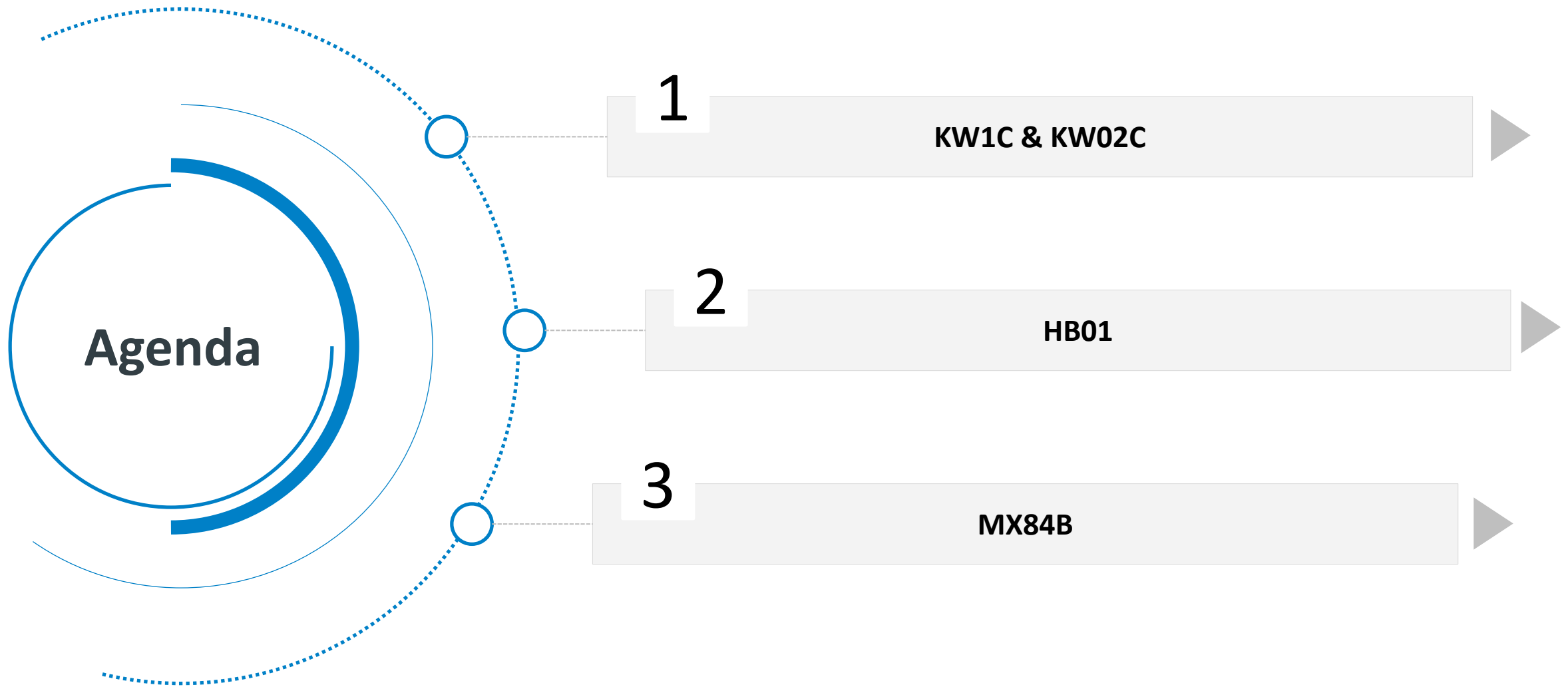


TECHTALK

ENERGY & POWER

Rutronik

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



Agenda

1

KW1C & KW02C

2

HB01

3

MX84B

A futuristic scene featuring two cars on a light-colored surface. 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



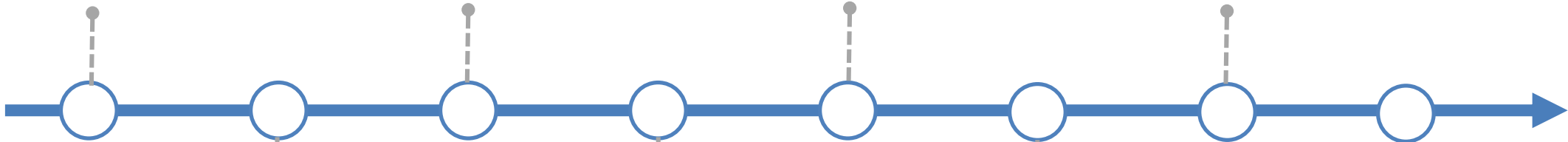
KW02
Release 2017



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



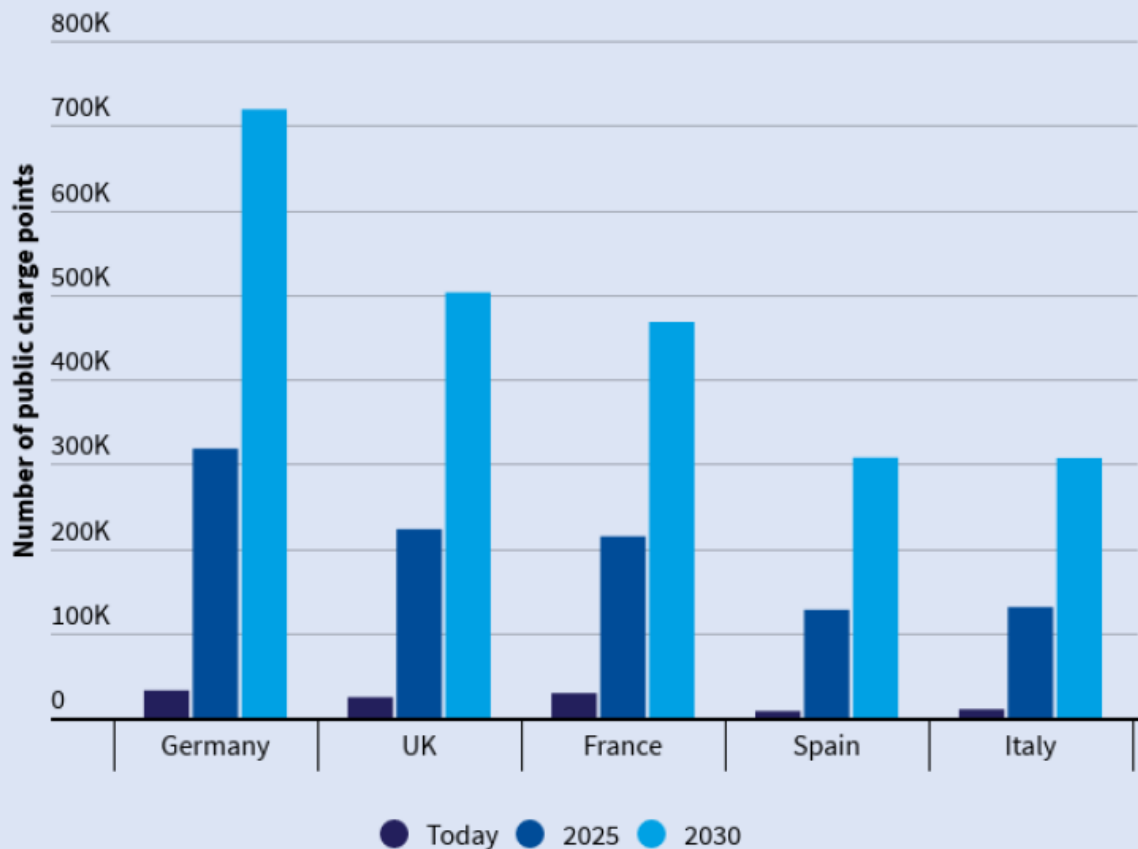
A wide-angle, high-angle photograph of a modern automotive manufacturing plant. The scene shows a complex network of assembly lines with numerous cars in various stages of production. Robotic arms and industrial machinery are visible throughout the facility. The lighting is bright and even, highlighting the metallic surfaces and organized layout of the factory floor.

OUR MARKET POSITION

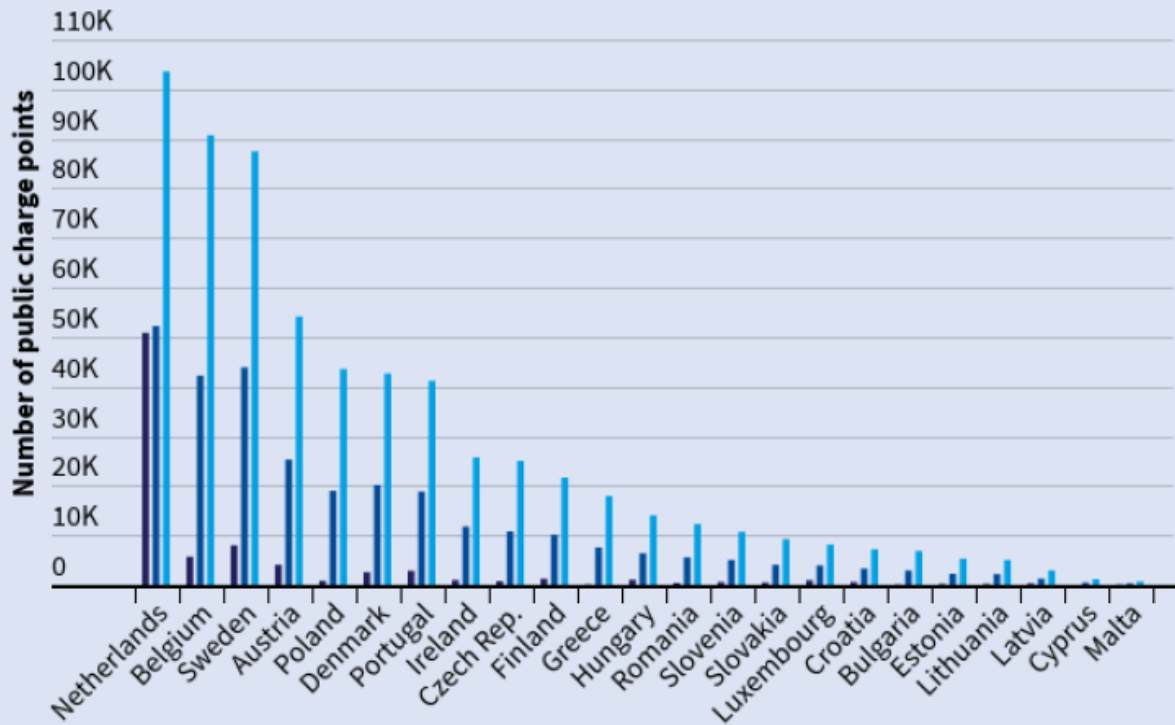
*The market looks for **innovative solutions** that drive continuous **COST** improvements.*

*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
KW1(CE) KW1(UL)		CHAdeMO 1.2 IEC62196-3	125 A	500 VDC	UL /CE	CE: -30°C~+50°C UL: -30°C~+40°C	Fast Charge
KW1C		CHAdeMO 2.0 IEC62196-3	MAX150 A * Note	500 VDC	CE	CE: -30°C~+50°C	Fast Charge (w/V2G)
KW02		CHAdeMO 1.2 V2H Guideline 2.1 IEC62196-3	25 A	450 VDC	CE	CE: -30°C~+50°C	Slow Charge (w/V2H, V2G)
KW02C		CHAdeMO 2.0 V2H Guideline 2.1 IEC62196-3	MAX37 A * Note	500 VDC	CE	CE: -30°C~+50°C	Slow Charge (w/V2H, V2G)
KW03		CHAdeMO 1.2 V2H Guideline 2.1 IEC62196-3	80 A	500 VDC	UL /CE	CE: -30°C~+50°C UL: -30°C~+50°C	Mid-Charge (w/V2H, V2G)
KW04		CCS Type-2 IEC62196-3	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

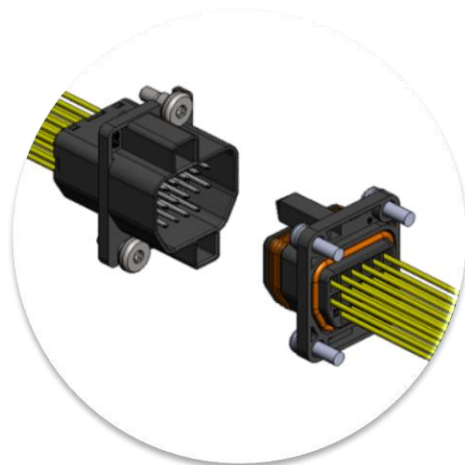
CURRENT EV CHARGING PRODUCTS (KW-SERIES)

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

★ : Under Consideration

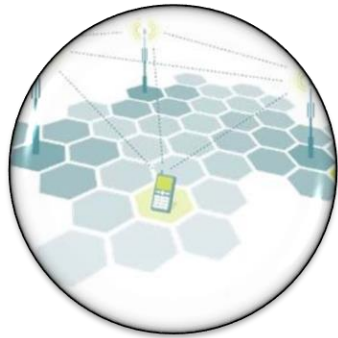
WATER PROOF DOCKING CONNECTOR FOR COOLING FAN

HB01



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

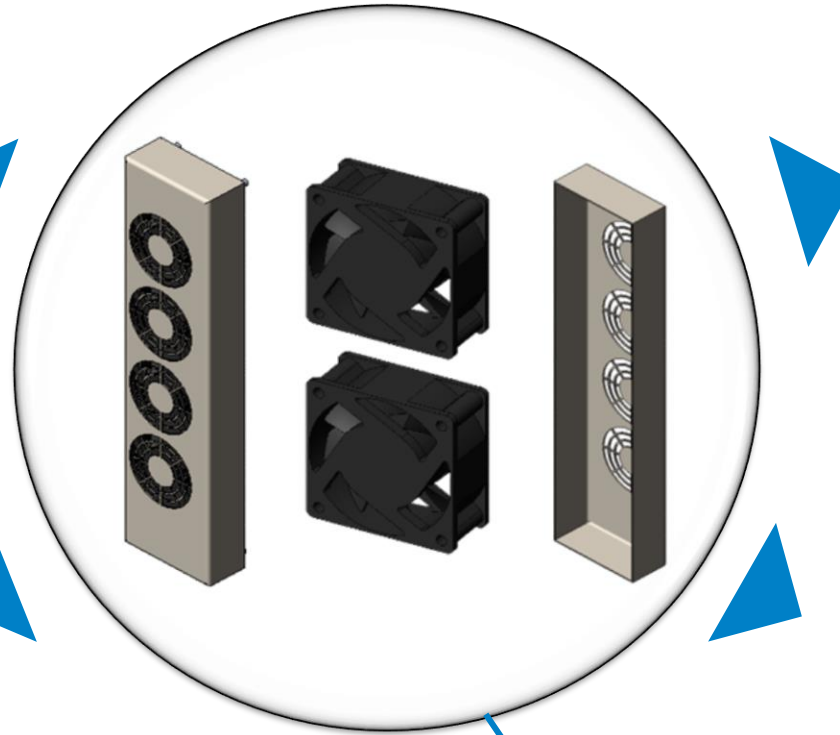
- ▶ Cooling fans are needed to lower the temperature in addition to natural cooling.
- ▶ Waterproof is required for outdoor applications.



Base Station



EV Charging Station



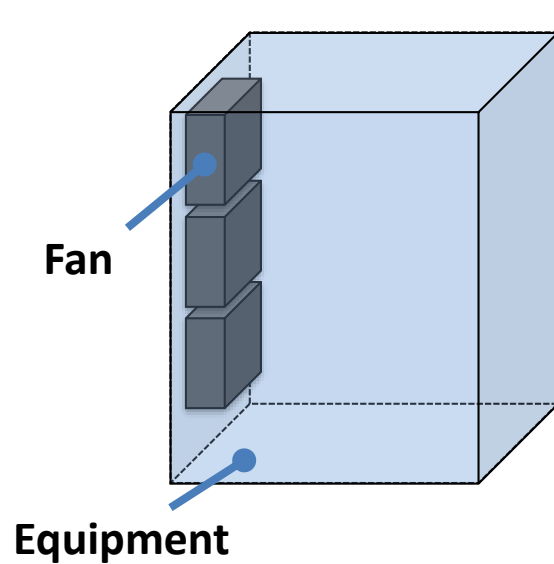
Cooling Fan



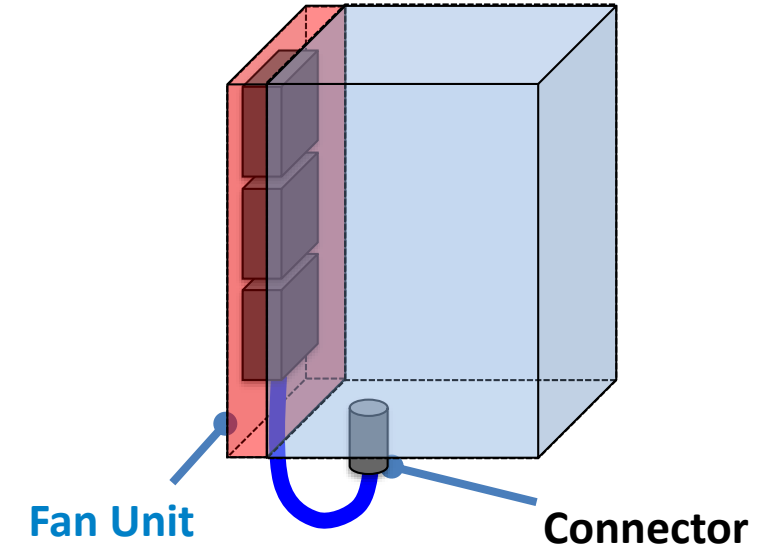
Power Control



Signage



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



Advantage

- Flexibility in setting the fan

Challenges

- Complicated for wiring
- Complicated for maintenance

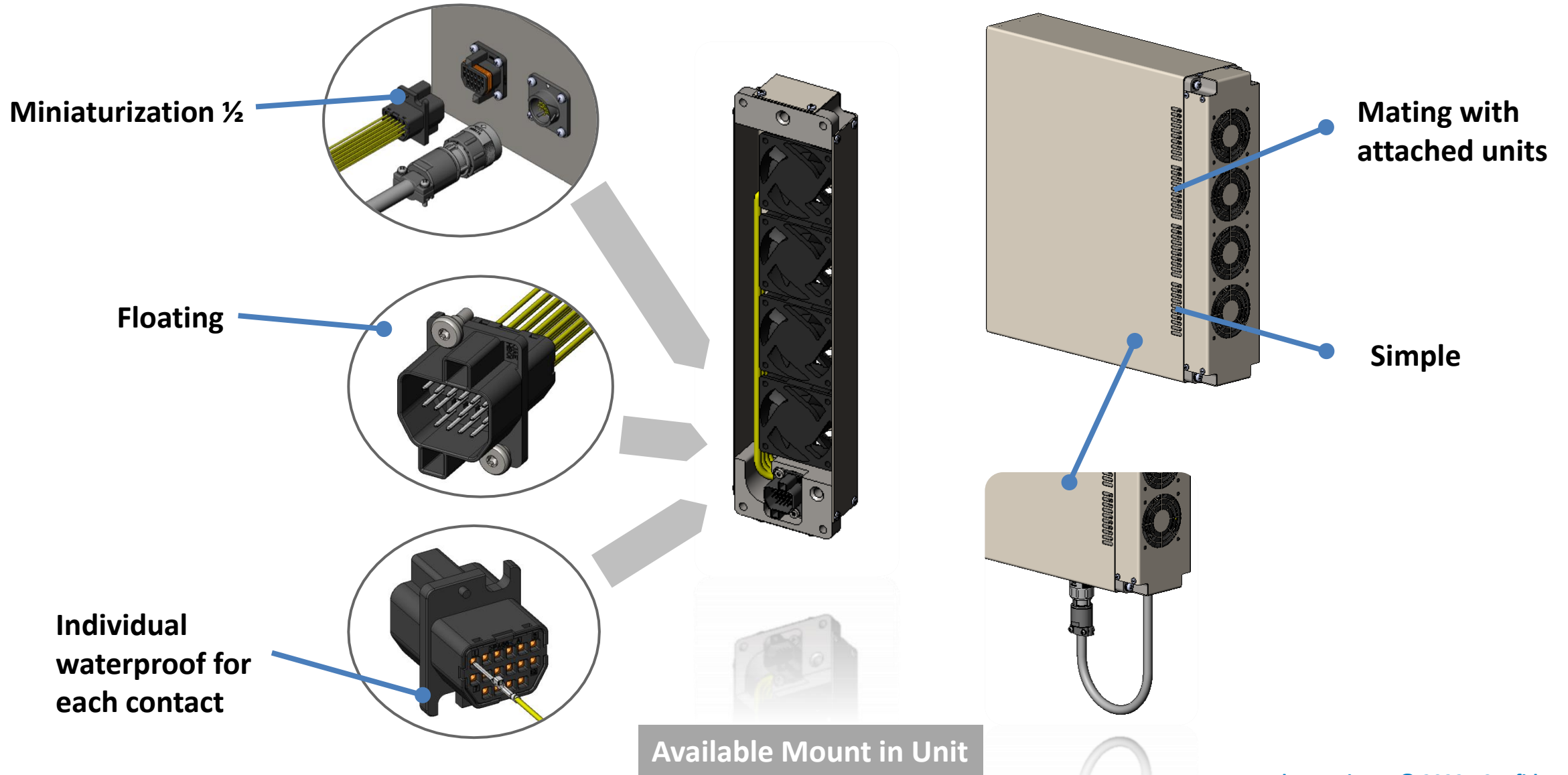
Advantage

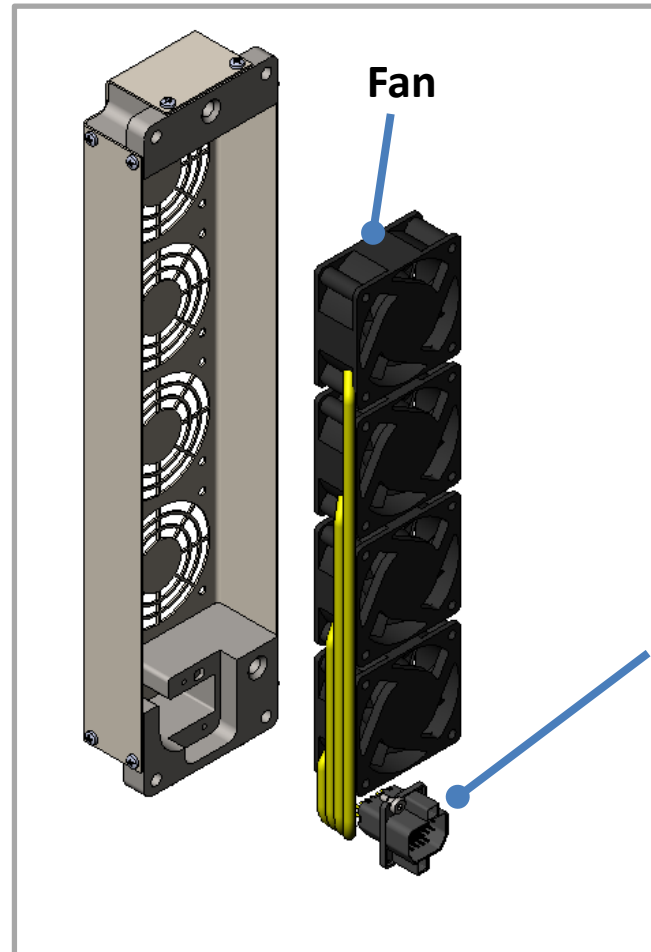
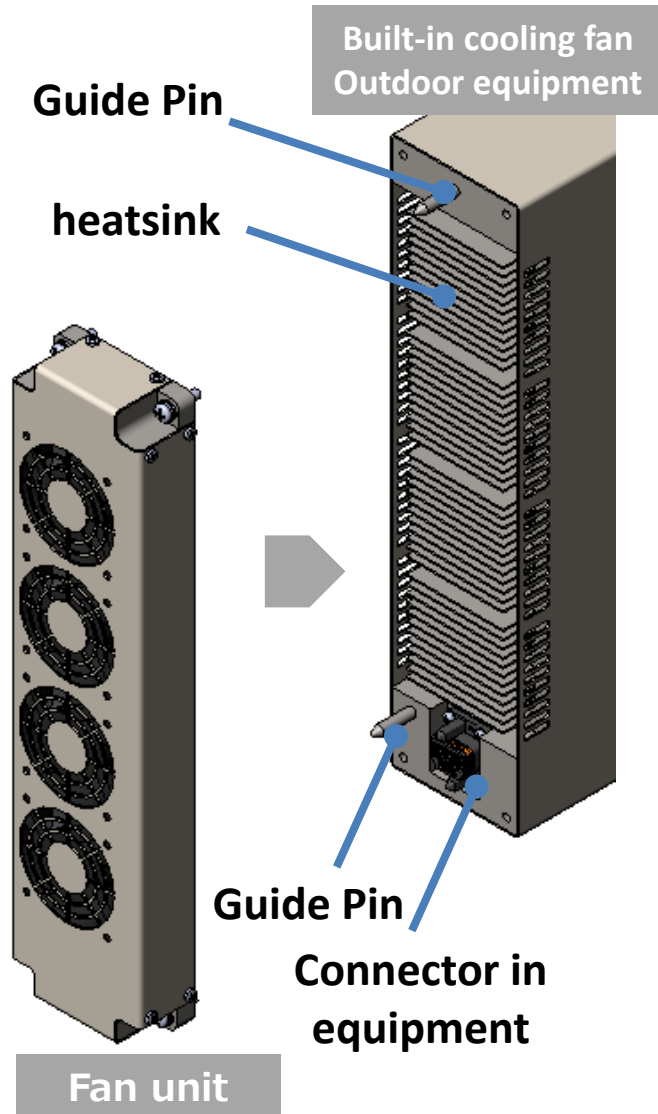
- Reduce maintenance cost
- Reduce cost by standardizing units

Challenges

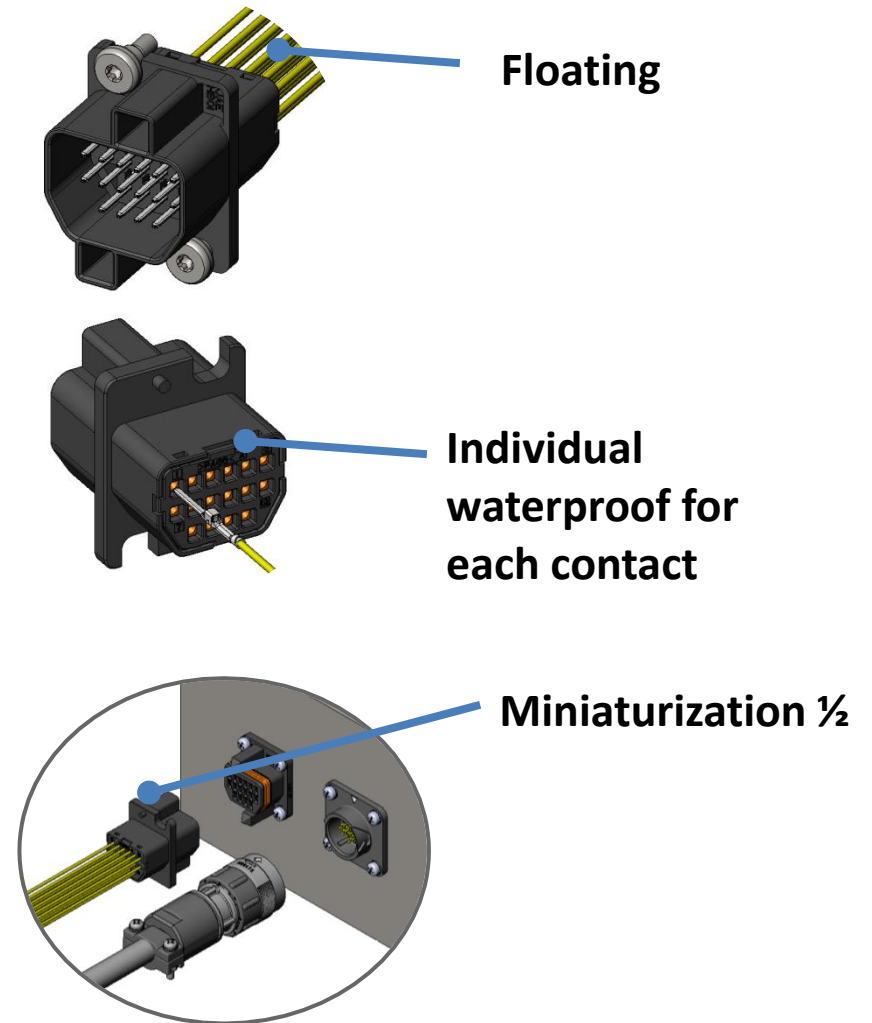
- Need I/O connector to supply power

COMPARISON BETWEEN CURRENT AND NEW





Available built into the unit
Docking type
Save cost



Comparison with round I / O connector

HB01 SPECIFICATION

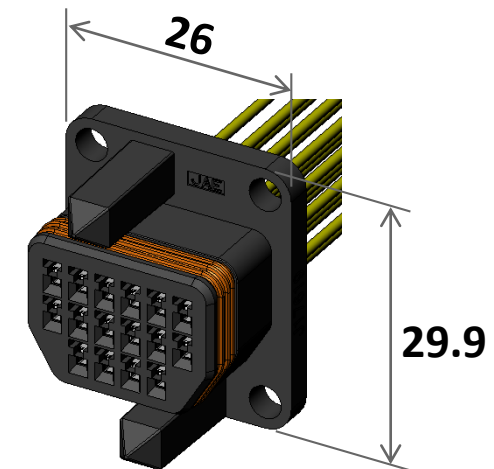
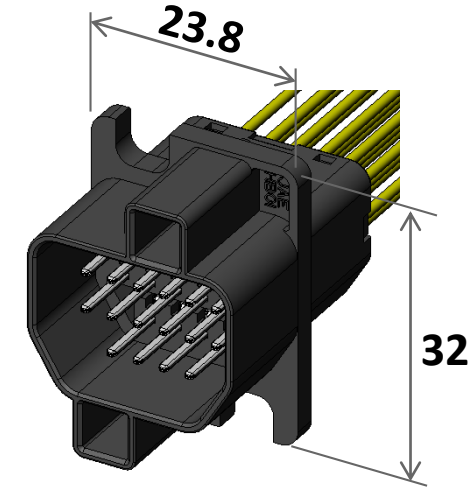
GEU22-037

22



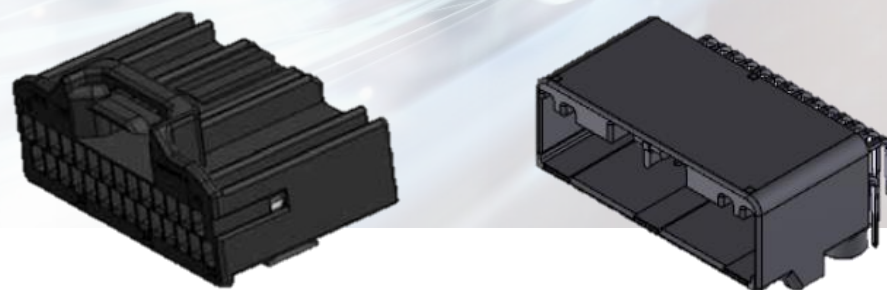
Mount
Connector
Material

Voltage	AC/DC50V
Current	1A/Pin
Applicable Wire Size	AWG#22 ~ 24 Φ 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
Pin Connector	Shoulder bolt \times 2EA (M3 · Hexalobular)
Socket Connector	M3 Screw \times 4EA

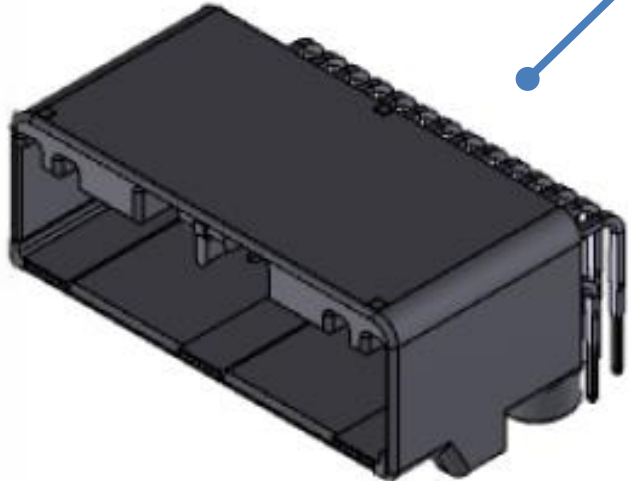


MX84B SERIES

*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

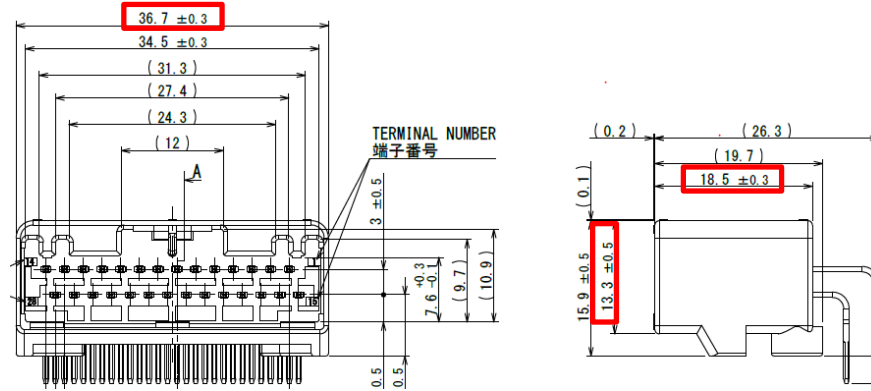
Material

▶ Pin-header: SPS

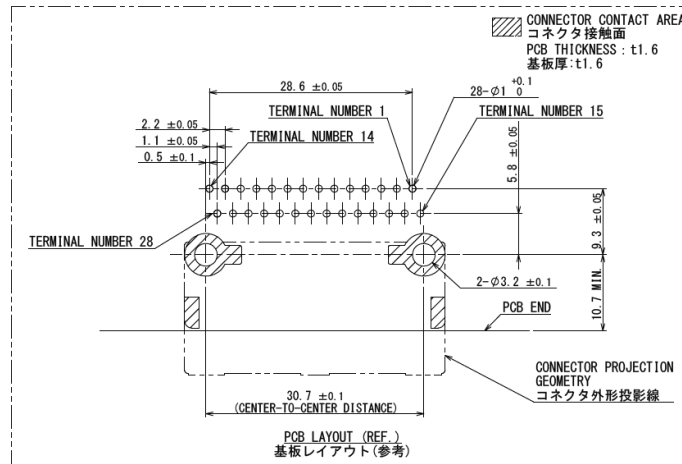
▶ Socket/In-line: PBT

MX84

Size

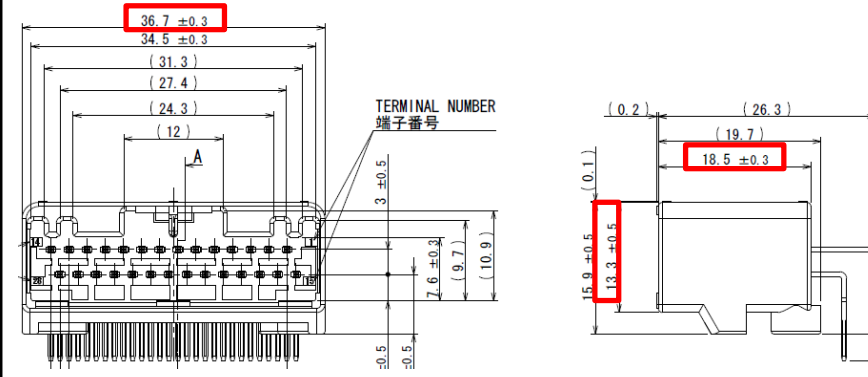


Foot Pattern

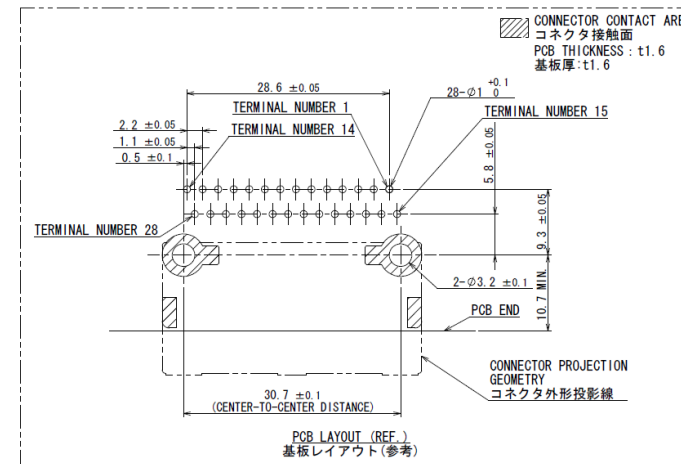


MX34

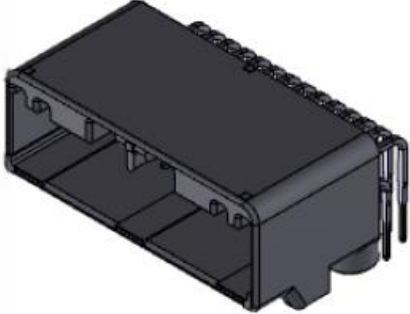
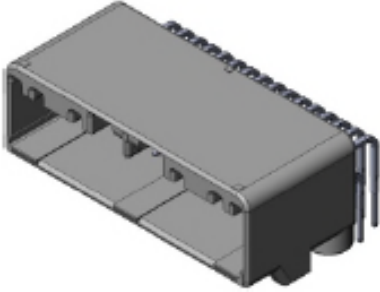
Size



Foot Pattern

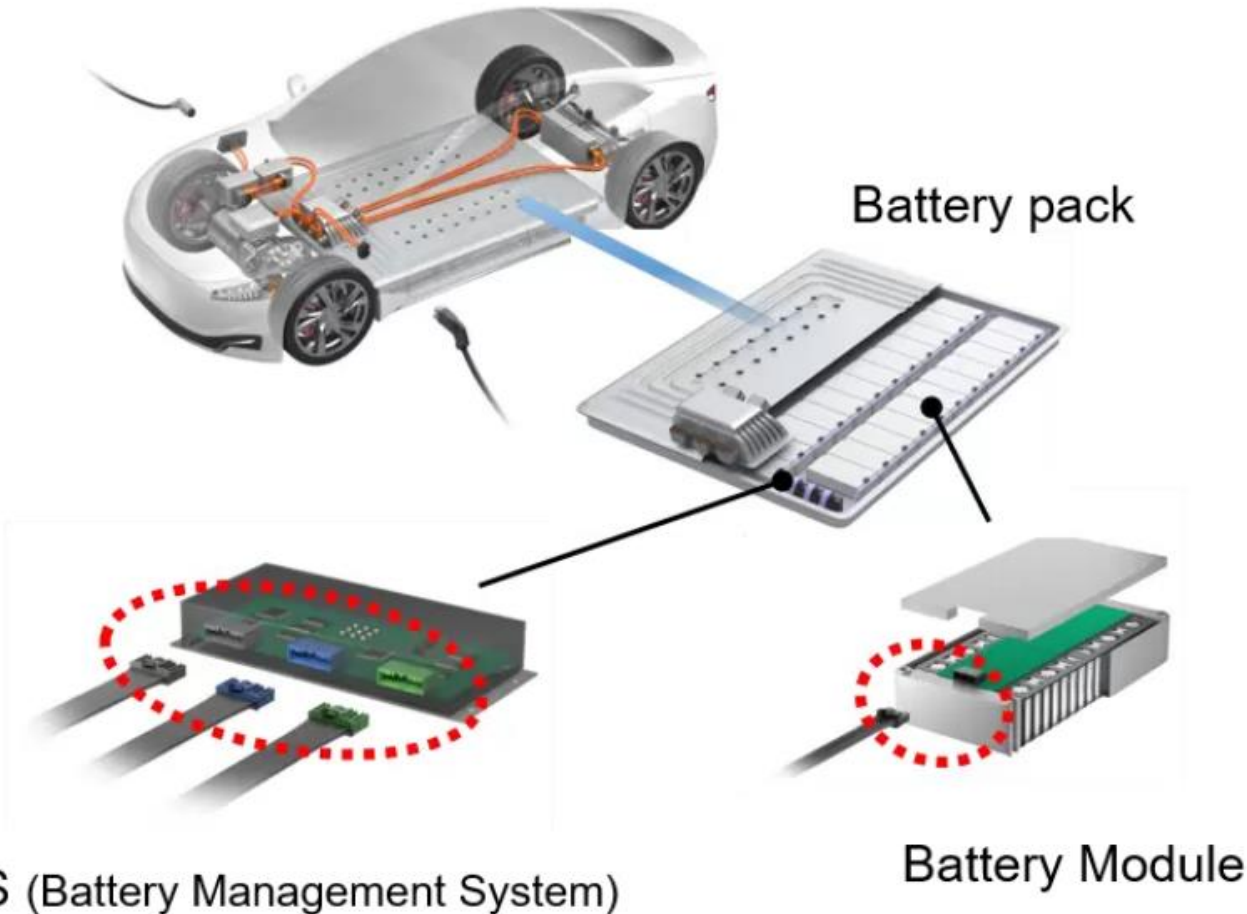


Size and foot pattern are compatible to each other

	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!