



POWER.S³

*Power **S**upply **S**afe **S**olutions*

INTERCONNECT PRODUCTS

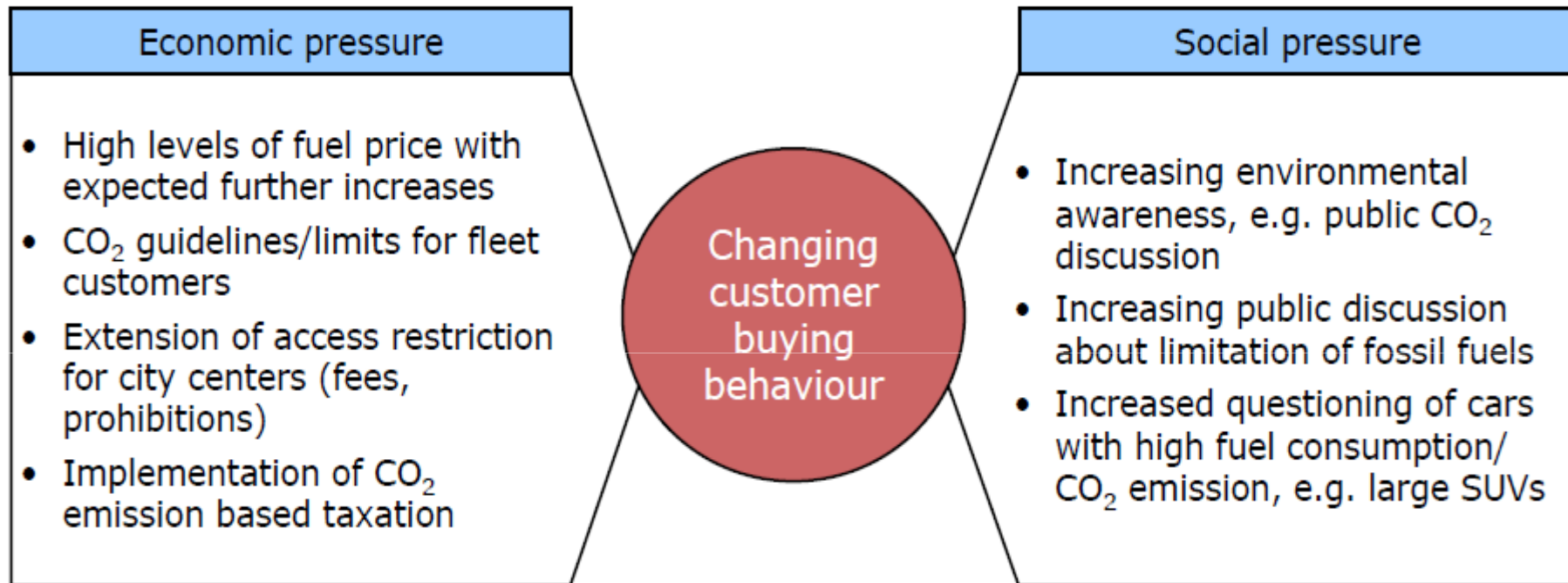


2012

FCI MVL Division

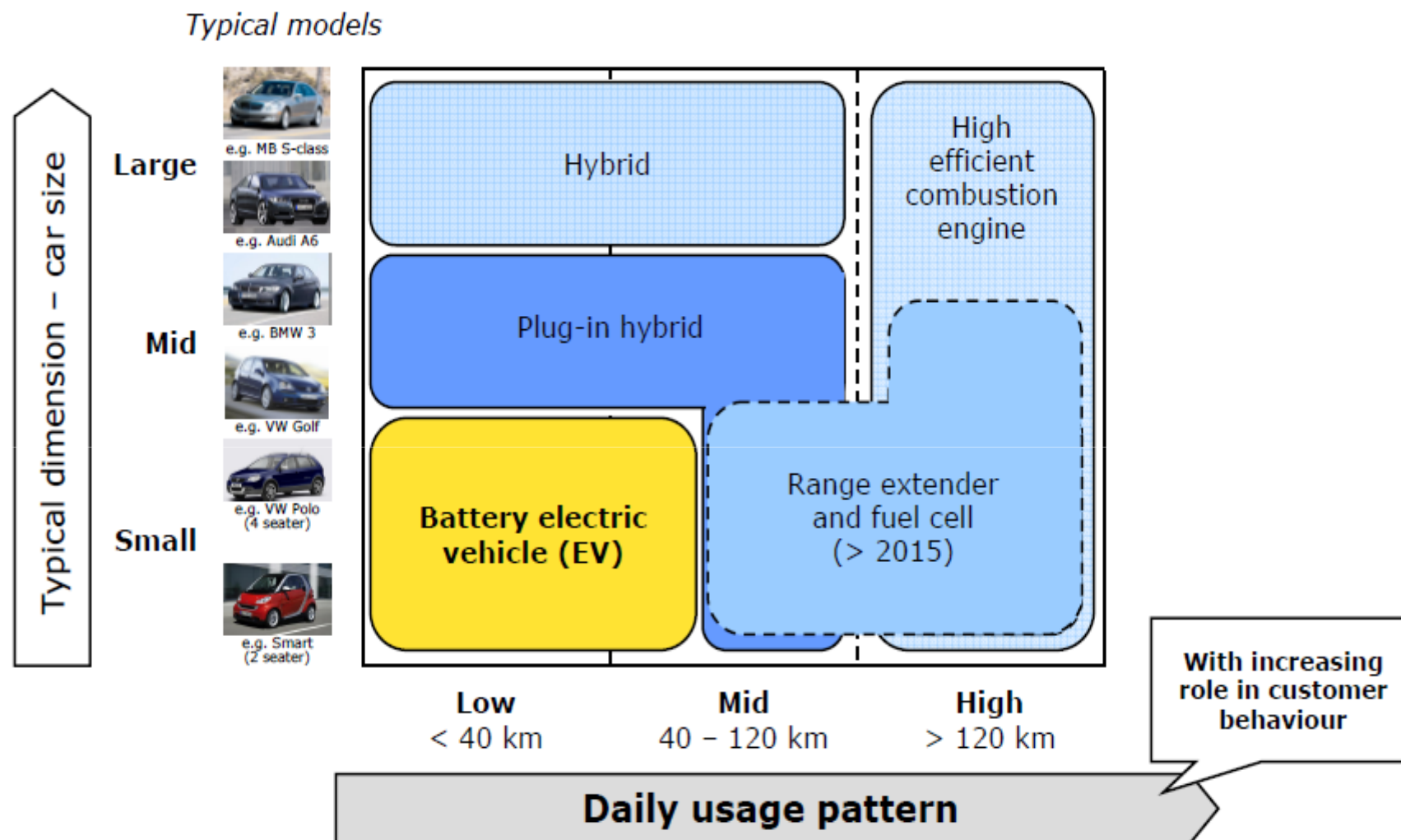
FCI COPYRIGHT

A changing automotive market environment



Source : Bain & Co

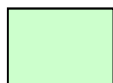
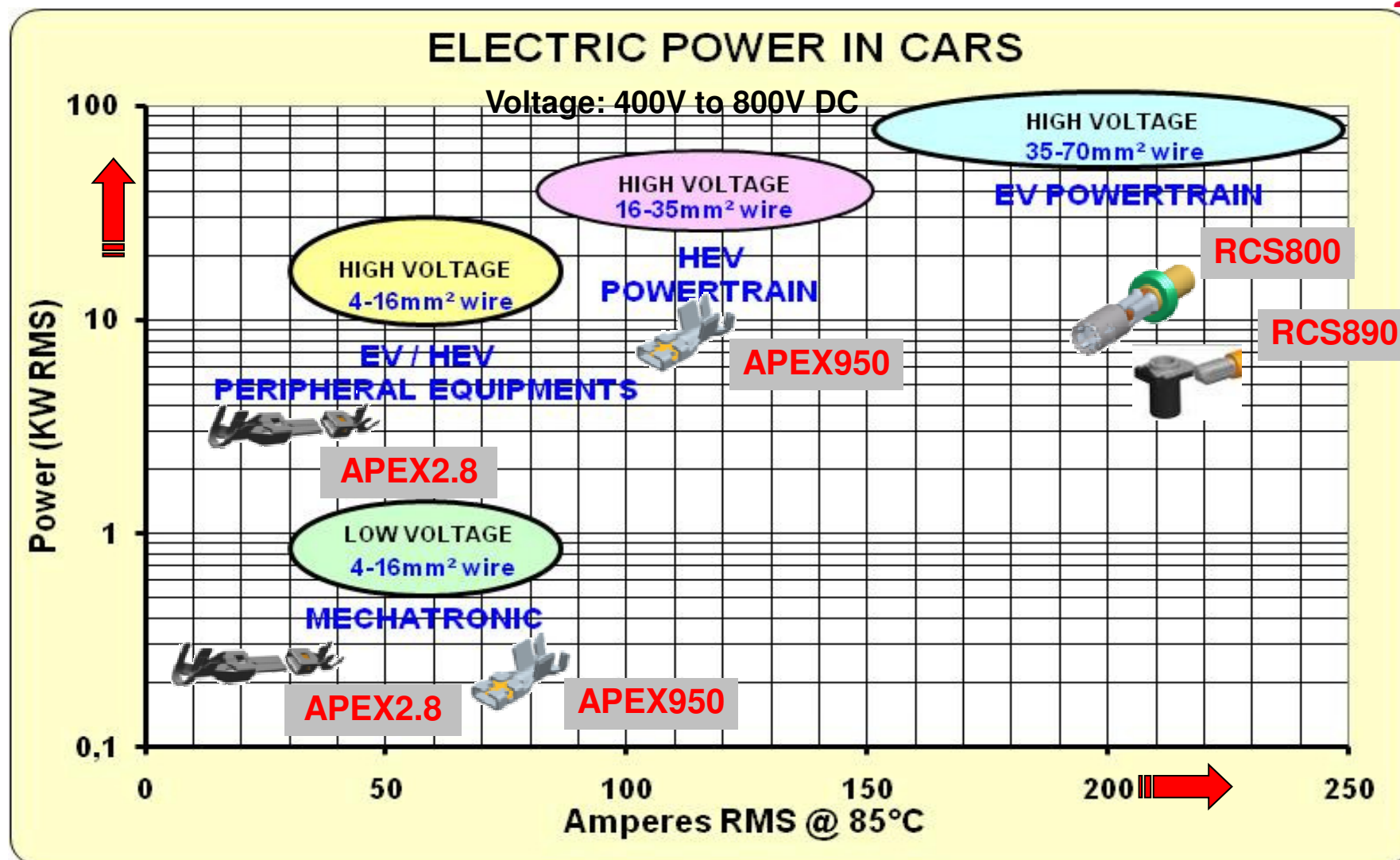
Battery electrical solutions for metropolitan mobility



Note: 70% of the European population drive less than 40 km per day; 80% of U.S. population drive less than 50 miles per day

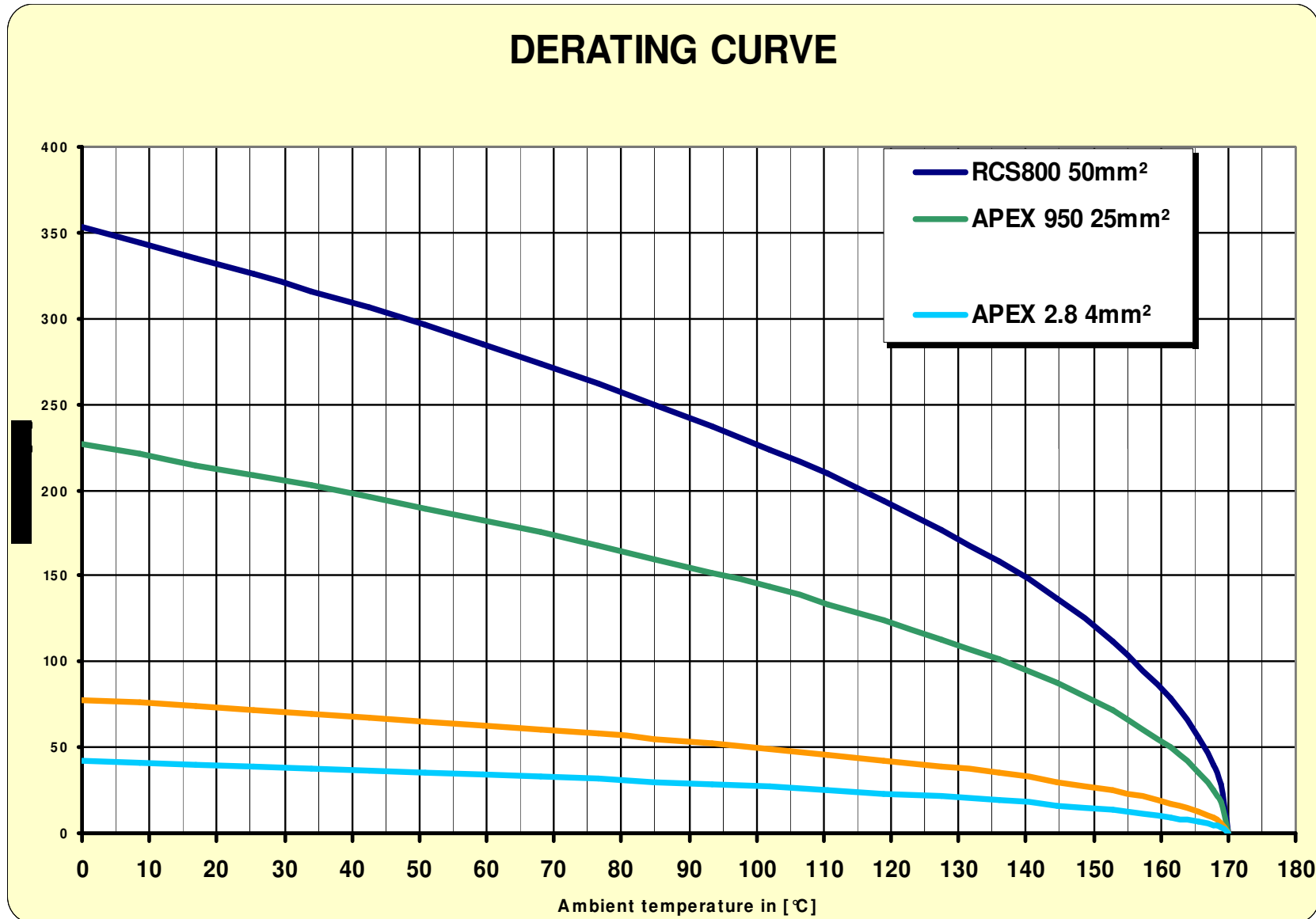
Source : Bain & Co

What does High Power means in Automotive?



FCI's complete range of terminals to cover all applications

Current carrying capacity - terminals derating curves*



* For RCS800, performance based on high quality cables.

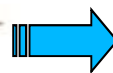
We equip serial cars ...



Example of Renault Fluence and Nissan Leaf EV

➤ *high power system
interconnection*

Apex280 2-way
RCS800 2-way



Renault L38 electric car (Fluence)



POWER.S³ - High power interconnect products



HOUSINGS

"Peripherals"

Air conditioning
Heating
In-car charger



APEX280 2-WAY

PERIPHERAL
SHIELDING



APEX950 4+1-WAY

UNSHIELDED

(serial Q3 2012)

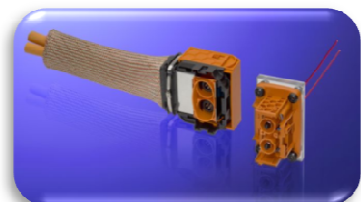
"Powertrain"

Battery
Junction box
Inverter
e-motor



RCS800 2-WAY

PERIPHERAL
SHIELDING



RCS890 2-WAY

PERIPHERAL
SHIELDING

(serial Q2 2012)

HIGH POWER TERMINALS



APEX-2.8mm
[2.8mm rectangular pin]

35A @ 70° C
(4mm² cable)



APEX-950
[for 9.5mm rectangular pin]

70A @ 70° C
(16mm² cable)



RCS-800 [straight]
[for 8mm round pin]

230A @ 70°C
(50mm² cable)



RCS-890 [90° angle]
[for 8mm round pin]

210A @ 70°C
(50mm² cable)

POWER.S³

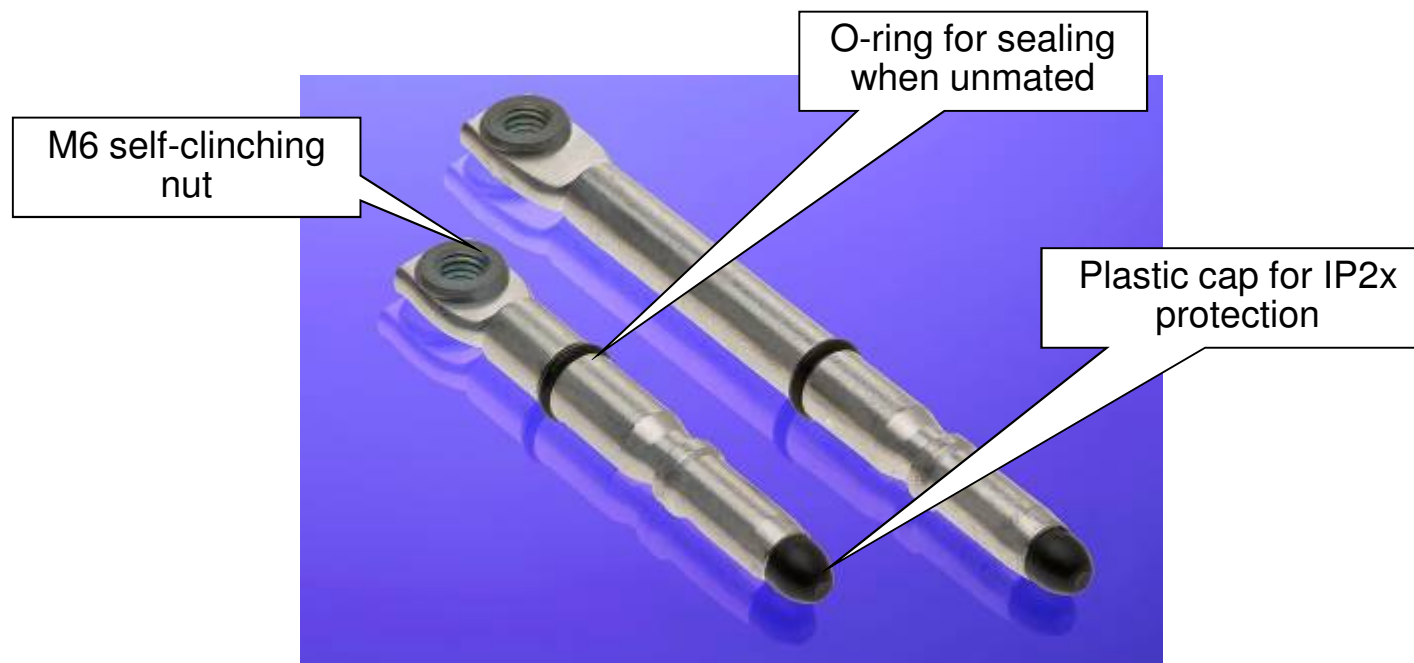
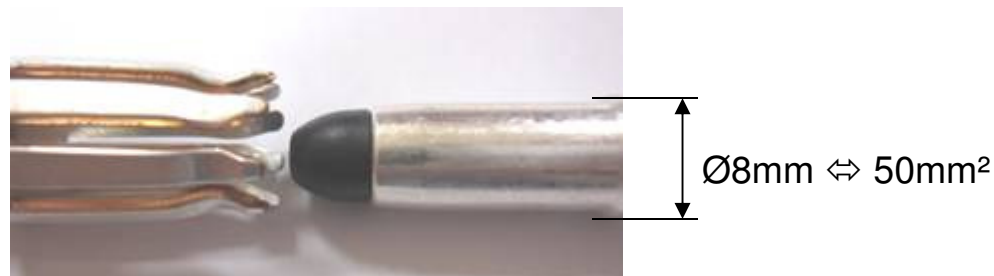
RCS800 – 400/800V, 250A



Power.S³ - RCS-800 male terminal



- ✓ Ø8mm screw machined pin
- ✓ 50 mm² section
- ✓ Plastic cap for IP2x protection
- ✓ To be screwed to busbar (M6)
- ✓ Several terminal lengths for flexible busbar configurations (straight, 90°...)



FCI Power.S³ - RCS-800 female terminal



- ✓ Round shape for optimized dimensions
→ rectangular terminal would require 15x2 mm male terminal

- ✓ Robust bend strength
- ✓ 8 contact points
- ✓ Mate with Ø8mm pin
- ✓ Protective metal cage



- ✓ Body material K75, Cu CR Ti Si, 1.20mm
- ✓ Box material stainless steel 0,4mm
- ✓ Crimping range 35 to 50 mm²
- ✓ Current capacity 230A at 70°C
- ✓ Contact resistance < 0.1mΩ
- ✓ Operating temp. -40°C / 170°C
- ✓ Plating Silver (Ag)

FCI Power.S³ - RCS-890 female terminal



- Same performances as RCS800
- 2 copper alloy parts and 1 isolating part

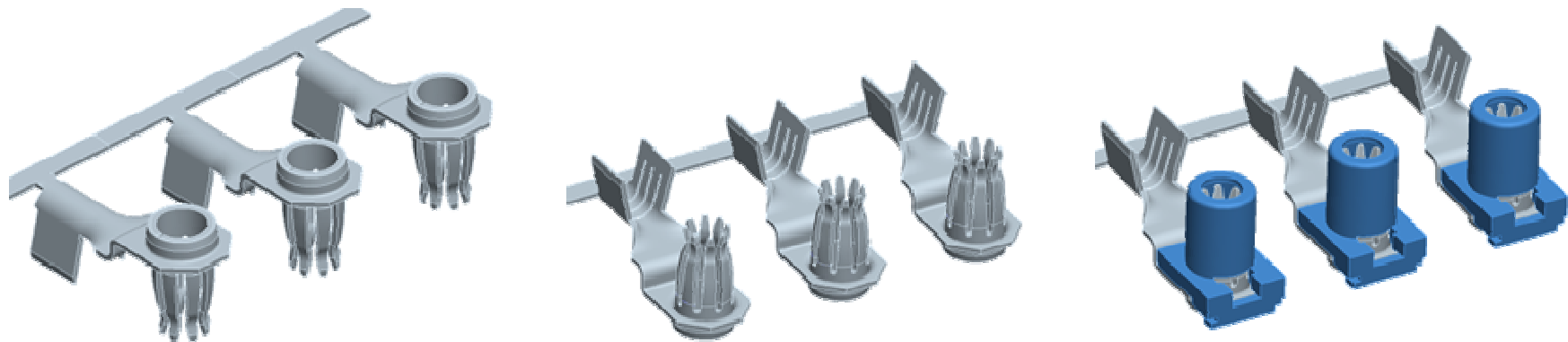
The active part is stamped and rolled



It is then inserted in force into a crimping part



Finally, an isolating body is added to ensure mechanical protection.



■ Features & benefits

- High voltage : 400 / 800 V
- Current rating: 230A @ 70°C
- Ergomate system with two-step disconnection system
- Dual sealing feature
- Shielding : 60 db
- Integrated Interlock system

■ Main applications : High current, high voltage DC connections for

- Battery
- Junction box
- Inverter

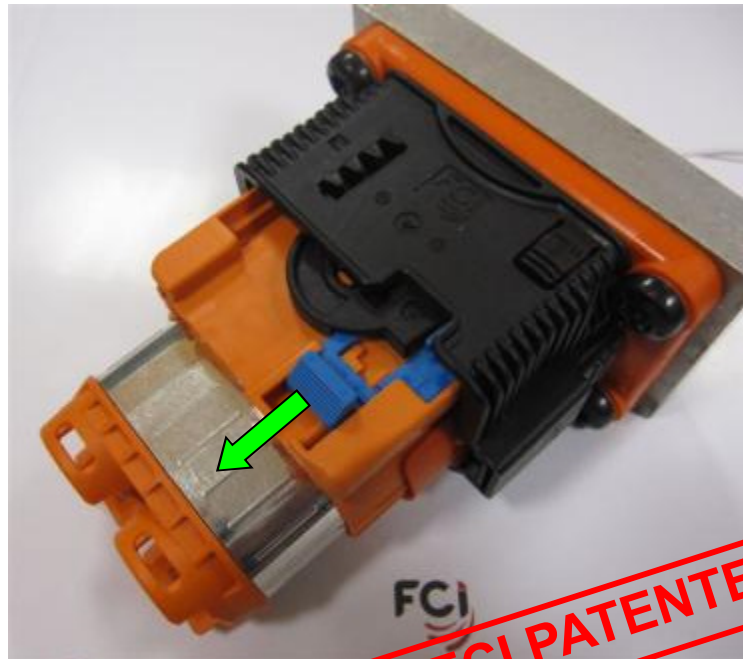


FCI Power.S³ : RCS-800 housings

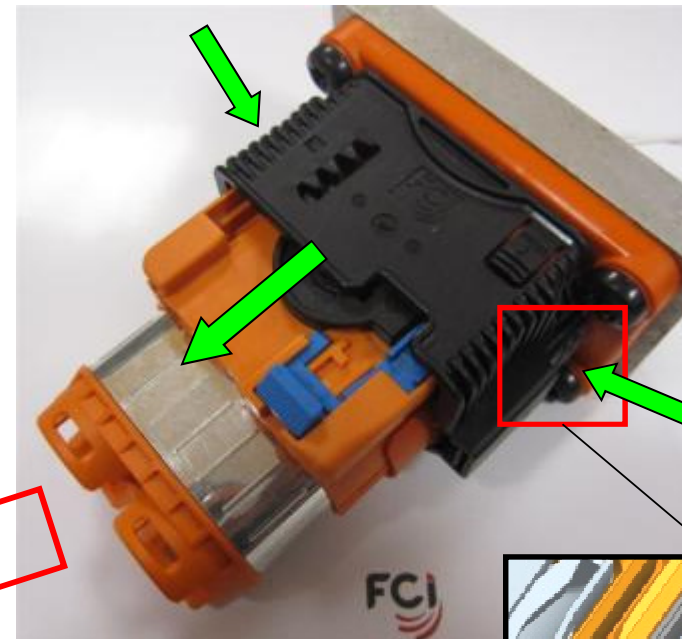


Two step unmating

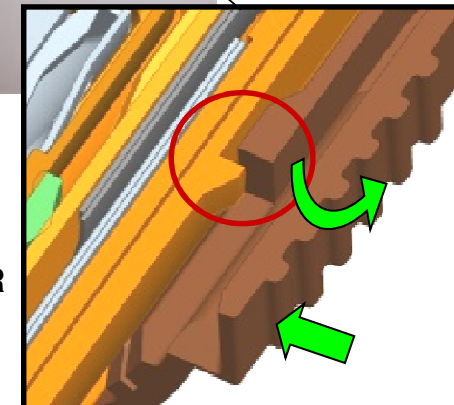
1st step



1 PULL THE CPA
TO ITS 'OPEN' POSITION



2 PRESS THE **SIDE LATCH** TO
UNMATE THE PLUG CONNECTOR
THEN PULL IT

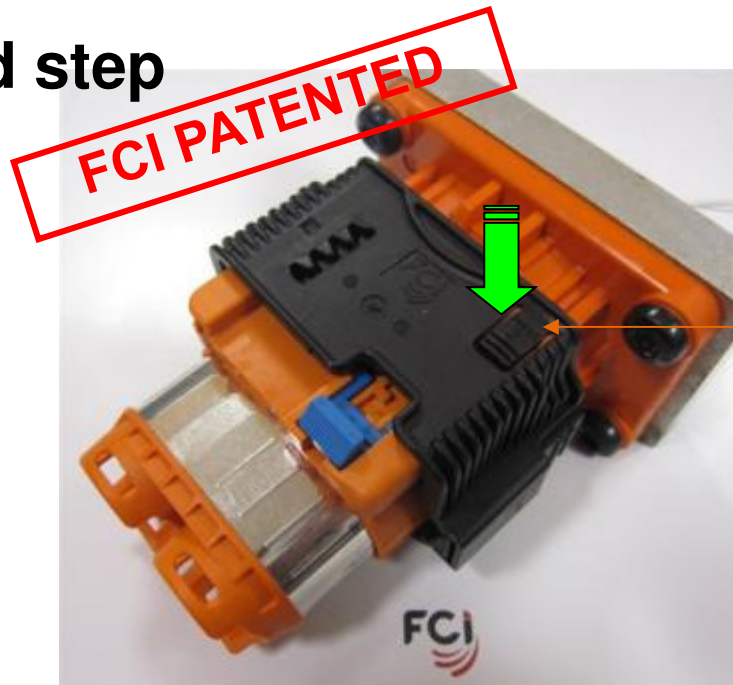


FCI Power.S³ : RCS-800 housings



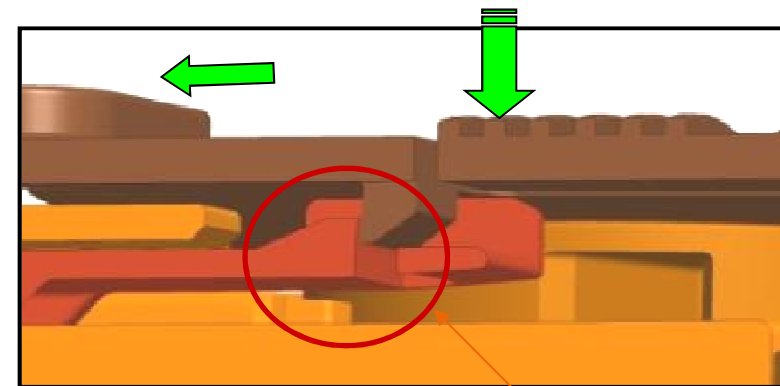
Two step unmating

2nd step



Similar concept on Apex 280 and RCS890 housing

- 1 **CHANGE HAND'S POSITION**
AND PRESS **TOP LATCH** TO
RELEASE THE SLIDER



- 2 **PULL THE SLIDER TO**
FINISH THE UNMATING

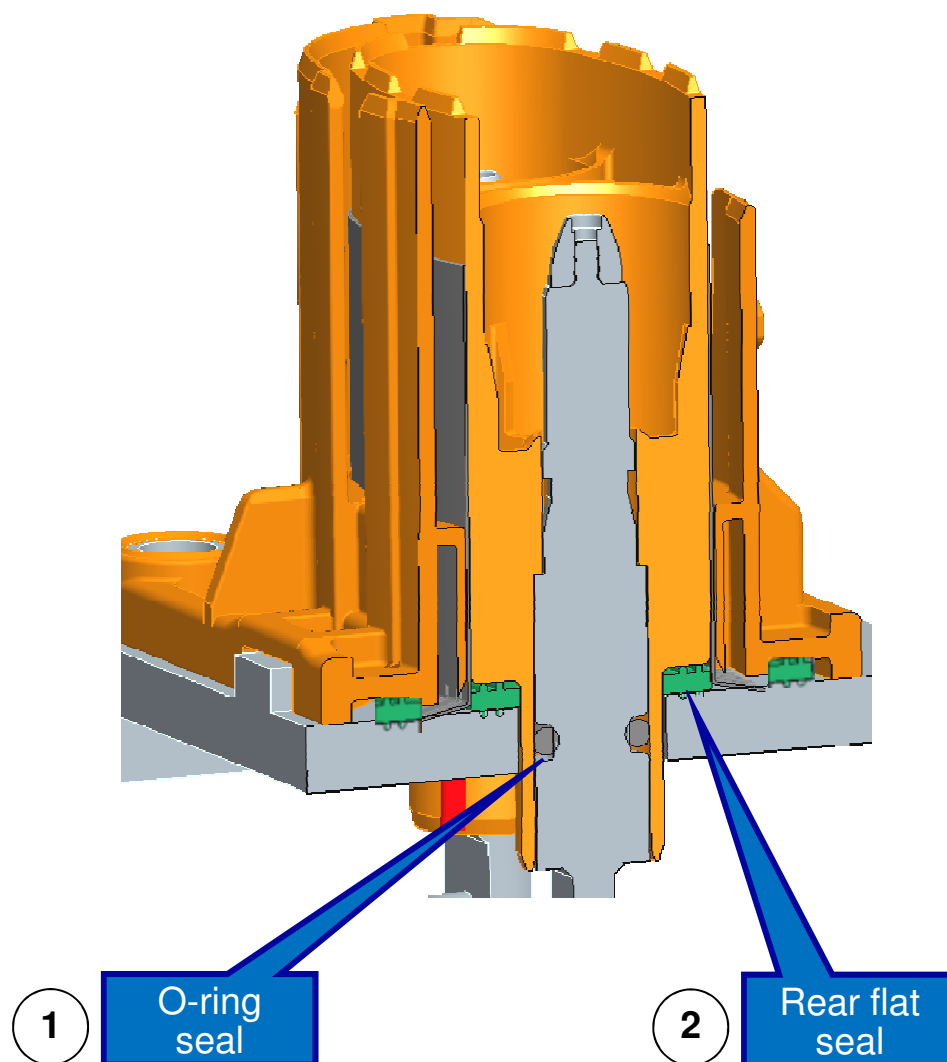
THE SLIDER IS STOPPED ON THE CPA
UNTIL TOP LATCH IS PRESSED

FCI Power.S³ : RCS-800 housings



Dual sealing feature - header

Header unmated sealed. Water can't go inside the box

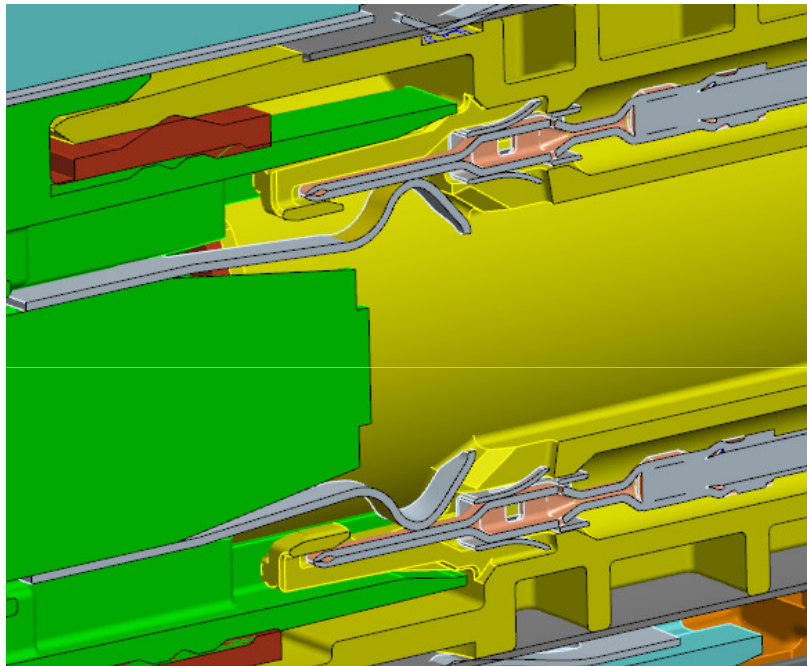


Peripheral seal for corrosion protection between connector shielded and metallic system.

Same concept for the Apex 280 housing

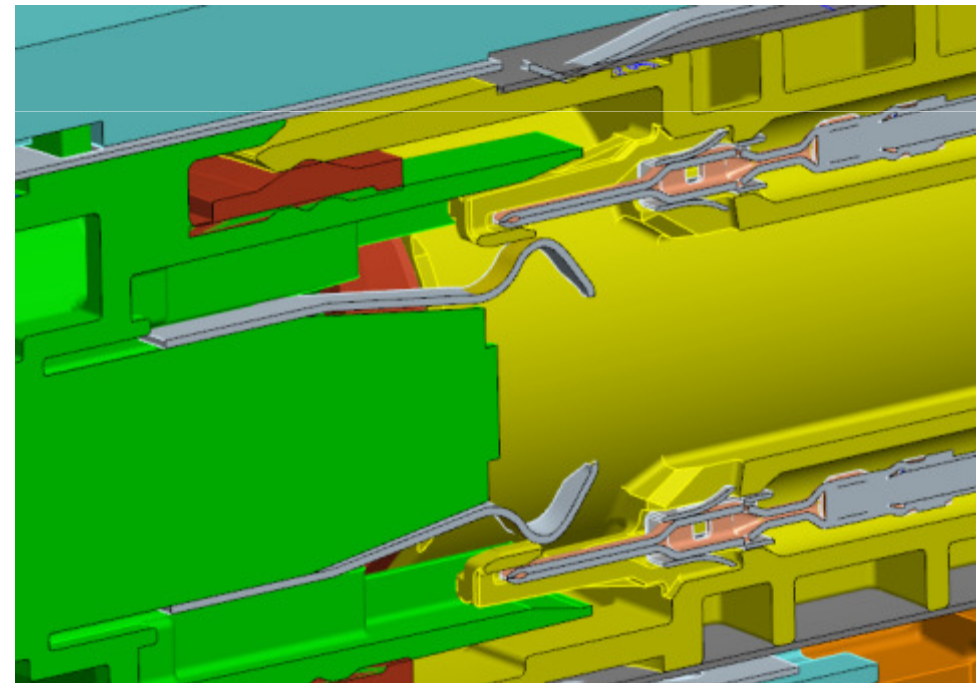
FCI Power.S³ : RCS-800 housings

Integrated interlock function



Mated position

Unmated intermediate position

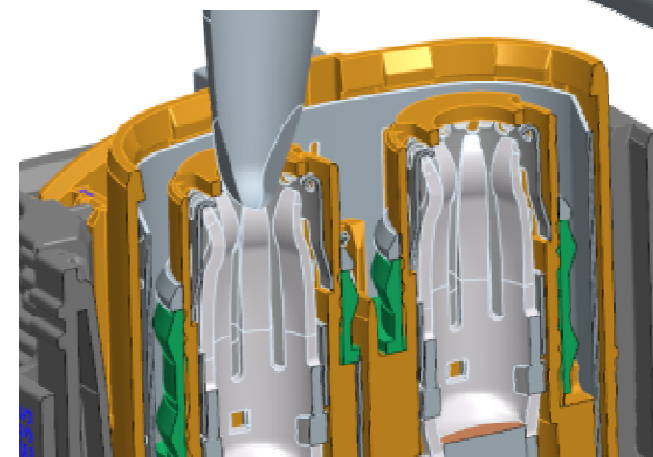
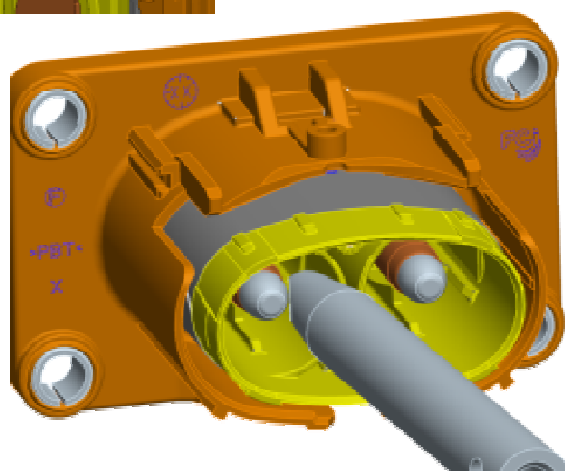
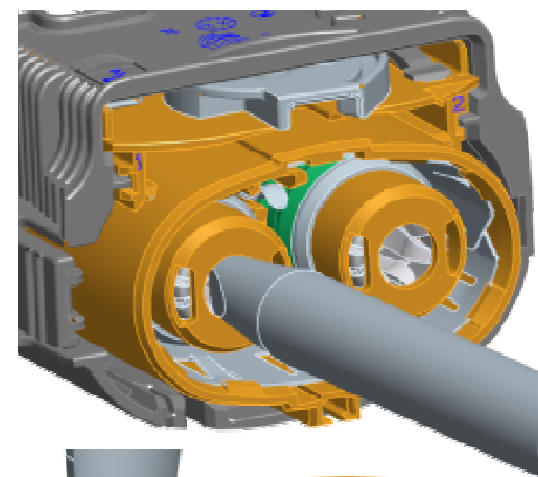
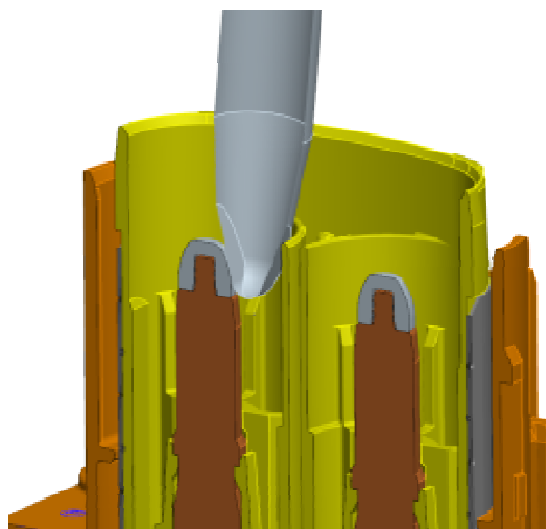


FCI Power.S³ : RCS-800 housings



IP2XB electrical shock protection

Protection of the connector active/conductive parts against electric shock
(i.e preventing access by operator's finger)

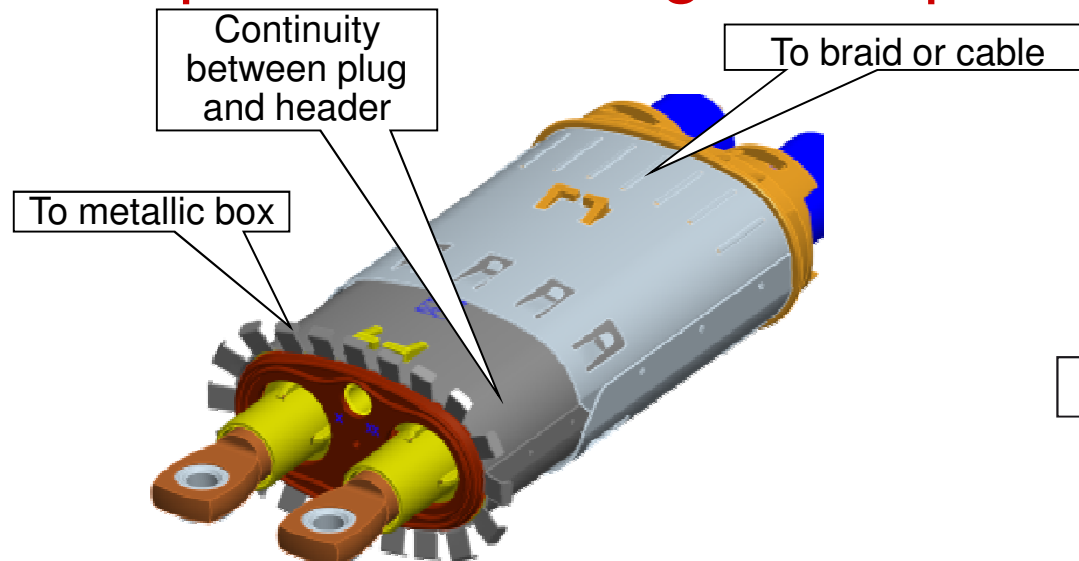


Same concept for APEX-280 housing

FCI Power.S³ : RCS-800 housings



Peripheral shielding concept



Same concept for APEX-280 housing

Shielding efficiency:
60dB according EN 50289-1-6 clause N°8 and IEC61196-1-12.6 triaxial method ($Z_t \leq 100\text{m}\Omega$ from 10 Hz to 100 MHz)

Shielding continuity:
 $R \leq 100\text{m}\Omega$

MAIN ADVANTAGES :

- ✓Fast and simple process to attach the metal braid on the female connector.
- ✓Usage of shielded cables is unnecessary



**EFFECTIVE
TOTAL APPLIED COST**



Shielded braid choice is essential to make sure to keep shielding efficiency performance after ageing. Please refer to our FCI user manual to select recommended braids.





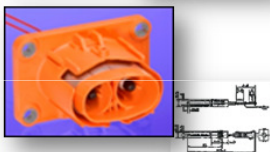





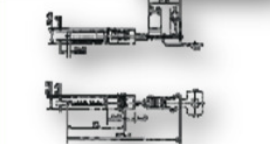

Power.S³ : RCS-800 Part numbers



Description	Bill of material BOM	New version P/N	Product image
RCS-800 2WAY PLUG CODE 1 BLACK	1	F673110	
RCS-800 2WAY PLUG CODE 2 BROWN	1	F773110	
RCS-800 FEMALE TERMINAL silver version 35 to 50 MM²	2	F385400	
RCS-800 FEMALE RETAINER (PLUG)	2	F527600	
RCS-800 FEMALE SWS 50 MM² (PLUG)	2	F327600	
RCS-800 FEMALE SWS 35-40 MM² (PLUG)	2	F427600	
RCS-800 HEADER CODE 1 BLACK	1	F473110	
RCS-800 HEADER CODE 2 BROWN	1	F573110	
RCS-800 MALE Bus Bar TERMINAL Round 8 Silver version - standard length 49.7 mm	2	F076600	
RCS-800 MALE Bus Bar TERMINAL Round 8 Silver version - V1 71.7 mm	optional	F176600	
RCS-800 MALE Bus Bar TERMINAL Round 8 Silver version - V2 95.7 mm	optional	F276600	
DCS2 1.5 gold-plated MALE TERMINAL 0,5-1,00 mm²	2	60100734	
DCS 1.5 MALE RED SWS 0,22 - 0,5 mm²	2	60993913	

Power.S³ : RCS-800 tooling (1)



RCS 800			
Related product Pictures	Tool Pictures	Description	Part-number
		RCS800 removing tool for female terminal	F 226010
		RCS800 removing tool for male terminal	F218500
		DCS2 1,5 removing tool for male terminal	F418500
		Press and positioning of the SWS 50² & 35² on the connector	F214600
		Insert help tool for the SWS (Optional tool : to be used if the SWS is positioned on the cable after terminal)	F979500
		DCS2 1,5 hand crimp tool (0,50 / 0.75 / 1.00 mm²)	6 520 04 14-M

Power.S³ : RCS-800 tooling (2)



RCS 800

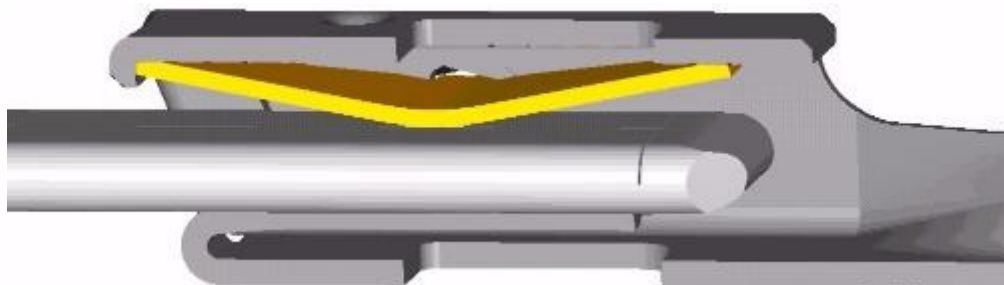
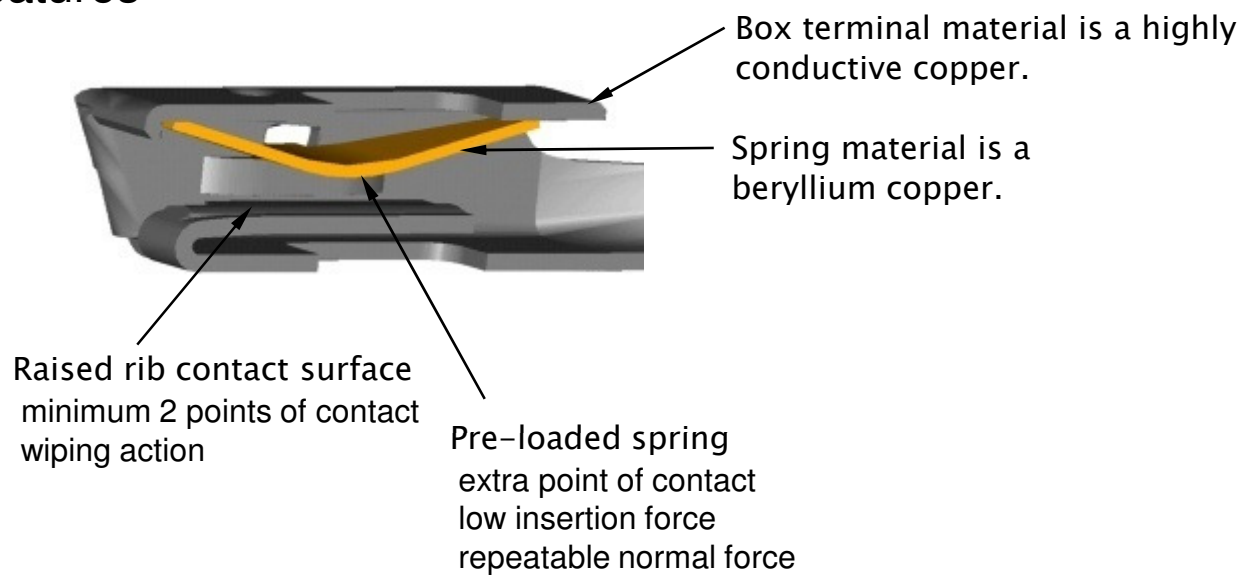
	 <p>RCS800 crimp tool</p> <table><tr><td>CRIMPING HEIGHT</td><td>272mm (10,7")</td></tr><tr><td>STROKE</td><td>50 mm (1,968")</td></tr><tr><td>TERMINAL PITCH</td><td>Loose</td></tr><tr><td>TERMINAL THICKNESS</td><td>> 1,5mm</td></tr><tr><td>WIRE SECTION</td><td>oltre 75mm²</td></tr><tr><td>FEEDING SYSTEM</td><td>Manual</td></tr><tr><td>WEIGHT</td><td>20,4 (44,85)</td></tr><tr><td>DIMENSION mm</td><td>W250xH270xD197</td></tr><tr><td>DIMENSION (")</td><td>W9,84xH10,6xD7,75</td></tr></table>	CRIMPING HEIGHT	272mm (10,7")	STROKE	50 mm (1,968")	TERMINAL PITCH	Loose	TERMINAL THICKNESS	> 1,5mm	WIRE SECTION	oltre 75mm²	FEEDING SYSTEM	Manual	WEIGHT	20,4 (44,85)	DIMENSION mm	W250xH270xD197	DIMENSION (")	W9,84xH10,6xD7,75	<p>RCS -800 TOLL 03.2010 (Model MECAL) Other Tool Typ please ask FCI Nürnberg</p>						
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	 <p>CH 460 0</p>	<p>HAND CRIMPPRESS FCI C10 for max. Cable: 100 mm².</p>																								
		<p>CRIMP SPARE PARTS SET for HAND CRIMP TOOL FCI C10</p> <p>CR10 (10mm²) CR16 (16mm²) CR25 (25 mm²) CR35 (35-40mm²) CR50 (50 mm²)</p>																								

POWER.S³

APEX-280 – 400/800V, 35A



■ Features



- Apex-280 housings offers same features and benefits as RCS-800 housings

- High voltage 400 / 800V
- Ergomate system with two-step disconnection system
- Dual sealing feature
- Shielding : 60 db @ 100MHz
- Integrated Interlock system













- Current rating: 35A @ 70°C

- Main applications : Medium current, high voltage DC connections for:

- Heating device
- Air conditioning
- In-car charge plug interconnection



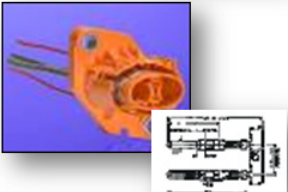

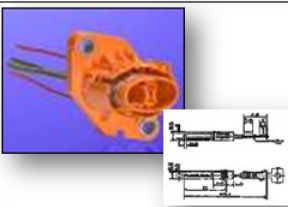

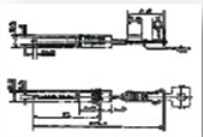

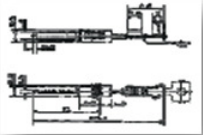

FCI Power.S³ : Apex-280 Part numbers



Description	Bill of material	New version P/N	Product image
APEX-280 PLUG CODE 1 BLACK	1	F083110	
APEX-280 PLUG CODE 2 BROWN	1	F183110	
APEX-2.8 FEMALE TERMINAL 4 mm ²	2	54001202	
APEX-2.8 MALE & FEMALE SWS Red 4 mm ²	2	C302400	
APEX-280 HEADER CODE 1 BLACK	1	F873110	
APEX-280 HEADER CODE 2 BROWN	1	F973110	
APEX-2.8 MALE TERMINAL 4 mm ²	2	54001027	
APEX-2.8 MALE & FEMALE SWS Red 4 mm ²	2	C302400	
DCS2 1.5 gold-plated MALE TERMINAL 0,5-1,00 mm ²	2	60100734	
DCS 1.5 MALE RED SWS 0,22 - 0,5 mm ²	2	60993913	

FCI Power.S³ : Apex-280 Tooling



APEX280			
Related product Pictures	Tool Pictures	Désignation	Part-number
		Apex 280 removing tool for female terminal	F911110
		Apex 280 removing tool for male terminal	F689500
		DCS2 1,5 removing tool for male terminal	F858400
		DCS2 1,5 hand crimp tool (0,50 / 0.75 / 1.00 mm ²)	6 520 04 14-M
		Apex 2.8 hand crimp tool (4.0 mm ² with SWS)	6 520 10 99 -M

THANK YOU !

