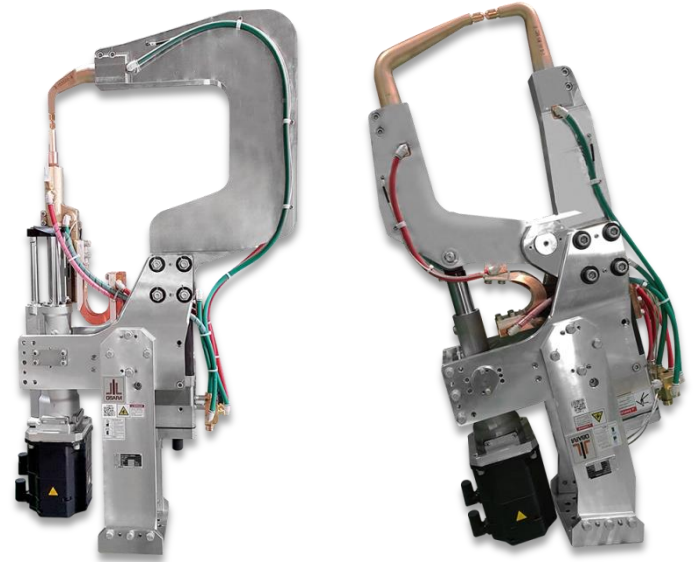


O B A R A K O R E A


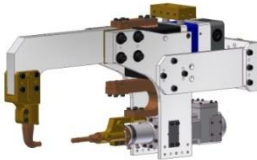
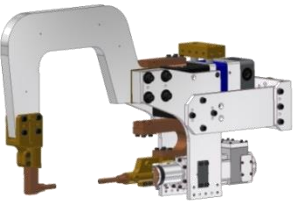


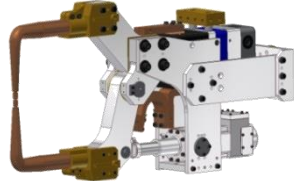
# X2C (Series Servo Gun)

Lightweight & Advanced Flexibility

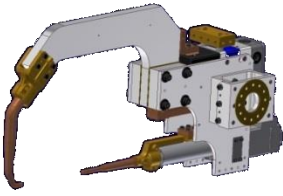
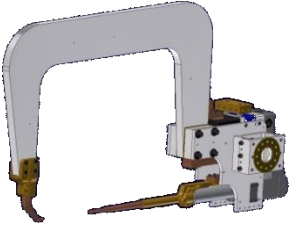
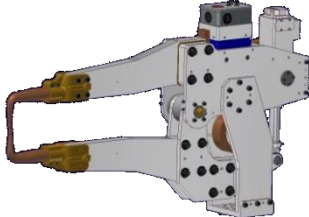
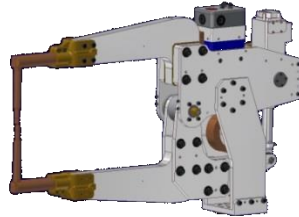


# X2C Series Servo Gun

## Standard X2C

	Small	Medium	Large
C-type			
X-type			

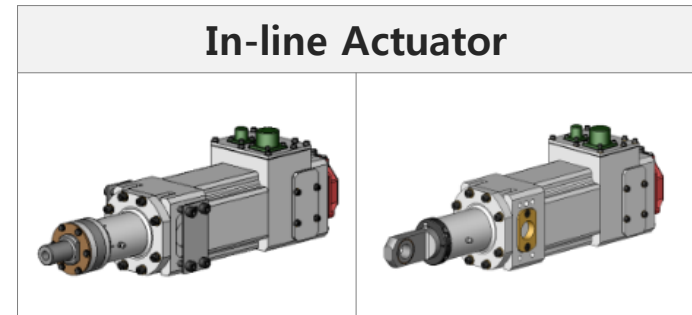
## Extra-Large X2C

Extra-Large C-type	Extra-Large X-type
 	 

# X2C Gun Development Background

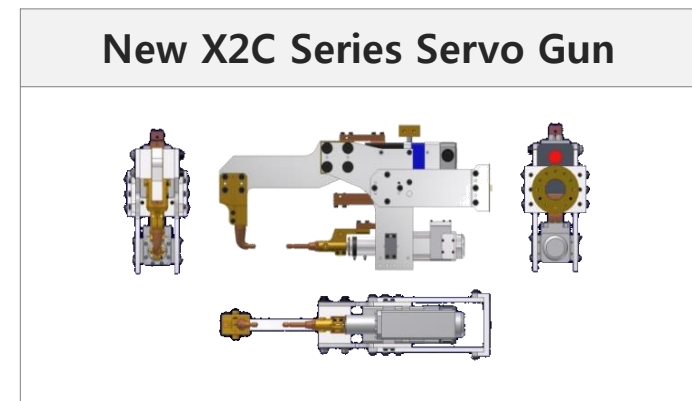
## Changing Demand (New Market Requirement)

- Increasing popularity of In-line actuator →
- Castings no longer preferred
- L/R Designs no longer preferred
- Spare Guns less popular



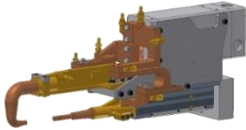
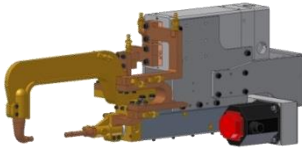
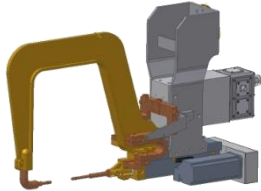
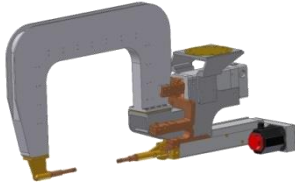
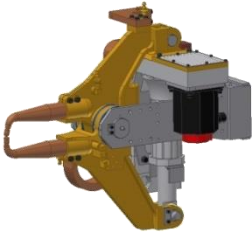
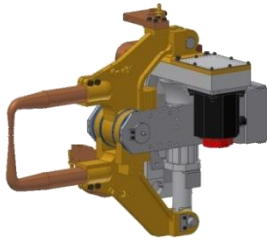
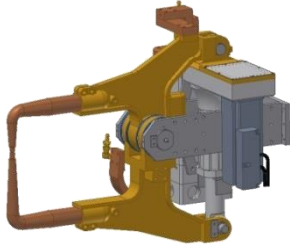
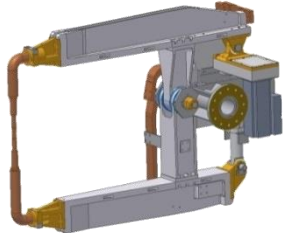
## Differentiate from Competitors

- Value-added Product
  - Lightweight + Compact + Standardized
  - Less spare parts
- Increasing Popularity of Small Robots
  - Take advantage of being the first player
  - Make good use of new mfg technology



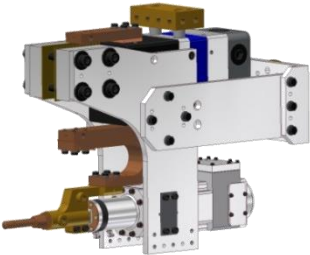

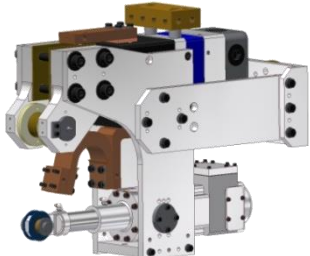
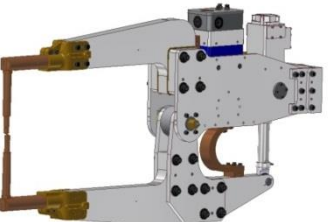
# Standard Body

More than 85% of C/X Bodies require only up to 450mm\*

	Small	Medium	Large	Special
	~150	150~300	300~450	450~
	21%	48%	21%	10%
<b>C-type</b>				
	15%	60%	10%	15%
<b>X-type</b>				

# Standard Body

More than 85% of C/X Bodies require only up to 450mm\*

	Small ~150	Medium 150~300	Large 300~450	Special 450~
C-type		<b>90%</b>		
X-type		<b>85%</b>		

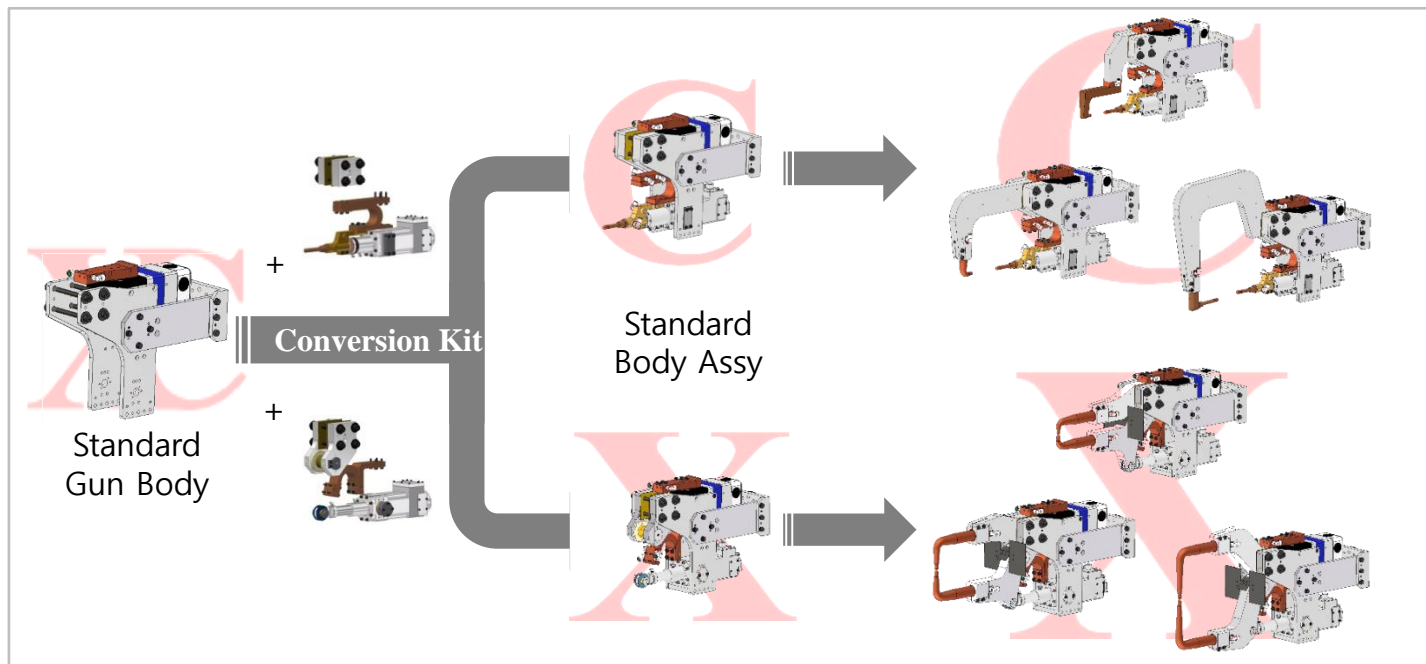
# X2C Concept

## Standard Body for All Gun types (both C & X)

- C-type and X-type Guns to be interchangeable with Conversion Kits

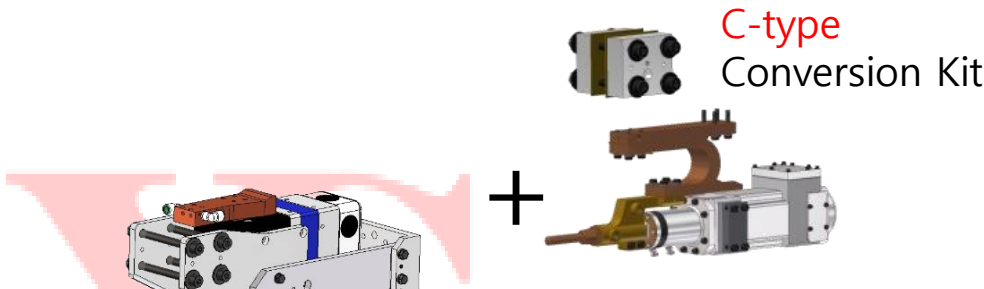
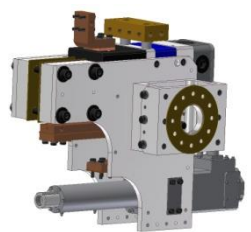
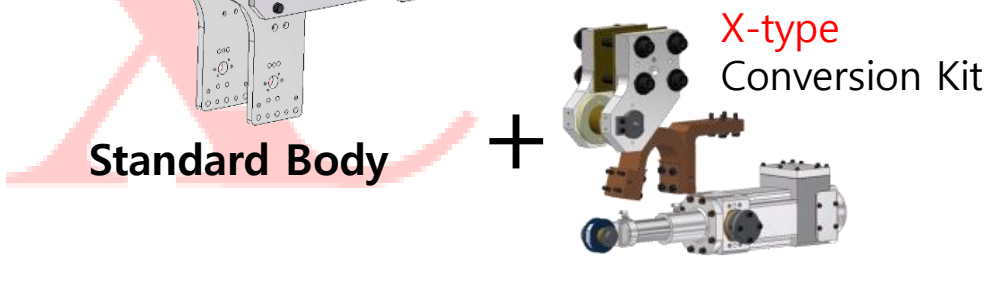
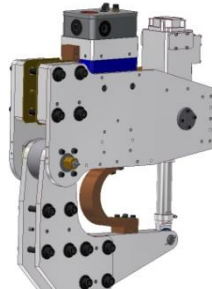
## Single Gun Body Assembly for each C & X

- Single Gun Body Assembly with various arm designs
- Standard components with minimum number of spares



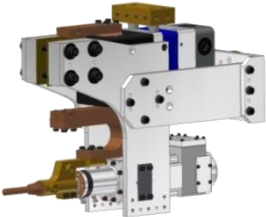
# X2C Gun Basic Structures

## Standard Body for All Gun types

	Small ~150	Medium 150~300	Large 300~450	Special 450~
C-type	 <p>Standard Body + C-type Conversion Kit</p>			
X-type	 <p>Standard Body + X-type Conversion Kit</p>			

# X2C Gun Basic Structures

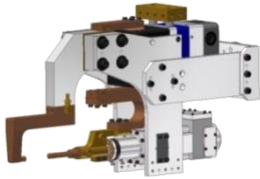
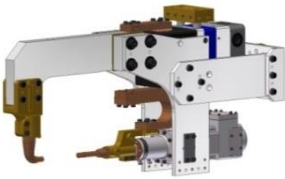
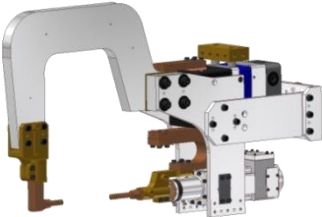


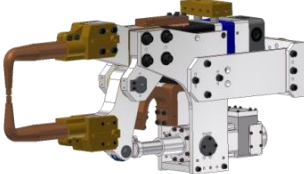
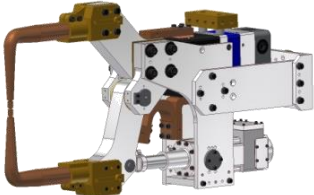
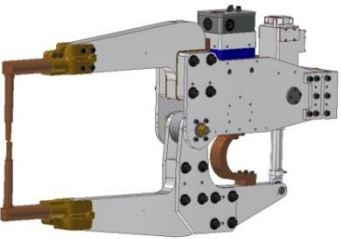
Single Gun Body Assembly for each C & X

	Small ~150	Medium 150~300	Large 300~450	Special 450~
C-type	<b>C-type Gun Body Assy</b> 			
X-type	<b>X-type Gun Body Assy</b> 			



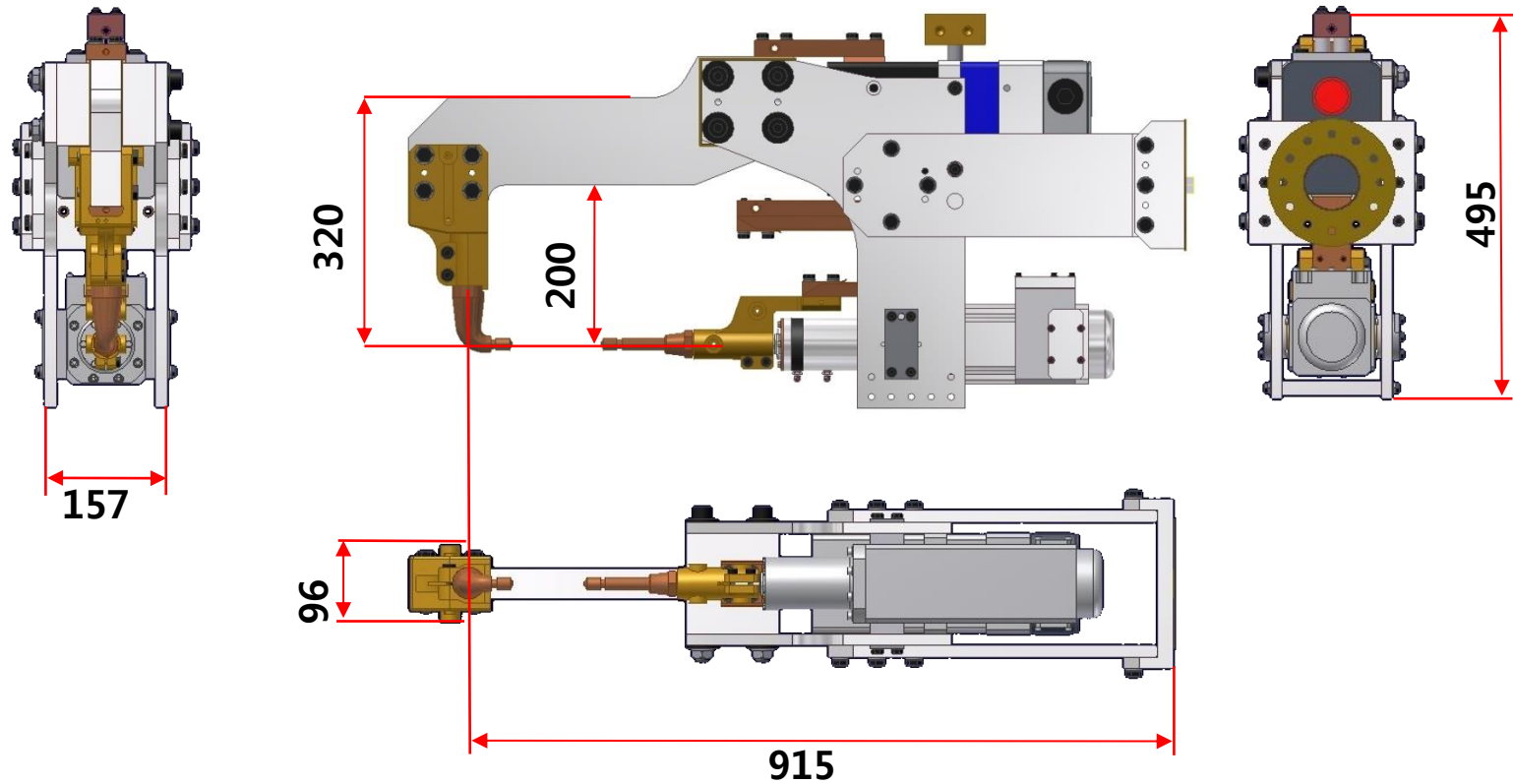
# X2C Gun Basic Structures

## Various Arm Designs

	Small	Medium	Large	Special
C-type				
X-type				

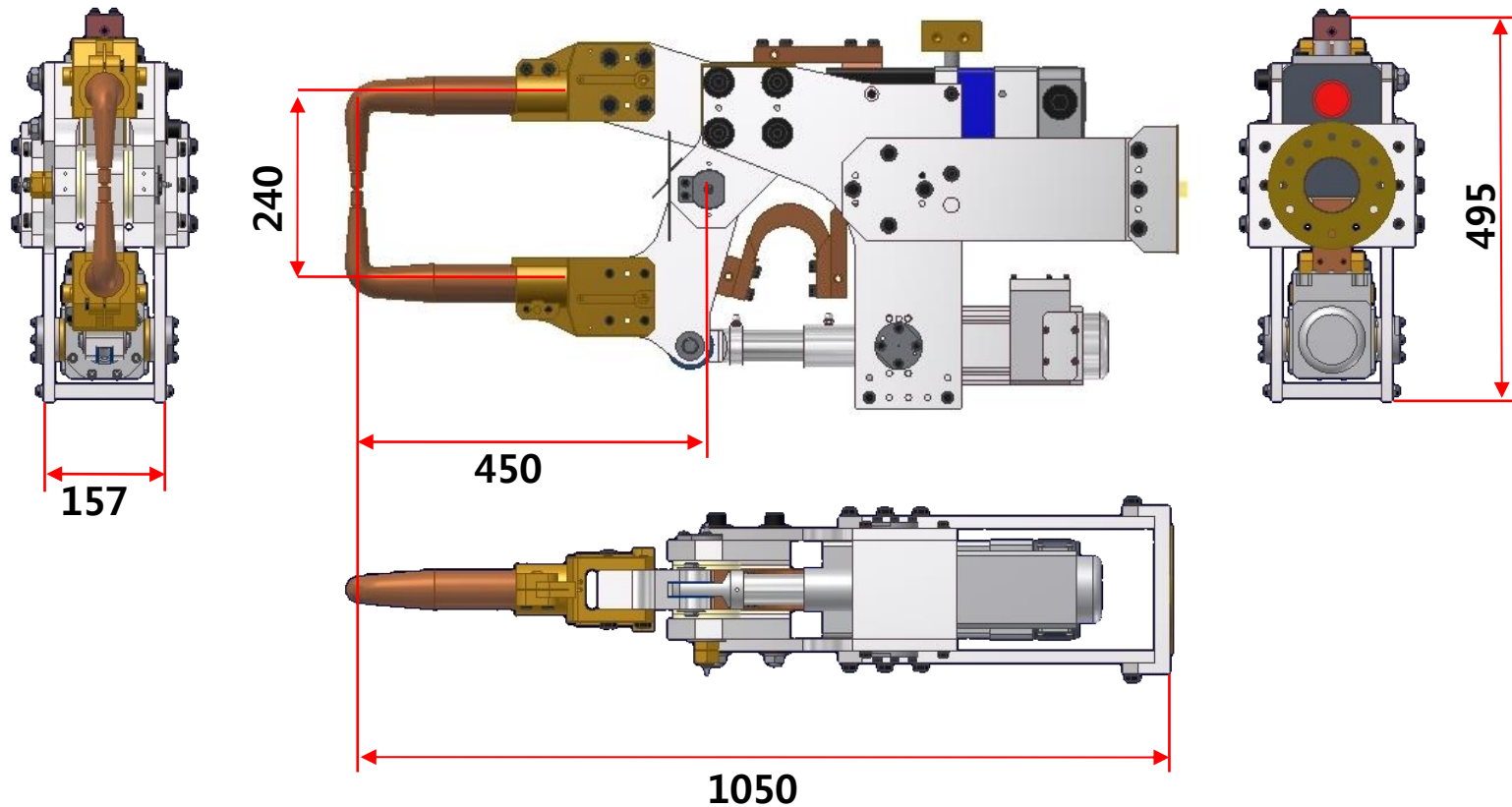
# X2C Gun Example Model

## Medium Standard C-Type Gun



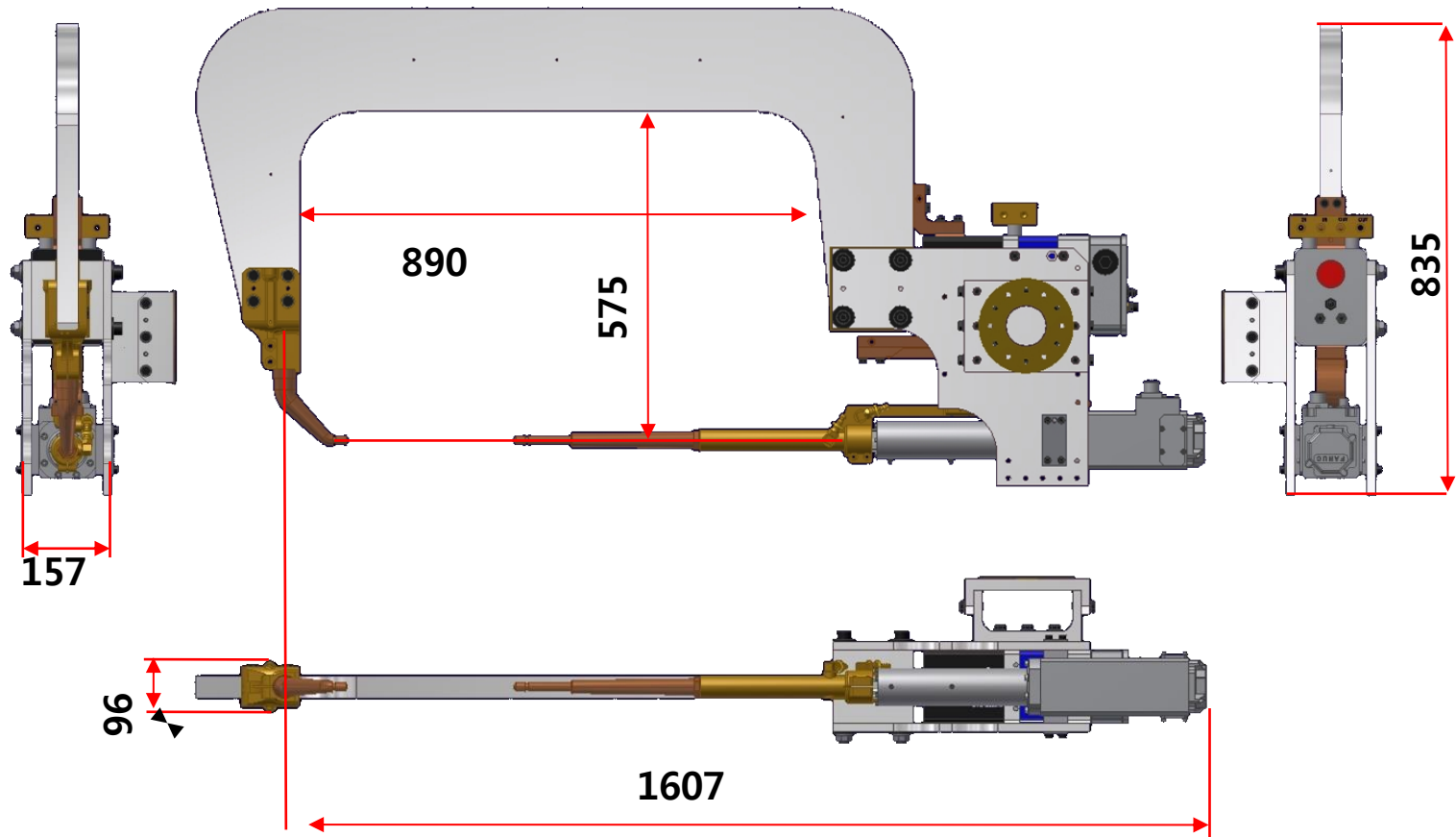
# X2C Gun Example Model

## Medium Standard X-Type Gun



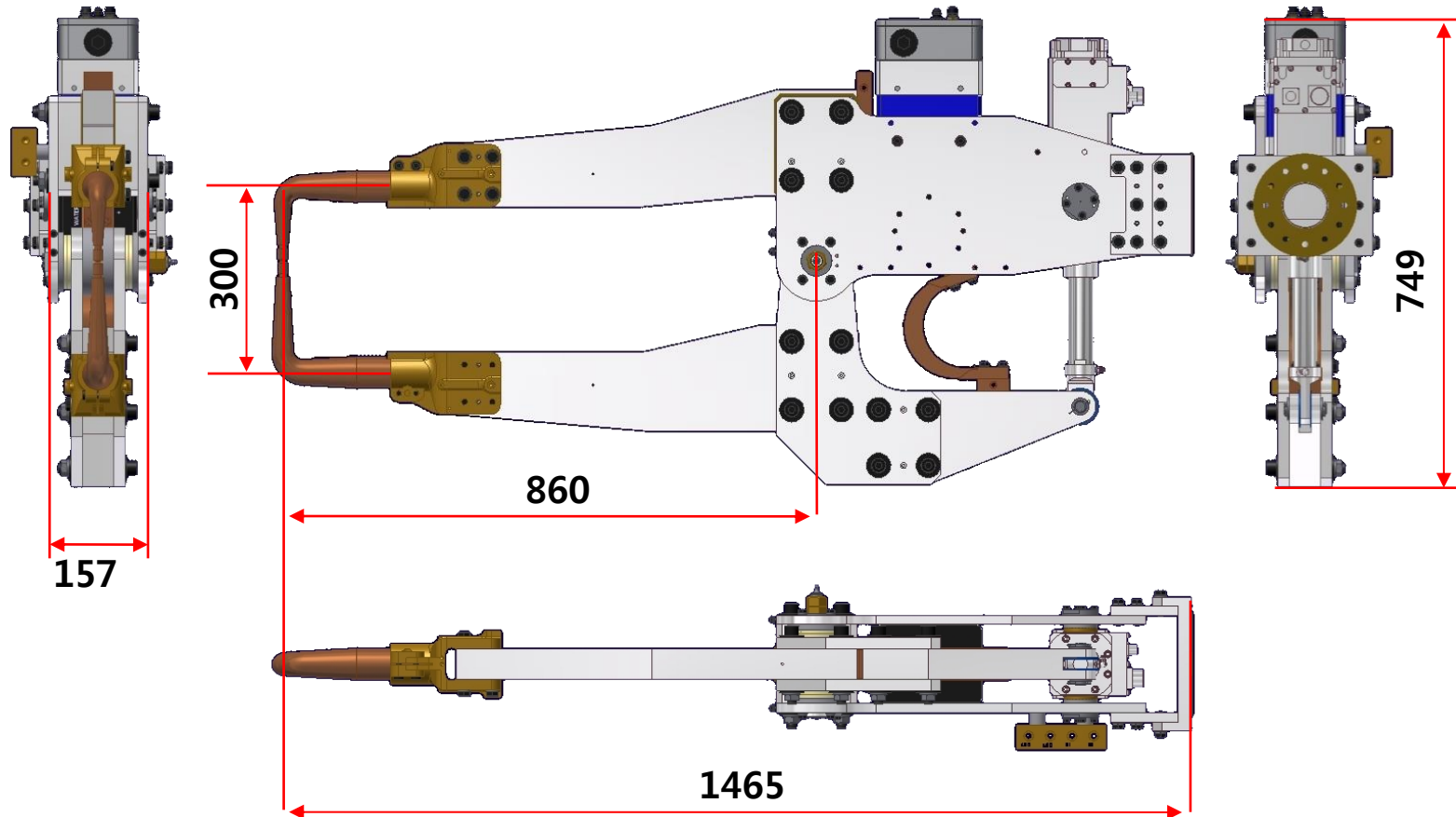
# X2C Gun Example Model

## Extra-Large C-Type Gun





# X2C Gun Example Model

## Extra-Large X-Type Gun



# Inline Actuator

Standardized & Compact with high performance

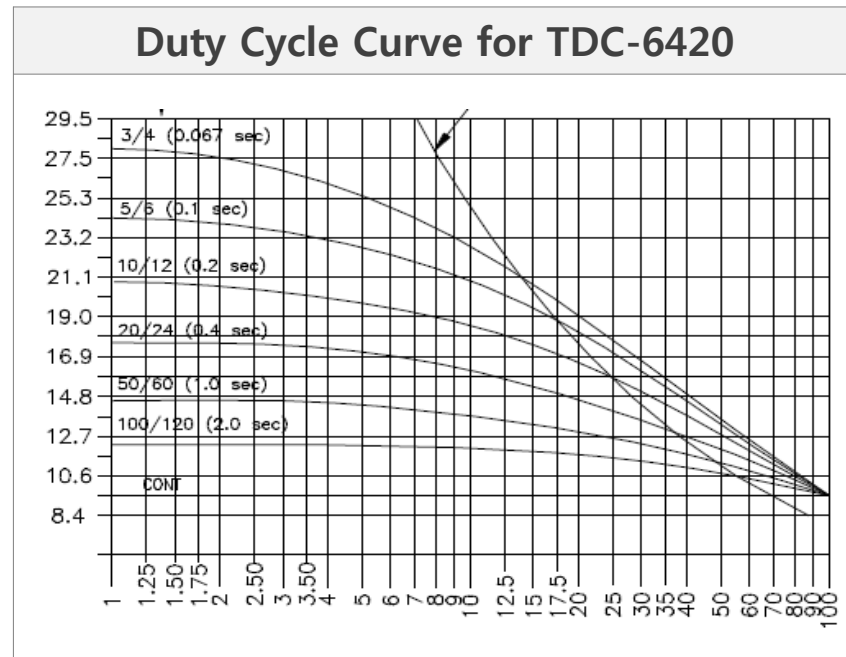
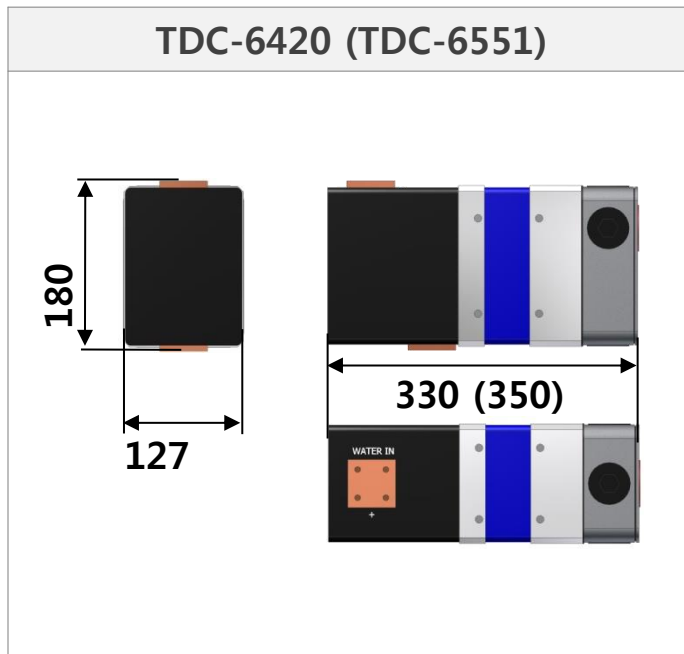
Type	C-type	X-type
2 C-type 1 X-type		
Max Stroke	210 (310) mm	160 mm
Length	458 (623) mm	479 mm
Width	100 mm (Symmetrical)	
Weight	13 (16) k g	13 kg

Tamagawa Motor	Spec
Rated Capacity	2 KW
Rated Torque	6.4 N•m
Instant Max Torque	19.1 N•m
Rated Rotating Speed	3000 rpm
Max Rotating Speed	4500 rpm
Insulation Class	F Class
Instant Max Elect Current	36A (rms)
Brake Voltage	24 V

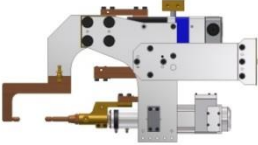
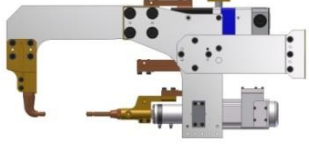
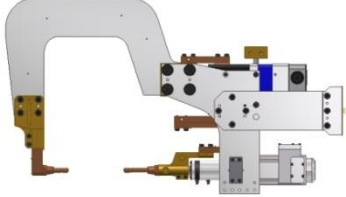
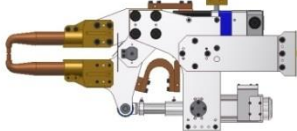
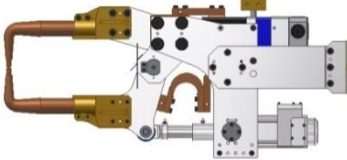
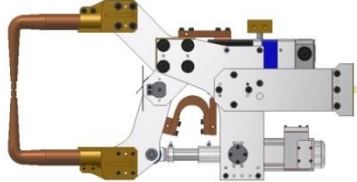
# Lightweight Transformer

## Specially Designed for X2C Series SV Gun

P/N	Rated Capacity (50% D.C)	Rated Primary Voltage	Frequency	Secondary Voltage	Turn Ratio	Weight	Cooling water
TDC-6420	100KVA	650V	1000 Hz	9.8V	66	20.0 kg	7.5 L
TDC-6551	150KVA	650V	1000 Hz	13.0V	50	23.2 kg	7.5 L



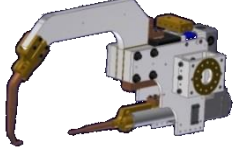
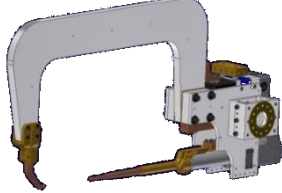
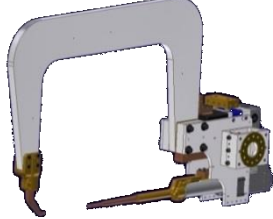
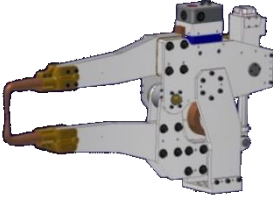
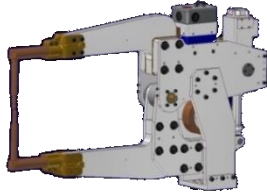
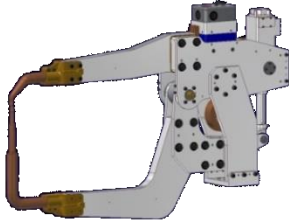
# Basic Spec: Standard X2C

		
<b>72 kg</b>	<b>77 kg</b>	<b>84 kg</b>
<b>Small</b>	<b>Medium</b>	<b>Large</b>
<b>91 kg</b>	<b>92 kg</b>	<b>95 kg</b>
		
<b>Type</b>	<b>C-type</b>	<b>X-type</b>
<b>Force</b>	6000N	
<b>Stroke</b>	Up to 190mm	Up to 170mm
<b>Transformer</b>	Std: 1000Hz / 100Kva	
<b>Size (H x D)</b>	Up to 450mm x 500mm*	Up to 420mm x 450mm*

\* Max. Size at 6000N Force



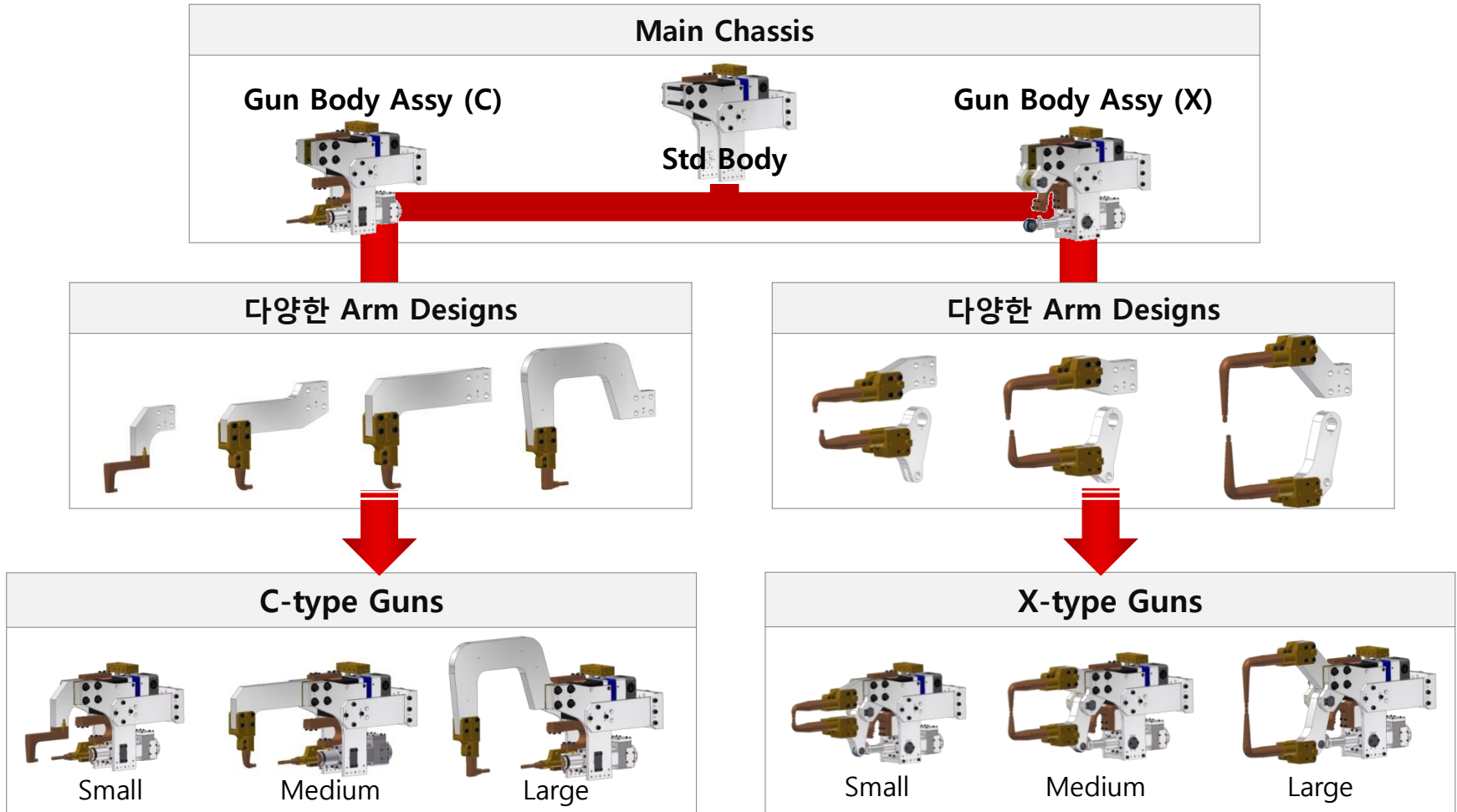
# Basic Spec: Extra-large X2C

		
<b>94 kg</b>	<b>117 kg</b>	<b>132 kg</b>
<b>Small</b>	<b>Medium</b>	<b>Large</b>
<b>136 kg</b>	<b>141 kg</b>	<b>148 kg</b>
		
<b>Type</b>	<b>C-type</b>	<b>X-type</b>
<b>Force</b>	6000N*	
<b>Stroke</b>	Up to 290 mm	Up to 300 mm
<b>Transformer</b>	Std: 1000Hz / 100Kva	
<b>Size (H x D)</b>	Up to 900 mm x 900 mm*	Up to 1000 mm x 950 mm*

\* Max. Size at 6000N Force

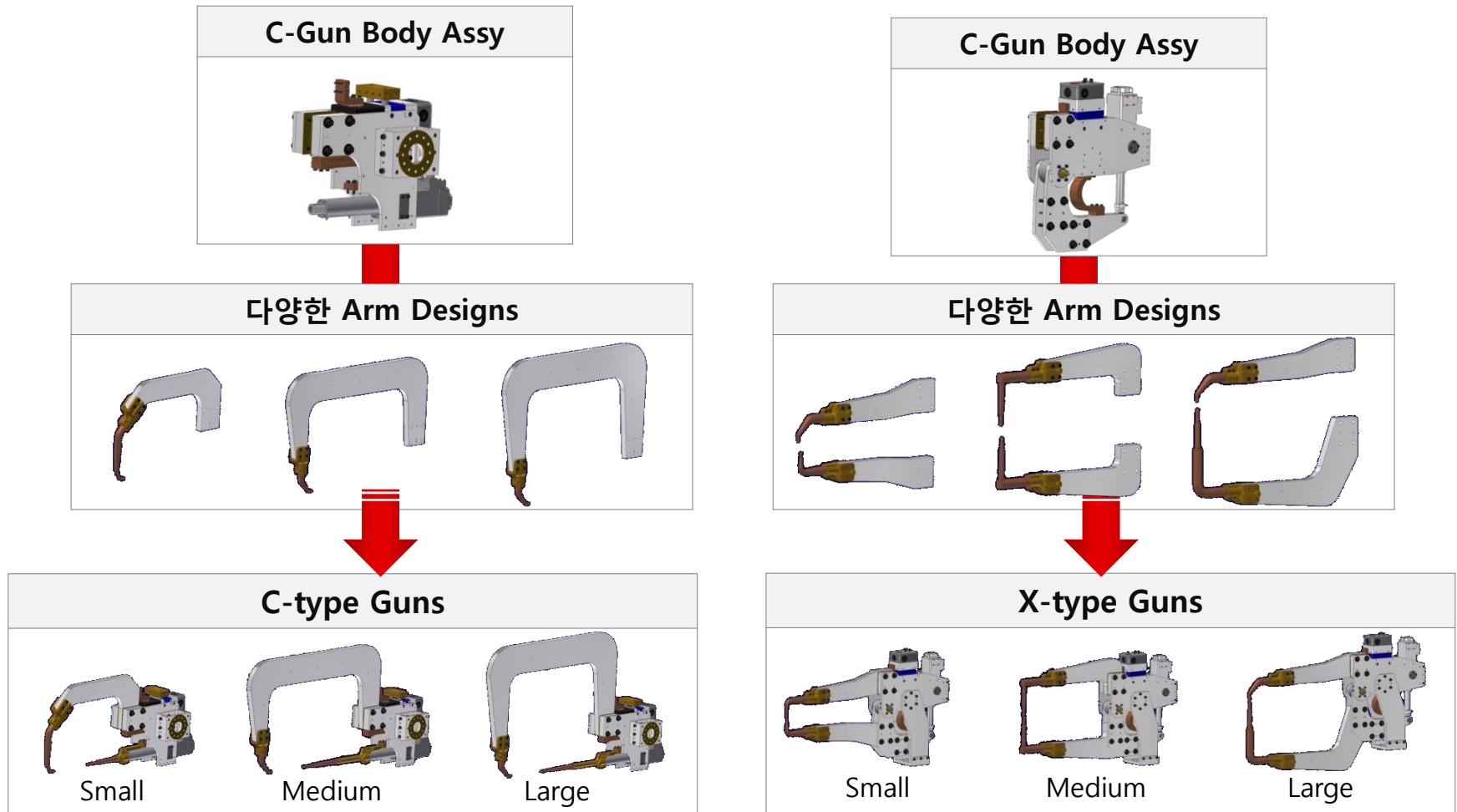
# Structure of Standard X2C

## Standard Main Chassis + Arm configurations



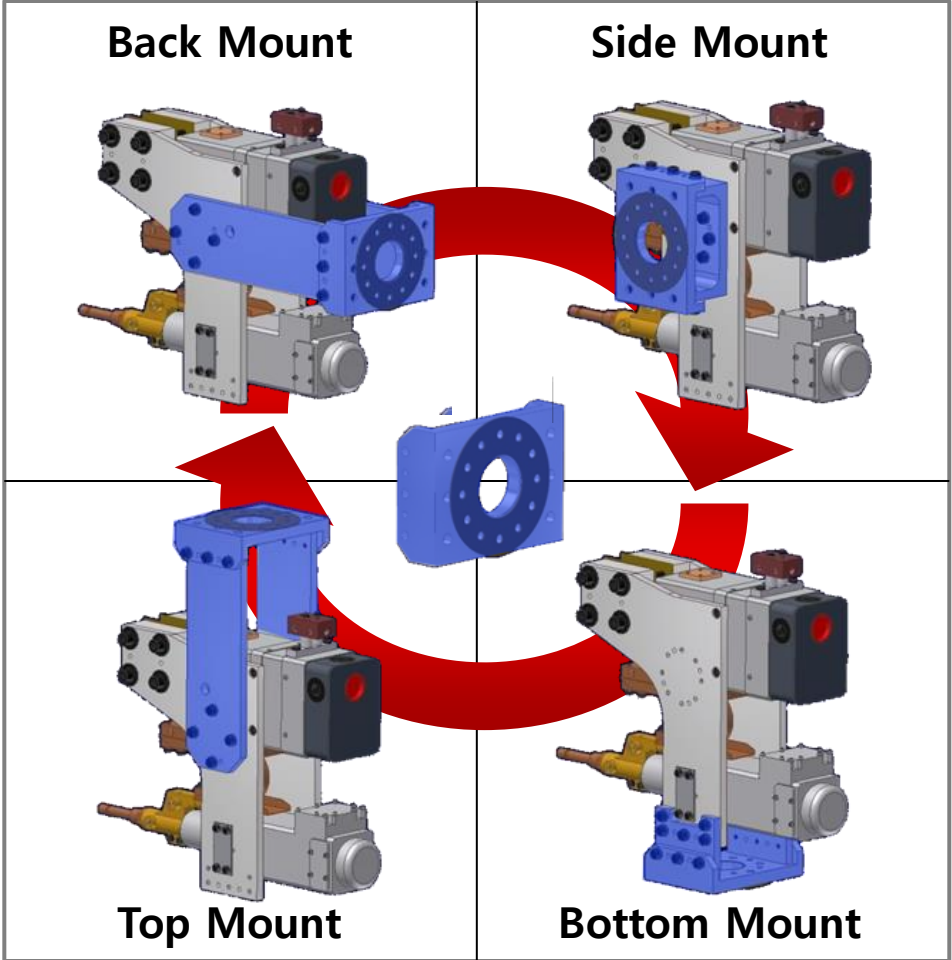
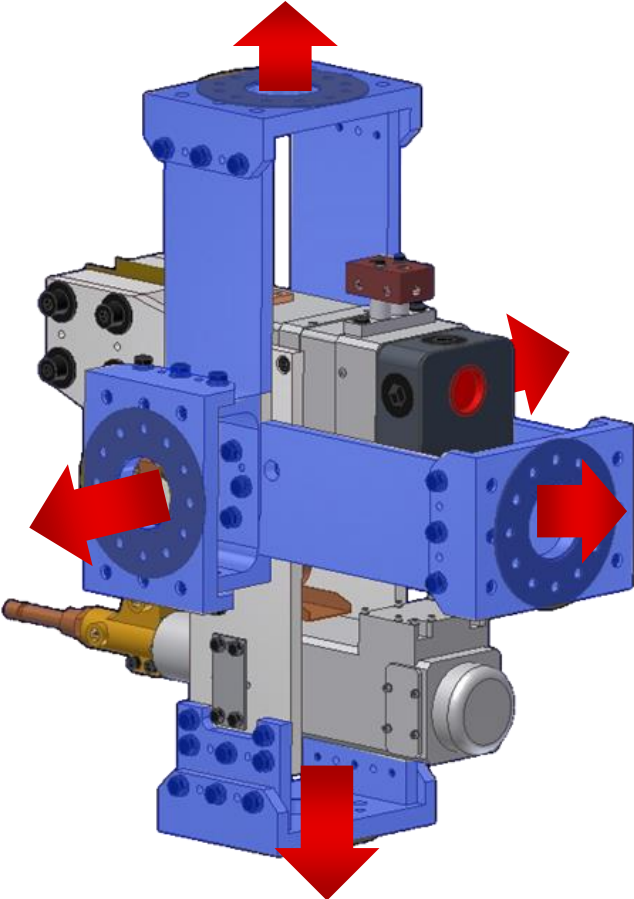
# Structure of Extra-large X2C

## Single Gun Body Assys (C&X) + Arm configurations



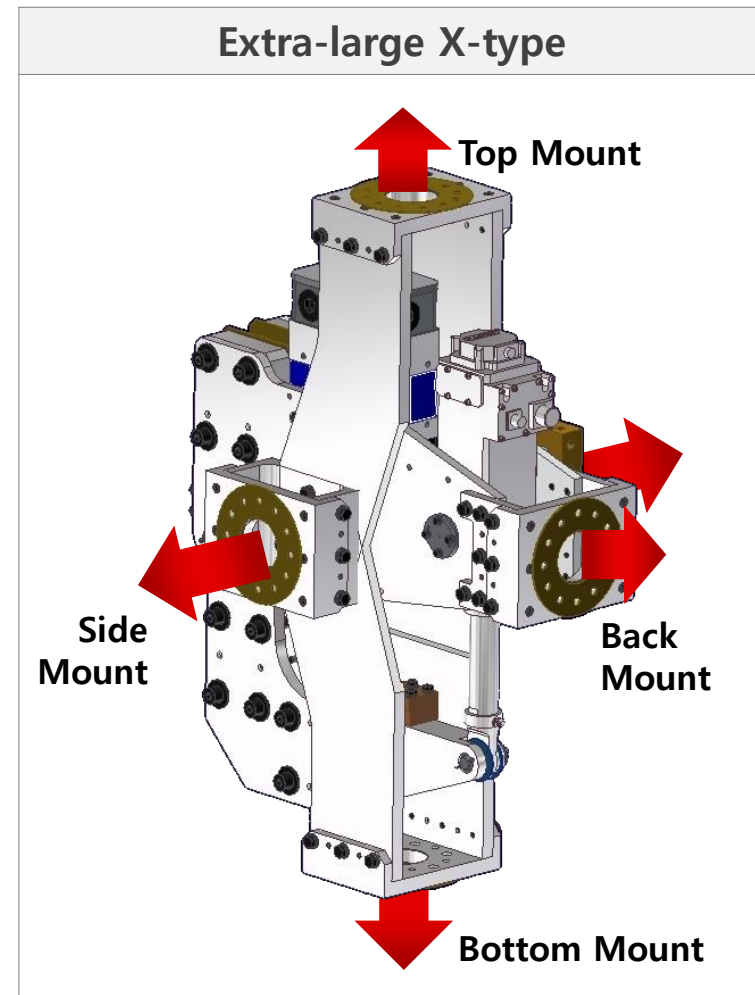
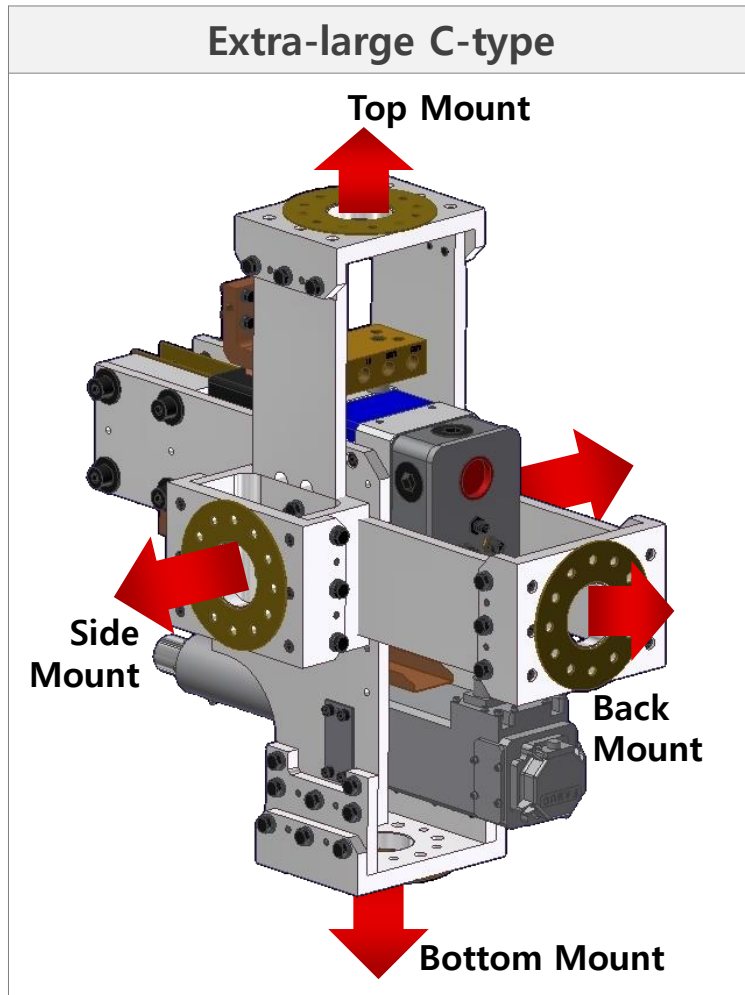
# Bracket for Standard X2C

C and X types



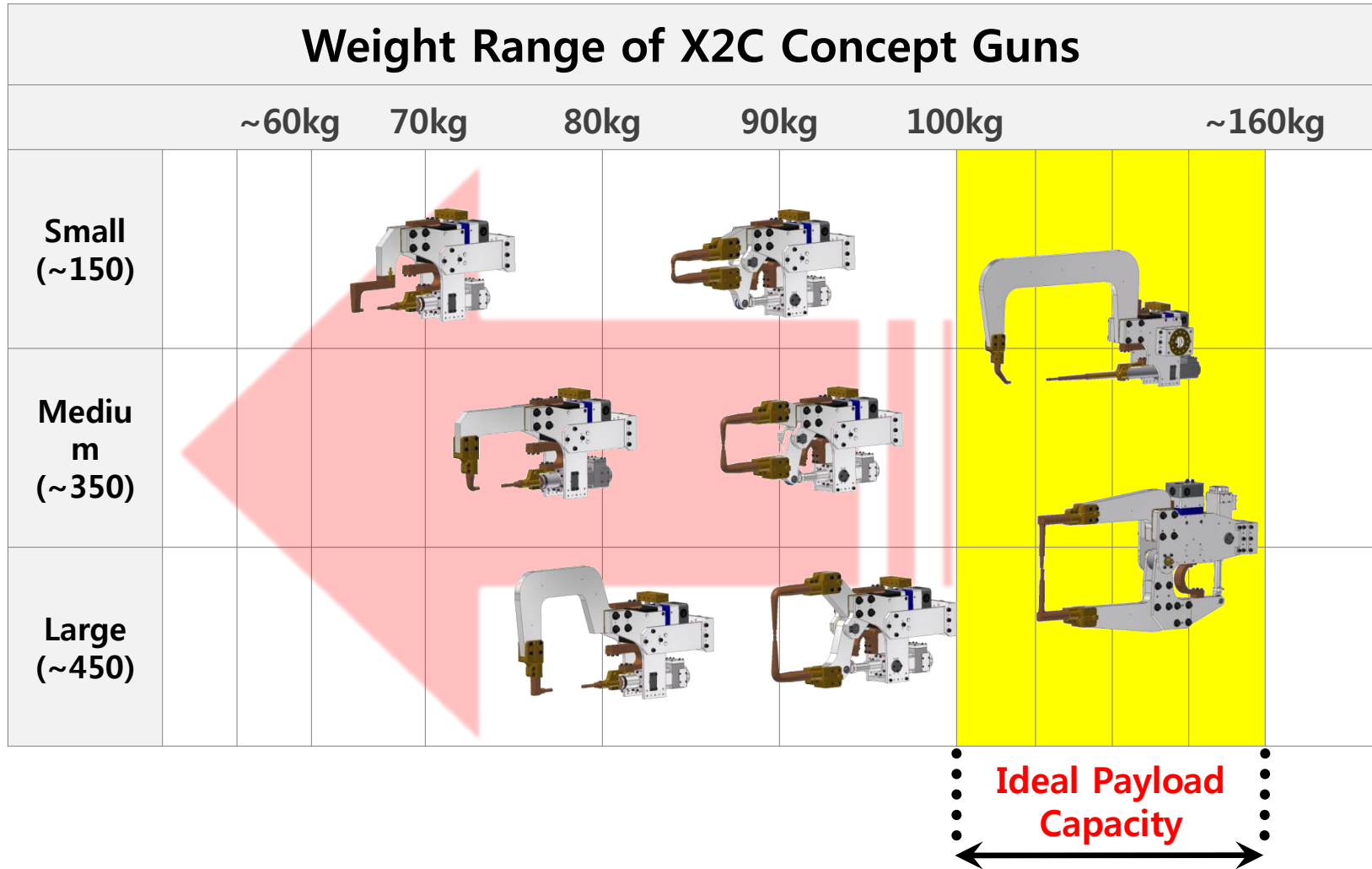
# Bracket for Extra-large X2C

All directions even with Extra-large guns



# Weight Range

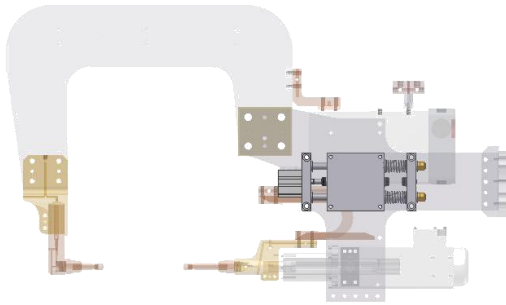
All directions even with Extra-large guns



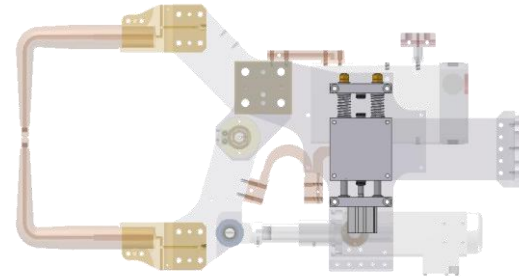
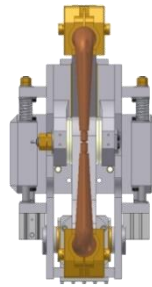
# Equalizing Option

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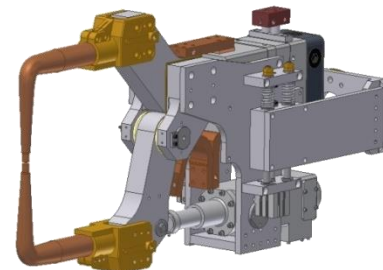
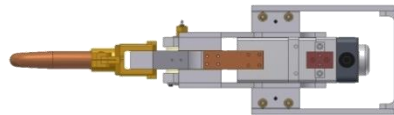
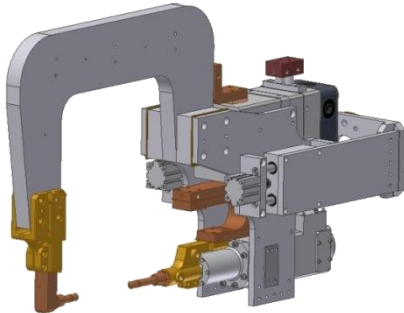
- Add-on Feature - Simply bolt-on to Standard Body
- Universal Design - Same unit for both C&X
- Air Equalizing - Equalizing cylinder + valves



**C-type Gun with EQ**



**X-type Gun with EQ**

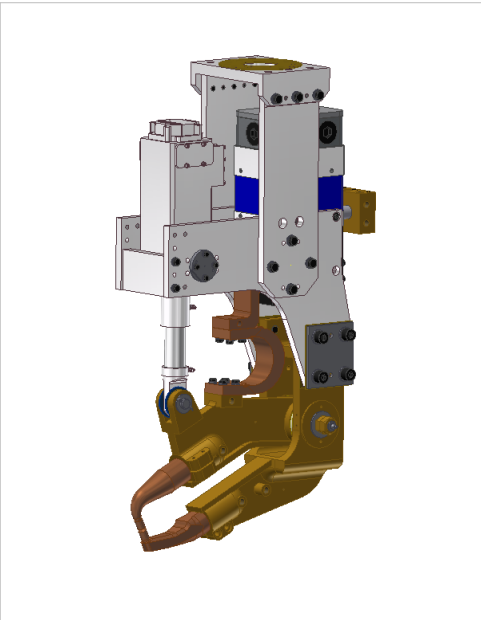


# Other Variations

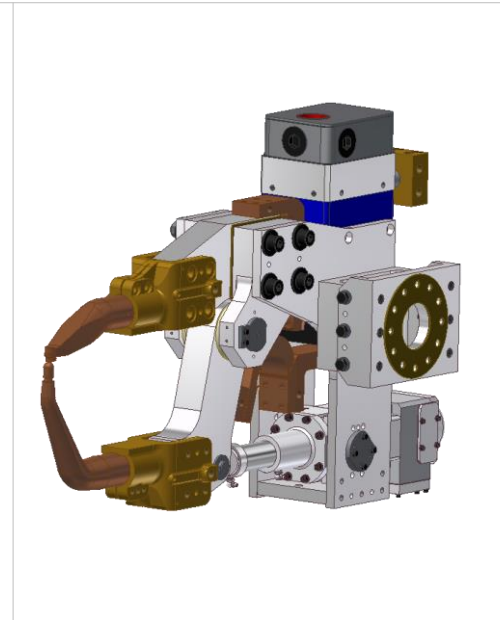
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**Y-Type Gun**  
(Lower Side Movable)



**Y-Type Gun**  
(Upper Side Movable)

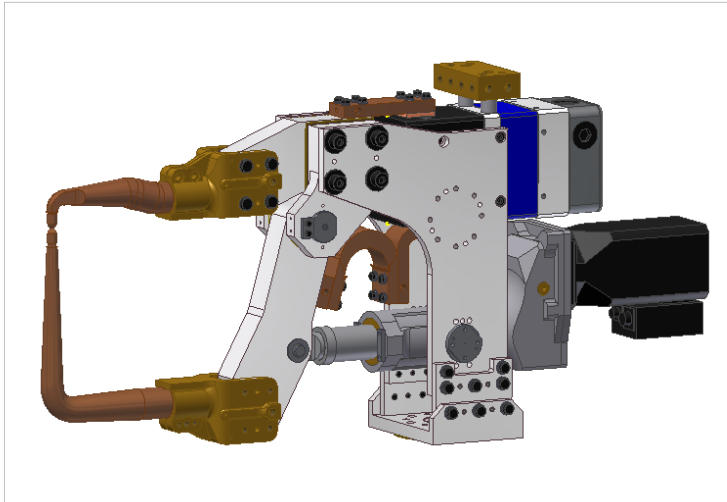


**X-Type Gun**  
(with vertical trans)

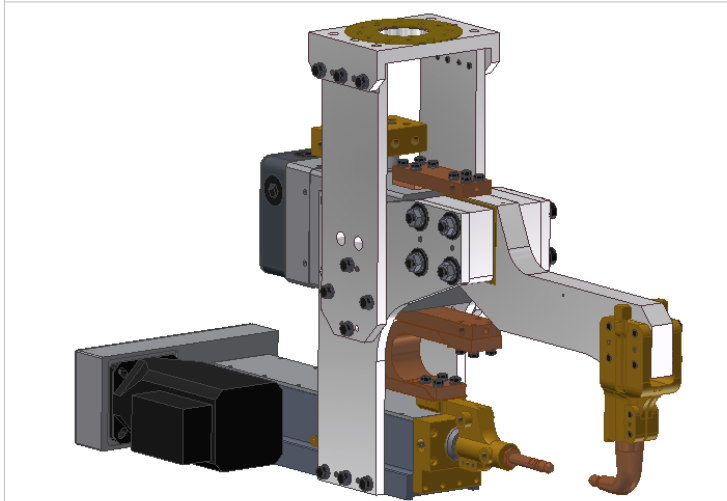


# Other Variations

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**X-type gear case assy is completely interchangeable with the standard inline actuator.**

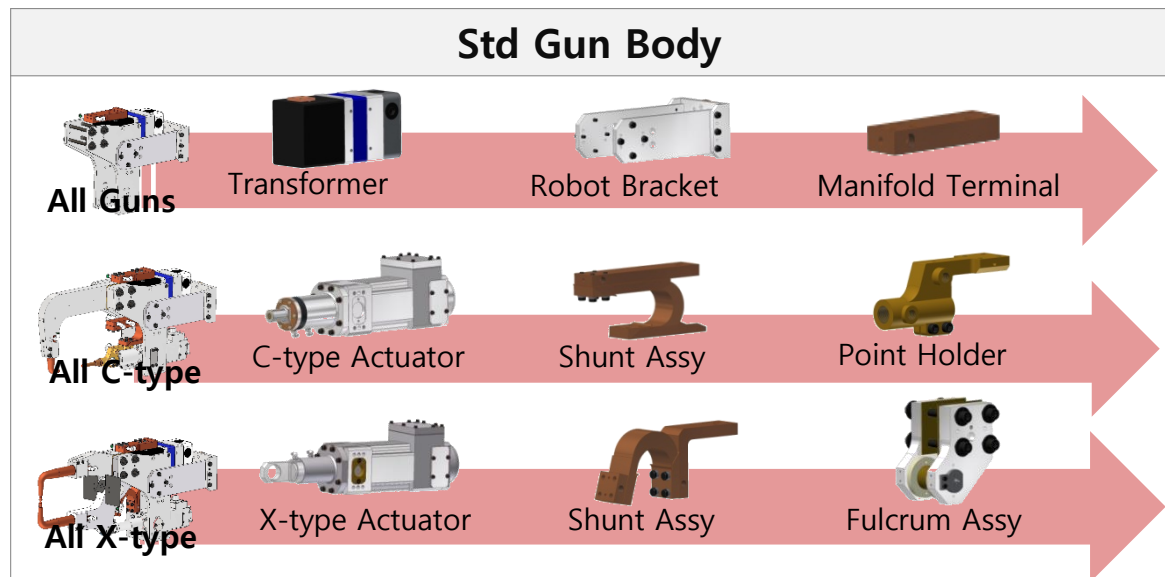
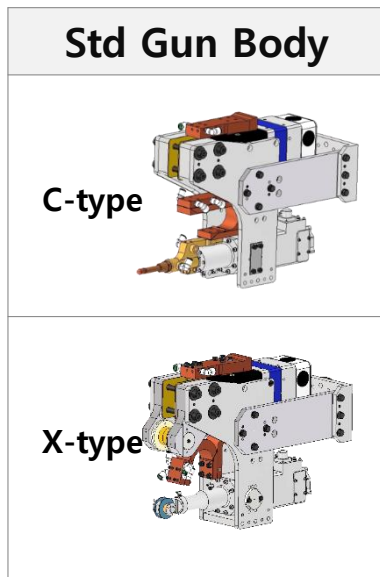
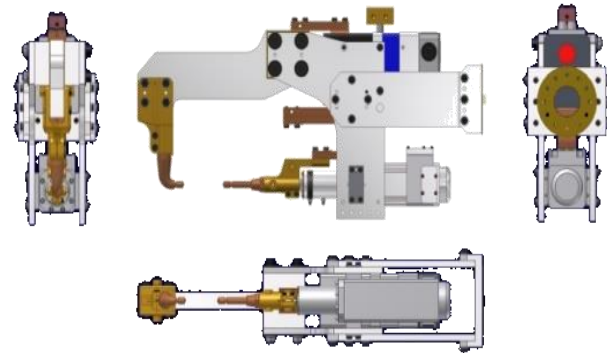


**C-type gear case assy uses special main body side plates with thru holes instead of the standard threaded mounting holes. The same water jet cut-out can be used.**

# Direct Benefits

## Standardized Design

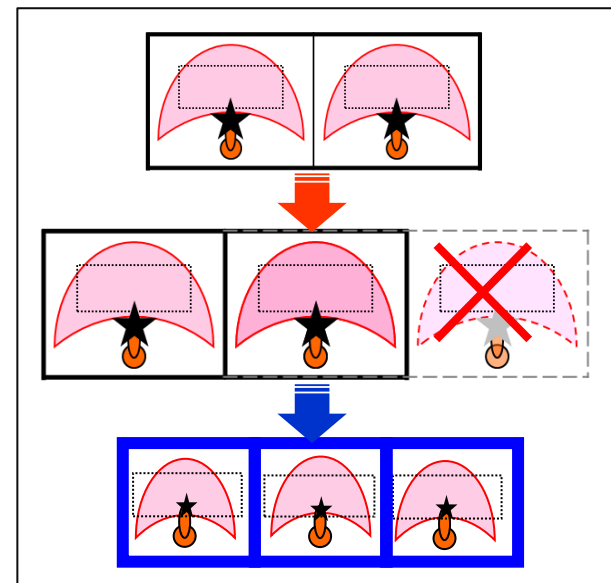
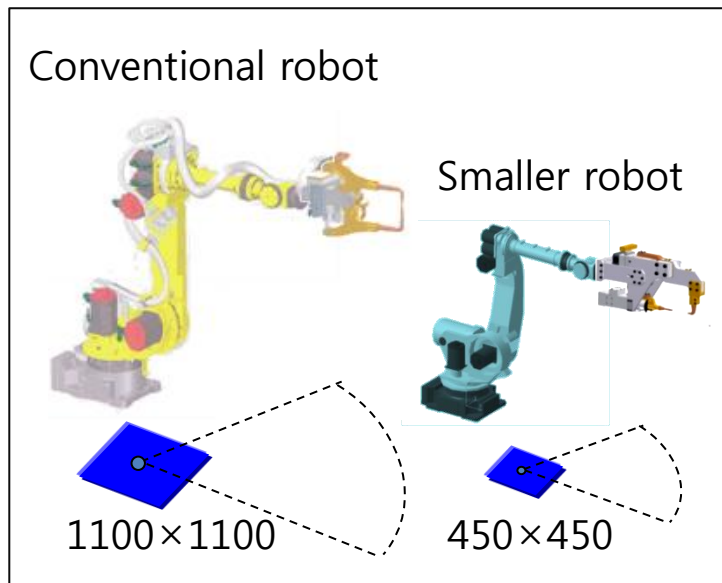
- Standard Gun Body
- Common Spare Parts
- Symmetrical Design
- In-line Actuator Standard
- Maintenance Friendly Design



# Indirect Benefits

## Advanced Space Saving Concept

- Able to use Slim Robot (Payload Capacity: 80kg~130kg)
- Suitable for multi-layered installation
- Able to increase the number of welds per cell
- Able to decrease total length (area) of production line (cell)
- Able to reduce tact time



# Summary

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## Suitable for Small Robots

- Lightweight & Compact In-line Actuator
- No reduction in Transformer capacity

## Ideal for Smaller Cells

- Symmetrical Design
- Narrow Body

## Suitable for Increased Robot Speed

- Lighter design results less stress and higher speed
- Designed to accommodate stress up to 3G

