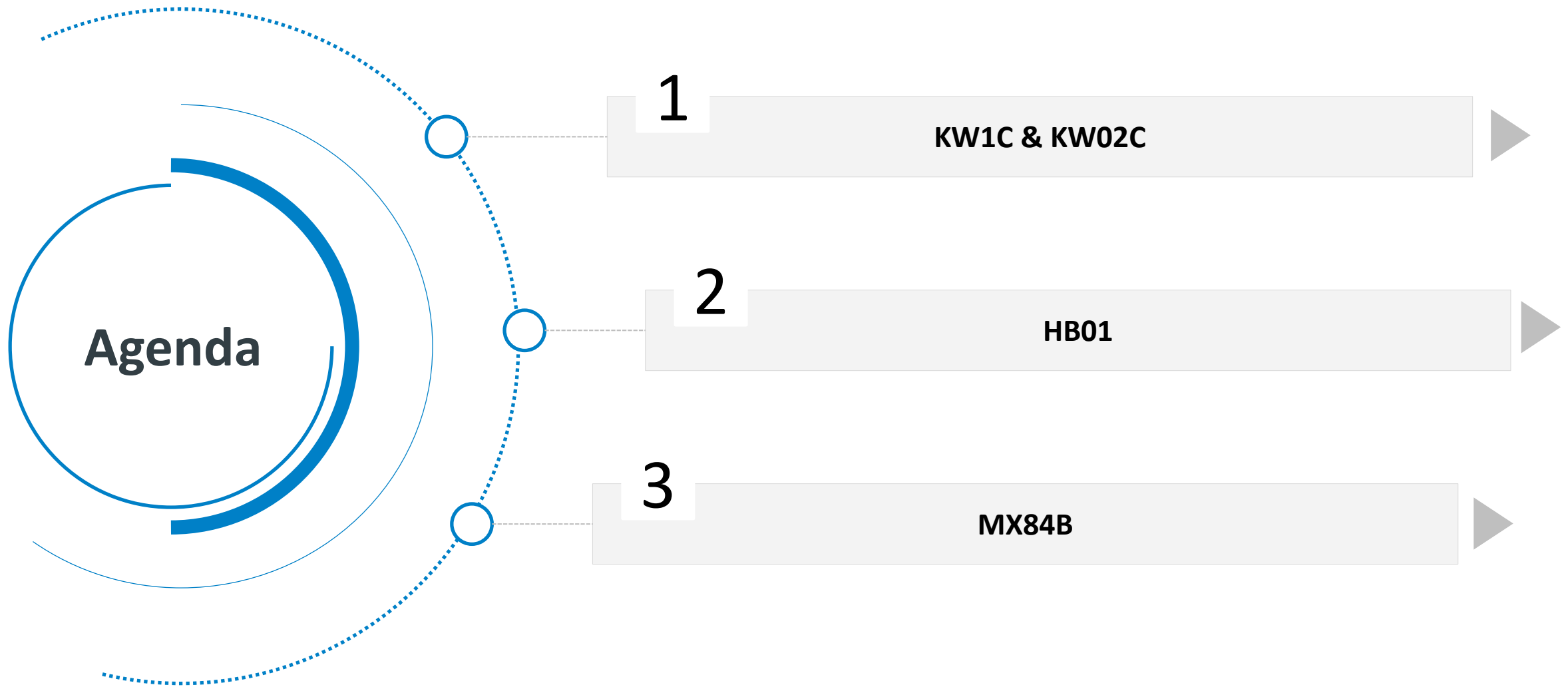


# TECHTALK

## ENERGY & POWER

*Rutronik*

**Erik Tröger, Head of Connector Sales, Distribution**  
**Dr. Levon Altunyan, Product and Marketing Manager**  
**26.04.2022**



A futuristic scene featuring two cars on a light-colored road. The car on the left is a white, semi-transparent wireframe model. The car on the right is a solid red sports car. Both cars are surrounded by glowing blue energy lines and light trails, suggesting high-speed motion or energy transfer. The background is a bright, hazy sky with some distant structures.

# KW1C & KW02C

*EV Charging*



# KW SERIES DEVELOPMENT TIMELINE



CHAdeMO

Joined  
CHAdeMO 2010



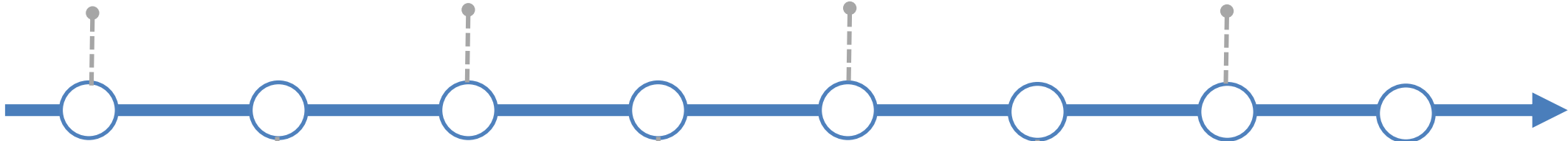
KW02  
Release 2017



Joined  
CharIn 2019



KW1C and KW02  
Release 2021



KW1  
Release 2015



KW03  
Release 2018



KW04  
Release 2020



First to Market with  
Replaceable Front Cap

KW\*\*  
Release Soon



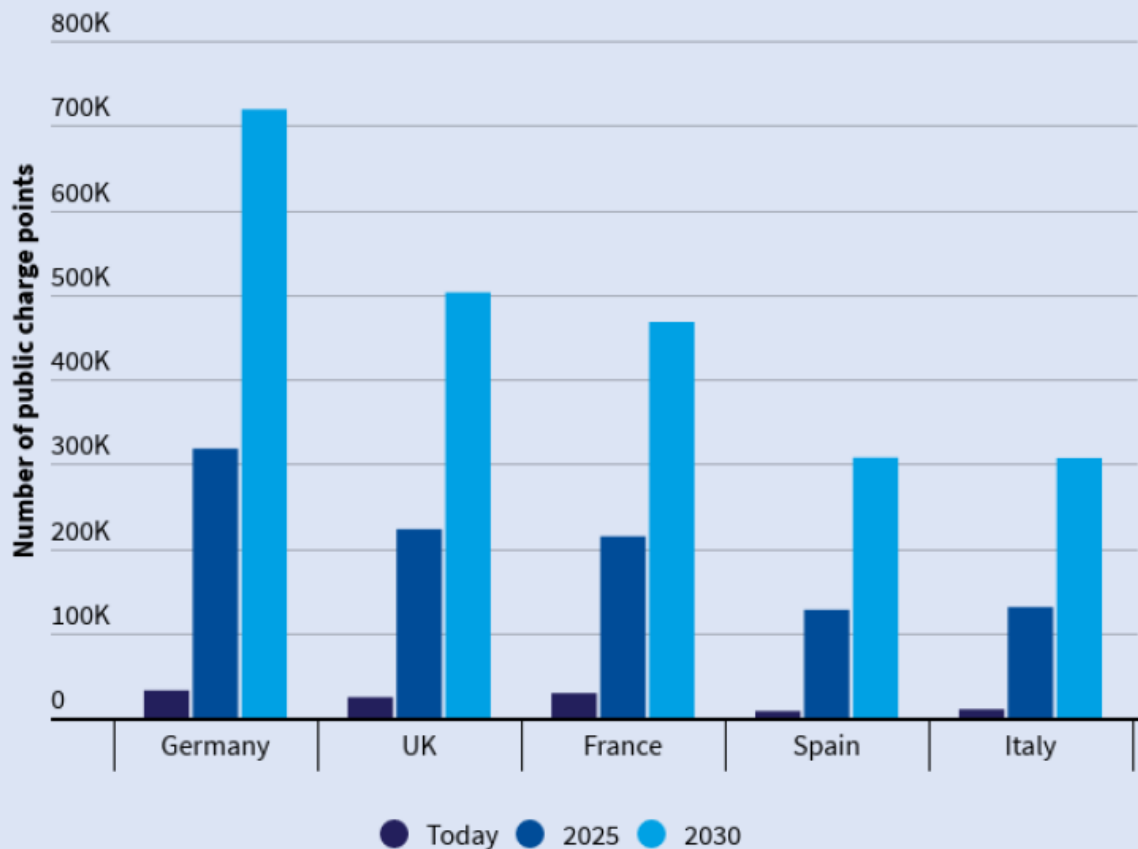
A wide-angle, high-angle photograph of a modern automotive manufacturing plant. The scene shows a complex network of assembly lines, robotic arms, and partially assembled vehicles. The lighting is bright and industrial, with a clean, organized appearance. The text 'OUR MARKET POSITION' is overlaid in large, white, bold, sans-serif capital letters across the center of the image.

# OUR MARKET POSITION

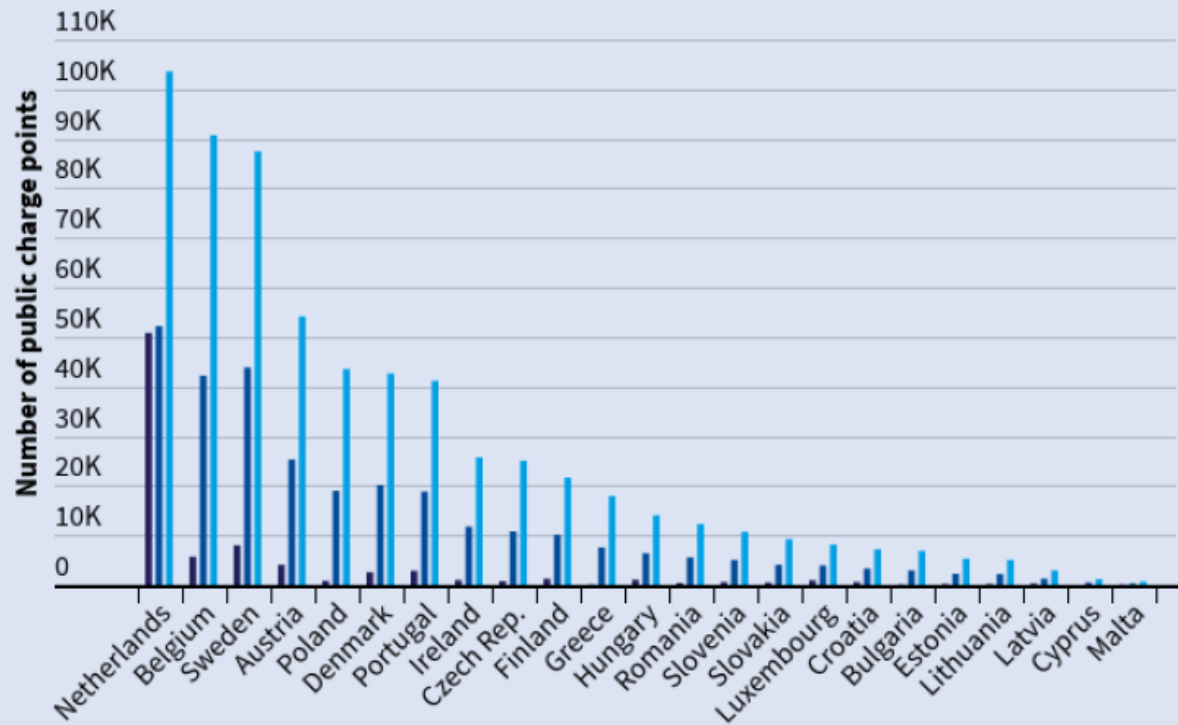
*The market looks for **innovative solutions** that drive continuous **COST** improvements.*

*We, at JAE offer **right solutions** with **quality products** that keep your **maintenance cost low**.*

## 1.3 million public chargers in 2025 and 2.9 million in 2030 (Road2Zero scenario)



Source: T&E Infrastructure Report 2020



Road2Zero scenario is compliant with the EU's climate ambitions for carbone neutrality by 2050  
 About 78% of the EU's public charge points will be needed in the five biggest EU markets

Source: T&E Charging Infrastructure Supply and Cost model

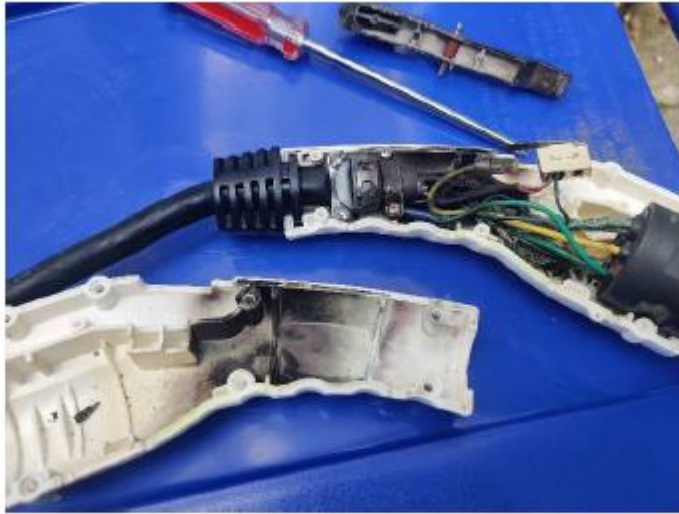


Figure 3. Inspection of a connector producing smoke during a charge session [6].



Figure 4. Exploded connector, Daegu, South Korea, 2018. The explosion was allegedly caused by a short-circuit [7].



Figure 2. Common mechanical failures of connectors, including damage to the housing (left [3]), damage to the mating interface (right [4])

# CHARGING CONNECTOR SOLUTIONS



Product		Standard	Rated Current	Rated Voltage	Certification	Operating Temp	Charging Type
<b>KW1(CE)</b> <b>KW1(UL)</b>		<b>CHAdeMO 1.2</b> <b>IEC62196-3</b>	125 A	500 VDC	UL /CE	CE: -30°C~+50°C UL: -30°C~+40°C	Fast Charge
<b>KW1C</b>		<b>CHAdeMO 2.0</b> <b>IEC62196-3</b>	MAX150 A * Note	500 VDC	CE	CE: -30°C~+50°C	Fast Charge (w/V2G)
<b>KW02</b>		<b>CHAdeMO 1.2</b> <b>V2H Guideline 2.1</b> <b>IEC62196-3</b>	25 A	450 VDC	CE	CE: -30°C~+50°C	Slow Charge (w/V2H, V2G)
<b>KW02C</b>		<b>CHAdeMO 2.0</b> <b>V2H Guideline 2.1</b> <b>IEC62196-3</b>	MAX37 A * Note	500 VDC	CE	CE: -30°C~+50°C	Slow Charge (w/V2H, V2G)
<b>KW03</b>		<b>CHAdeMO 1.2</b> <b>V2H Guideline 2.1</b> <b>IEC62196-3</b>	80 A	500 VDC	UL /CE	CE: -30°C~+50°C UL: -30°C~+50°C	Mid-Charge (w/V2H, V2G)
<b>KW04</b>		<b>CCS Type-2</b> <b>IEC62196-3</b>	150 A 200 A	1000 VDC	CE	CE: -30°C~+50°C	Fast Charge



## Product Feature

- ▶ **Light, compact plastic body with enough robustness**
- ▶ **User Friendly**
  - Just Plug in w/o any button operation
  - One button action for unlocking
  - Ergonomic Grip design
- ▶ **High reliability**
  - Stainless steel used in Latch
  - High weather resistance in Resin part
  - Block foreign material around release button
  - Inside parts switch LED are water/dust proof (KW1, KW1C)
- ▶ **Emergency release/removal and recovery are possible**
- ▶ **Alcohol-resistant for antibacterial cleaning**



Latch  
(Stainless steel)



Plastic body  
(High Weather  
resistance)



Lock-release button - No rubber Cover  
Transparent Window to block foreign  
material



KW02-C



KW1-C

Inside parts have water/dust proof

- Live Contacts
- Electromagnetic lock mechanism
- Unlock detection switch



Mate face is easily broken when charging connector is dropped.

Mating face



**Why this workgroup?**  
Today's technical limitations & shortcomings will amplify over time...

- # EVs Up
- Current Up Heat Up
- Duty Cycle & Mating count up
- More EVSE – Chargers in Field
- More Different Use Cases

## Advantages

- Cost reduction of EV connector full assembly replacement
- Remove the mating face and replace the new one
- Replace only the outer part to reduce costs

**Reduce Replacement Costs**

CE



### Interchangeable Mating







Mating section can be easily replaced with contacts



### Double Insulation Structure

The live components are protected by the internal housing

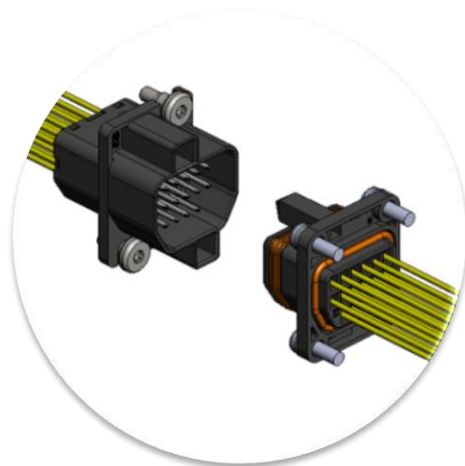
# CURRENT EV CHARGING PRODUCTS (KW-SERIES)

System	Output	CHAdeMO			CCS		ChaoJi
		CE	JCS	UL	CE	UL	CCC
HPC (High Power Charge)	>1000A		★ ChaoJi		★ MCS		★
	600A						★
	400A				<b>KW04</b> CCS-2		★
Fast Charge	200A	<b>KW1C</b> CHAdeMO	<b>KW1</b> CHAdeMO				★
	125A					★ CCS-1	★
	80A	<b>New</b>		<b>KW03</b> CHAdeMO			★
V2G V2H	37A	<b>New</b> 	<b>KW02C</b> CHAdeMO		★ CCS-2		★
	25A		<b>KW02</b> CHAdeMO				★

★ : Under Consideration

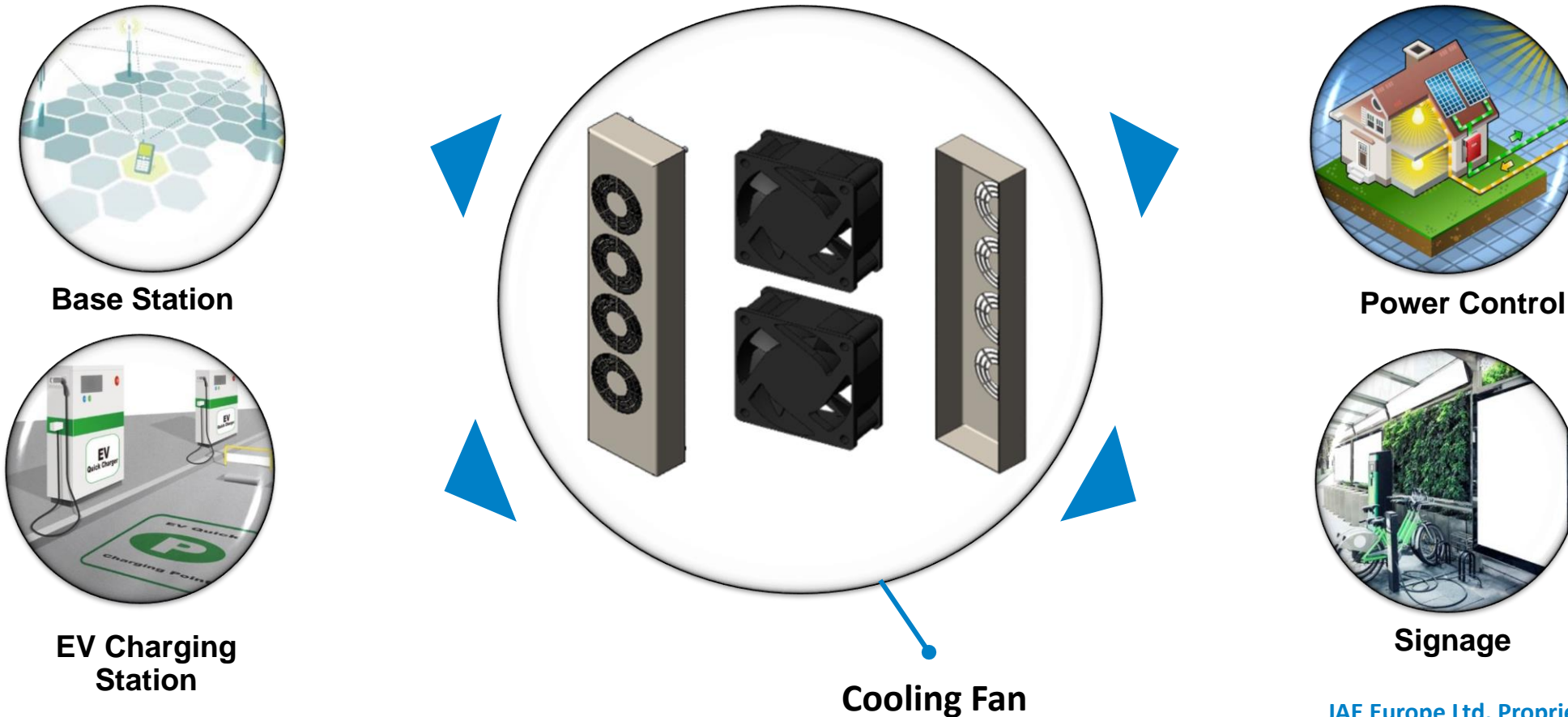
# WATER PROOF DOCKING CONNECTOR FOR COOLING FAN

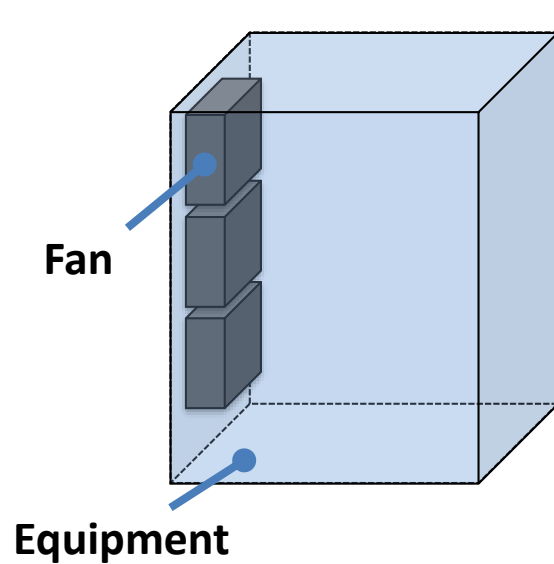
*HB01*



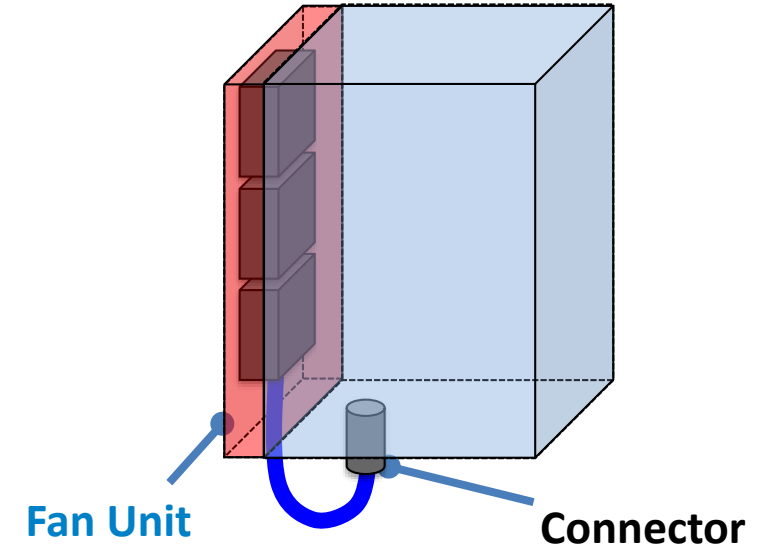
The demand of having fan have been increased for outdoor applications.

- ▶ Cooling fans are needed to lower the temperature in addition to natural cooling.
- ▶ Waterproof is required for outdoor applications.





Requirement  
Exchange workability  
(Reduce maintenance cost)  
(Increase machine availability)



## Advantage

- Flexibility in setting the fan

## Challenges

- Complicated for wiring
- Complicated for maintenance

## Advantage

- Reduce maintenance cost
- Reduce cost by standardizing units

## Challenges

- Need I/O connector to supply power

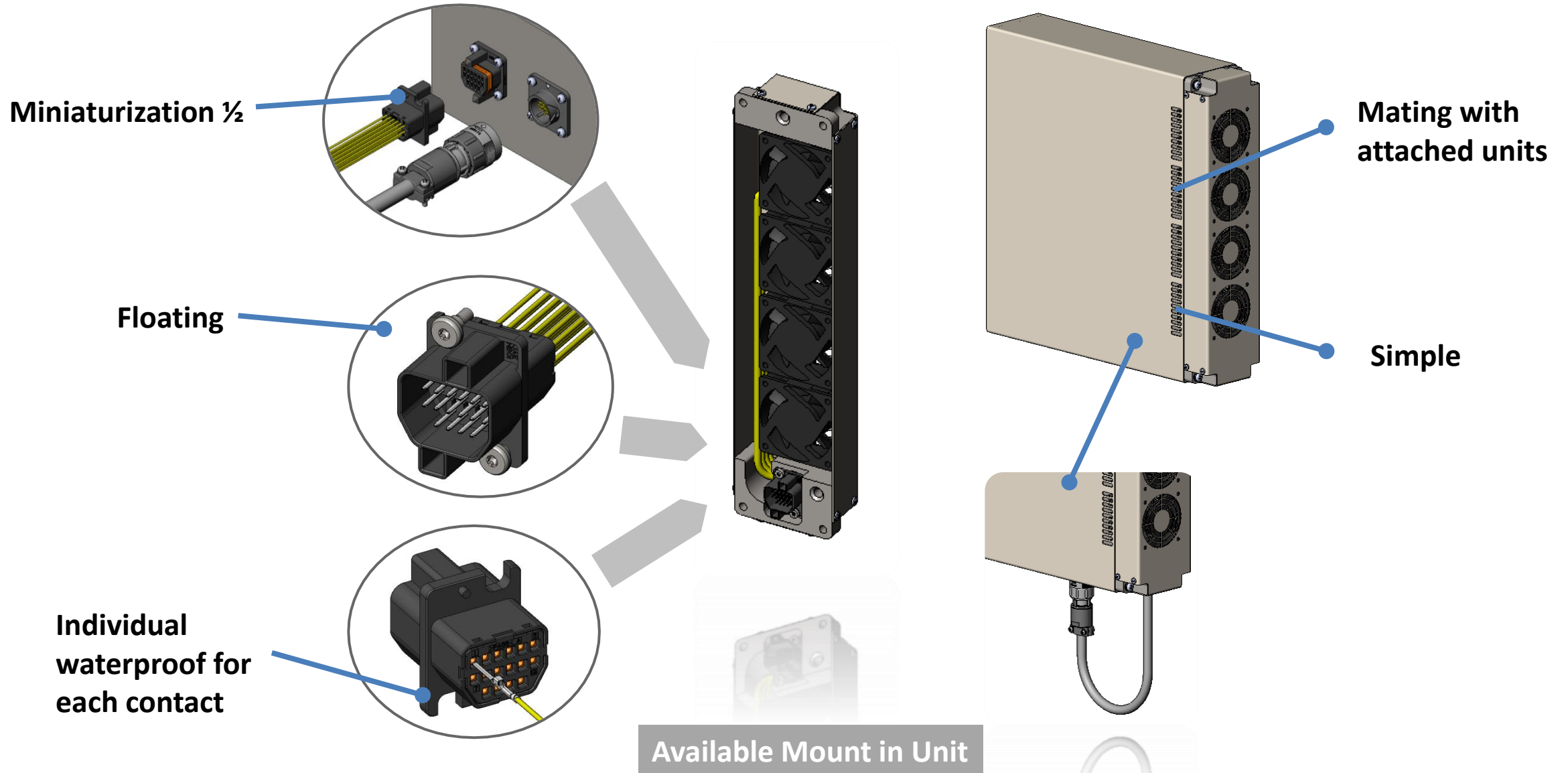


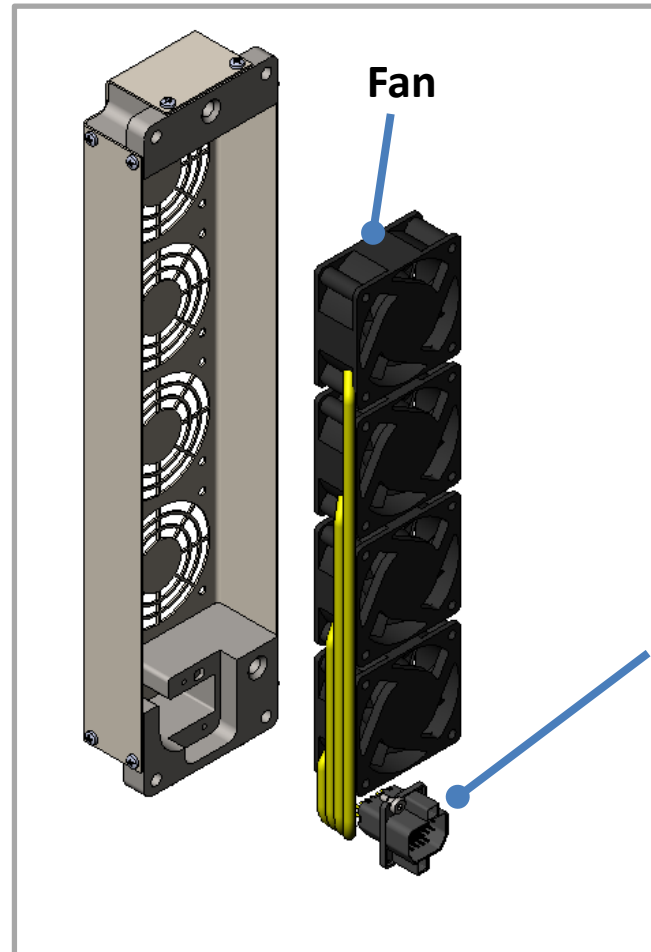
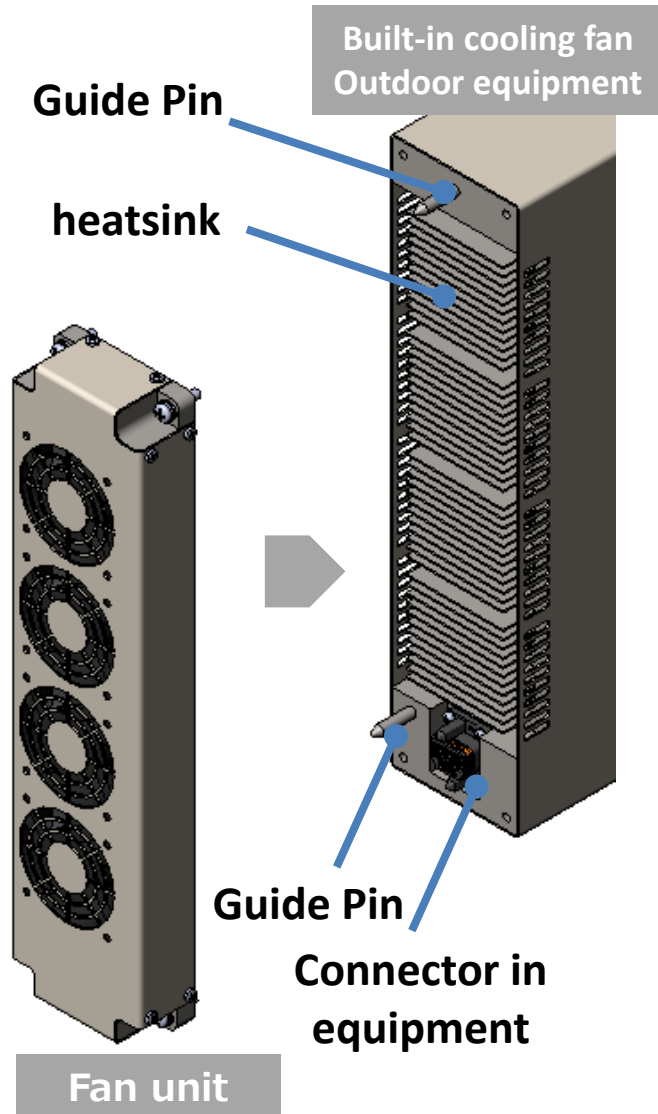
# COMPARISON BETWEEN CURRENT AND NEW

GEU22-037

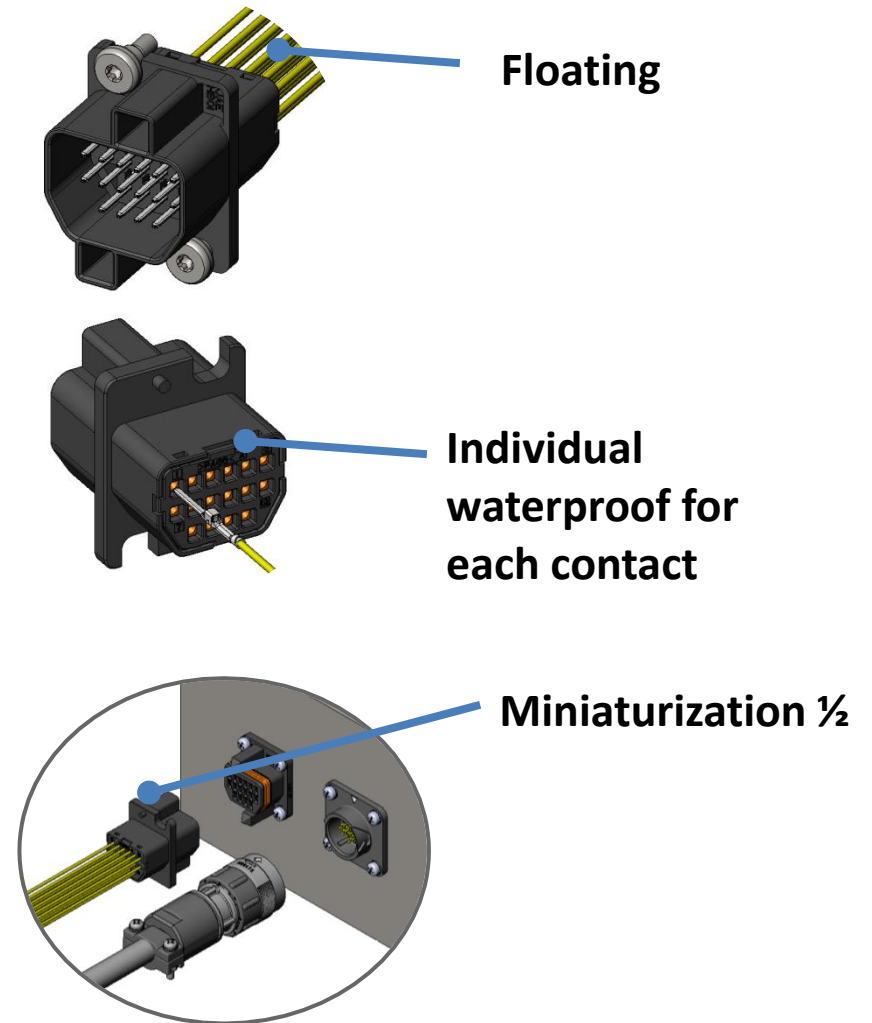
19







**Available built into the unit  
Docking type  
Save cost**



Comparison with round I / O connector

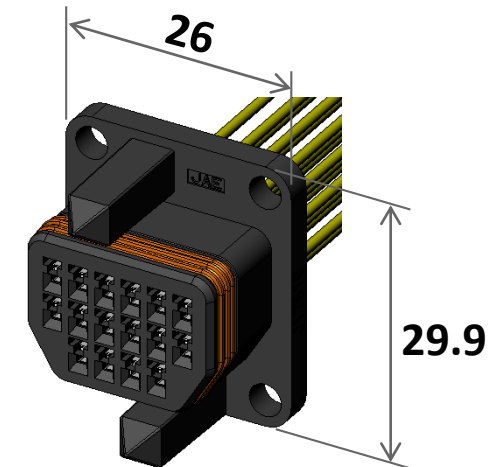
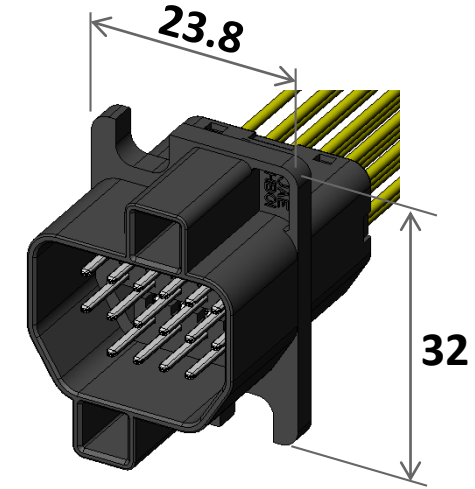
# HB01 SPECIFICATION

GEU22-037

22

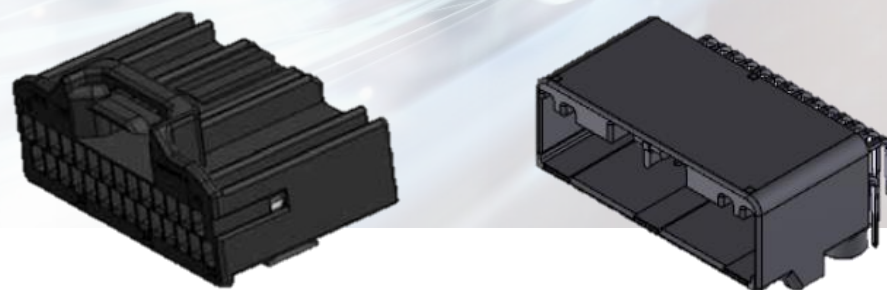


Material	Voltage	AC/DC50V
	Current	1A/Pin
	Applicable Wire Size	AWG#22 ~ 24 $\Phi$ 0.9 ~ 1.5
	Pin Count	16 pin count (12 pin count)
	IP Rating	IP67(when mated)
	Tolerance mis-mating	$\pm$ 1mm(X,Y,Z axis)
	Contact	Copper alloy Contact area Au Crimp area Sn
	Insulator	15%GF 6-6Ny
	Seal	Silicon rubber
	Mount Connector	Pin Connector
Socket Connector		M3 Screw $\times$ 4EA

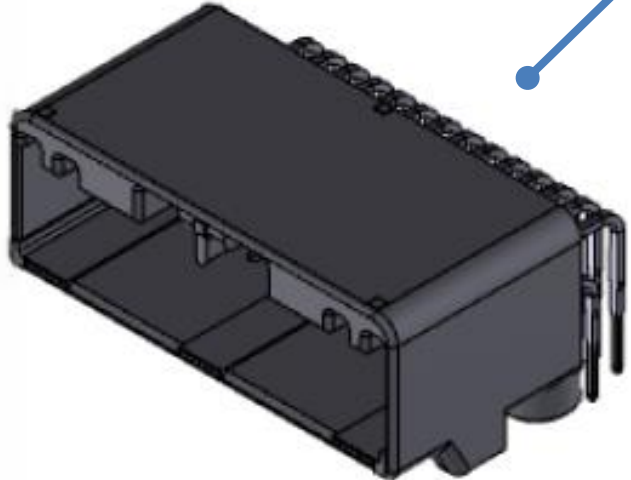


# MX84B SERIES

*UL94 V-0 Compatible Model of  
MX34 Series*



JAE developed MX84B series in response to safety requirement.



▶ Design based on MX34

▶ Change material to comply with UL94 V-0

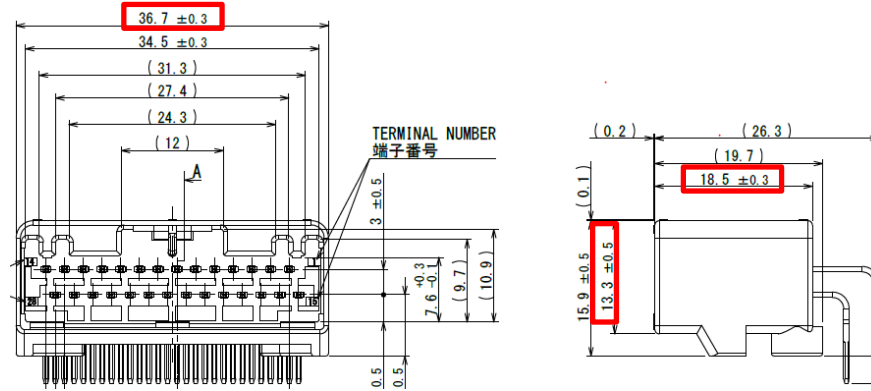
Material

▶ Pin-header: SPS

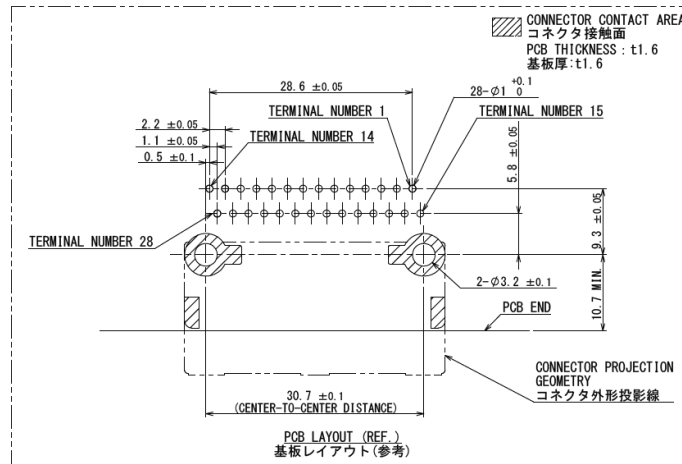
▶ Socket/In-line: PBT

## MX84

### Size

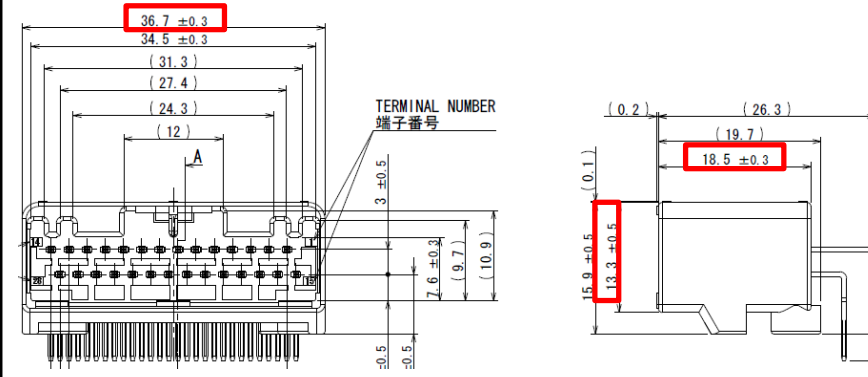


### Foot Pattern

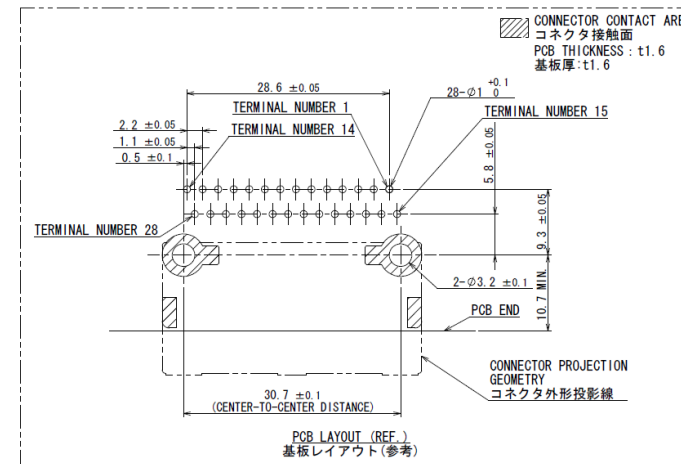


## MX34

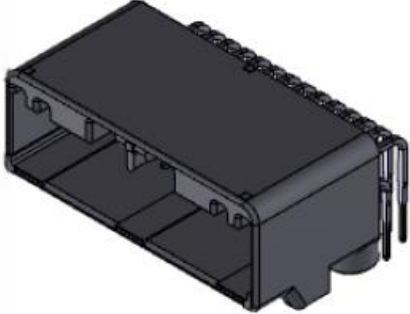
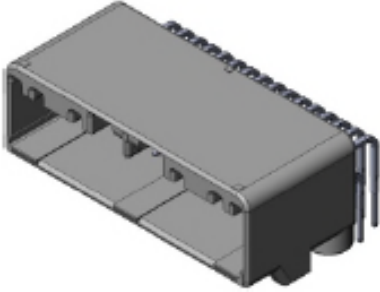
### Size



### Foot Pattern



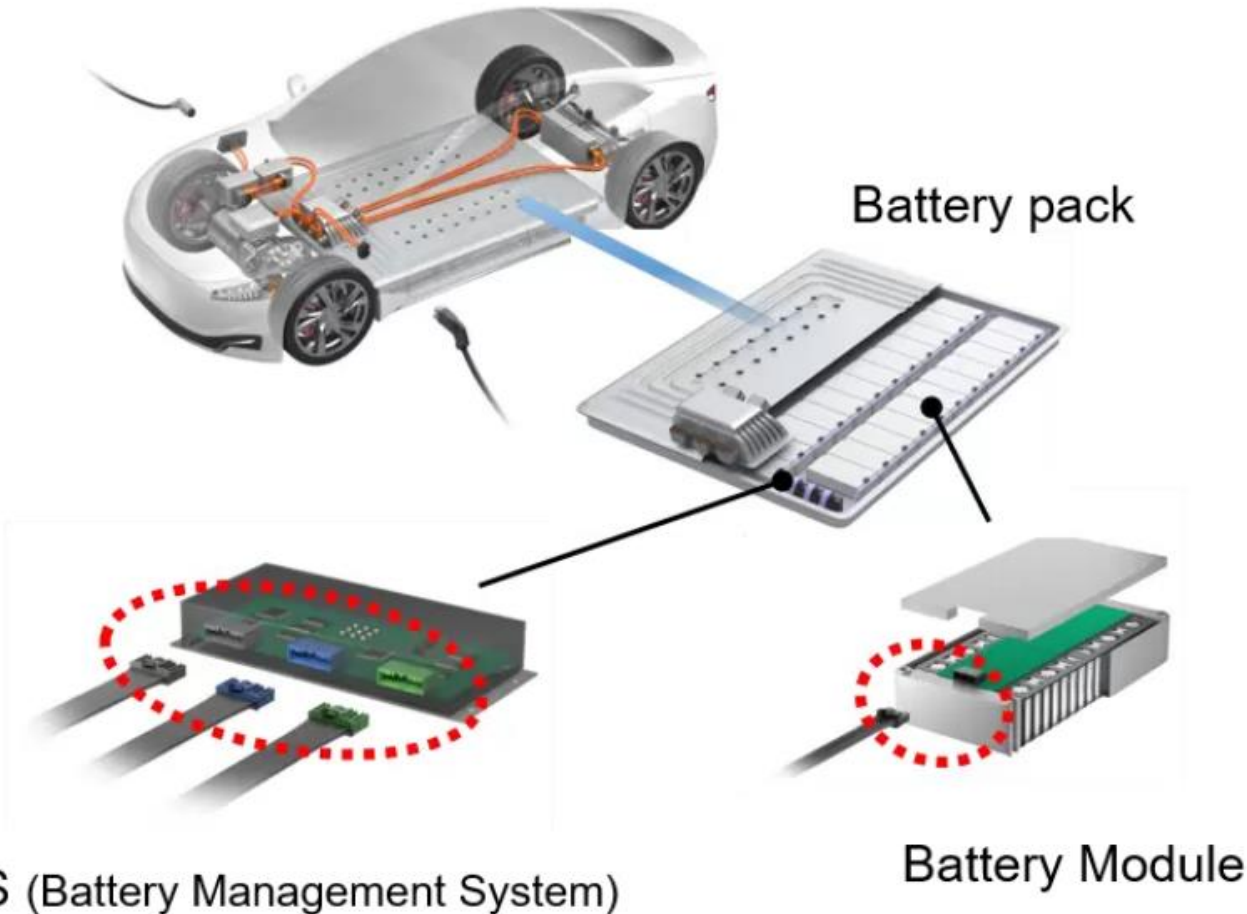
Size and foot pattern are compatible to each other

	MX84	MX34
Appearance		
Current Rating	3A	3A
Operating Temp. <small>(incl. temp. increase by current)</small>	-40 to +130°C	-40 to +130°C
Connector Insertion Force	147.1N max.	147.1N max.
Connector Retention Force	58.8N min.	58.8N min.
Terminal Plating	Post-plating	Pre/Post-plating

Similar Specification to MX34



# APPLICATIONS OF MX84 SERIES





***Thank you!***