi-core shielded

Voltage Range:
850V DC

Operation Temperature:
-40 °C up to 140 °C

Current Carrying Capacity:
24 A @ 85°C

IP Rating:
Plugged: IP67, IP6k9k
Unplugged: IP2xB

HVIL:
. / .

Fire Classification:
HB

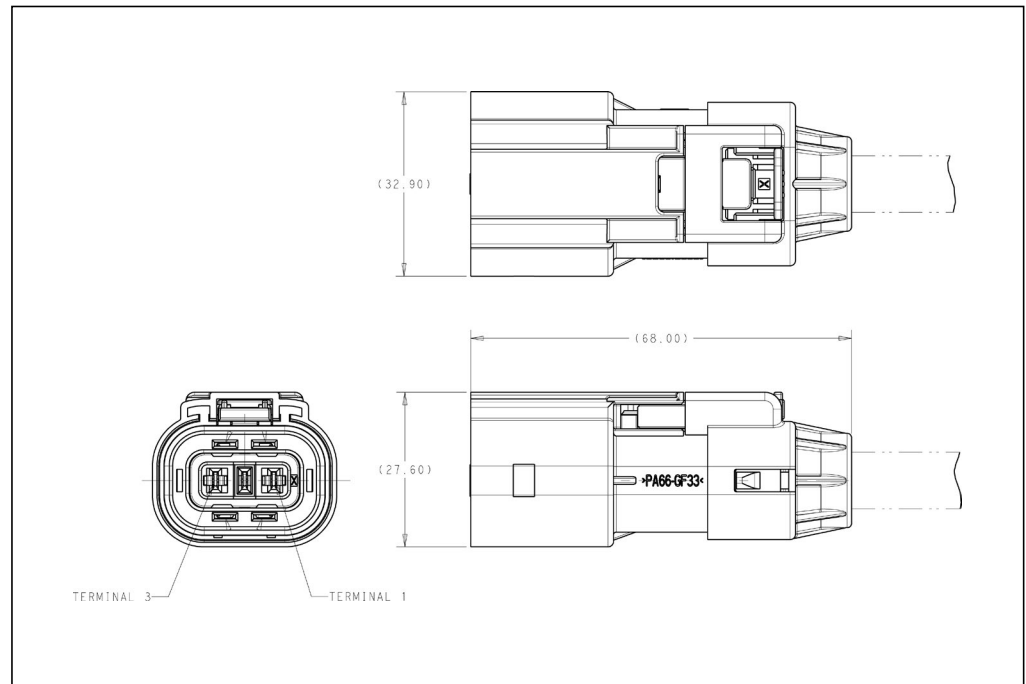
Vibration Level:
V1

Available Keys:
A, B, D, E, F, and AK Severity 2
(Body-Sealed)

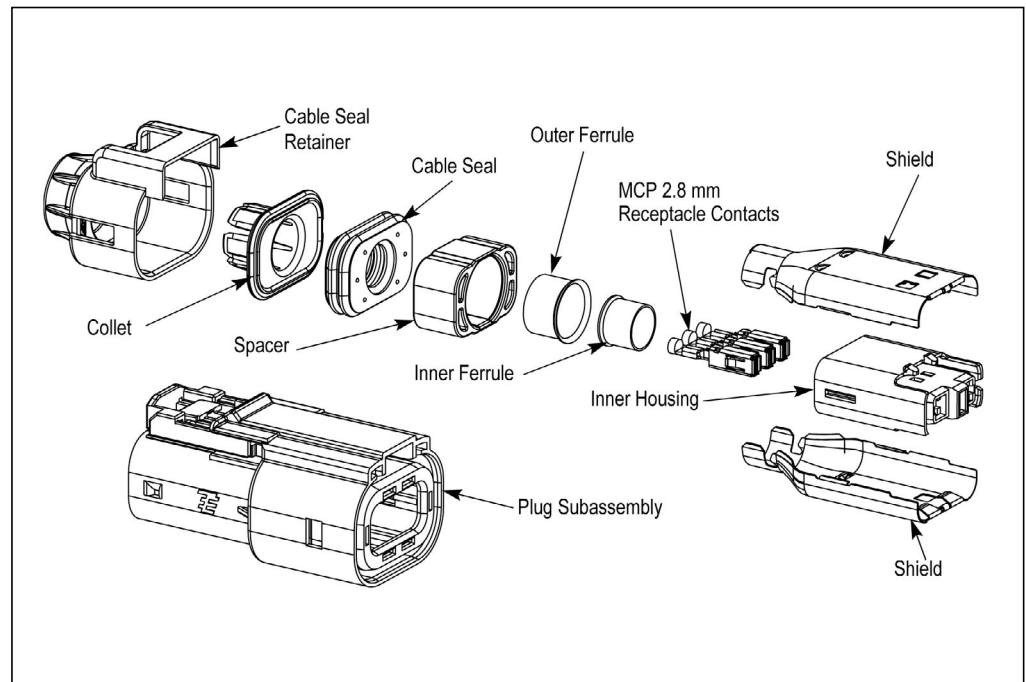
Product Specification:
108-32020

Application Specification:
114-32056

AMP+ HVA 280 3PXM – XE Plug



Drawing 2103309 *



* Drawing Number is NOT the Order Number!



AMP+ HVA 280 3PXM – XE Plug (Single Click)

Technical Features

Pin Number:

3

Contact System:

2.8 mm AMP MCP

Conductor Cross-Sections:

2 x 4.0 mm² + 3 x 2.5 mm²,
 multi-core shielded

Voltage Range:

850V DC

Operation Temperature:

-40 °C up to 140 °C

Current Carrying Capacity:

24 A @ 85°C

IP Rating:

Plugged: IP67, IP6k9k

Unplugged: IP2xB

HVIL:

./.

Fire Classification:

HB

Vibration Level:

V1

Available Keys:

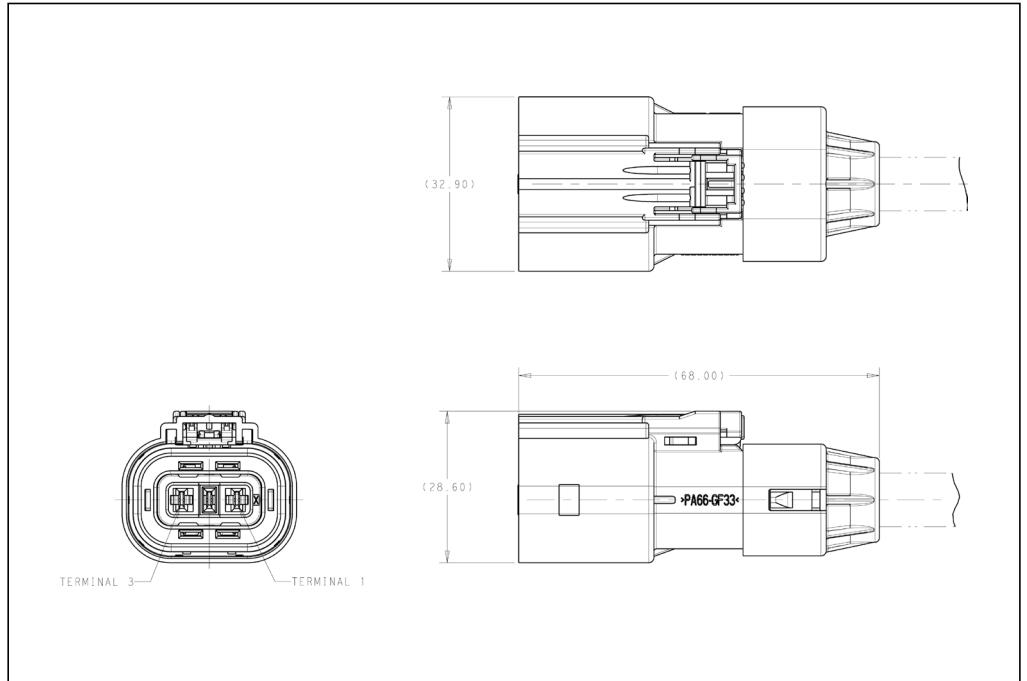
A, B, D, E, F

Product Specification:

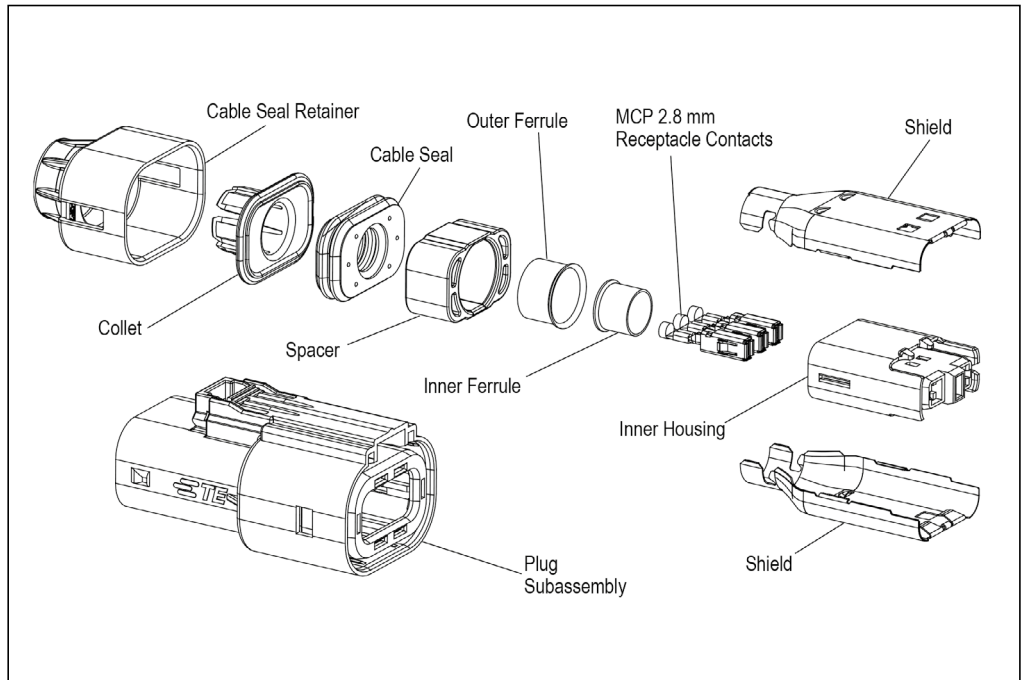
108-32077

Application Specification:

114-32125



Drawing 2103533 *

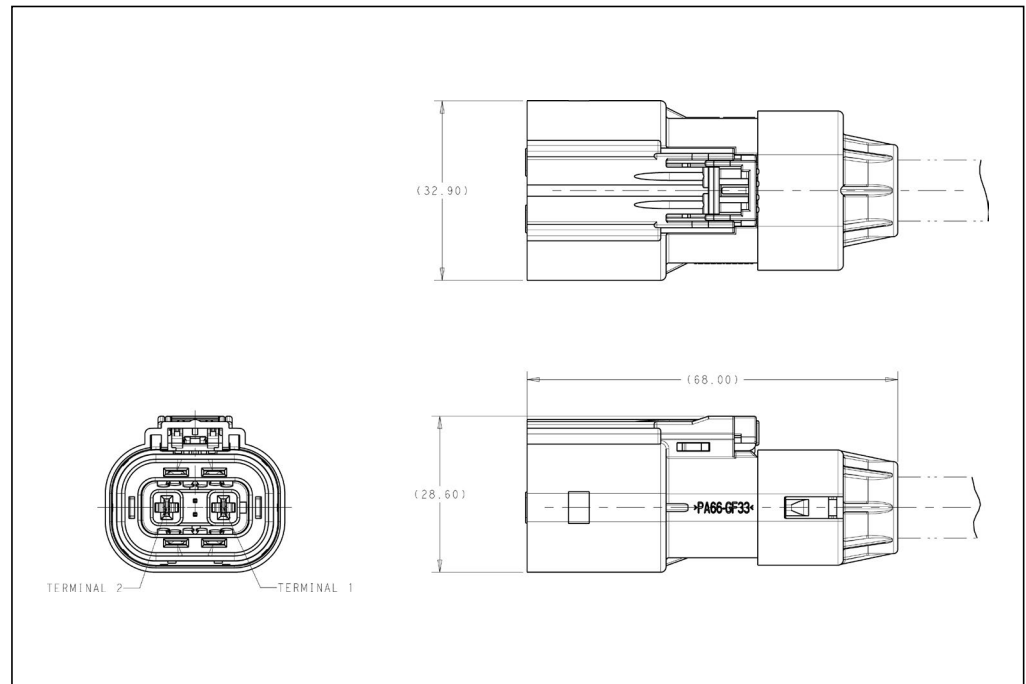


* Drawing Number is NOT the Order Number!

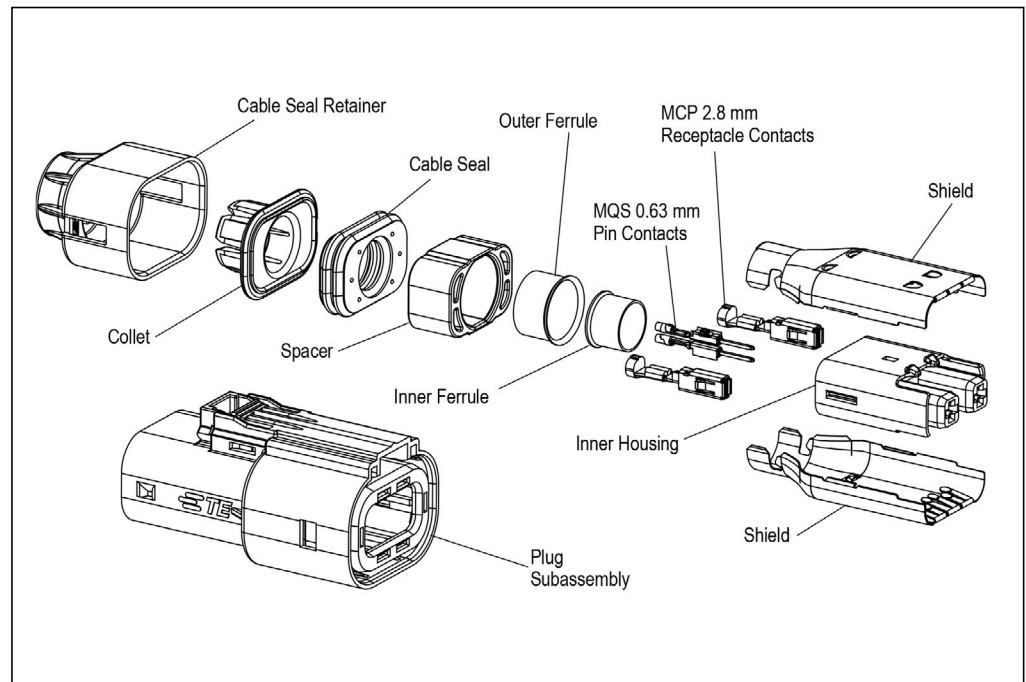
Technical Features

- Pin Number:**
2(+2 HVIL)
- Contact System:**
2.8 mm AMP MCP
- Conductor Cross-Sections:**
2x4.0 mm² + 2x0.5 mm²,
mult-core shielded
- Voltage Range:**
850V DC
- Operation Temperature:**
-40 °C up to 140 °C
- Current Carrying Capacity:**
33A at 85 °C
- IP rating:**
Plugged: IP67, IP6k9k
Unplugged: IP2XB
- HVIL:**
Integrated, internal
- Fire Classification:**
HB
- Vibration Level:**
AK Severity 2 (body-sealed)
and V1
- Product Specification:**
108-32077
- Application Specification:**
114-32124
- Available Keys:**
A, B, D, E, F

AMP+ HVA 280 2PHM Pass-Through Plug (Single Click)



Drawing 2103531 *

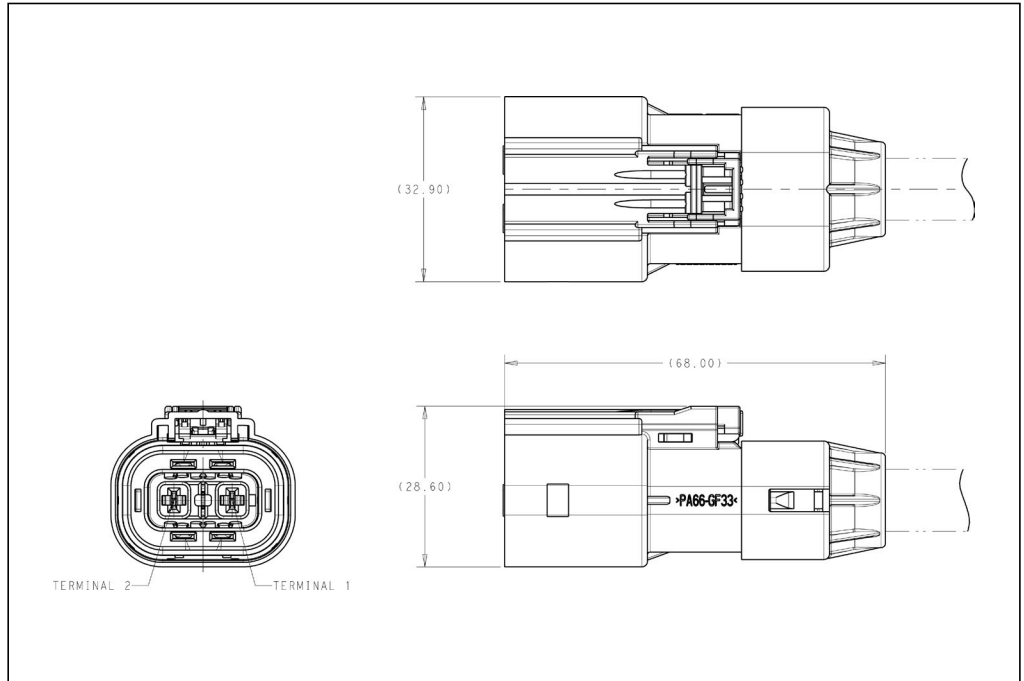


* Drawing Number is NOT the Order Number!

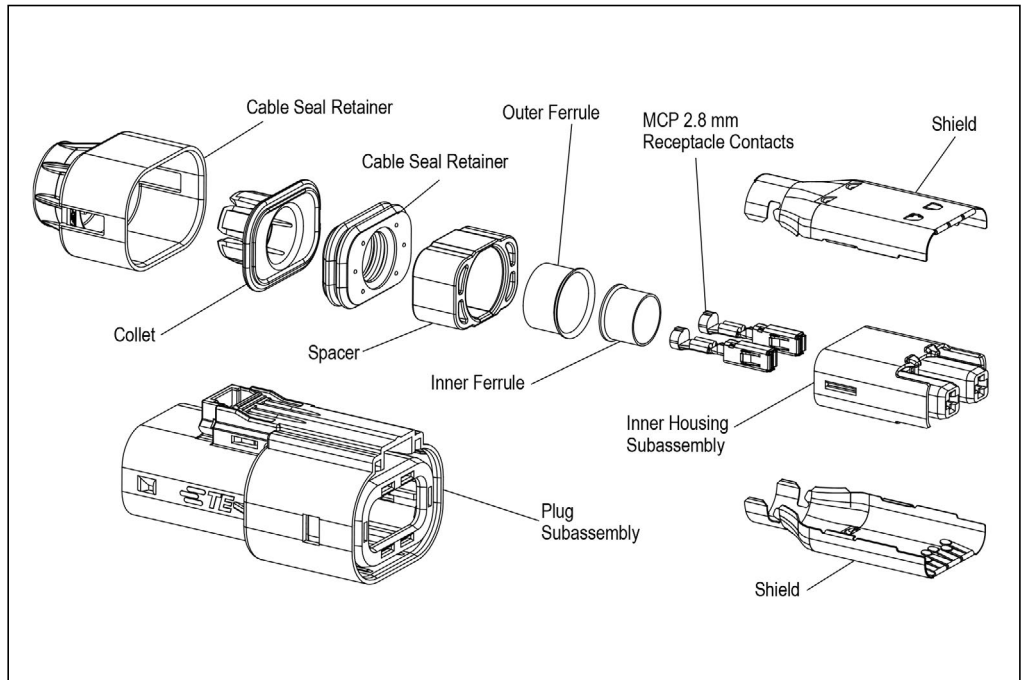
Technical Features

- Pin Number:**
2 (+2 HVIL)
- Contact System:**
2.8 mm AMP MCP
- Conductor Cross-Sections:**
2x4.0 mm², multi-core shielded
- Voltage Range:**
850V DC
- Operation Temperature:**
-40 °C up to 140 °C
- Current Carrying Capacity:**
33A at 85 °C
- IP rating:**
Plugged: IP67, IP6k9k
Unplugged: IP2XB
- HVIL:**
Integrated, internal
- Fire Classification:**
HB
- Vibration Level:**
AK Severity 2 (body-sealed)
and V1
- Product Specification:**
108-32077
- Application Specification:**
114-32123
- Available Keys:**
A, B, D, E, F

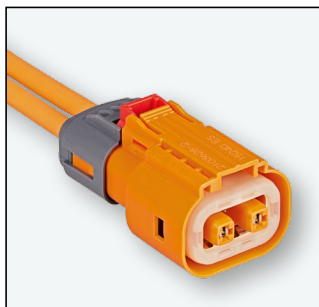
AMP+ HVA 280 2PHM Shunted Plug (Single Click)



Drawing 2103532 *



* Drawing Number is NOT the Order Number!



AMP+ HVA 280 2PHI XE Plug

Technical Features

Pin Number:

2 (+2 HVIL)

Contact System:

2.8 mm AMP MCP

Conductor Cross-Sections:

3.0 mm² and 4.0 mm²,
individually shielded

Voltage Range:

600V DC

Operation Temperature:

-40 °C up to 125 °C

Current Carrying Capacity:

40A at 85 °C

IP rating:

Plugged: IP67, IP6k9k

Unplugged: IP2XB

HVIL:

Integrated, internal

Fire Classification:

HB

Vibration Level:

V1

Product Specification:

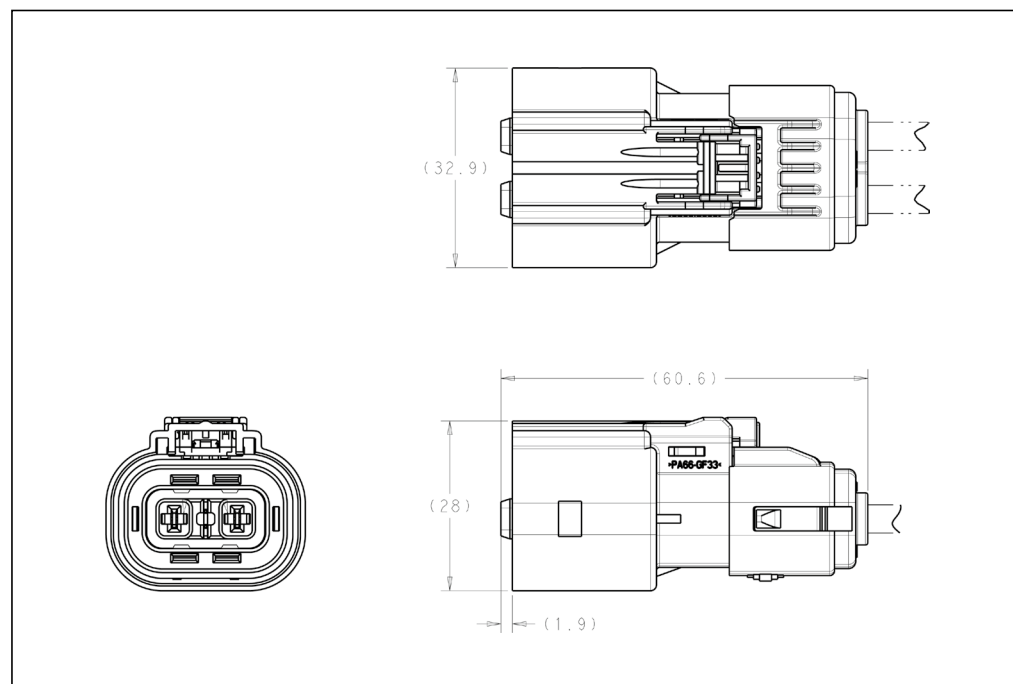
tbd

Application Specification:

tbd

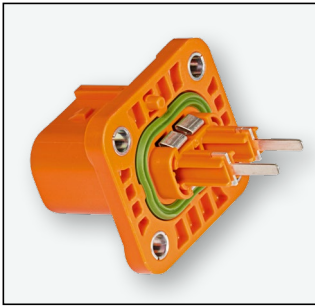
Available Keys:

A, B, D, E, F, G



Drawing 2103749 *

* Drawing Number is NOT the Order Number!



AMP+ HVA 280 2P Header – Stitched

Technical Features

Pin Number:

2 (+2 HVIL)

Contact System:

2.8mm AMP MCP

Conductor Cross-Sections:

4 mm²

Tab Size:

0.8 x 2.8 mm

Voltage Range:

up to 850V DC
(depends on the mating plug)

Operation Temperature:

-40 °C up to 140 °C

Current Carrying Capacity:

40A at 85 °C

IP rating:

Plugged: IP67, IP6k9k
Unplugged: IP2XB

HVIL:

Integrated, internal

Fire Classification:

HB

Vibration Level:

V1

Product Specification:

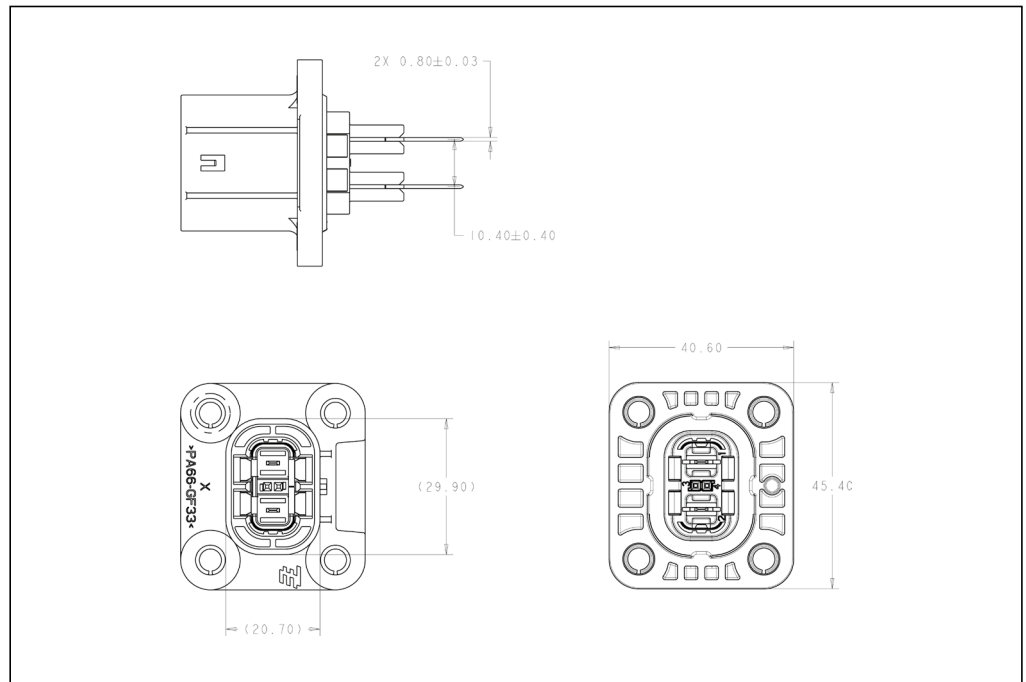
tbd

Application Specification:

408-10441

Available Keys:

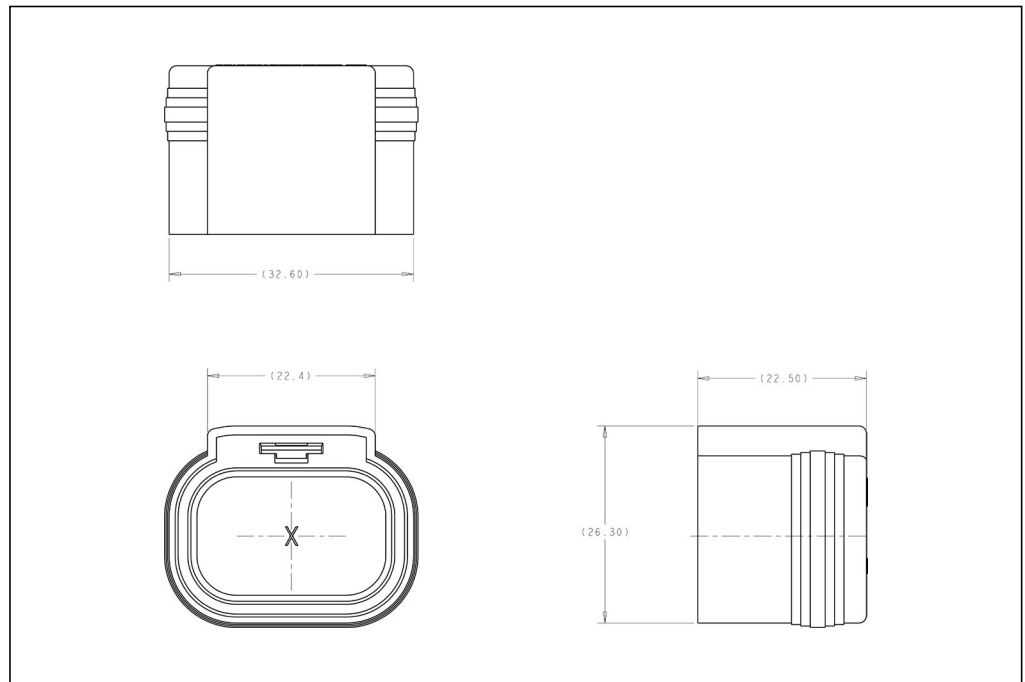
A, B, D, E, F



Drawing 2103396 *

* Drawing Number is NOT the Order Number!

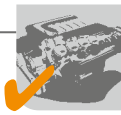
AMP+ HVA 280 Shipping Caps



Drawing 1587733 *
Shipping caps fit TE standard headers

* Drawing Number is NOT the Order Number!

POWERTRAIN SYSTEMS



SAFETY & SECURITY SYSTEMS



CONVENIENCE



DRIVER INFORMATION



BODY & CHASSIS SYSTEMS



AMP+ HVA 630 2-Position

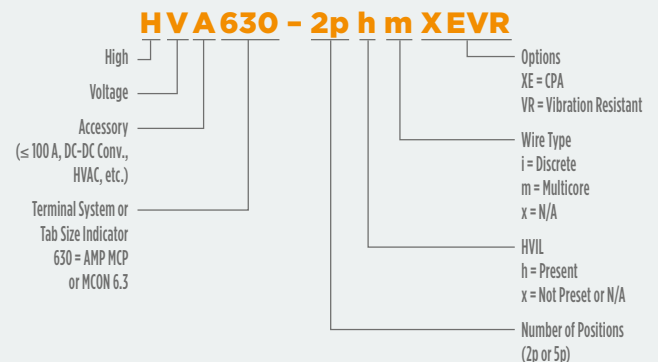
INTRODUCTION

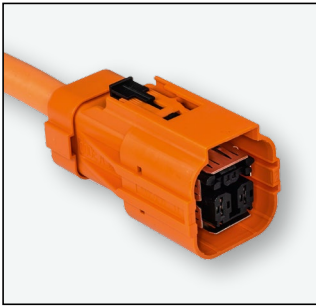
The AMP+ HVA 630 product family is touch-safe and provides CPA (Connector Position Assurance), as well as HVIL (High Voltage Interlock) functionality.

High-voltage applications like onboard chargers (OBC) typically required sealed and shielded two-position DC connectors and headers. Therefore, TE Connectivity has developed the AMP+ HVA 630 product family.

The standard contact system AMP MCP 6.3/4.8 is a well-proven contact system in the industry. The shielded multicore wire is designed for conductor cross-section from 2.5 up to 6.0 mm². This allows currents of 40 A at 140°C ambient temperature and voltages of up to 850V DC.

Naming Convention HVA 630 Connector Family





AMP+ HVA 630 2phm - Plug

Technical Features

Pin Number:

2 (+2 HVIL)

Contact System:

AMP MCP 6.3 / 4.8 contact system

Conductor Cross-sections:

2.5 mm² - 6.0 mm²
from LV216-2

Voltage Range:

850 V DC

Operation Temperature:

-40 °C up to 140 °C

Current Carrying Capacity:

40A @ 140 °C ambient temperature

IP Rating:

Plugged: IP6k7, IP6k9k

Unplugged: IP2XB

HVIL:

Bridged in the connector

CPA:

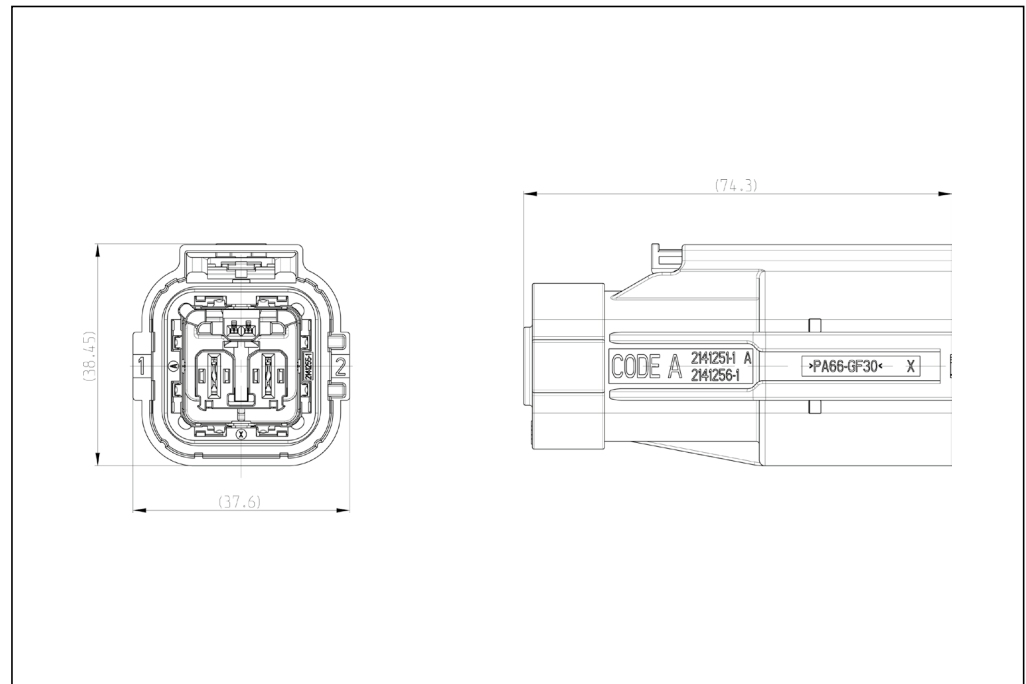
Yes

Product Specification:

108-94264

Application Specification:

114-94100



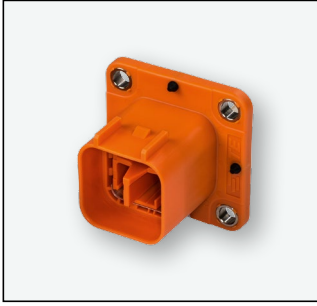
Drawing 114-94100-1 *

AMP+ HVA630 2phm - Plug

Version (Cable Dimension)	Coding	With CPA	Order Information
2.0 x 4.0 mm ²	A	✓	To be Ordered see drawing!
released	F	✓	
2.0 x 6.0 mm ²	A	✓	
released			

Intelligent Plug	Order Information
The HVA 630 Intelligent Plug is an high voltage connector, which acts as an blind plug. The Intelligent Plug includes no power contacts. Its function is limited to act as shunt of the HVIL contacts, to shield and seal the system	To be Ordered see drawing!

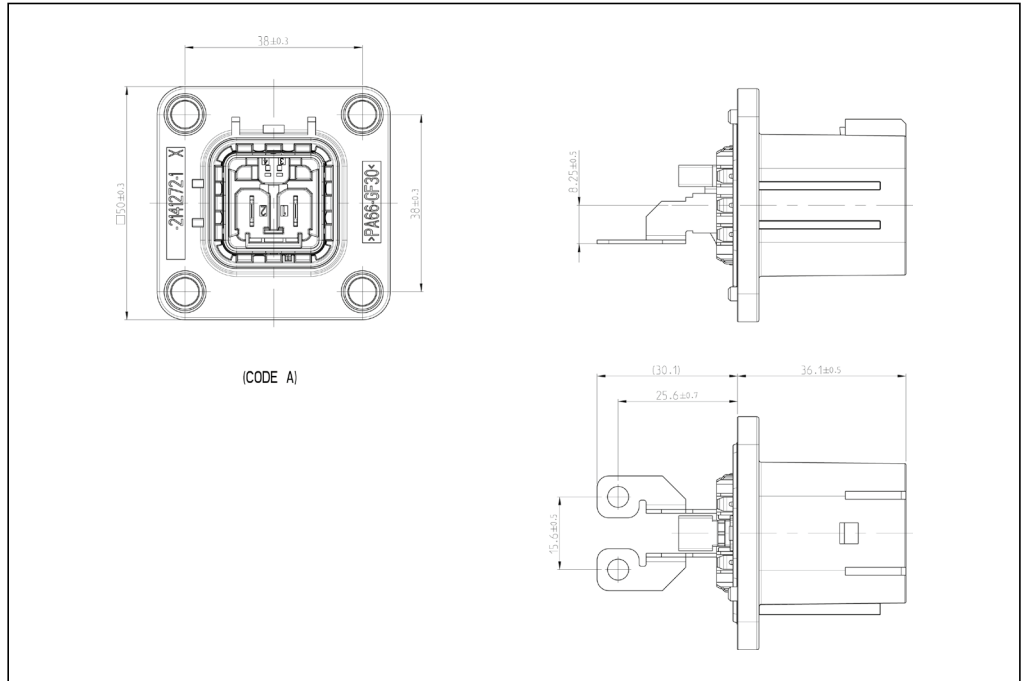
* Drawing Number is NOT the Order Number!



AMP+ HVA 630 2phi - Header

Technical Features

- Pin Number:**
2 (+2 HVIL)
- Contact System:**
AMP MCP 6.3 / 4.8 contact system
- Conductor Cross-sections:**
2.5 mm² - 6.0 mm²
from LV216-2
- Voltage Range:**
850 V DC
- Operation Temperature:**
-40 °C up to 140 °C
- Current Carrying Capacity:**
40A @ 140 °C ambient temperature
- IP Rating:**
Plugged: IP6k7, IP6k9k
Unplugged: IP2XB
- HVIL:**
Bridged in the connector
- CPA:**
Yes
- Interface Drawing:**
114-94036
- Interface Drawing Adapter Plate:**
114-94037
- Product Specification:**
108-94264
- Application Specification:**
114-94100

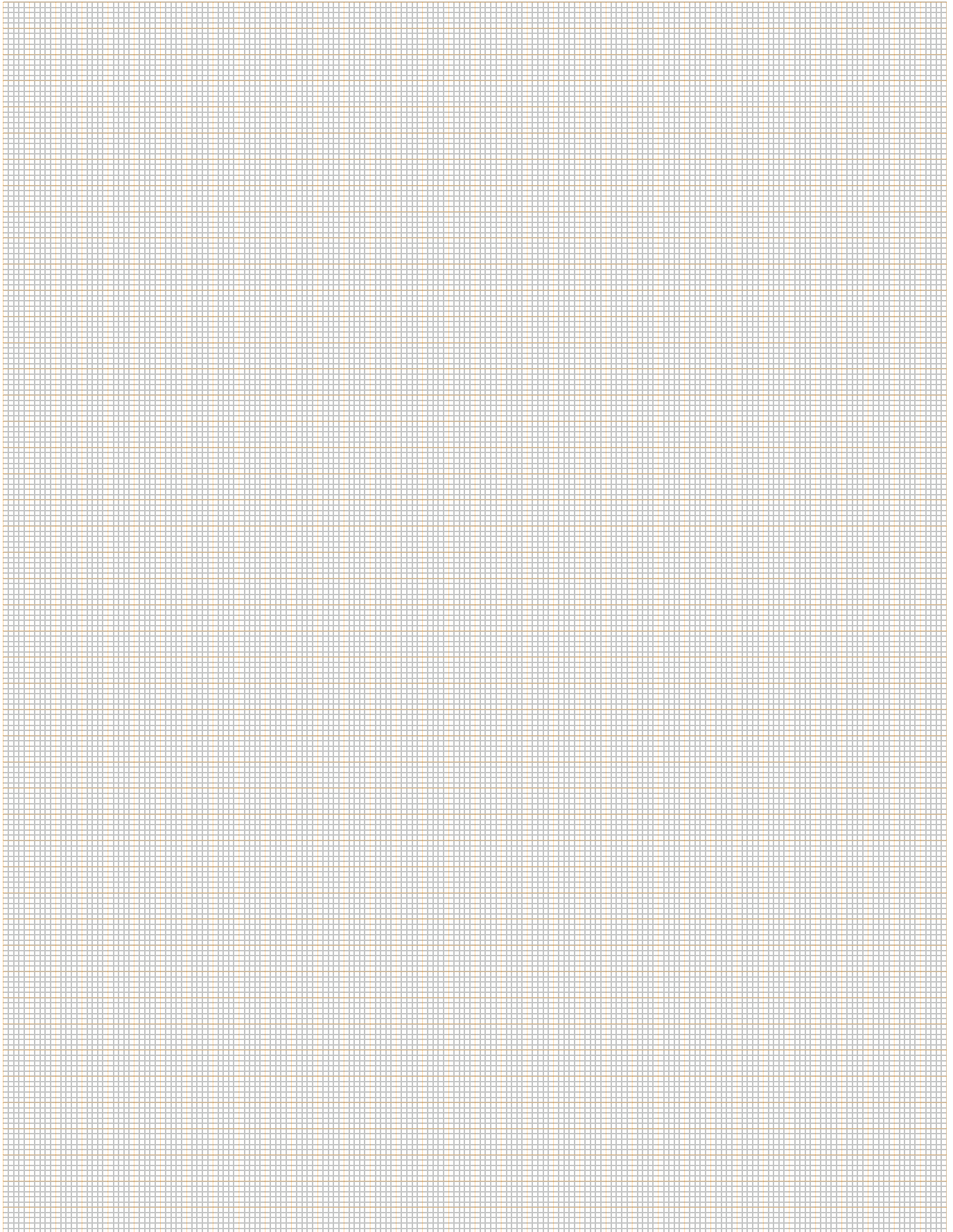


Drawing 2141272 *

AMP+ HVA630 2phi - Header

	Coding	Order Information
HVA 630 - 2p Header	A	To be Ordered see drawing!
	F	

* Drawing Number is NOT the Order Number!



POWERTRAIN SYSTEMS



SAFETY & SECURITY SYSTEMS



CONVENIENCE



DRIVER INFORMATION



BODY & CHASSIS SYSTEMS



AMP+ HVA 630 5-Position

INTRODUCTION

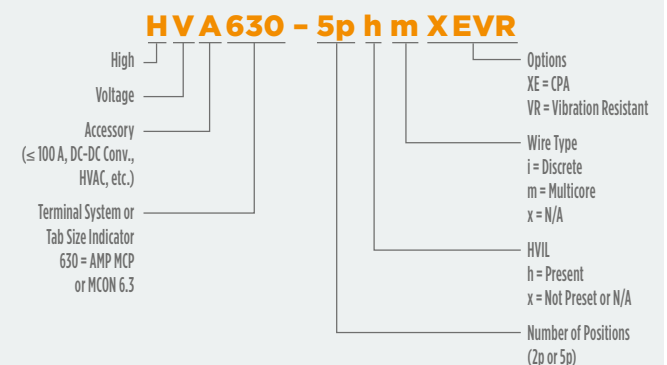
The AMP+ HVA 630 5-position connector allows for a three-phase charging current of 32 A and meets the relevant IEC62196-2 type 2 standard for a maximum charging capacity of 22 kW.

The increasing battery capacity of plug-in hybrid and electric vehicles requires a higher amount of charging power to make charging times of less than four hours possible.

The connector provides finger protection and is designed for multi-shielded 360°, includes High Voltage Interlock functionality and is based on synthetic material with VO inflammability Classification.

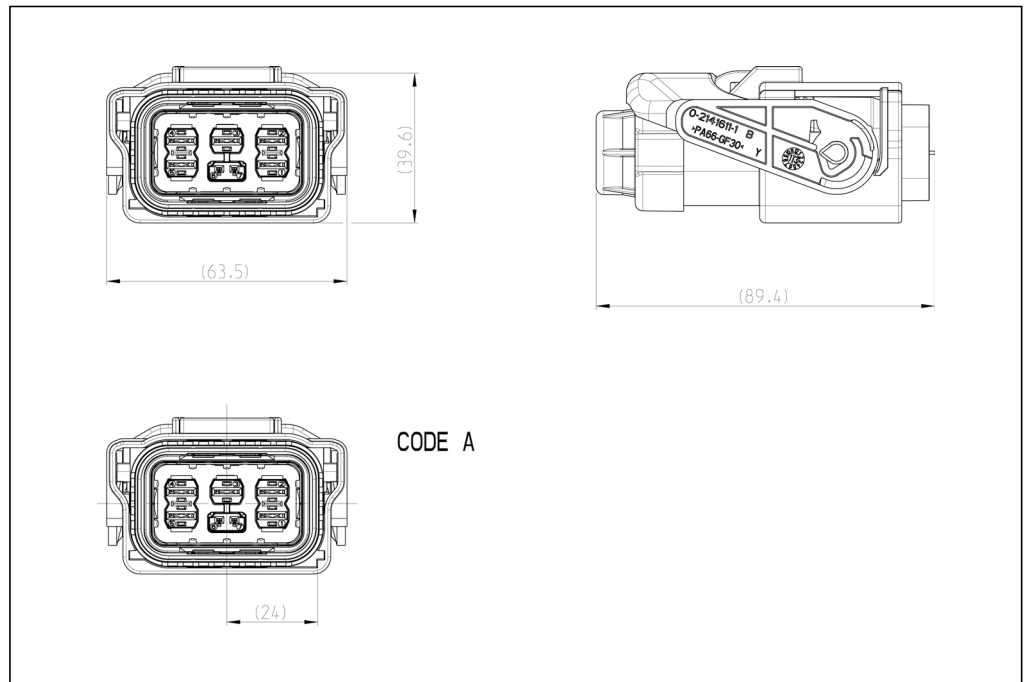
Due to its lever control, the necessary mating forces is less than 70 N.

Naming Convention HVA 630 Connector Family





AMP+ HVA 630 5phm - Plug



Drawing 114-94114-1 *

Technical Features

Pin Number:

5 (+2 HVIL)

Contact System:

AMP MCP 6.3 / 4.8 contact system

Conductor Cross-sections:

4.0 mm² and 6.0 mm², according to LV216-2

Voltage Range:

750 V DC

Operation Temperature:

-40 °C up to 140 °C

Current Carrying Capacity:

32A @ 140 °C

ambient temperature

IP Rating:

Plugged: IP6k7, IP6k9k

Unplugged: IP2XB

HVIL:

Bridged in the connector

CPA:

Yes

Fire Classification:

VO

Vibration Level:

VL2

Product Specification:

108-94235

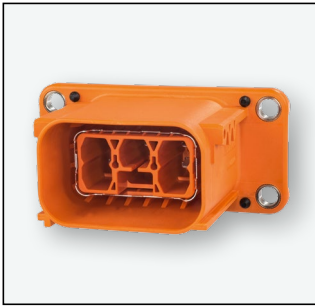
Application Specification:

114-94114

AMP+ HVA630 5phm - Plug

Version (Cable Dimension)		Coding	With CPA	Without CPA	Order Information
5.0 x 6.0 mm ²	released	A	✓		To be Ordered see drawing!
		A		✓	
4.0 x 4.0 mm ²	released	A	✓		
		A		✓	
3.0 x 4.0 mm ²	released	A	✓		
		A		✓	
3.0 x 6.0 mm ²	In planning				
4.0 x 6.0 mm ²					

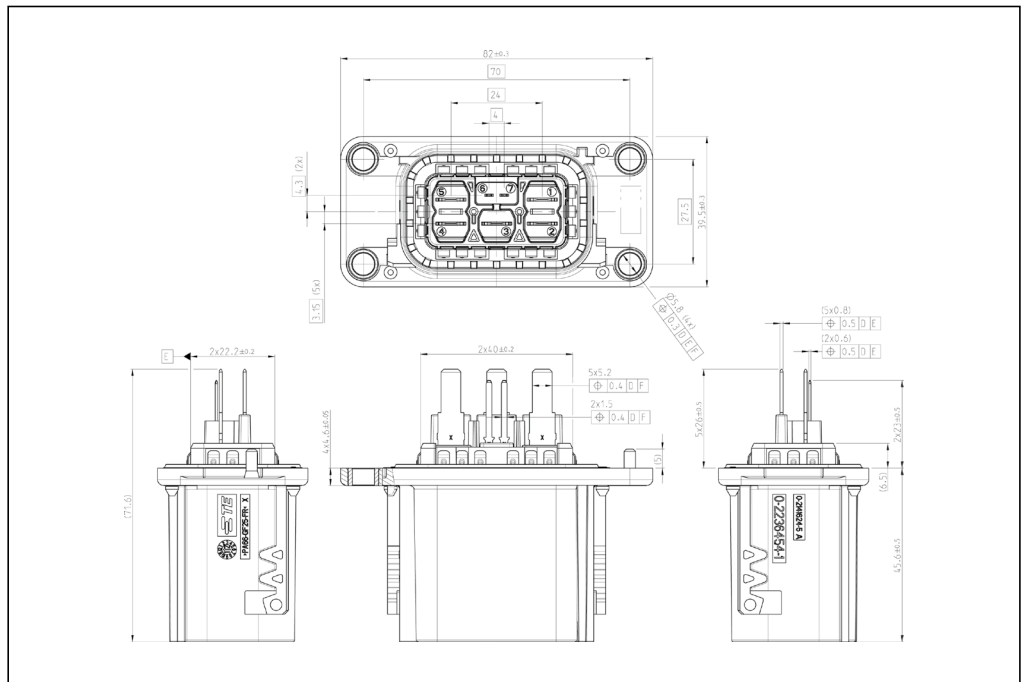
* Drawing Number is NOT the Order Number!



AMP+ HVA 630 5phx - Header, 180° Tabs

Technical Features

- Pin Number:**
5 (+2 HVIL)
- Contact System:**
AMP MCP 6.3 / 4.8 contact system
- Conductor Cross-sections:**
4.0 mm² and 6.0 mm²,
according to LV216-2
- Voltage Range:**
750 V DC
- Operation Temperature:**
-40 °C up to 140 °C
- Current Carrying Capacity:**
32A @ 140 °C
ambient temperature
- IP Rating:**
Plugged: IP6k7, IP6k9k
Unplugged: IP2XB
- HVIL:**
Bridged in the connector
- CPA:**
Yes
- Fire Classification:**
VO
- Vibration Level:**
VL2
- Interface Drawing:**
114-94099
- Interface Drawing Adapter Plate:**
114-94279
- Product Specification:**
108-94235
- Application Specification:**
114-94114



Drawing 2236454 *

AMP+ HVA630 5phx - Header, 180° Tabs

	Coding	Order Information
HVA 630 - 5p - Header	A	To be Ordered see drawing!

* Drawing Number is NOT the Order Number!



AMP+ HVA 630 5phx - Header, 90° Tabs

Technical Features

Pin Number:

5 (+2 HVIL)

Contact System:

AMP MCP 6.3 / 4.8 contact system

Conductor Cross-sections:

4.0 mm² and 6.0 mm²,
 according to LV216-2

Voltage Range:

750 V DC

Operation Temperature:

-40 °C up to 140 °C

Current Carrying Capacity:

32A @ 140 °C

ambient temperature

IP Rating:

Plugged: IP6k7, IP6k9k

Unplugged: IP2XB

HVIL:

Bridged in the connector

CPA:

Yes

Fire Classification:

VO

Vibration Level:

VL2

Interface Drawing:

114-94099

Interface Drawing Adapter Plate:

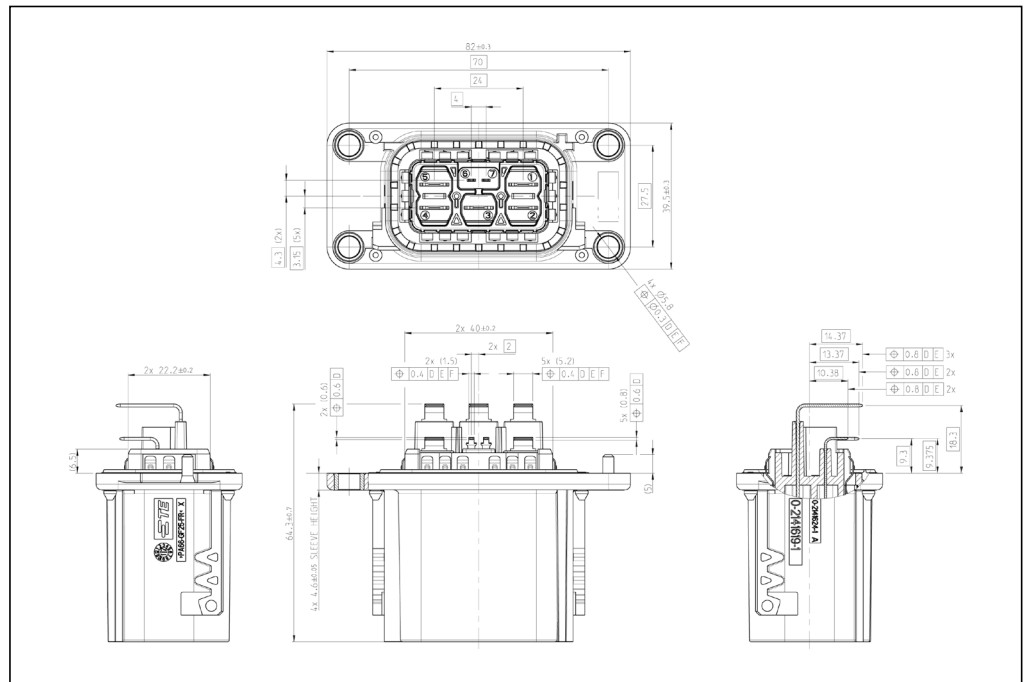
114-94279

Product Specification:

108-94235

Application Specification:

114-94114



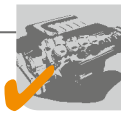
Drawing 2141619 *

AMP+ HVA630 5phx - Header, 90° Tabs

	Coding	Order Information
HVA 630 - 5p - Header	A	To be Ordered see drawing!

* Drawing Number is NOT the Order Number!

POWERTRAIN SYSTEMS



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DRIVER INFORMATION



BODY & CHASSIS SYSTEMS

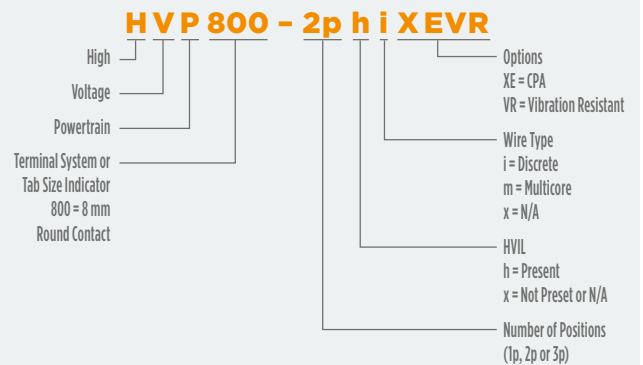


AMP+ HVP 800

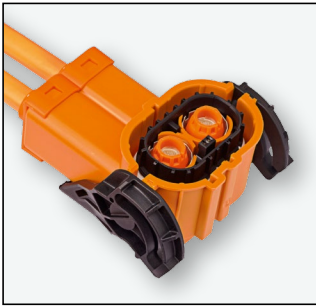
INTRODUCTION

Sealed and shielded pluggable connector for various applications in the e-mobility car infrastructure with up to 200A at 85° (depending on wire cross section). Used e.g. to connect HV battery and inverter or in charging applications.

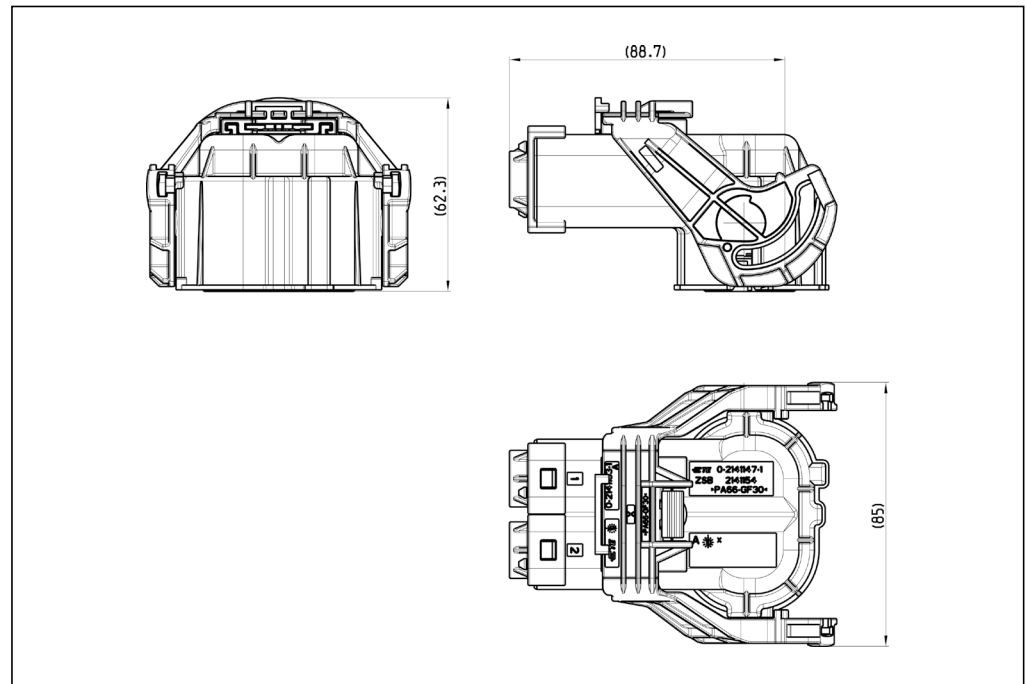
Naming Convention HVP 800 Connector Family



AMP+ HVP 800



AMP HVP 800 2phi XE Plug 90°



Drawing 2282334 *

Technical Features

Terminal Size/Style:

8.0 mm round contact

Contact System:

Plug & Header

Conductor Cross-sections:

25-50 mm²

Voltage Range:

650V / 850V

Operation Temperature:

-40 °C to 140 °C

Current Carrying Capacity:

200 AMP @ 85 °C

IP Rating:

Mated: IP6k9k

Unmated: IpxxB

Mated IPxxD

HVIL:

yes

CPA:

Shunted in plug (design allows for pass-through)

Fire Classification:

HB

Vibration Level:

2 (body mount)

Product Specification:

108-94268

Application Specification:

114-94052

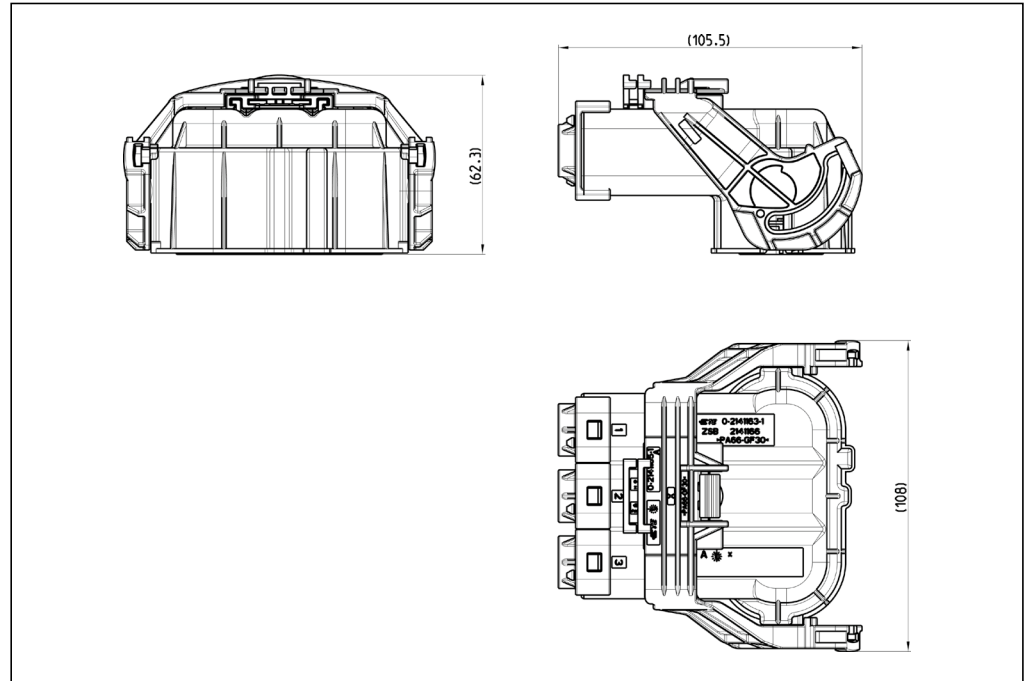
AMP HVP 800 2phi XE Plug 90 deg

Version (Cable Dimension)	Coding	With CPA	With Lever	Order Information
25 / 35 / 50 mm ² (acc. LV216-2)	A	✓	✓	To be Ordered see drawing!
	B	✓	✓	
	C	✓	✓	
	D	✓	✓	
16 mm ²				in planning

* Drawing Number is NOT the Order Number!



AMP HVP 800 3phi XE Plug 90°



Drawing 2282335 *

Technical Features

Terminal Size/Style:

8.0 mm round contact

Contact System:

Plug & Header

Conductor Cross-sections:

25-50 mm²

Voltage Range:

650V / 850V

Operation Temperature:

-40 °C to 140 °C

Current Carrying Capacity:

200 AMP@ 85 °C

IP Rating:

Mated: IP6k9k

Unmated: IpxxB

Mated IPxxD

HVIL:

yes

CPA:

Shunted in plug (design allows for pass-through)

Fire Classification:

HB

Vibration Level:

2 (body mount)

Product Specification:

108-94268

Application Specification:

114-94052

AMP HVP 800 3phi XE Plug 90 deg

Version (Cable Dimension)	Coding	With CPA	With Lever	Order Information
25 / 35 / 50 mm ² (acc. LV216-2)	A	✓	✓	To be Ordered see drawing!
	B	✓	✓	
	C	✓	✓	
	D	✓	✓	
16 mm ²	in planning			

* Drawing Number is NOT the Order Number!



AMP HVP 800 2phi XE Plug 180°

Technical Features

Terminal Size/Style:

8.0 mm round contact

Contact System:

Plug & Header

Conductor Cross-sections:

25-50 mm²

Voltage Range:

850V

Operation Temperature:

-40 °C to 140 °C

Current Carrying Capacity:

200 AMP @ 85 °C

IP Rating:

Mated: IP6k9k

Unmated: IpxxB

Mated IPxxD

HVIL:

yes

CPA:

Shunted in plug (design allows for pass-through)

Fire Classification:

HB

Vibration Level:

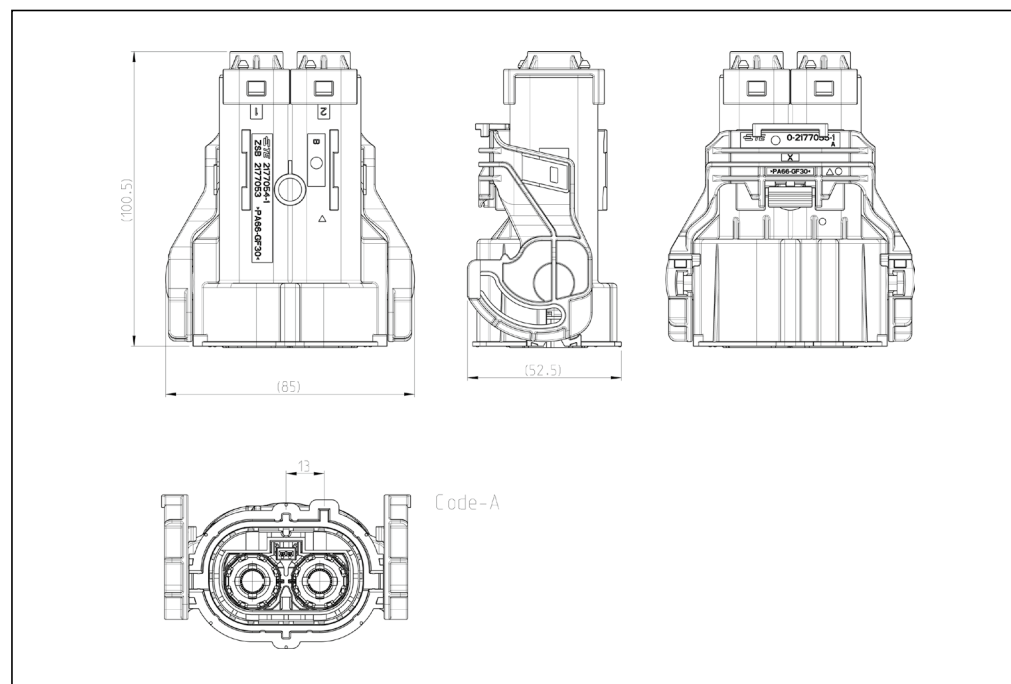
2 (body mount)

Product Specification:

108-94297

Application Specification:

114-94130

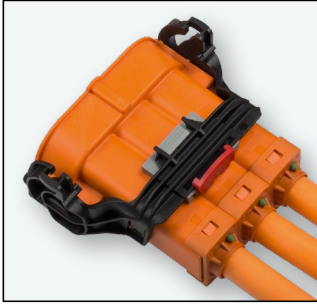


Drawing 2177052 *

AMP HVP 800 2phi XE Plug 180 deg

Version (Cable Dimension)	Coding	With CPA	With Lever	Order Information
25 / 35 / 50 mm ² (acc. LV216-2)	A	✓	✓	To be Ordered see drawing!
	B	✓	✓	
	C	✓	✓	
	D	✓	✓	
16 mm ²	in planning			

* Drawing Number is NOT the Order Number!



AMP HVP 800 3phi XE Plug 180°

Technical Features

Terminal Size/Style:
 8.0 mm round contact

Contact System:
 Plug & Header

Conductor Cross-sections:
 25-50 mm²

Voltage Range:
 850V

Operation Temperature:
 -40 °C to 140 °C

Current Carrying Capacity:
 200 AMP @ 85 °C

IP Rating:
 Mated: IP6k9k
 Unmated: IpxxB
 Mated IPxxD

HVIL:
 yes

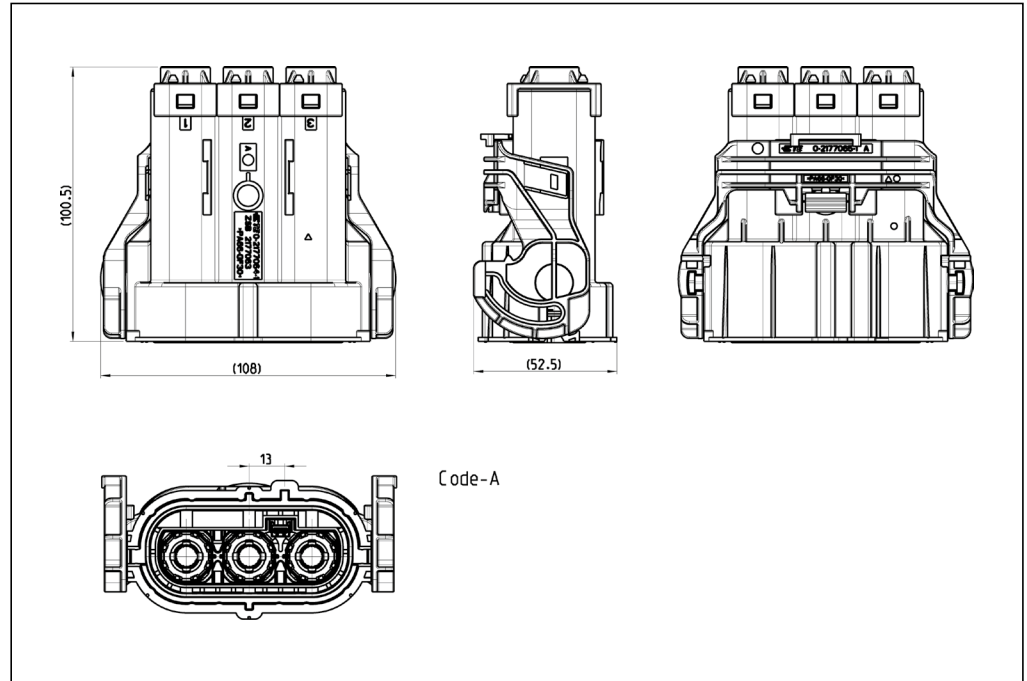
CPA:
 Shunted in plug (design allows
 for pass-through)

Fire Classification:
 HB

Vibration Level:
 2 (body mount)

Product Specification:
 108-94297

Application Specification:
 114-94130

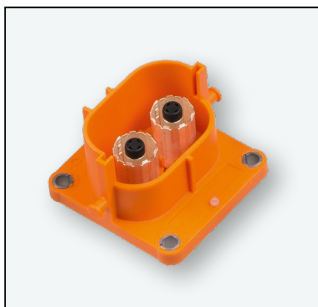


Drawing 2177062 *

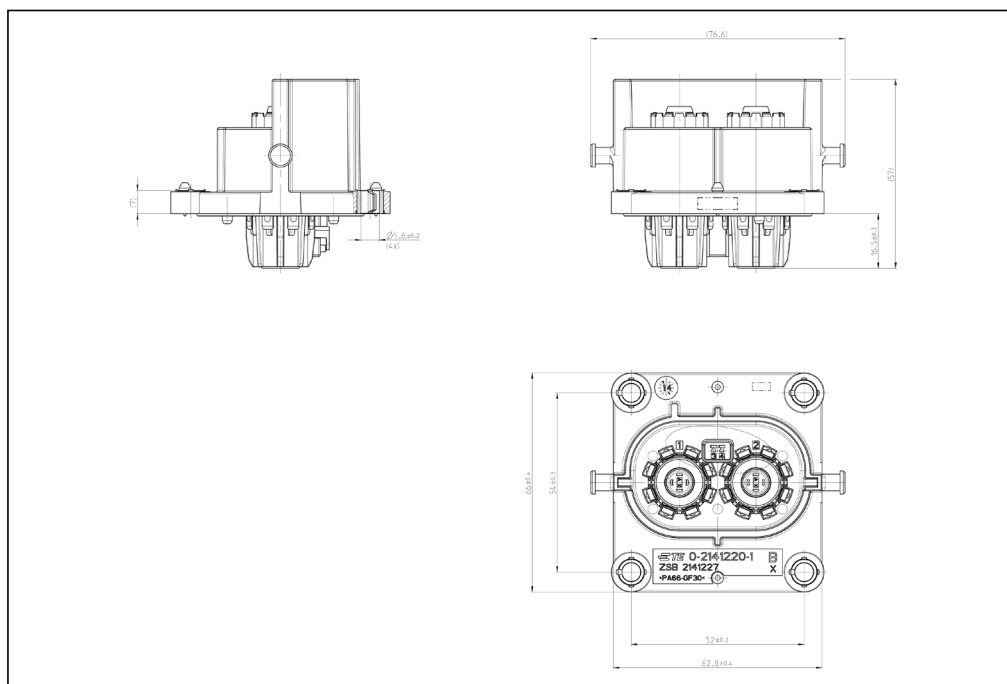
AMP HVP 800 3phi XE Plug 180 deg

Version (Cable Dimension)	Coding	With CPA	With Lever	Order Information
25 / 35 / 50 mm ² (acc. LV216-2)	A	✓	✓	To be Ordered see drawing!
	A	✓	✓	
	B	✓	✓	
	B	✓	✓	
16 mm ²				in planning

* Drawing Number is NOT the Order Number!



AMP HVP 800 2phi Header



Drawing 2141227 *

Technical Features

Pin Number:

2

Contact System:

Plug & Header

Conductor Cross-sections:

all

Voltage Range:

850V

Operation Temperature:

-40 °C to 140 °C

Current Carrying Capacity:

200 AMP @ 85 °C

IP Rating:

Mated: IP6k9k

Unmated: IP2xB (touch safe)

HVIL:

yes

CPA:

yes

Fire Classification:

HB

Vibration Level:

2

Interface Drawing:

114-94034

Interface Drawing Adapter Plate:

114-94032

Product Specification:

108-94268 / 108-94297

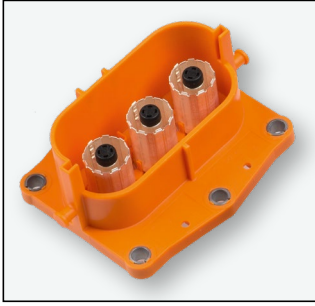
Application Specification:

114-94153

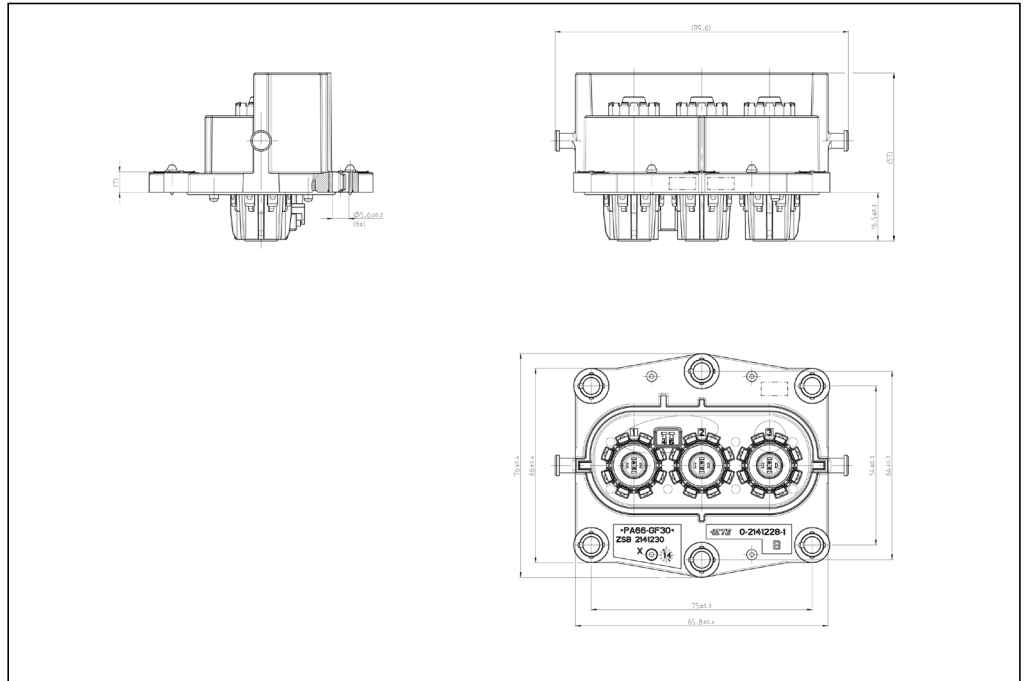
AMP HVP 800 2phi Header

Version (Cable Dimension)	Coding	Order Information
one for all	released	To be Ordered see drawing!
	A	
	B	
	C	
	D	

* Drawing Number is NOT the Order Number!



AMP HVP 800 3phi Header



Drawing 2141230 *

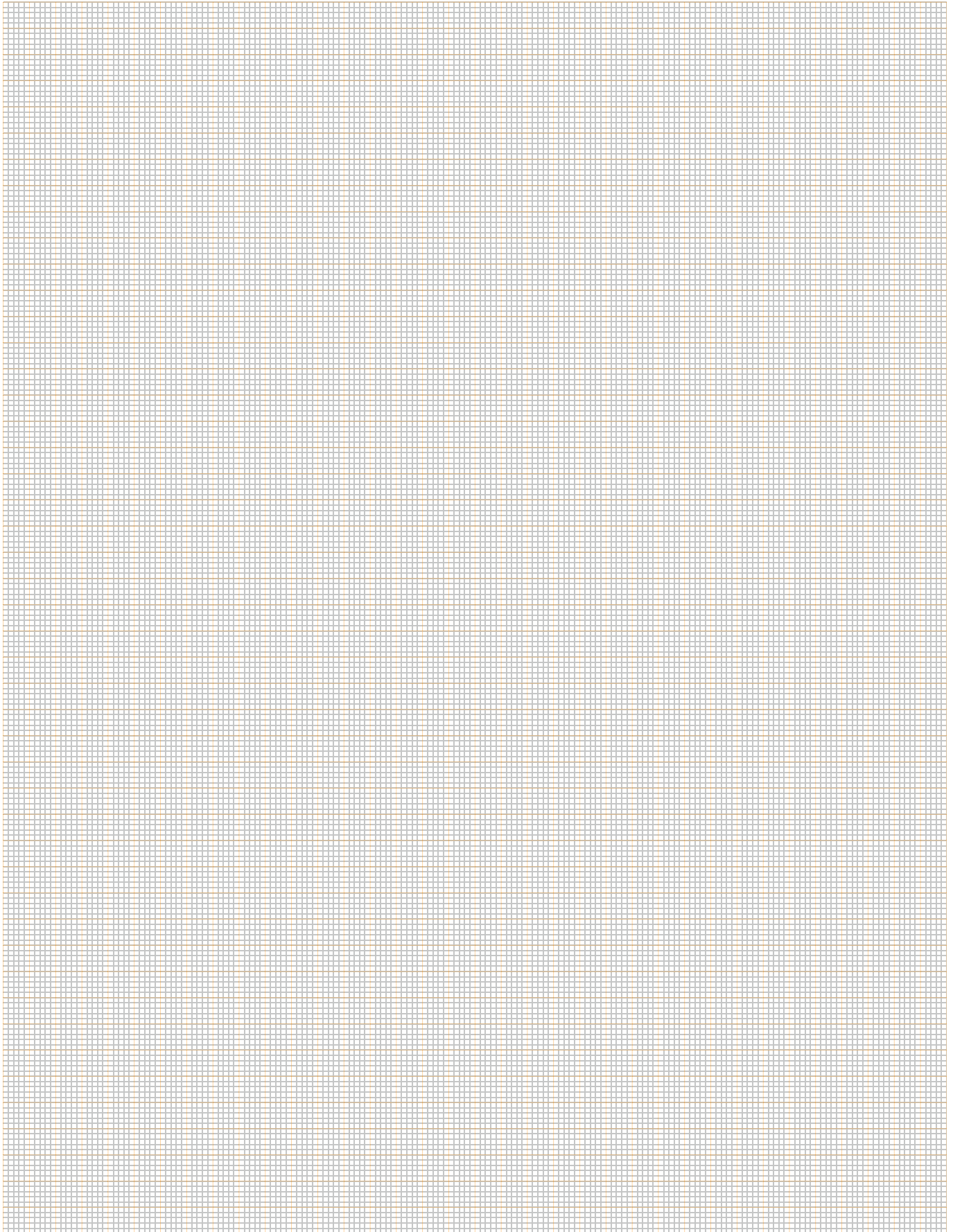
Technical Features

- Pin Number:**
3
- Contact System:**
Plug & Header
- Conductor Cross-sections:**
all
- Voltage Range:**
850V
- Operation Temperature:**
-40 °C to 140 °C
- Current Carrying Capacity:**
200 AMP @ 85 °C
- IP Rating:**
Mated: IP6k9k
Unmated: IP2xB (touch safe)
- HVIL:**
yes
- CPA:**
yes
- Fire Classification:**
HB
- Vibration Level:**
2
- Interface Drawing:**
114-94034
- Interface Drawing Adapter Plate:**
114-94032
- Product Specification:**
108-94268 / 108-94297
- Application Specification:**
114-94153

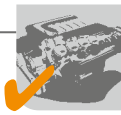
AMP HVP 800 3phi Header

Version (Cable Dimension)	Coding	Order Information
one for all	released	To be Ordered see drawing!
	A	
	B	
	C	
	D	

* Drawing Number is NOT the Order Number!



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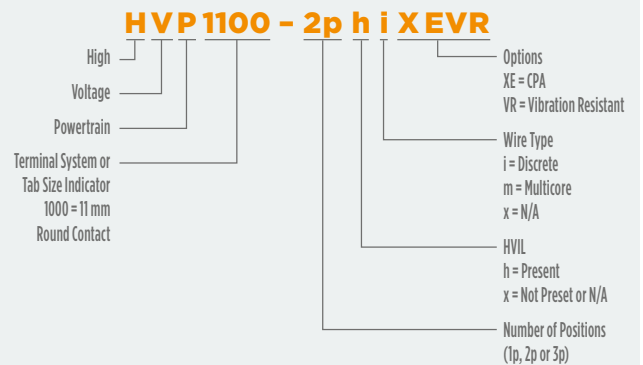
AMP+ HVP 1100

INTRODUCTION

Finger proof, touch safe, one position high current connectors and headers AMP+ 1100 are designed for flexibility with the options needed for various hybrid and electric vehicle device applications.

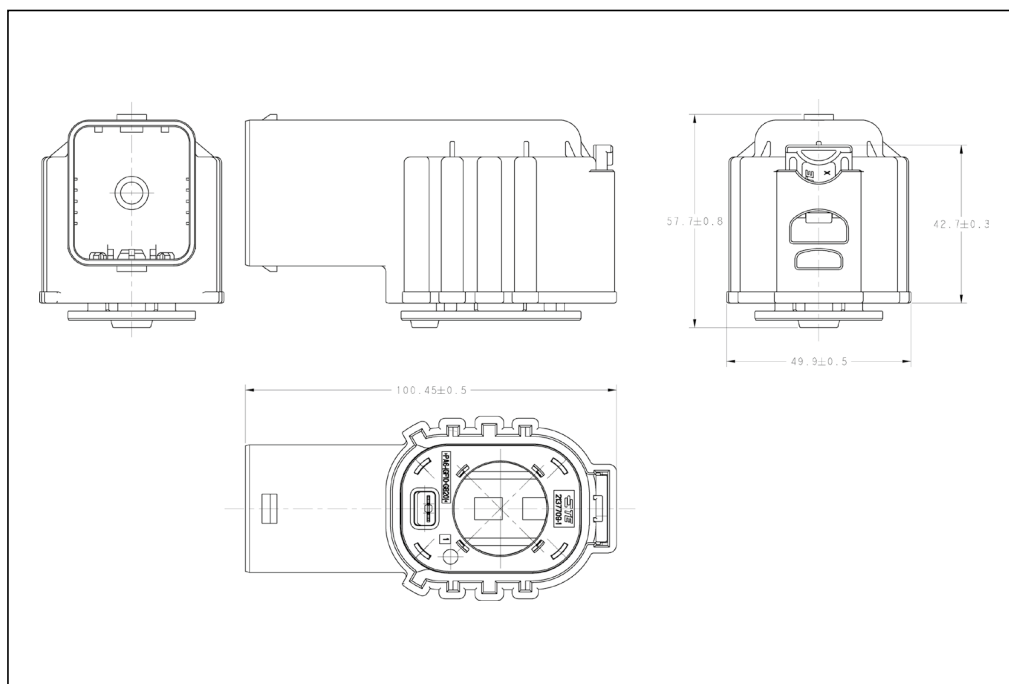
With a current carrying capability up to 300 A at 85° C, and a cable range between 50 mm² and 950 mm² individually shielded wire, the AMP+ HVP 100 can be used in many high voltage applications. The system provides an integrated internal HVIL for package size optimization.

Naming Convention HVP 1100 Connector Family





AMP HVP 1100 1phi XE Plug 90 deg



Drawing 2137704 *

Technical Features

Pin Number:

1 (+2 HVIL)

Contact System:

11 mm Round Contact

Conductor Cross-Sections:

70 mm² according to USCAR-2 REV.5, USCAR37

Voltage Range:

750 VDC

Operation Temperature:

-40 °C up to 125 °C

Current Carrying Capacity:

300A @ 85 °C (0.9 DeRating)
ambient temperature

IP Rating:

Plugged: IP6k7, IP6k9k

Unplugged: IP2XB

HVIL:

Integrated, Internal

CPA:

Yes

Fire Classification:

HB

Vibration Level:

USCAR V1

Product Specification:

108-101203

Application Specification:

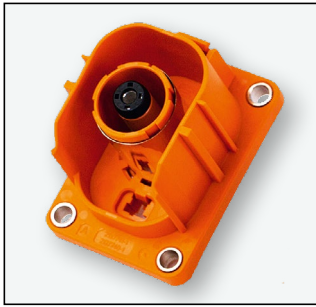
114-101010

AMP HVP 1100 1phi XE Plug 90 deg

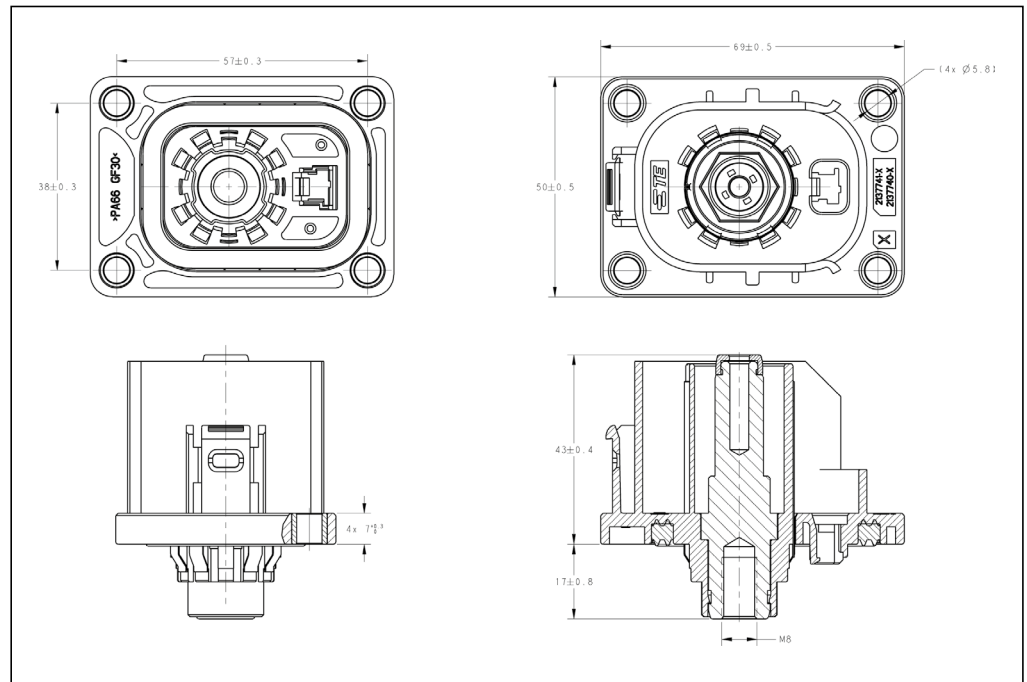
Version (Cable Dimension)	Coding	Order Information
	released	A
	in planning	B
1*70 mm ²	in planning	C
	in planning	D
	in planning	E
	in planning	F

To be Ordered
see drawing!

* Drawing Number is NOT the Order Number!



AMP HVP 1100 1phi XE Header



Technical Features

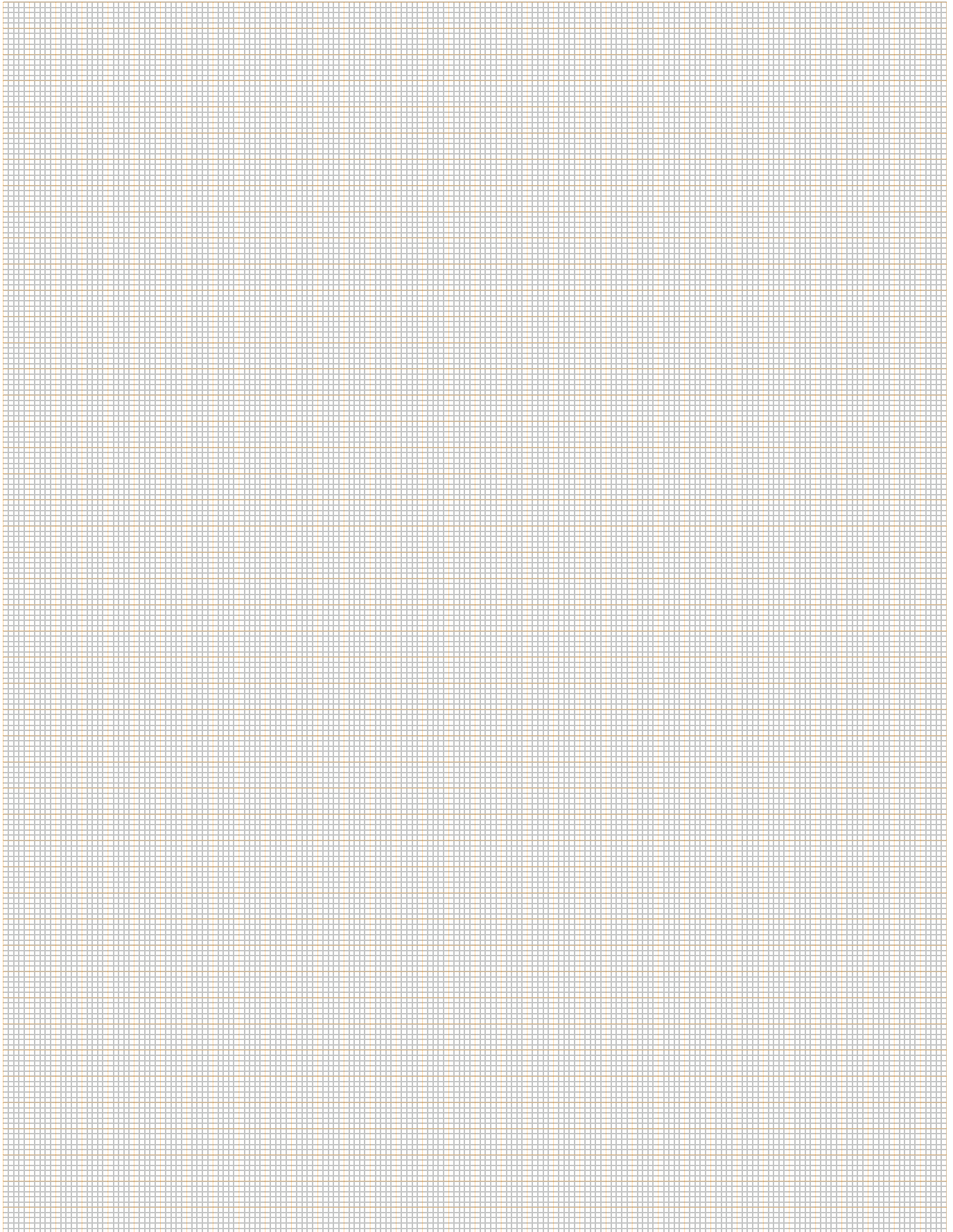
- Pin Number:**
1 (+2 HVIL)
- Contact System:**
11 mm round contact
- Conductor Cross-sections:**
70 mm² according to USCAR-2 REV.5, USCAR37
- Voltage Range:**
750 VDC
- Operation Temperature:**
-40 °C up to 125 °C
- Current Carrying Capacity:**
300A @ 85 °C (0.9 DeRating) ambient temperature
- IP Rating:**
Plugged: IP6k7, IP6k9k
Unplugged: IP2XB
- HVIL:**
Integrated, Internal
- CPA:**
Yes
- Fire Classification:**
HB
- Vibration Level:**
USCAR V1
- Product Specification:**
108-101203
- Application Specification:**
114-101010

Drawing 2137740 *

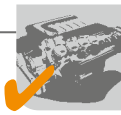
AMP HVP 1100 1phi XE Header

	Coding	Order Information
released	A	To be Ordered see drawing!
in planning	B	
in planning	C	
in planning	D	
in planning	E	
in planning	F	

* Drawing Number is NOT the Order Number!



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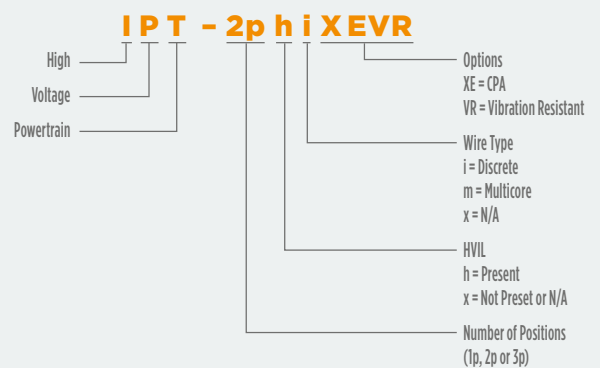


AMP+ IPT

INTRODUCTION

Connector for powertrain applications in high vibration environment, up to 300A (depending on wire cross section) at 105°. Used e.g. to connect inverter to e-machine and charging applications.

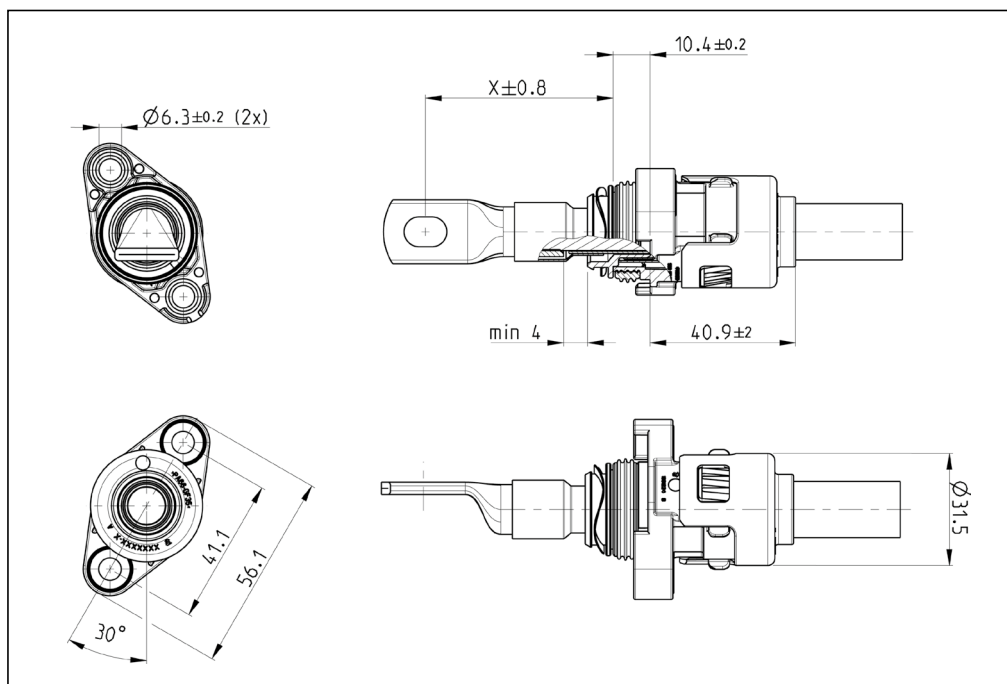
Naming Convention IPT Connector Family



AMP+ IPT



AMP IPT 1pxi



Drawing 114-94131-1 *

Technical Features

Pin Number:

1

Contact System:

IPT screwed

Conductor Cross-sections:

16-50 mm²

Voltage Range:

800-1000 VDC

Operation Temperature:

-40 °C to +140 °C

Current Carrying Capacity:

300A @ 105 °C (50 mm²)

IP Rating:

IP6k9k

HVIL:

no

CPA:

no

Fire Classification:

HB

Vibration Level:

4

Application Specification:

114-94133

Product Specification:

108-94293

Interface Drawing:

114-94132-1

AMP IPT 1pxi

Version (Cable Dimension)		Coding	Order Information
25 / 35 / 50 mm ² (acc. LV216-2)	released	A	To be Ordered see drawing!
		B	
		C	
		D	
		E	
		F	
16 mm ²	in planning		

* Drawing Number is NOT the Order Number!



AMP IPT 2pxi

Technical Features

Pin Number:

2

Contact System:

IPT screwed

Conductor Cross-sections:

16-50 mm²

Voltage Range:

800-1000 VDC

Operation Temperature:

-40 °C to +140 °C

Current Carrying Capacity:

300A @ 105 °C (50 mm²)

IP Rating:

IP6k9k

HVIL:

no

CPA:

no

Fire Classification:

HB

Vibration Level:

4

Application Specification:

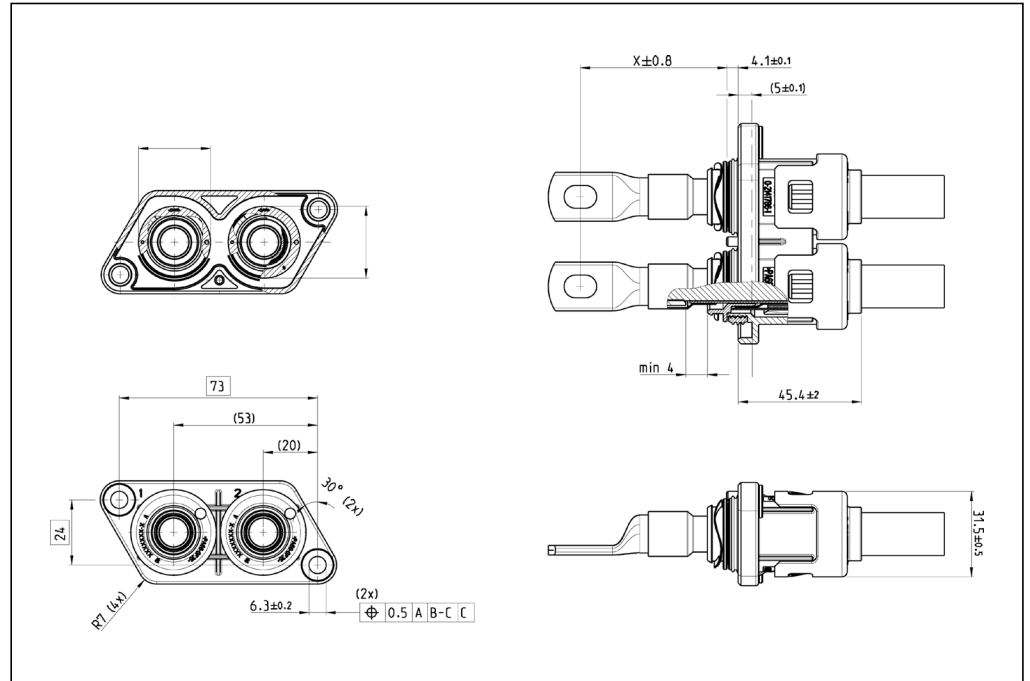
114-94133

Product Specification:

108-94293

Interface Drawing:

114-94132-2



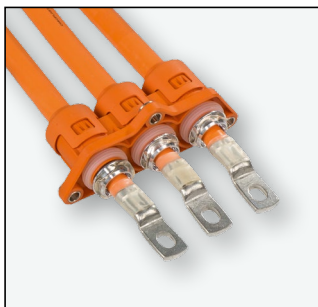
Drawing 114-94131-2 *

AMP IPT 2pxi

Version (Cable Dimension)	Coding	Order Information
25 / 35 / 50 mm ²	released	A
16 mm ²	in planning	To be Ordered see drawing!

* Drawing Number is NOT the Order Number!

AMP+ IPT



AMP IPT 3pxi

Technical Features

Pin Number:

3

Contact System:

IPT screwed

Conductor Cross-sections:

16-50 mm²

Voltage Range:

800-1000 VDC

Operation Temperature:

-40 °C to +140 °C

Current Carrying Capacity:

300A @ 105 °C (50 mm²)

IP Rating:

IP6k9k

HVIL:

no

CPA:

No

Fire Classification:

HB

Vibration Level:

4

Application Specification:

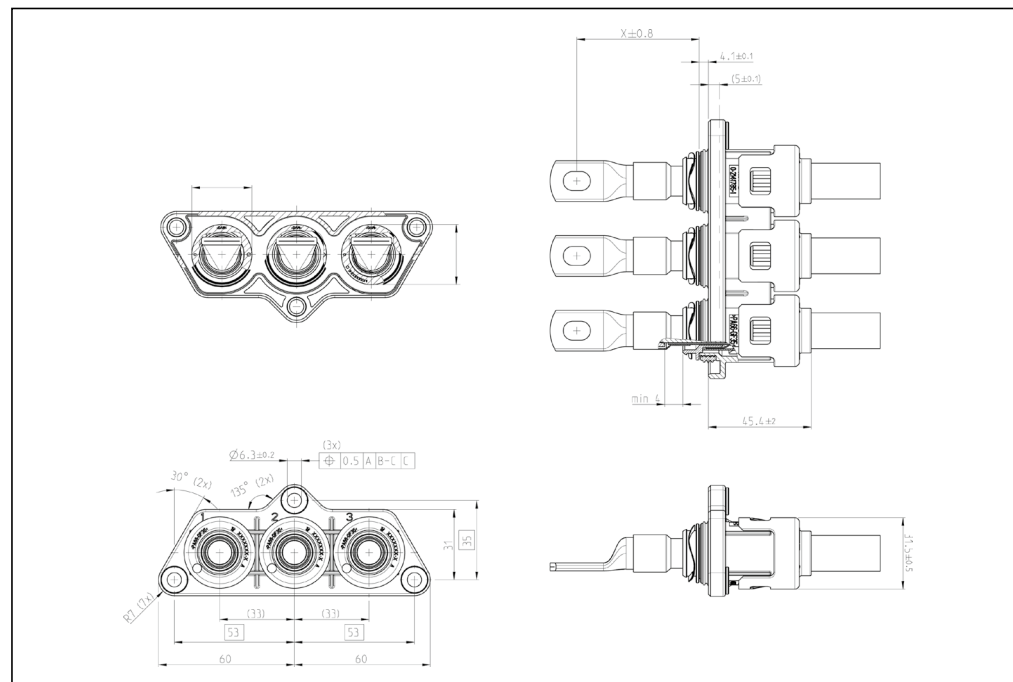
114-94133

Product Specification:

108-94293

Interface Drawing:

114-94132-3



Drawing 114-94131-3 *

AMP IPT 3pxi

Version (Cable Dimension)	Released	Coding	Order Information
25 / 35 / 50 mm ²	released	A	To be Ordered see drawing!
16 mm ²	in planning		

* Drawing Number is NOT the Order Number!

POWERTRAIN SYSTEMS



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BODY & CHASSIS SYSTEMS



AMP+ Charging Cables

INTRODUCTION

The batteries for plug-in hybrid vehicles can be recharged externally, just like those of electric vehicles. TE Connectivity has developed a charging cable that meets requirements of the international charging standard IEC61851-1/-22.

This defines the on-board vehicle type 1 interfaces for the US and Japan, as well as type 2 for Europe.

The latter provides for two charging modes: With mode 2 charging can take place wherever there is no special charging infrastructure available - at home, for example.

If there is a high-performance charging station available, the mode 3 charging cable can be used.

AMP+ Charging Cable Mode 2 Type 1 US

Technical Features

Conductor Cross-Sections:
0.5 mm² / 2.50 mm²

Voltage Range:
99-121V (single phase)

Operation Temperature:
-30 °C and +50 °C

Current Carrying Capacity:
15A

IP Rating:
IP55 ICCB
IP44 connectors plugged to inlet

Norms & Standards:
IEC 61851-1; SAE J 1772

Versions Domestic Plug:
NEMA 5-15

**Temperature Sensor
Domestic Plug:**
Yes



AMP+ Charging Cable Mode 2 Type 1 Japan

Technical Features

Conductor Cross-Sections:
0.5 mm² / 2.50 mm²

Voltage Range:
180-220V

Operation Temperature:
-30 °C and +50 °C

Current Carrying Capacity:
15A

IP Rating:
IP55 ICCB
IP44 connectors plugged to inlet

Norms & Standards:
IEC 61851-1; SAE J 1772

Versions Domestic Plug:
JIS C 8303 A.16

**Temperature Sensor
Domestic Plug:**
Yes



AMP+ Charging Cable Mode 2 Type 2 Europe

Technical Features

Conductor Cross-sections:
0.5 mm² / 2.50 mm²

Voltage Range:
195-260V (single phase)

Operation Temperature:
-30 °C and +50 °C

Current Carrying Capacity:
15A

IP Rating:
IP55 ICCB
IP44 connectors plugged to inlet

Norms & Standards:
IEC 61851-1

Versions domestic plug:
-CEE7/7 90°
-CEE7/7 180°
-CEI 23-16/VII
-BS 1363
-SEV 1011
-AFSNIT 107-2-D1

Temperature sensor domestic plug:
Yes



AMP+ Charging Cable Mode 3 Type 2 / Type 3

Technical Features

Conductor Cross-sections:
0.5 mm² / 2.50 mm²

Voltage Range:
160-240V (single phase)

Operation Temperature:
-30 °C and +50 °C

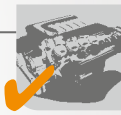
Current Carrying Capacity:
Type 2 Mode 3: 20A
Type 3 Mode 3: 16A

IP Rating:
IP44 connectors plugged to inlet
or station

Norms & Standards:
IEC 61851-1



POWERTRAIN SYSTEMS



SAFETY & SECURITY SYSTEMS



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DRIVER INFORMATION



BODY & CHASSIS SYSTEMS



AMP+ Charging Inlets

INTRODUCTION

To charge their batteries, plug-in-hybrid and electric vehicles share the need to connect to the electrical infrastructure.

TE Connectivity's AMP+ charging inlets are a modular system, sharing identical parts between the three inlet types.

Priority was given to technical compatibility, allowing vehicle makers and system suppliers to fully harmonize functionality across their different Ranges.

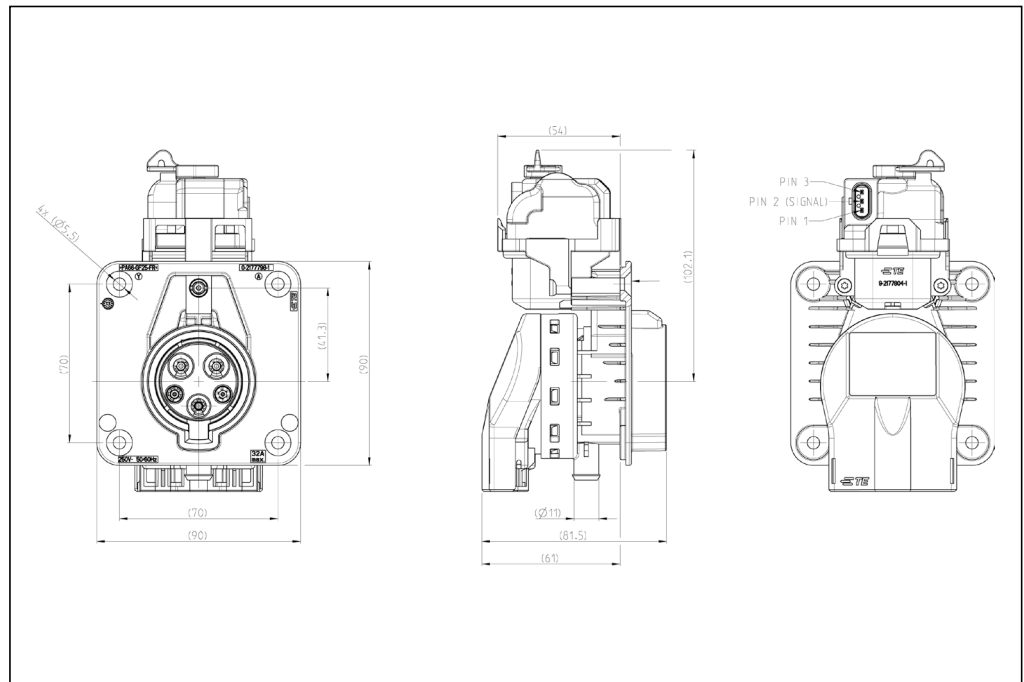
TE offers a complete product range of compatible charging inlets for worldwide hybrid and electric vehicle applications.



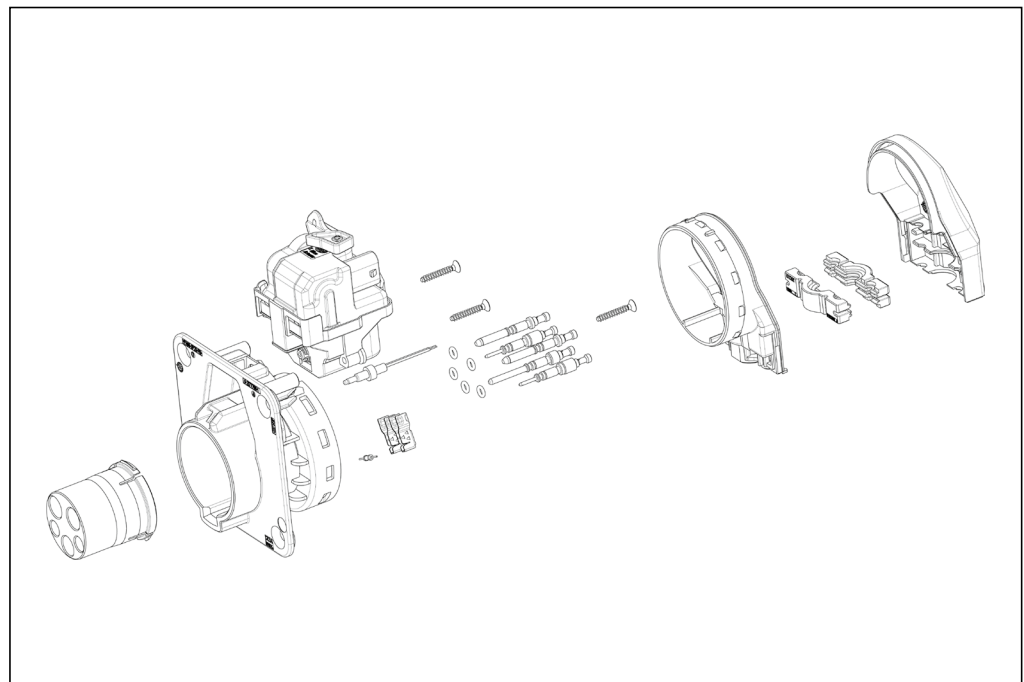
AMP+ Charging Inlet Type 1

Technical Features

- Pin Number:**
5 pos
- Contact System:**
roundcontact
- Conductor Cross-Sections:**
0.75-1.00 mm² / 4.00 mm² / 6.00 mm²
- Voltage Range:**
250V
- Operation Temperature:**
-30 °C and +50 °C
- Current Carrying Capacity:**
32A
- IP Rating:**
IP54 (front),
IP44 (rear)
- Cable Outlet:**
90° (can be rotated)
- Finger protected:**
Yes
- Vibration Level:**
Level 2
- Application Specification:**
114-94163-1



Drawing 114-94163-1 *



* Drawing Number is NOT the Order Number!



AMP+ Charging Inlet Type 2

Technical Features

Pin Number:

5-7 pos

Contact System:

roundcontact

Conductor Cross-sections:

0.75-1.00 mm² / 4.00 mm² /
 6.00 mm²

Voltage Range:

480V

Operation Temperature:

-30 °C and +50 °C

Current Carrying Capacity:

16/32A

IP Rating:

IP54 (front),

IP44 (rear)

Cable Outlet:

90° (can be rotated)

Finger protected:

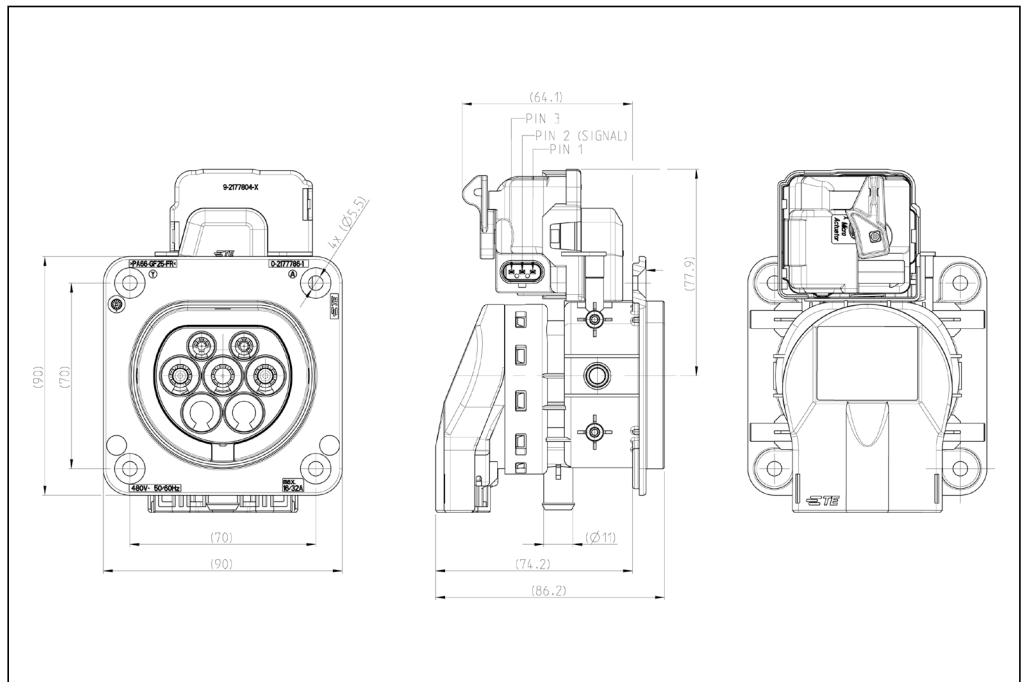
yes

Vibration Level:

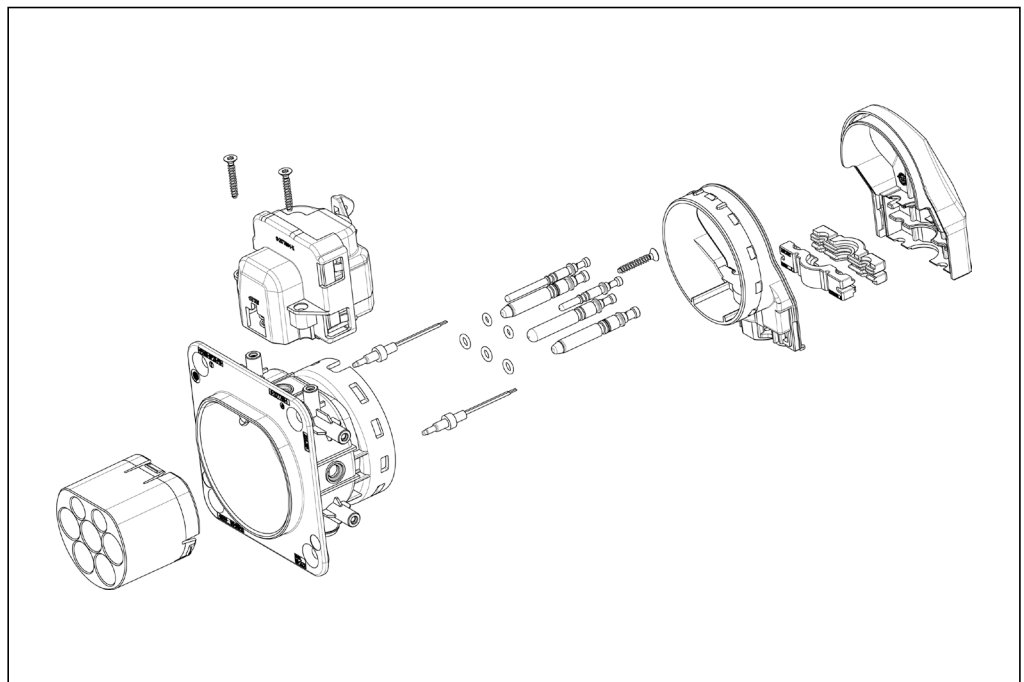
Level 2

Application Specification:

114-94163-2



Drawing 114-94163-2 *



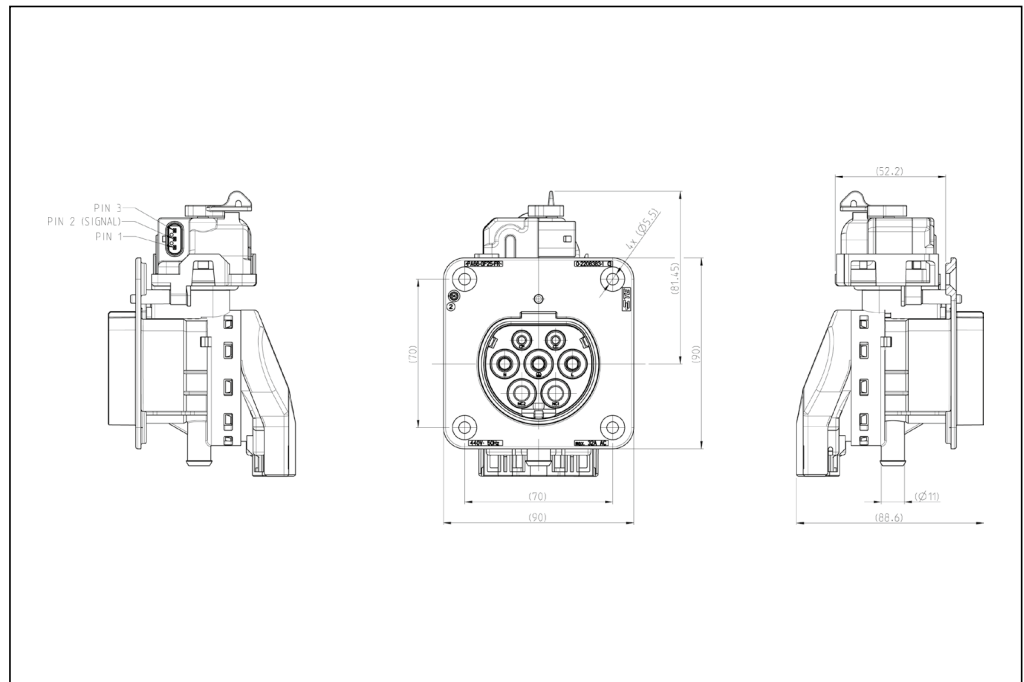
* Drawing Number is NOT the Order Number!



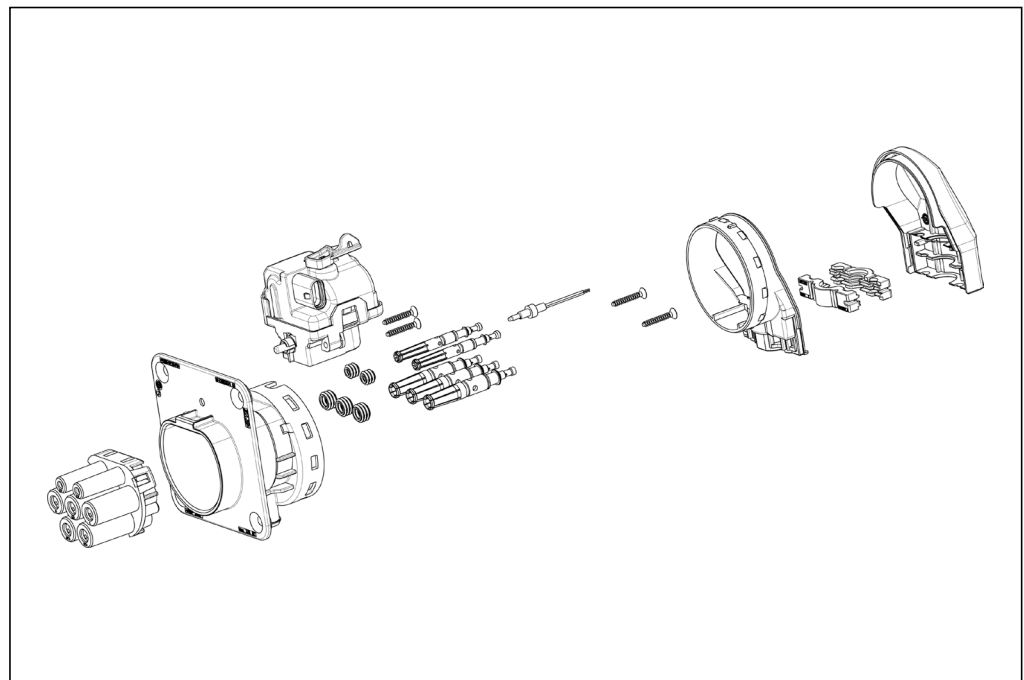
AMP+ Charging Inlet Type GB

Technical Features

- Pin Number:**
5-7 pos
- Contact System:**
roundcontact
- Conductor Cross-Sections:**
0.75-1.00 mm² / 4.00 mm² / 6.00 mm²
- Voltage Range:**
440V
- Operation Temperature:**
-30 °C and +50 °C
- Current Carrying Capacity:**
16/32A
- IP Rating:**
IP54 (front),
IP44 (rear)
- Cable Outlet:**
90° (can be rotated)
- Finger protected:**
yes
- Vibration Level:**
Level 2
- Application Specification:**
114-94212

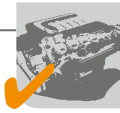


Drawing 114-94212 *



* Drawing Number is NOT the Order Number!

POWERTRAIN SYSTEMS



SAFETY & SECURITY SYSTEMS



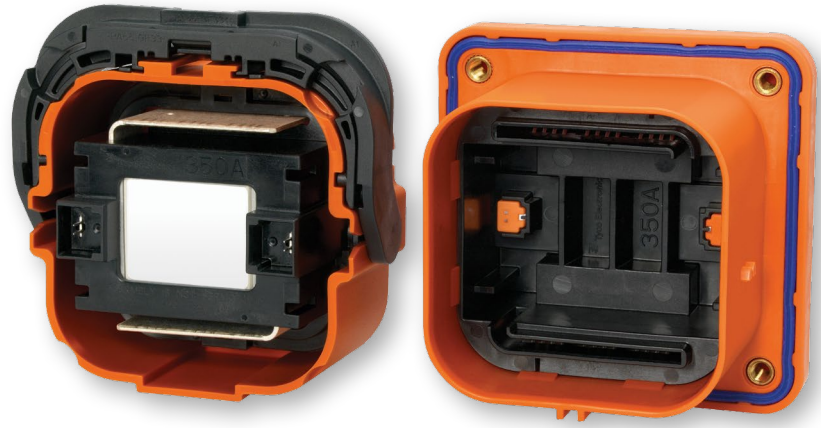
CONVENIENCE



DRIVER INFORMATION



BODY & CHASSIS SYSTEMS



AMP+ Manual Service Disconnect

INTRODUCTION

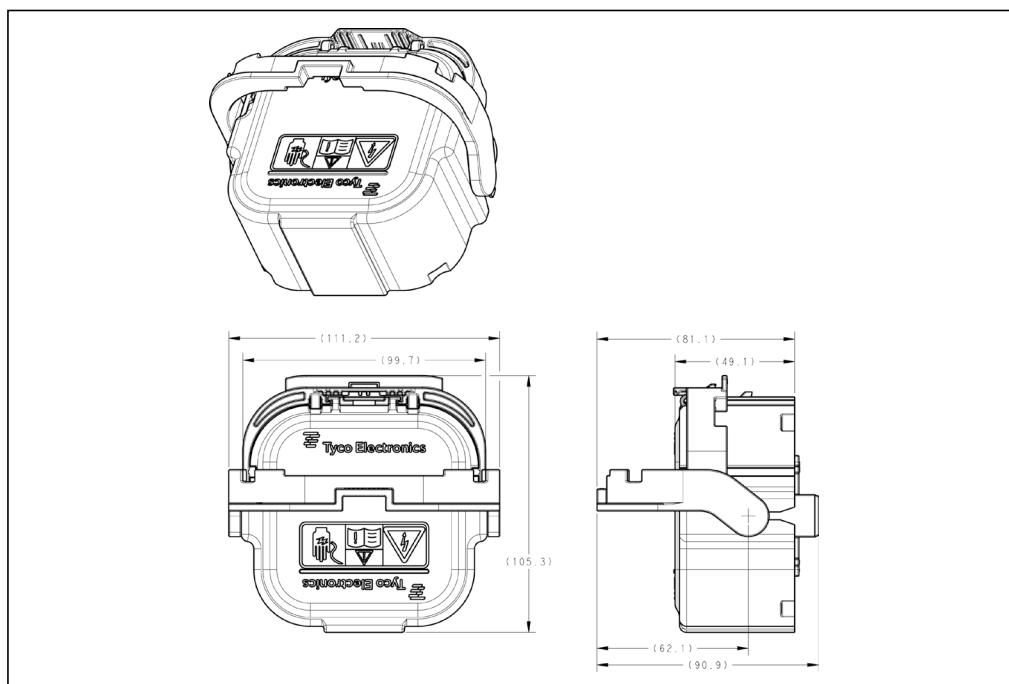
Safe, reliable solutions are required to protect service technicians and emergency response teams when working with the high voltages required in electric vehicles.

TE Connectivity's AMP+ Manual Service Disconnect utilizes a two-stage lever to open the HVIL circuit prior to separation of HV contacts. This tool-free solution for disconnecting the internal HV battery pack and protecting the battery pack HV cables from short circuiting is available in a scalable design with a variety of fuse Ratings.

All HV conducting surfaces on receptacle assembly are finger proof touch safe.



AMP+ Manual Service Disconnect – Plug



Drawing 2103172 *

* Drawing number is NOT the Order number!

Technical Features

Fuse Rating:

Up to 630A

Voltage Rating:

450VDC (with fuse)
 1000VDC (Shunt)

Operating Temperature:

-40 °C to 65 °C

Storage Temperature:

-40 °C to 85 °C

IP Rating:

Mated: IPx7, IP6k9k
 Unmated: IP2xb

HVIL:

2x integrated, internal

Current Rating:

Based on fuse selection

Standards and Specifications:

USCAR-2
 USCAR-37
 IEC 60529
 RoHS

Product Specification:

108-127000

Application Specification:

408-10432

AMP+ Manual Service Disconnect – Plug

Fuse Rating	Order Information
200A	To be Ordered see drawing!
250A	
350A	
630A	
Shunt	



AMP+ Manual Service Disconnect – Receptacle

Technical Features

Fuse Rating:

Up to 630A

Voltage Rating:

450VDC (with fuse)
 1000VDC (Shunt)

Operating Temperature:

-40 °C to 65 °C

Storage Temperature:

-40 °C to 85 °C

IP Rating:

Mated: IPx7, IP6k9k
 Unmated: IP2xb

HVIL:

2x integrated, internal

Current Rating:

Based on fuse selection

Standards and Specifications:

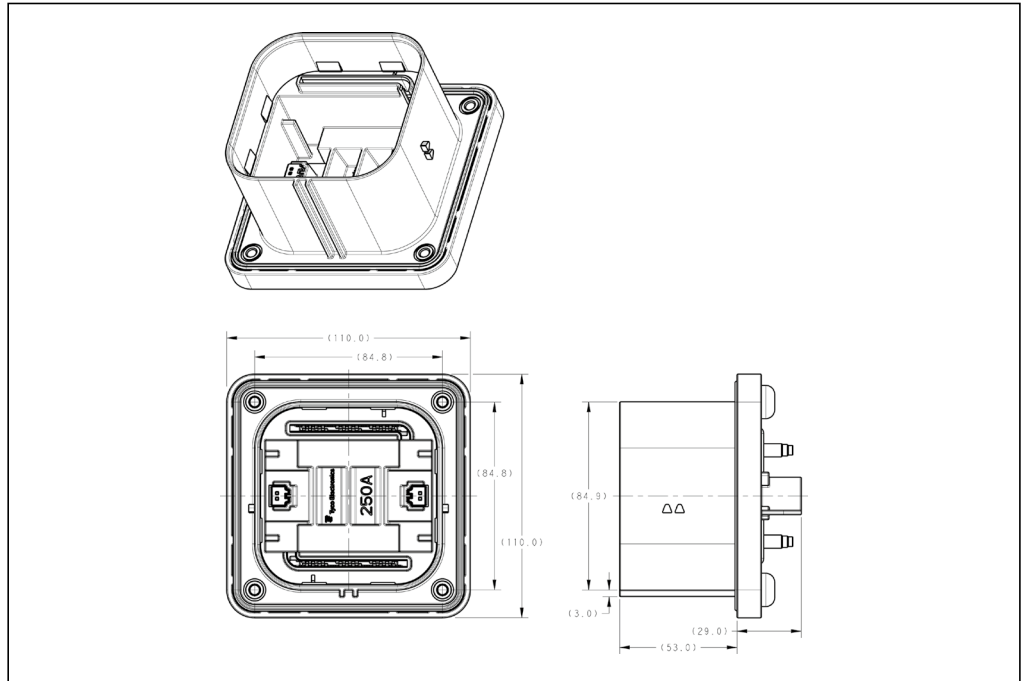
USCAR-2
 USCAR-37
 IEC 60529
 RoHS

Product Specifications:

108-127000

Application Specifications:

408-10377

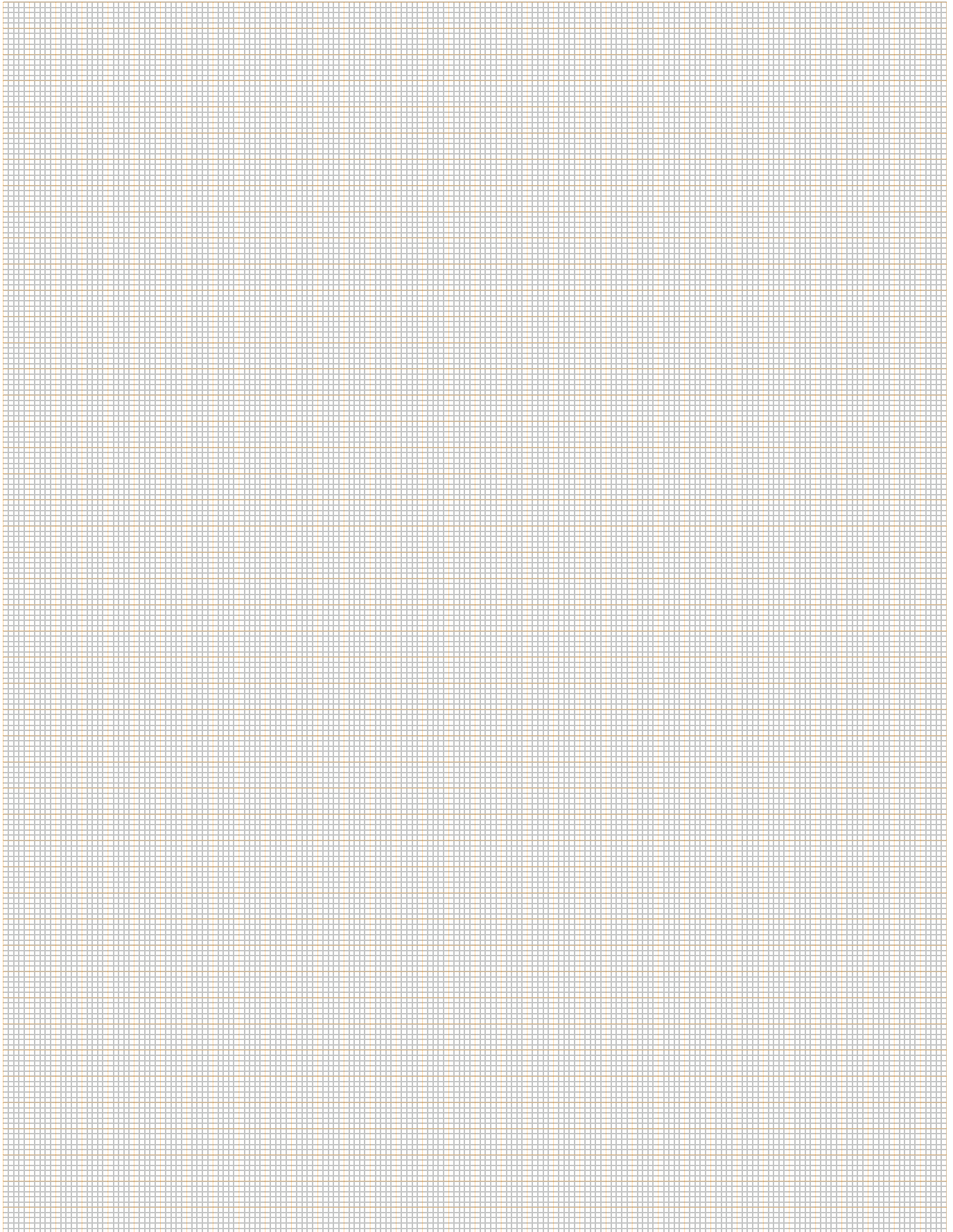


Drawing 1587987 *

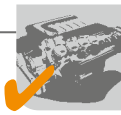
* Drawing number is NOT the Order number!

AMP+ Manual Service Disconnect – Receptacle

	Order Information
Receptacle	To be Ordered
Housing	see drawing!



POWERTRAIN SYSTEMS



SAFETY & SECURITY SYSTEMS



CONVENIENCE



DRIVER INFORMATION



BODY & CHASSIS SYSTEMS

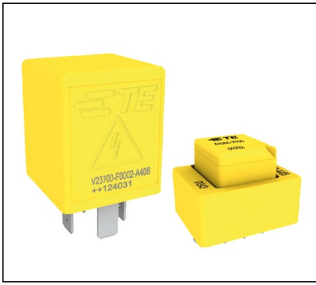


Relays & Contactors

INTRODUCTION

Better. Smaller. Safer. TE's high-voltage contactors and relays enable safe disconnection and connection of the traction battery. Suited for use in hybrid, full electric, fuel cell vehicles and vehicle charging systems, they use proven technology in an innovative manner.

Our high-voltage product portfolio includes the EVC 175, EVC 250 and EVC 250-800 main contactors. Each high-performing device represents TE's new generation of high-voltage contactors. TE's long-proven EVC 135 and EVC 500 contactors also provide fast and reliable current switching. Completing the range, our Mini K HV pre-charge relays are a cost-effective, safe and light-weight solution for DC high-voltage power systems. All our products fully comply with the demanding switching requirements of hybrid and electric vehicles.



Key Features

- Compact high voltage relay for precharge applications up to 450 VDC
- Precharge current up to 20 A
- Limiting break current up to 20 A
- Small package size, low profile
- Quick connect (QC) terminal assignment similar to ISO 7588-1

Typical Applications

- DC high voltage precharge applications in hybrid, full battery electric vehicles and fuel cell cars

Contact Data

Contact arrangement:
1 Form X (NO DM)

Rated voltage:
400 VDC

Limiting cont. current at 85 °C:
n/a ¹⁾

Limiting making / breaking current:
20 A >10⁵ ops. / 20 A >10 ops. ²⁾

Operate /release time max. (typ.):
2.5 ms / 1 ms

Coil Data

Rated coil voltage / power:
12 VDC ¹⁾

Rated coil power (+23 °C):
PCB: 2.9 W / Plug-in: 3.5 W ¹⁾

Coil resistance (+23 °C):
PCB: 50 Ω / Plug-in: 41.6 Ω

Coil Data

Ambient temperature:
-40 °C to +85 °C

Category and degree of protection:
sealed, RT III – immersion cleanable

Terminal type and mounting:
PCB and plug-in/QC

Dimensions LxWxH (approx.):
PCB: 25.5 x 20.7 x 19.3 mm,
(1.0 x 0.8 x 0.8")

Plug-in: 29.9 x 29.9 x 34.7 mm,
(1.2 x 1.2 x 1.4") w/o terminals

Weight (approx.):
PCB: 17 g (0.6 oz)
Plug-in: 39 g (1.4 oz)

Mini K HV Precharge Relays

Dimensions PCB Version

Dimensions Plug-in Version

Terminal Assignment 1 form X (NO DM)

Terminal Assignment 1 form X (NO DM) with resistor

Ordering Information Mini K HV precharge Relays

Product Code	Arrangement	Coil	Terminal / Mounting	Coil Suppression	Rated Voltage	Resistance	Part Number
V23700-C0001-A408	1 form X (NO DM)	12 VDC	PCB, sealed	without parallel resistor	400 VDC	50 Ω	2-1904058-5
V23700-F0002-A408	1 form X (NO DM)	12 VDC	Plug-in, QC	with parallel resistor	400 VDC	41.6 Ω	2-1904058-7

1) Max. continuous current is limited and depends on operating conditions. Consult TE Connectivity for details.
2) Min. 10 fault break operations.



Key Features

- Continuous current up to 135 A
- Load voltage up to 450 VDC ¹⁾
- Short circuit carry capability 2,000 A
- Available in side mount or bottom mount configuration
- Customized connections available

Typical Applications

- Main contactor, precharge and auxiliary relay for hybrid and electric vehicles

Contact Data

Contact arrangement:

1 Form X (NO DM)

Rated voltage:

450 VDC ^{*)}

Limiting cont. current at 85°C:

250 A

Limiting making / breaking current:

50 A / 50 A (>50,000 ops.)

Short term current rating:

(1 min) 400 A

Short circuit carry current:

2,000 A

Operate /release time max. (typ.):

25 ms / 10 ms

Coil Data

Rated coil voltage / power:

12 VDC, 24 VDC

Rated coil power (+23°C):

5.5 W (standard version),
 9.5 W (low pull-in version)

Coil resistance (+20°C):

26 Ω, 15.3 Ω, 3.8 Ω available for different pull-in voltages

Coil Data

Ambient temperature:

-40°C to +85°C

Category and degree of protection:

hermetically sealed

Terminal type and mounting:

stripped wires (coil) / M5 threaded inserts (load); screws

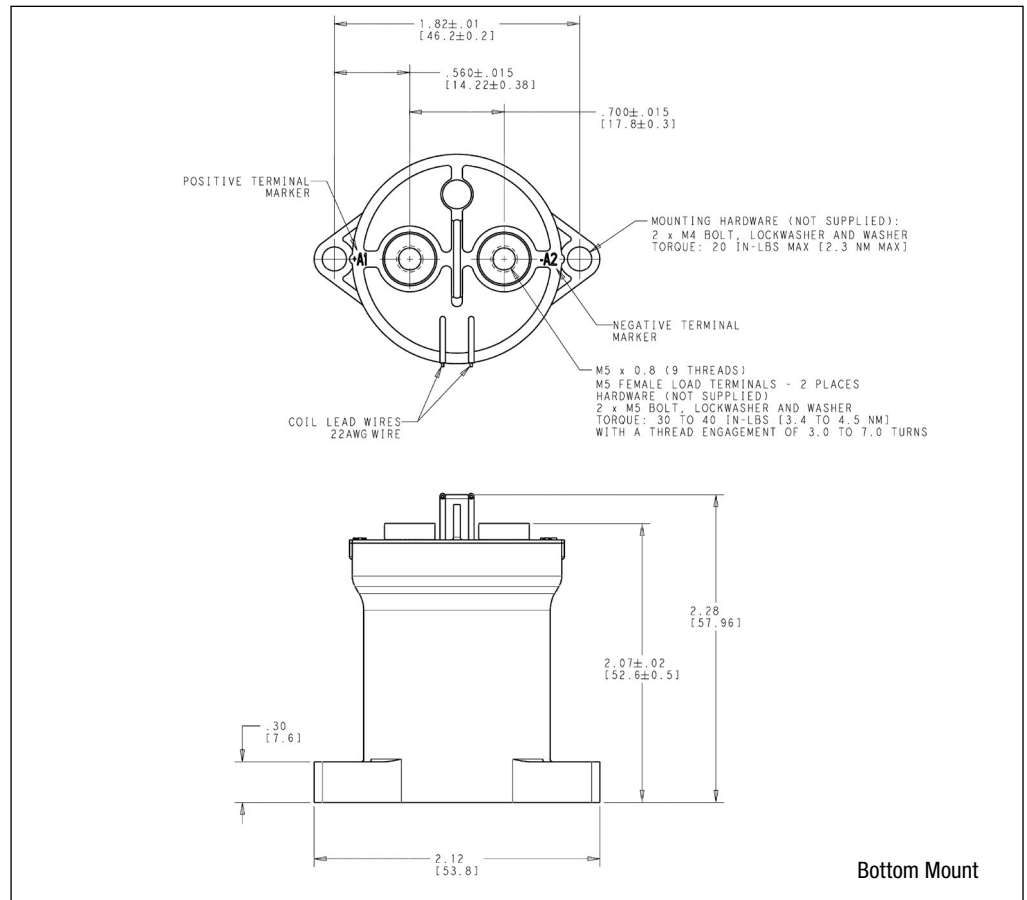
Dimensions LxWxH (approx.):

54.2 x 35.4 x 57.8 mm (2.1 x 1.4 x 2.3")

Weight (approx.):

180 g (6.3 oz)

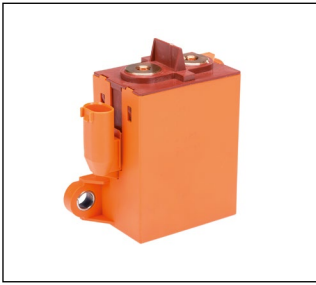
EVC 135 Contactor



Ordering Information EVC 135 Contactor

Product Code	Arrangement	Coil (VDC)	Econo-mization	Coil Suppr.	Rated Voltage (VDC)	Terminal Type	Mounting	Resis-tance	Part Number
									Asia Americas
EVC 135-4BNGA	1 form X (NO DM)	12	Required	On request ¹⁾	450	Stripped wires / Screws	Bottom	15.3 Ω	2219560-2
									2203194-1
EVC 135-5ANGA	1 form X (NO DM)	12	Optional	On request ¹⁾	450	Stripped wires / Screws	Bottom	26 Ω	2219560-7
									2138622-1
EVC 135-7BNGA	1 form X (NO DM)	24	Optional	On request ¹⁾	450	Stripped wires / Screws	Bottom	96 Ω	2219560-4
EVC 135-4BNHA	1 form X (NO DM)	12	Required	On request ¹⁾	450	Stripped wires / Screws	Side	15.3 Ω	2138168-1
EVC 135-5BNGA	1 form X (NO DM)	12	Optional	On request ¹⁾	450	Stripped wires / Screws	Bottom	26 Ω	2219560-3
									2098371-1
EVC 135-6BNGA	1 form X (NO DM)	12	Required	On request ¹⁾	450	Stripped wires / Screws	Bottom	3.8 Ω	2219560-1
									2138084-1

1) Consult TE Connectivity for higher voltages. For details please refer to datasheet.



EVC 175 Main Contactor

Key Features

- Continuous current up to 175 A
- Suitable for voltage levels up to 500 VDC ¹⁾
- Short circuit carry capability 5,000 A
- Mounting in any direction
- Available with dual and single coil

Typical Applications

- DC high voltage high current applications
- Main contactors for hybrid, full battery electric vehicles and fuel cell cars
- Battery charging systems

Contact Data

Contact arrangement:

1 Form X (NO DM)

Rated voltage:

450 VDC ¹⁾

Limiting cont. current at 85°C:

175 A

Limiting making / breaking current:

210 A / 30 A (>100,000 ops.)

Short term current rating:

(0.5 min) 500 A

Short circuit carry current:

(20 ms) 5,000A

Operate / release time max. (typ.):

20 / 8 ms at 12 VDC (coil voltage)

Coil Data

Rated coil voltage / power: 12 VDC

Rated coil power (+23°C):
0.8 W (single coil), 0.49 W (dual coil) ²⁾

Coil resistance (+23°C):

5 Ω (single coil), 3 / 33 Ω (dual coil)

Coil Data

Ambient temperature:

-40 °C to +85 °C

Category and degree of protection:

dustproof, IP 50 (upright); IP54 ³⁾ (others)

Terminal type and mounting:

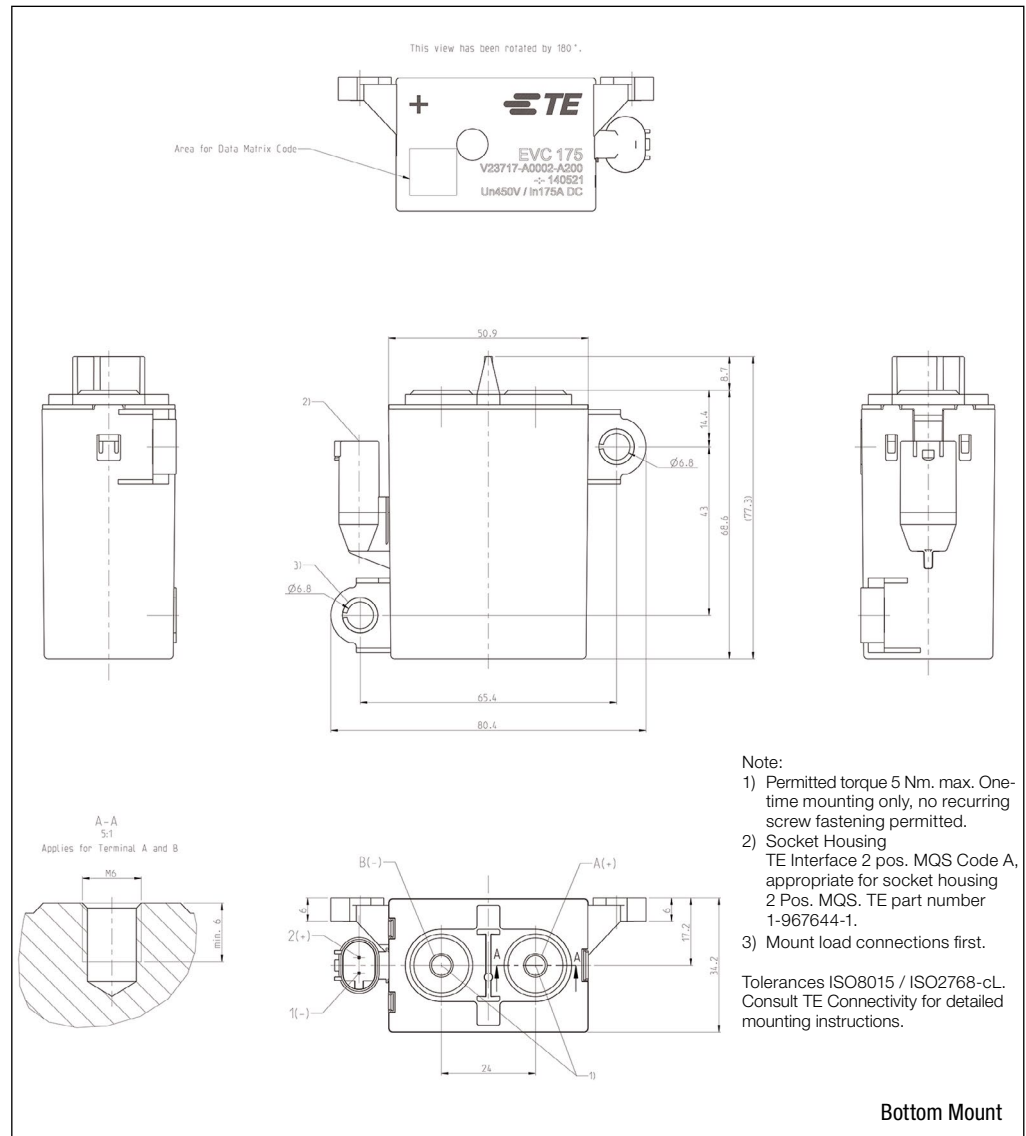
Connector (coil) / M6 bolts (load); screws

Dimensions LxWxH (approx.):

77.3 x 50.9 x 34.2 mm (3.0 x 2.0 x 1.3")

Weight (approx.):

295 g (10.4 oz)



Ordering Information EVC 175 Main Contactor

Product Code	Arrangement	Coil (VDC)	Econo- mization	Coil Suppr.	Rated Voltage (VDC)	Terminal Type	Mounting	Resistance	Part Number
V23717-A0001-A200	1 form X (NO DM)	12	External economizer	External > 36 V	450	Connector/ Screws	Side	5 Ω Single coil	6-1904123-6
V23717-A0002-A200	1 form X (NO DM)	12	Internal economizer	Internal	450	Connector/ Screws	Side	3 / 33 Ω Dual coil	2-1904070-1

1) Consult TE Connectivity for higher voltages. For details please refer to datasheet.

2) Valid for 23°C coil temperature with active economization.

3) Protection class applicable for all mounting orientations except load terminals on top.



EVC 250 Main Contactor

Key Features

- Continuous current up to 250 A
- Suitable for voltage levels up to 450 VDC ¹⁾
- Short circuit carry capability 6,000 A
- Mounting in any direction
- Available with dual and single coil

Typical Applications

- DC high voltage high current applications
- Main contactors for hybrid, full battery electric vehicles and fuel cell cars
- Battery charging systems

Contact Data

Contact arrangement:
 1 Form X (NO DM)

Rated voltage:
 450 VDC ¹⁾

Limiting cont. current at 85 °C:
 250 A

Limiting making / breaking current:
 250 A / 100 A (>50,000 ops.)

Short term current rating:
 (1 min) 600 A

Short circuit carry current:
 (25 ms) 6,000 A

Operate / release time max. (typ.):
 25 ms at 14 VDC (coil voltage)

Coil Data

Rated coil voltage / power:
 12 VDC

Rated coil power (+23 °C):
 1.0 W min. (single coil),
 0.44 W (dual coil) ²⁾

Coil resistance (+23 °C):
 4 Ω (single coil), 3 / 36 Ω (dual coil)

Coil Data

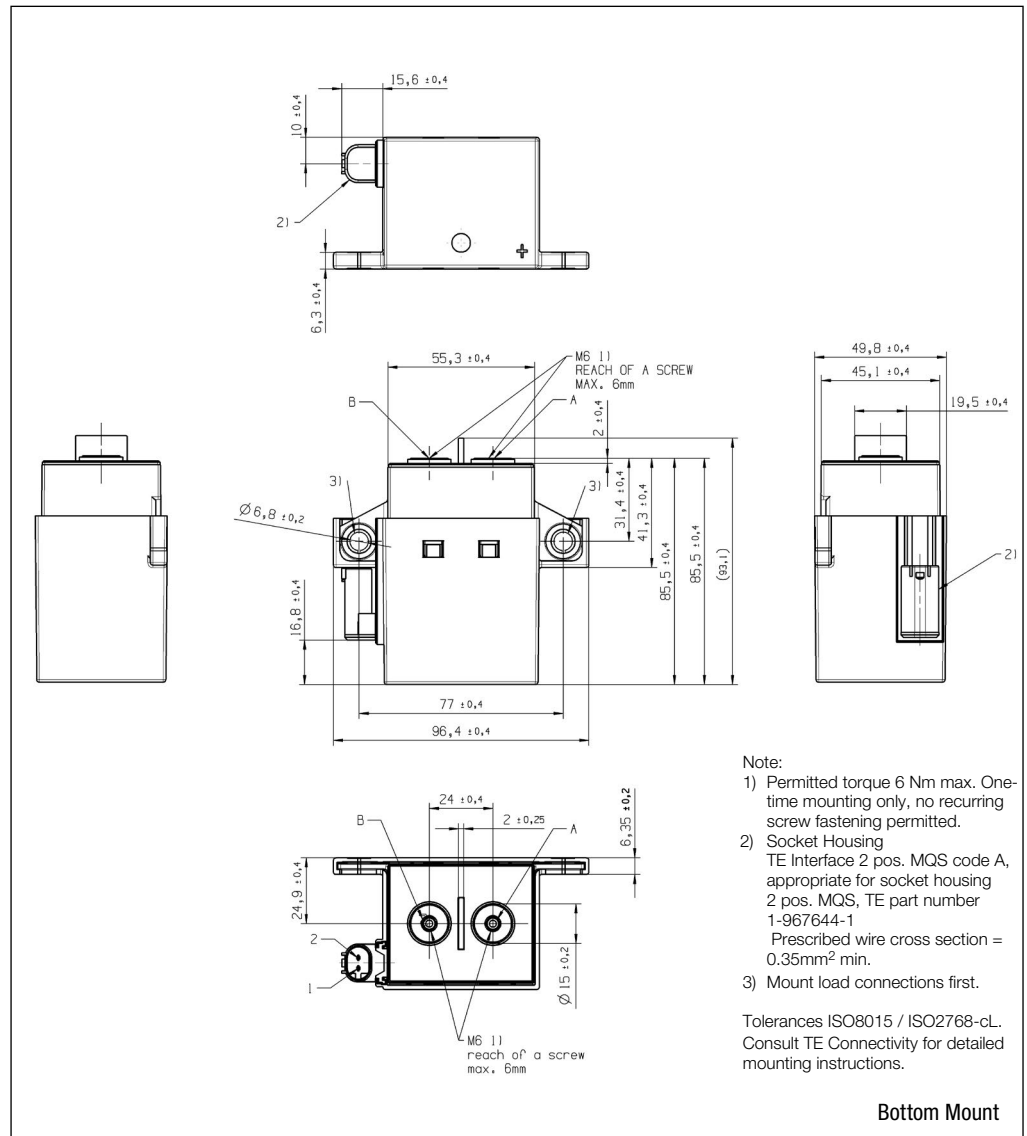
Ambient temperature:
 -40 °C to +85 °C

Category and degree of protection:
 dustproof, IP 50 (upright); IP54 ³⁾
 (others)

Terminal type and mounting:
 Connector (coil) / M6 bolts (load);
 screws

Dimensions LxWxH (approx.):
 93.1 x 55.3 x 49.8 mm (3.7 x 2.2 x 2.0")

Weight (approx.):
 approx. 560 g (19.7 oz)



- Note:
- 1) Permitted torque 6 Nm max. One-time mounting only, no recurring screw fastening permitted.
 - 2) Socket Housing TE Interface 2 pos. MQS code A, appropriate for socket housing 2 pos. MQS, TE part number 1-967644-1 Prescribed wire cross section = 0.35mm² min.
 - 3) Mount load connections first.

Tolerances ISO8015 / ISO2768-cL. Consult TE Connectivity for detailed mounting instructions.

Bottom Mount

Ordering Information EVC 250 Main Contactor

Product Code	Arrangement	Coil (VDC)	Econo-mization	Coil Suppr.	Rated Voltage (VDC)	Terminal Type	Mounting	Resistance	Part Number
V23720-A001-A001	1 form X (NO DM)	12	No economizer	External > 36 V	450	Connector/ Screws	Side	4 Ω Single coil	2-1904070-2
V23720-A002-A001	1 form X (NO DM)	12	Coil switch	Internal	450	Connector/ Screws	Side	3 / 36 Ω Dual coil	4-1904065-7

1) Consult TE Connectivity for higher voltages. For details please refer to datasheet.

2) Valid for 23°C coil temperature with active economization.

3) Protection class applicable for all mounting orientations except load terminals on top.



Key Features

- Continuous current up to 250 A
- Suitable for voltage levels up to 800 VDC
- High peak current carrying capability up to 6000 A ¹⁾

Typical Applications

- DC high voltage high current applications
- Main contactors for hybrid, full battery electric vehicles and fuel cell cars
- Battery charging systems

Contact Data

Contact arrangement:

1 Form X (NO DM)

Rated voltage:

800 VDC

Limiting cont. current at 85 °C:

250 A

Limiting making / breaking current:

250 A / 50 A (>50,000 ops.)

Short term current rating:

(1 min) 600 A

Short circuit carry current:

(25 ms) 6,000 A

Operate / release time max. (typ.):

25 ms at 14 VDC (coil voltage)

Coil Data

Rated coil voltage / power:

12 VDC, 24 VDC

Rated coil power (+23 °C):

1.0 W min. (single coil), 0.57 W (12 V dual coil), 0.8W (24 V dual coil) ²⁾

Coil resistance (+23 °C):

4 Ω (single coil), 3.2 / 28 Ω (12 V dual coil), 5 / 80 Ω (24 V dual coil)

Coil Data

Ambient temperature:

-40 °C to +85 °C

Category and degree of protection:

dustproof, IP 50 (upright); IP54 ³⁾ (others)

Terminal type and mounting:

Connector (coil) / M6 bolts (load); screws

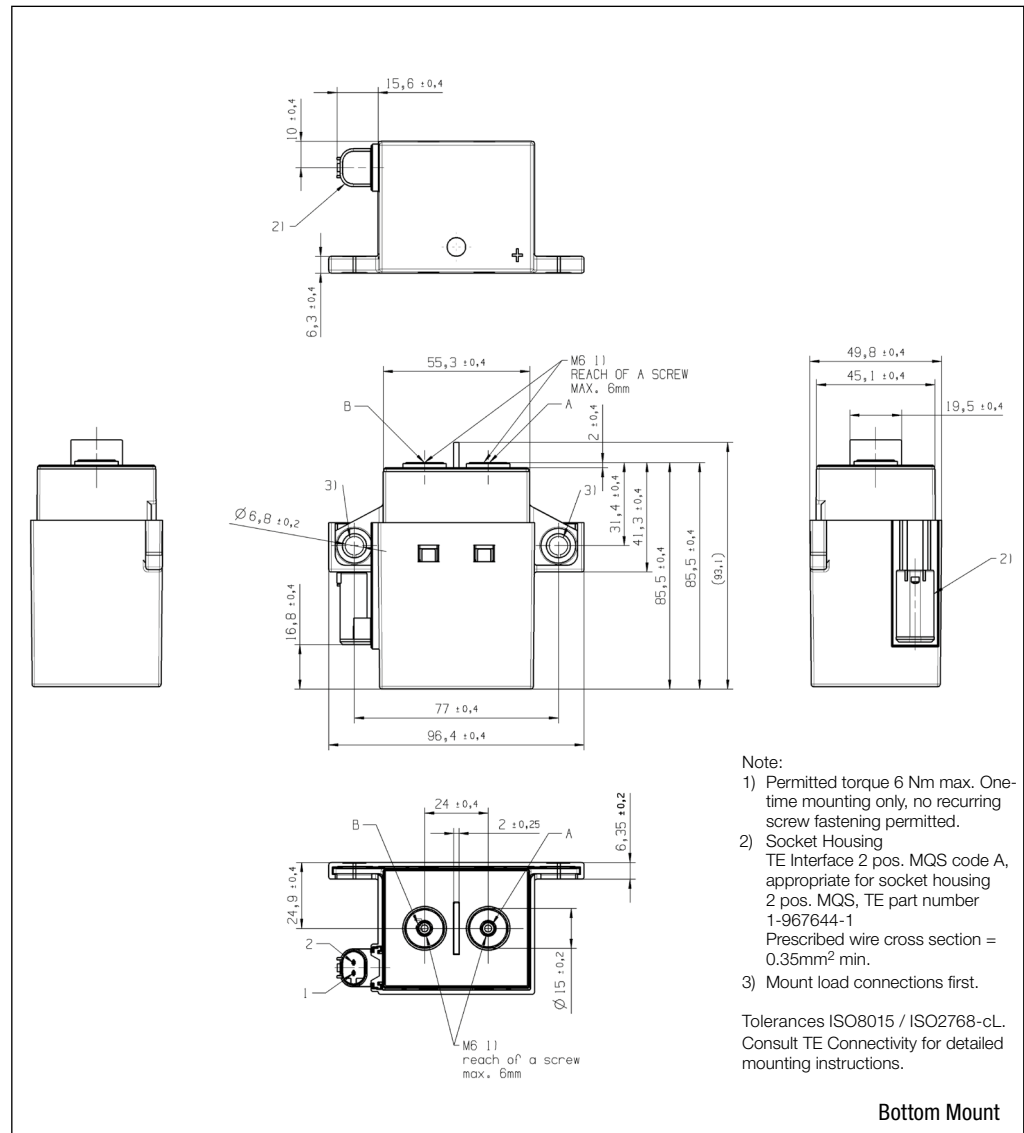
Dimensions LxWxH (approx.):

93.1 x 55.3 x 49.8 mm (3.7 x 2.2 x 2.0")

Weight (approx.):

approx. 560 g (19.7 oz)

EVC 250-800 Main Contactor



Ordering Information EVC 250-800 Main Contactor

Product Code	Arrangement	Coil (VDC)	Econo-mization	Coil Suppr.	Rated Voltage (VDC)	Terminal Type	Mounting	Resis-tance	Part Number
V23720-M0101-M001	1 form X (NO DM)	12	External economizer	tbd	800	Connector/ Screws	Side	4 Ω Single coil	4-1904129-0
V23720-M0102-M001	1 form X (NO DM)	12	Dual coil int. switch	tbd	800	Connector/ Screws	Side	3 / 36 Ω Dual coil	4-1904129-1
V23720-M0112-M001	1 form X (NO DM)	24	Dual coil int. switch	tbd	800	Connector/ Screws	Side	3 / 36 Ω Dual coil	4-1904130-3

1) Values are influenced by system temperature and load current. Consult TE Connectivity for details.

2) Valid for 23°C coil temperature with active economization.

3) Protection class applicable for all mounting orientations except load terminals on top.



EVC 500 Main Contactor

Key Features

- Continuous current up to 500 A
- Load voltage up to 450 VDC ¹⁾
- Short circuit carry capability 3,500 A
- Optional coil economizer
- Robust bottom mounting with optional economizer enclosure

Typical Applications

- Main contactor for hybrid and electric vehicles

Contact Data

Contact arrangement:
 1 Form X (NO DM)

Rated voltage:
 450 VDC ¹⁾

Limiting cont. current at 85 °C:
 500 A

Limiting making / breaking current:
 150 A / 150 A (>10,000 ops.)

Short term current rating:
 (1 min) 800 A

Short circuit carry current:
 3,500 A

Operate / release time max. (typ.):
 20 ms / 12 ms

Coil Data

Rated coil voltage / power:
 12 VDC

Rated coil power:
 PWM required

Coil resistance (+23 °C):
 3.14 Ω

Coil Data

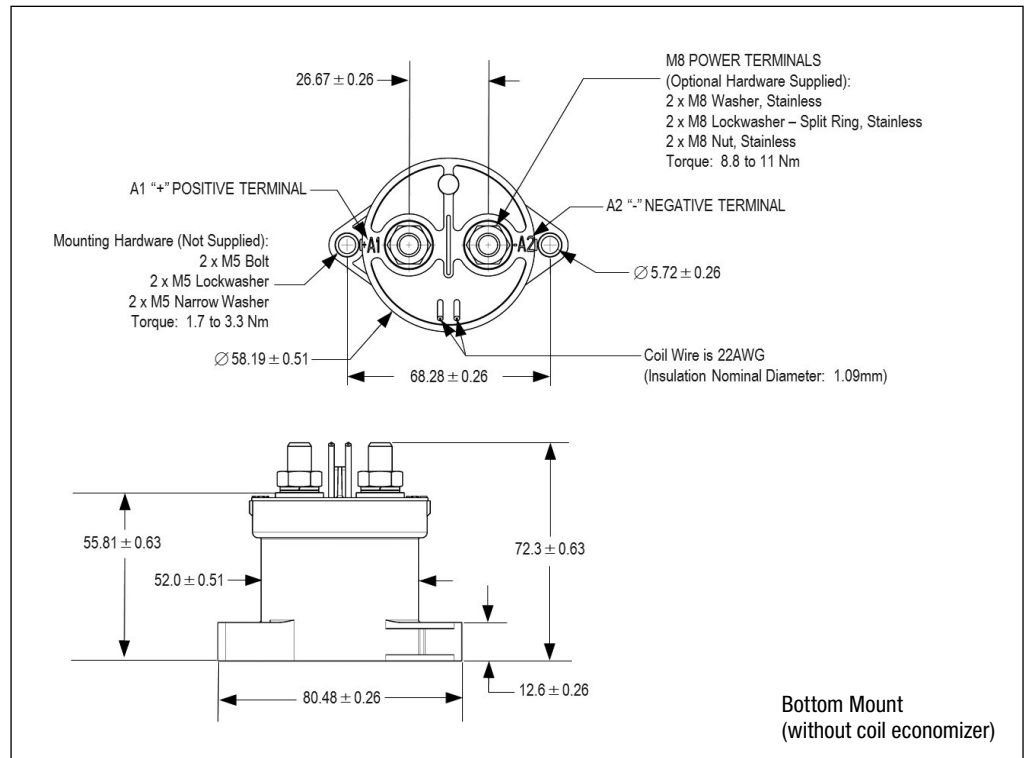
Ambient temperature:
 -40 °C to +85 °C

Category and degree of protection:
 hermetically sealed

Terminal type and mounting:
 Stripped wires (coil) / M8 bolts (load); screws

Dimensions LxWxH (approx.):
 80.5 x 58.2 x 72.3 mm (3.2 x 2.3 x 2.9")

Weight (approx.):
 430 g (15.2 oz)



Ordering Information EVC 500 Main Contactor

Product Code	Arrangement	Coil (VDC)	Economization	Coil Suppr.	Rated Voltage (VDC)	Terminal Type	Mounting	Resistance	Part Number Asia Production Americas Prod.
EVC 500-A1ANAM	1 form X (NO DM)	12	No economizer	External > 40 V	450	Stripped wires / Screws	Bottom	3.14 Ω	2219561-1 2098372-1
EVC 500-AAANAM	1 form X (NO DM)	12	Internal PWM	Internal	450	Stripped wires / Screws	Bottom	3.14 Ω	2299223-2 2098190-1

1) Consult TE Connectivity for higher voltages. For details please refer to datasheet.

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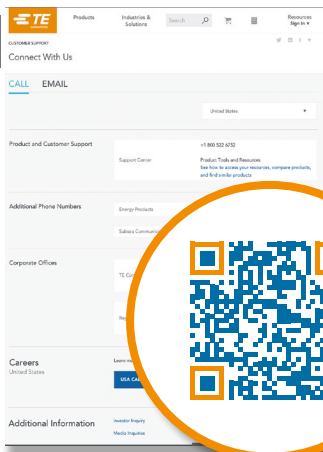
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