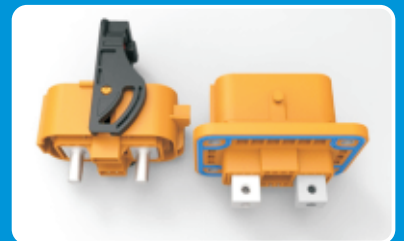
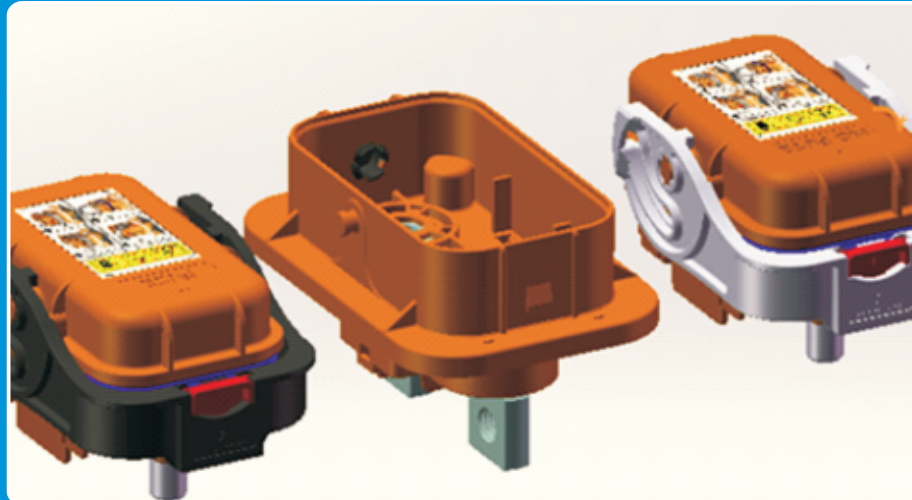


# Manual Service Disconnect solution

MSD(Manual Service Disconnect)It is mainly used in the main circuit of electric vehicle. When the electric vehicle needs maintenance, it provides a safe and reliable power cut guarantee for the maintenance. At the same time, the fuse will be integrated inside to play the role of short circuit protection

RECODEAL design and production MSD are mainly divided into two categories;

- 1)、 passenger cars and logistics vehicles MSD, such MSD generally require a voltage below 500 V DC, rated working current 200 A, fuse current 200 Require small space volume, relatively low cost. For this, there are MSD7、 MSD3、 MSD5 and other options.
- 2)、 buses and special vehicles MSD, such MSD generally require a voltage higher than 600 V DC, rated working current 200 fuse current generally requires 200 A—630A. This kind of MSD belt fuse volume is large, so the whole MSD volume is also relatively large, the cost is relatively high. For this, there are MSD1、 MSD2、 MSD4、 MSD9 and other options.



## Manual Service Disconnect (MSD1)



### Features/Application

- Recodeal MSD1 provides stable high voltage power transmission for EV/HEV systems. The fuses inside MSD1 provides overcurrent and short-circuit protection.
- Breaking structure and fuses are highly integrated inside which saves installation space and convenient for repair and maintenance.
- MSD1 is straight type connectors comprising of plug and jack. The jack is joint with cable.
- Back and front installation of Jack for option.
- Operating current is 400A the contact elements are comprised of a pair of power contact ( $\phi 11$ ) and two pairs of signal contact ( $\phi 1$ ). Power contact is designed with crown spring inside which would maintain a reliable connection and longer mating cycle.
- The connectors have rotatable locking handle and secondary locking structure.

### Technical Specification

#### Environmental Property

Working temperature:  $-40^{\circ}\text{C} \sim +130^{\circ}\text{C}$

Relative humidity: 95%( $40^{\circ}\text{C}$ )

Vibration: 10~55Hz, amplitude 0.75mm

Mechanical shocks:  $980\text{m/s}^2$

Handle lock after retention :  $\geq 200\text{N}$

#### Electrical Property

Contact resistance: total power contact resistance  $\leq 1.5\text{m}\Omega$   
 (fuse resistance  $\leq 0.35\text{m}\Omega$ );  
 signal contact resistance  $\leq 10\text{m}\Omega$

Current rating: 250A (300A in 10 mins)

Voltage rating: 1250V AC

Withstand voltage: 3500V AC 1 min (normal status)

Insulation resistance : 3500M $\Omega$  (normal status), 100M $\Omega$ (damp heat)

#### Mechanical Property

Mating cycle: 750 times

Single contact separation force: 15N~30N (power contact)

Sealing: IP67 B in mated condition

#### Material

Shell: thermoplastic flame-retardant

Contact: copper alloy silver plated

Seal: silicon rubber

## Ordering Information

### Plug

RC-MSD1-400-H-A

Extensive character

H: HVIL (non-HVIL unmarked)

Fuse specification(A)

Serial code

R: RECODEAL

### Jack

RC-MSD1-H-Z-A

Extensive character

Z : Jack

H: HVIL (non-HVIL unmarked)

Serial code

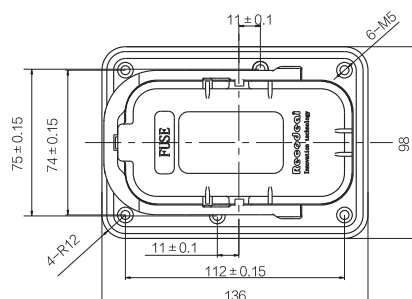
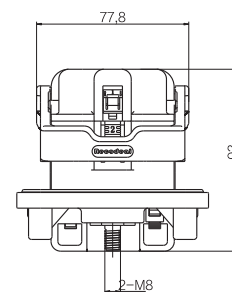
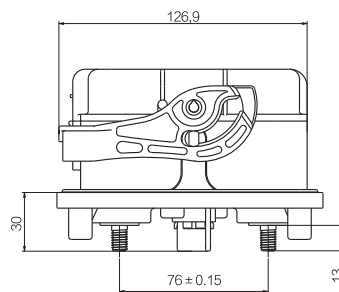
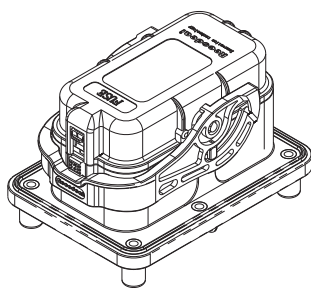
R: RECODEAL

Note:1 RC-EV-MSD1-400-H-A:MSD with 400A fuse. RC-EV-MSD1-H-A:MSD with copper bar inside.

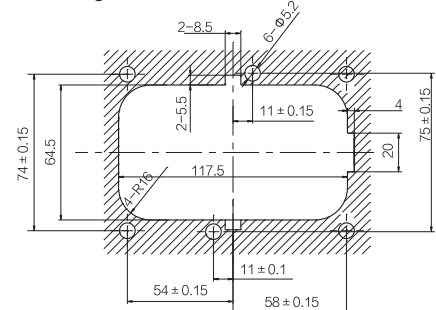
2 Fuse max current rating:400A.

## Size

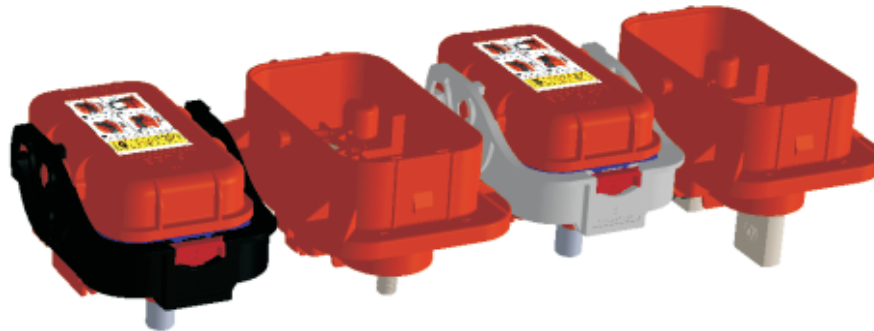
MSD(dimension for MSD with fuse and copper bar inside are same.)



mounting hole dimension



## Manual Service Disconnecter (MSD2)



### Features/Application

- Recodeal MSD2 provides stable high voltage power transmission for EV/HEV systems. The fuses in MSD2 provides overcurrent and short-circuit protection.
- Breaking structure and fuses are highly integrated inside which saves installation space and convenient for repair and maintenance.
- MSD2 is handle type connectors comprising of plug and jack. The jack is joint with cable.
- Front installation of socket for option.
- Operating current 250A and contact elements are comprised of a pair of power contact ( $\phi 11$ ) and a pair of signal contact ( $\phi 1$ ). Multiple brands for option.
- The connectors have rotatable locking handle and secondary lock-unlock structure, it's convenient to operate and save strength.

### Technical Specification

#### Electrical property

contact resistance: total power contact resistance  $\leq 1.5\text{m}\Omega$   
 signal contact resistance  $\leq 10\text{m}\Omega$   
 current rating: 250A (300A in 30 mins)  
 voltage rating: 750V DC  
 voltage Resistance: 3500V DC in 1 min (in normal status except fuse)  
 insulation resistance: 3500M $\Omega$  (normal status), 100 M $\Omega$  (damp heat)

#### Environment Property

Working temperature:  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$   
 Relative humidity: 95%(40 $^{\circ}\text{C}$ )  
 Vibration: 10~55GHz, amplitude 0.75mm  
 Mechanical shocks: 980m/s<sup>2</sup>  
 Handle lock after retention:  $\geq 200\text{N}$

#### Mechanical Property

Mating cycle: 500 times  
 Single contact separation force: 15N~30N  
 Sealing: after installation head plug IP68, plug IPXXB separately and Silicone oil resistant option

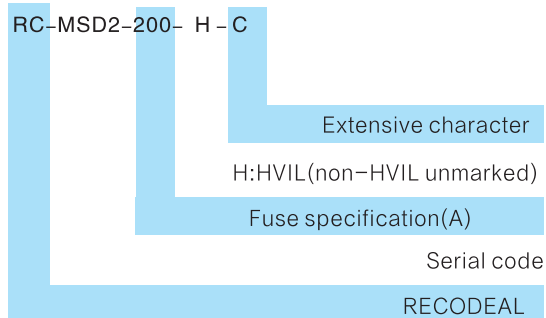
#### Material

Shell: thermoplastic flame-retardant  
 Contact: copper alloy silver plated  
 Seal: silicon rubber

## Ordering Information

The plug and socket are separate as default, if you need whole part connect with "&" between plug and socket P/N;  
RC-MSD2-630-H-C&RC-MSD2-Z-H-D" means: 630A fuse with HVIL Plug and HVIL Jack whole part.

### Plug



NOTE:HVIL plug and non-HVIL socket can't be exchanged.

1.plug Final syllable:

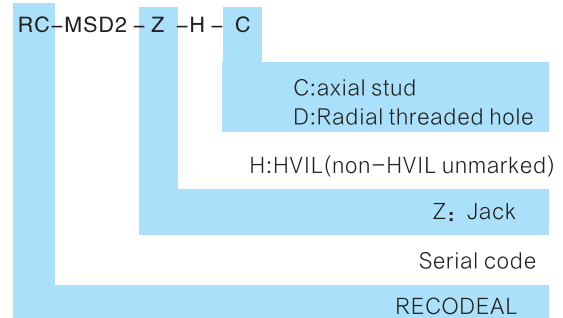
Plug Suffix	instruction	Plug Suffix	instruction
B	ZB type fuse or copper bar	C	M8 axial stud
B1	BS type fuse	D	M10 Radial threaded hole
C	ZB type fuse		
D	AD type fuse		

2."RC-MSD2-630-H-C" means with 630A ZB Type fuse and HVIL MSD2 Plug.

3.RC-MSD2-H-B:Disconnected fuse (copper bar) with HVIL Plug.

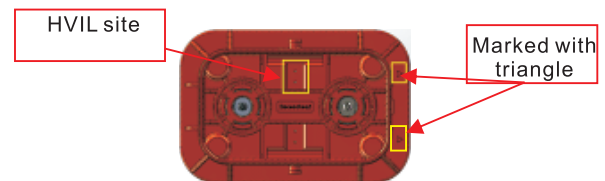
4.RC-MSD2-B:Disconnected fuse (copper bar) with Non-HVIL Plug.

### Jack



NOTE:

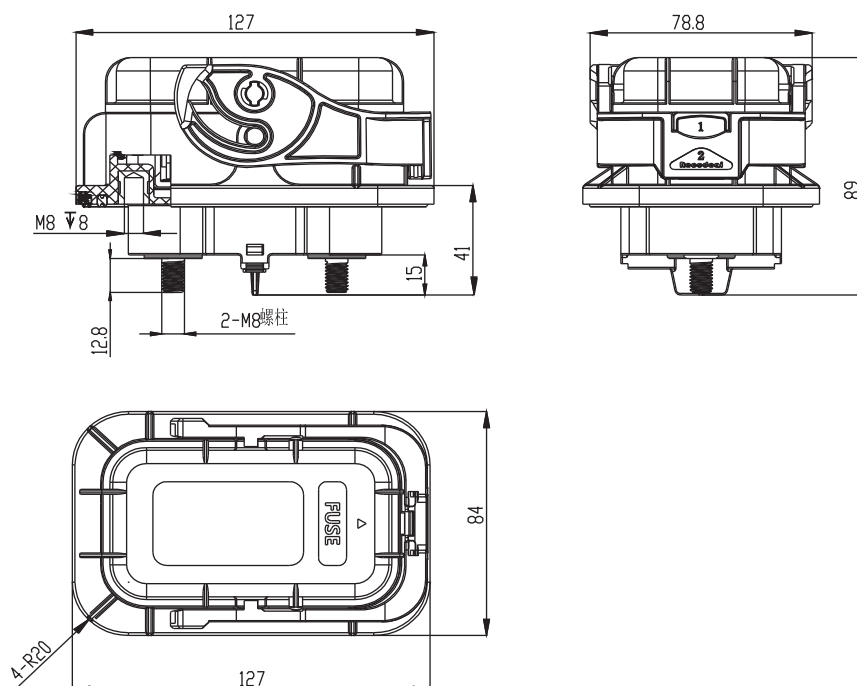
1. Socket non-HVIL with Silicone oil resistant is with plug non-HVIL.
2. RC-MSD2-Z-Ctype means M8 axial stud with non-HVIL plug.
3. RC-MSD2-Z-H-D type means with M10 Radial threaded hole socket.
4. Plug and socket can only meet function when both are HVIL, as the picture below HVIL do like this on the top.



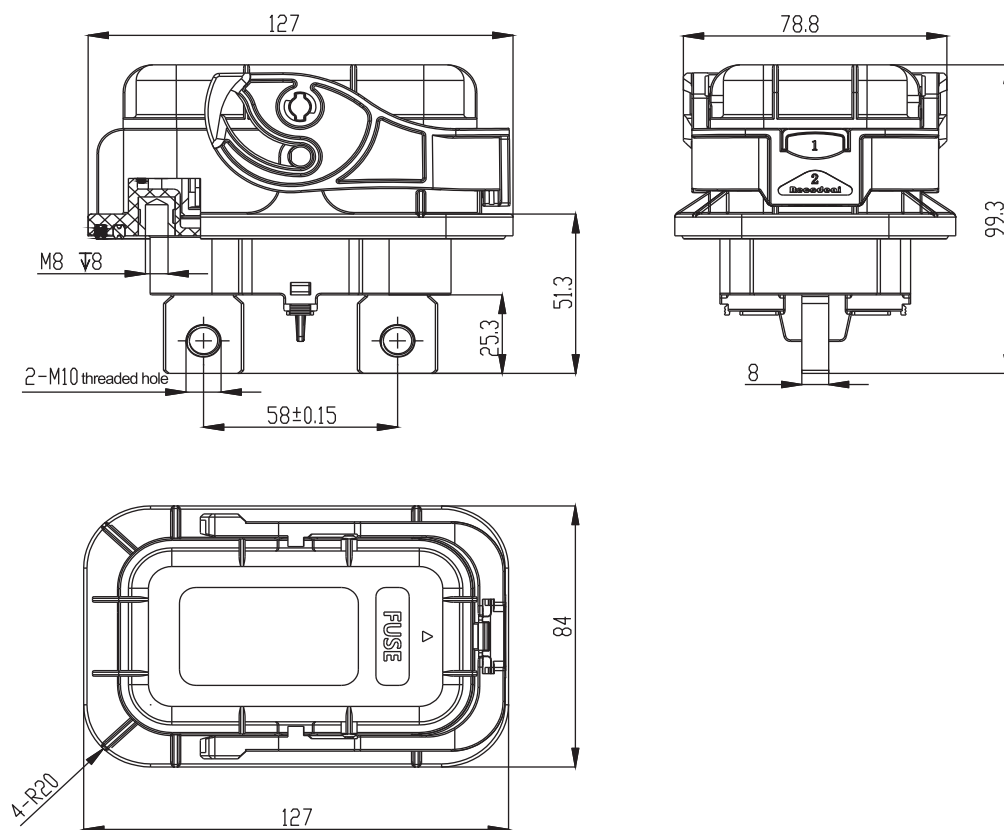
## Size

The shape of fuse and copper are the same.

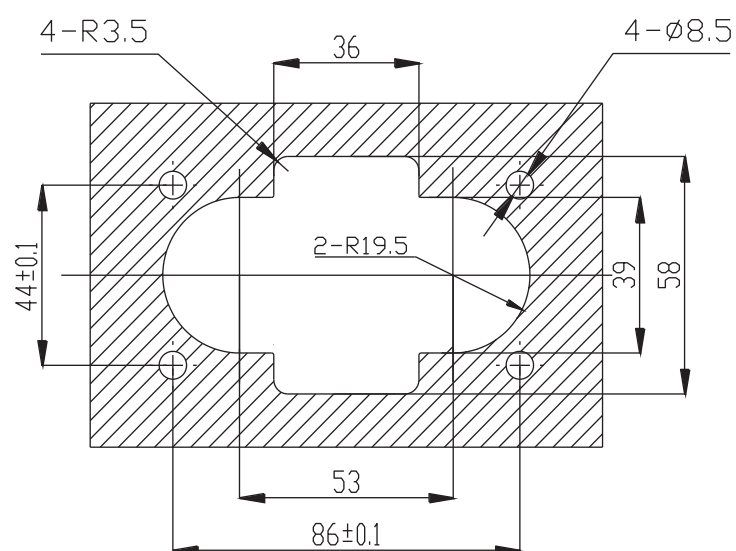
### Manual Service Disconnecter (Socket Jack:M8)



## Manual Service Disconnect (Socket Jack:M10)



### Mounting hole dimension



## Manual Service Disconnecter (MSD3)



### Features/Application

- Recodeal MSD3 provides stable high voltage power transmission for EV/HEV systems. The fuses in MSD3 provides overcurrent and short-circuit protection.
- Breaking structure and fuses are highly integrated inside which saves installation space and convenient for repair and maintenance.
- MSD3 is consist of plug and jack, plug need not be equipped with cables, sockets are front-installed, plug and jack are locked by assistant handles.
- Current rating 180A and 200A in 30 mins and catch a pair of HVIL.

### Technical Specification

#### Electrical Property

Contact resistance:

Total power contact resistance  $\leq 0.5\text{m}\Omega$  (not including fuse resistance)

Signal contact resistance  $\leq 5\text{m}\Omega$  (not including HVIL resistance)

Current rating: 180A (200A in 30 mins) temperature rise  $< 55\text{K}$

Voltage rating: 500V DC

Voltage Resistance:

3200V DC in 1 min, Leakage current  $< 0.1\text{mA}$  (in normal status except fuse)

Fuse technical specification:

Voltage rating: 500V DC

Current rating: 225A~400A

#### Mechanical Property

Mating cycle: 100 times

Vibration: 10~55GHz, amplitude 0.75mm

Mechanical shocks: 980m/s<sup>2</sup>

plug and socket divorce:  $\leq 75\text{N}$

#### Material

Shell: thermoplastic flame-retardant

Contact: copper alloy silver plated

Seal: silicon rubber

#### Environment Property

Working temperature:  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$

Relative humidity: 95%(40°C)

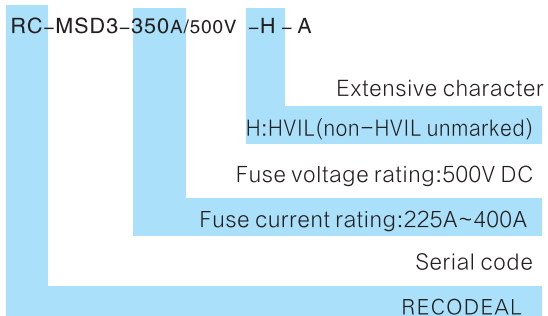
Sealing: IP68 (plug and socket in mated, 1 metre depth, immerse 48h, no leakage);  
plug meet IPXXB separately

## Ordering information

The plug and socket are separate as default, if you need whole part connect with "&".

For example, RC-MSD3-350A/500V-H-A&RC-MSD3-Z-H-A means Equipped with 350A/500V fuse, with HVIL plug and socket whole part.

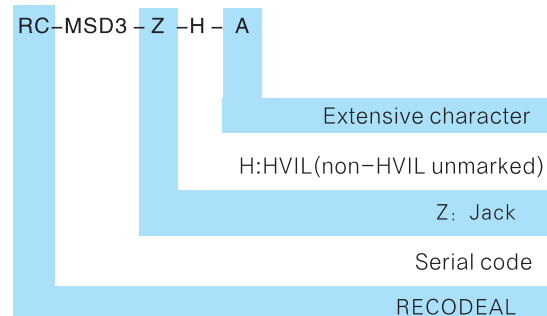
### Plug



NOTE:

- 1.RC-MSD4-350A/500V-H-A means Equipped with 350A/500V fuse, with HVIL MSD3 plug.
- 2.RC-MSD3-A: NON-HVIL without fuse.
- 3.RC-MSD3-H-A: HVIL without fuse.

### Jack

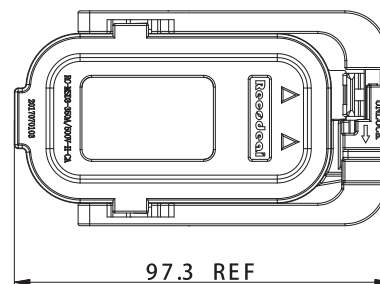
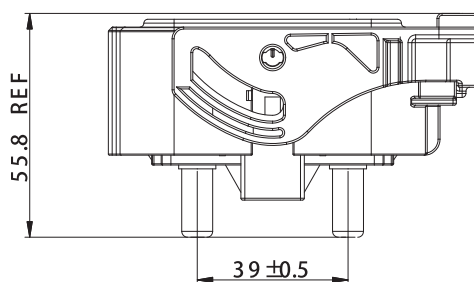
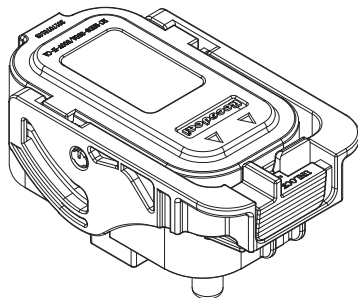
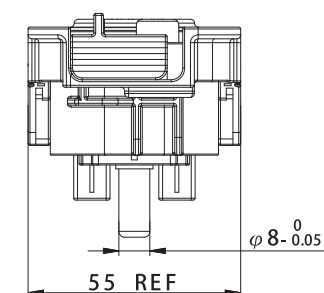


NOTE:

Plug with socket with HVIL together meet function, HVIL is designed together for certain.

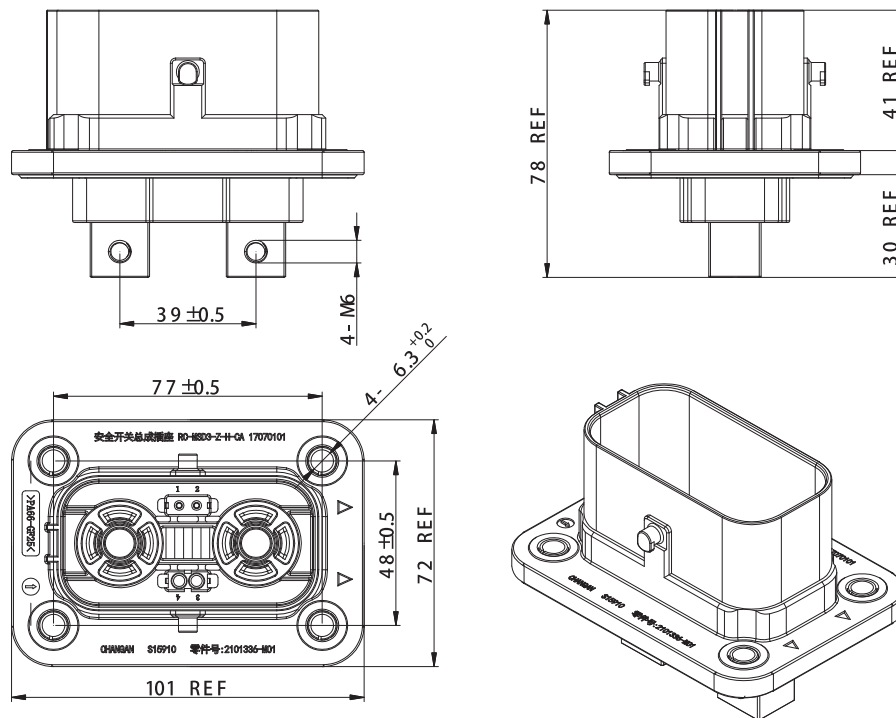
## Size

### Plug





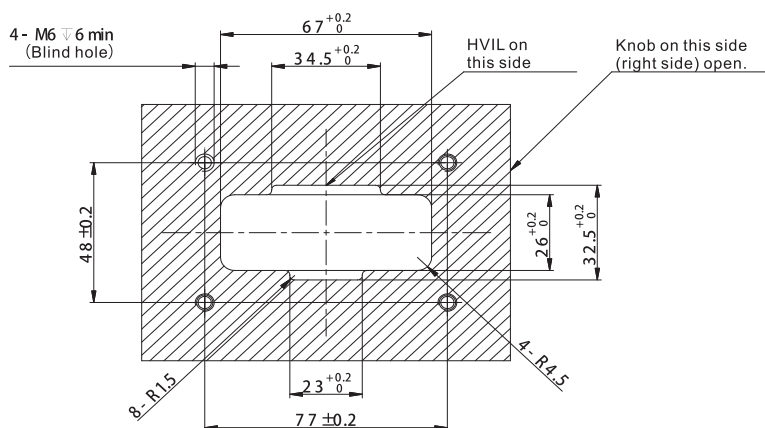
## Jack



### NOTE:

1. The end of thread hole size connected to the tail of socket and Copper platoon or cable is M6, allowing 15mm depth.
2. The direction of locking copper platoon is available in two Perpendicular directions , as seen in 3D drawing.
3. The end of socket connected to the copper platoon M6 is recommended 10±1 N.m.

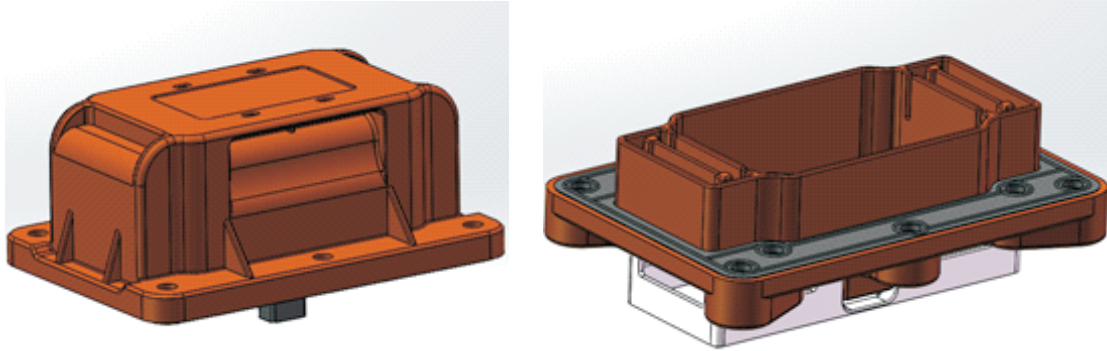
## Mounting hole dimension



### NOTE:

1. To meet protection level, the roughness of the panel should be not less than 1.6, flatness should be not less than 0.2;
2. The way of stalling is done before digging the hole, so the panel M6 nut hole should meet the requirement of waterproof.
3. The product socket and the panel connected to M6 is recommended 9~11 N.m.

## Manual Service Disconnect (MSD4)



### Features/Application

- Recodeal MSD4 provides stable high voltage power transmission for EV/HEV systems. The fuses in MSD4 provides overcurrent and short-circuit protection.
- Breaking structure and fuses are highly integrated inside which saves installation space and convenient for repair and maintenance.
- MSD4 is connector comprising of plug and jack. The jack is joint with cable. Back installation of socket for option. Plug and socket adopts screw locking.
- Current rating 250A and 300A in 30 mins, catch 2 pairs of HVIL.

### Technical Specification

#### Electrical property

contact resistance:  
 total power contact resistance  $\leq 0.5\text{m}\Omega$  (not including fuse resistance)  
 signal contact resistance  $\leq 5\text{m}\Omega$  (not including HVIL resistance)  
 current rating: 25A (300A in 30 mins) temperature rise  $< 55\text{K}$   
 voltage rating: 750V DC  
 voltage Resistance:  
 3000V DC in 1 min, Leakage current  $< 0.1\text{mA}$  (in normal status except fuse)  
 fuse technical specification:  
 voltage rating: 750V DC  
 current rating: 125A~630A

#### Mechanical Property

Mating cycle: 500 times  
 Vibration: 10~55GHz, amplitude 0.75mm  
 Mechanical shocks:  $980\text{m/s}^2$   
 plug and socket divorce:  $\leq 100\text{N}$

#### Material

Shell: thermoplastic flame-retardant  
 Contact: copper alloy silver plated  
 Seal: silicon rubber

#### Environment Property

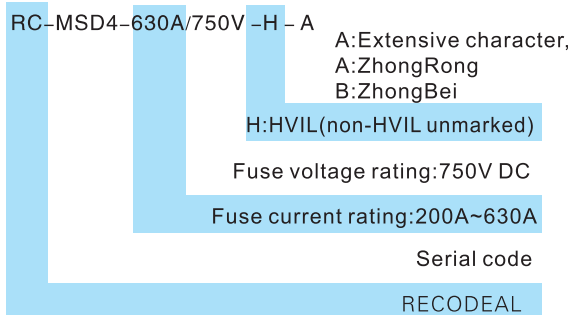
Working temperature:  $-40^\circ\text{C} \sim +125^\circ\text{C}$   
 Relative humidity: 95%(40°C)  
 Sealing: IP68 (plug and socket Insert or state, 1 metre depth, Immerse 48h, no leakage);  
 plug meet IPXXB separately

## Ordering info

The plug and socket are separate as default, if you need whole part connected with "&".

For example, RC-MSD4-630A/750V-H-A&RC-MSD4-Z-H-A means Equipped with 630A/750V ZhongRong fuse, with HVIL plug and socket whole part.

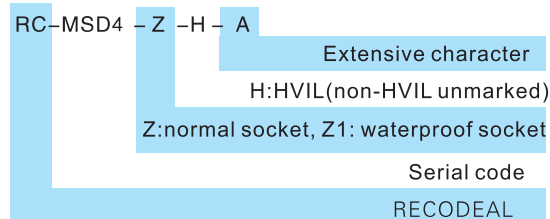
### Plug



Note:

1. Model "RC-MSD4-630A/750V-H-A" means fitting 630A/750V melt brand melting Breaker, MSD4Plug with high pressure interlock;
  2. Model "RC-MSD4-630A/750V-H-B" means fitting 630A/750V Zhongbei brand melting Breaker, MSD4Plug with high pressure interlock;
  2. Plug type without fuses without high voltage interlock: RC-MSD4-A;
  3. Plug type with high voltage interlock without fuse: RC-MSD4-H-A;
  4. Influenced by the temperature rise of the fuse itself, the rated working current of the product and the rated current value of the fuse
- The recommendations are as follows:

### Jack



NOTE:

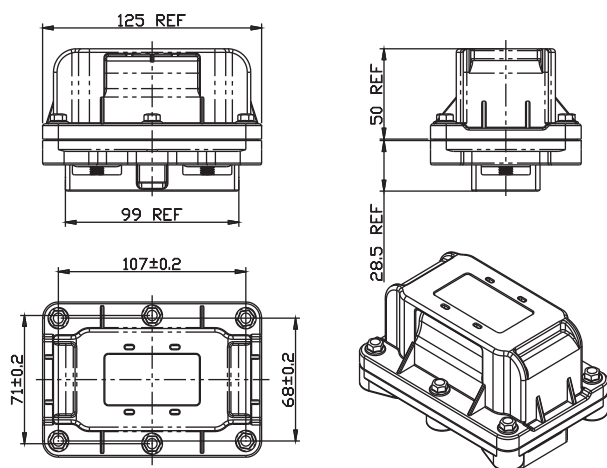
1. Normal socket can't be waterproof alone, waterproof socket meet IP67 level alone, socket has dustproof cover as default.
2. The plug and socket with HVIL together meet function, HVIL is designed together as default.

Item	Rating Current	Fuse rating current	Note
1	250A	630A	This watch is a recommendation consider of a product meeting the case of temperature rise $\geq 55K$ and different rated current valueshow much current can withstand.
2	220~240A	500A	
3	180~220A	400A	
4	150~180A	350A	
5	120~150A	315A	

The selection of the rated current of the fuse needs to be comprehensively evaluated in combination with the following points: the fuse is expected protection mode, line rated working current value, instantaneous current impact value and its impact frequency, wiring specifications, the breaking current is long and long, the time current curve of the fuse, the pre-arc Joule integral value.

## Size

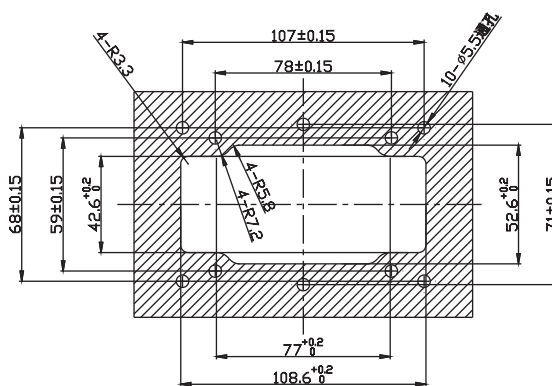
### Plug Jack Mated( plate thick is 0.8mm)



Remarks:

Jack tail lock copper row nut defaults to use M8 hexagon without elastic pad, flat padFlange nut, the national standard is GB/T 6177.1-2000.

### Recommended mounting hole dimension



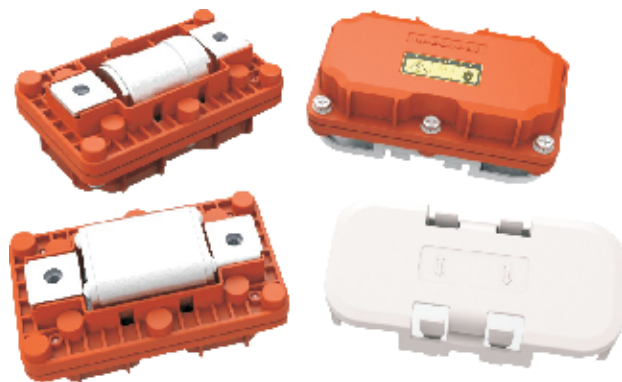
Remarks:It is recommended to install the panel thickness of 0.8mm~1.5mm.

Special statement:

This series of Jack (Z1) can meet the IP68 protection level alone, only for extreme cases (Plug is not assembled, Plug and Jack are not locked).

Tightening seal failure, etc.) Blocking External Environment Property continues to cause further damage to the subsystem, but it does not mean that jack can work normally without any further processing or repair after suffering from extreme conditions.

## Manual Service Disconnect (MSD5)



### Product Name

order	product name	Product type	fuse type	fuse current/voltage rating	note
1	MSD	RC-MSD5-250A/750V-A	Round tube	250A/750V.DC	
2	MSD	RC-MSD5-280A/750V-A	Round tube	280A/750V.DC	
3	MSD	RC-MSD5-315A/750V-A	Round tube	315A/750V.DC	
4	MSD	RC-MSD5-350A/750V-A	Round tube	350A/750V.DC	
5	MSD	RC-MSD5-400A/750V-A	Round tube	400A/750V.DC	
6	MSD	RC-MSD5-250A/750V-B	Square style	250A/750V.DC	
7	MSD	RC-MSD5-315A/750V-B	Square style	315A/750V.DC	
8	MSD	RC-MSD5-350A/750V-B	Square style	350A/750V.DC	
9	MSD	RC-MSD5-400A/750V-B	Square style	400A/750V.DC	
10	MSD	RC-MSD5-500A/750V-B	Square style	500A/750V.DC	
11	MSD	RC-MSD5-630A/750V-B	Square style	630A/750V.DC	
12	dustproof	8.074.191021	/	/	purchase alone

#### NOTE:

Protective cover is non-standard part, it can be purchased separately if customer need.

### Features/Application

- Recodeal MSD5 provides stable high voltage power transmission for EV/HEV systems. The fuses in MSD4 provides overcurrent and short-circuit protection.
- Recodeal MSD5 installs the fuse outside of the box, it's convenient for equipment maintenance and replacing fuse.
- Back installation for option, adopt screw locking.

## Technical Specification

### Electrical property

contact resistance:  
total power contact resistance  $\leq 0.5\text{m}\Omega$  (not including fuse resistance)  
current rating: 25A (300A in 30 mins) temperature rise  $< 55\text{K}$   
voltage rating: 750V DC  
voltage Resistance:  
4000V DC in 1 min, Leakage current  $< 0.1\text{mA}$  (in normal status except fuse)  
Insulation resistance:  
5000m  $\Omega$  (Normal; test environment temperature  $\leq 40^\circ\text{C}$ , humidity 50%RH)  
300m  $\Omega$  (humidity  $\geq 95\%\text{RH}$ )

### Environment Property

Working temperature:  $-40^\circ\text{C} \sim +125^\circ\text{C}$   
Relative humidity: 95%(40°C)  
Sealing: IP68 (plug and socket Insert or state, 1 metre depth, Immerse 48h, no leakage);

### Mechanical Property

Mating cycle: 100 times  
Vibration: 10~55GHz, amplitude 0.75mm  
Mechanical shocks: 980m/s<sup>2</sup>

### Material

Shell: thermoplastic flame-retardant  
Contact: copper alloy silver plated  
Seal: silicon rubber

## Ordering information

RC-MSD5-350A/750V -A

A: circular tube fuse, B: rectangle fuse

750V: fuse voltage rating

350A: fuse current rating

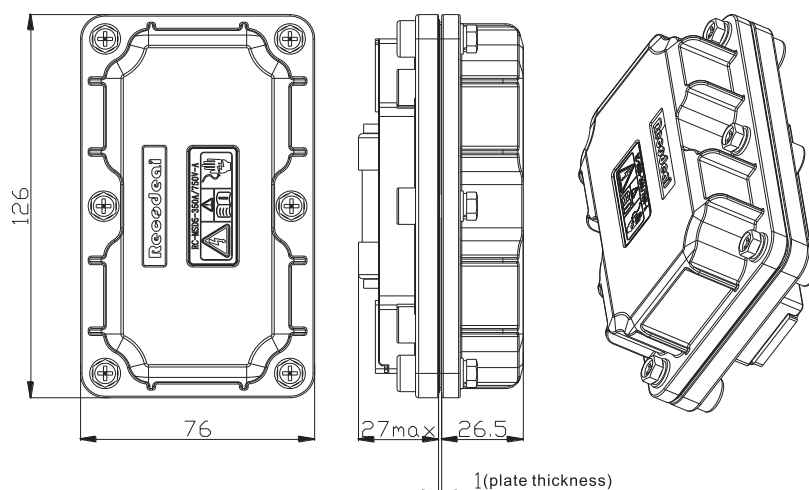
MSD5: Product series

RC: RECODEAL Serial code

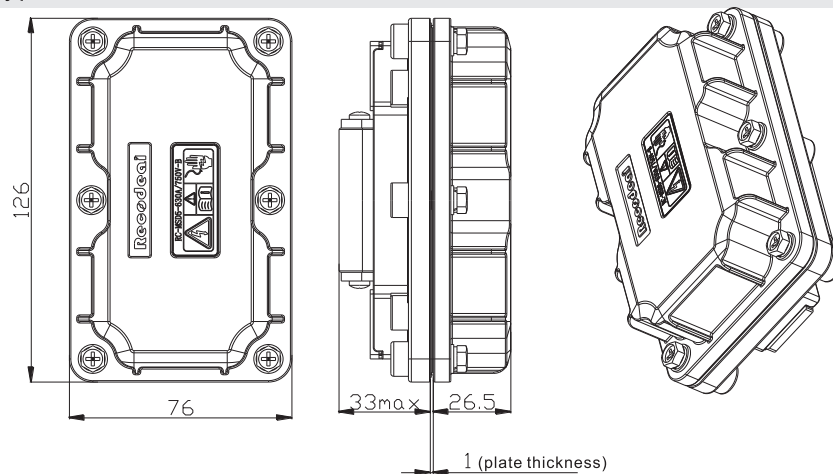
For example, "RC-MSD5-280A/750V-A" means made by RECODEAL, MSD5 fuse current rating 280A, fuse voltage rating 750V DC, circular tube fuse.

## Size

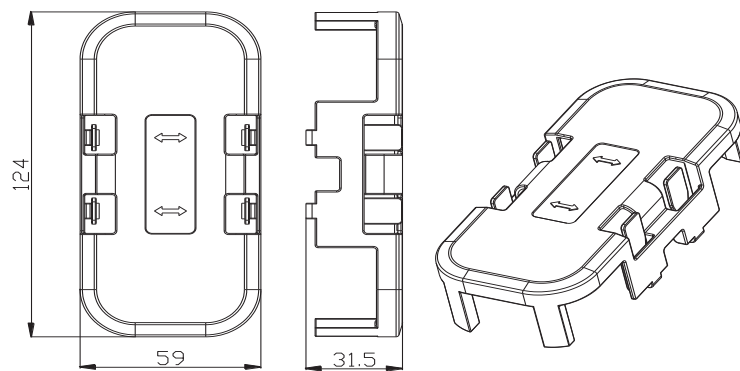
### circular tube fuse type



## Rectangle fuse type

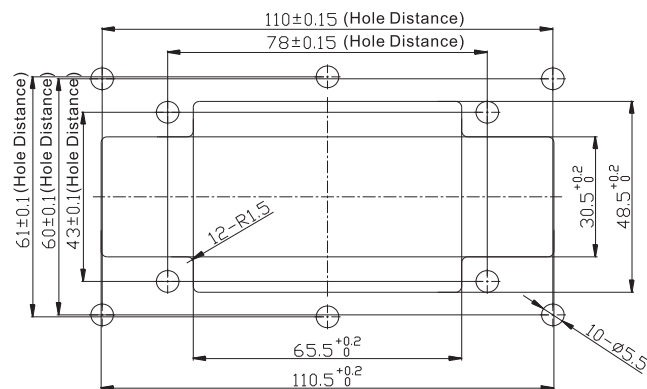


## Dustproof



## Size

## Recommend Mounting Hole Dimension



## NOTE:

1. In order to meet the requirement of protection level, the roughness of panel should be not less than 1.6, flatness should be not less than 0.2.
2. The end of socket and copper platoon or cable connected is recommended M8\*20 type.

## Manual Service Disconnect (MSD7)



### Features/Application

- Recodeal MSD7 provides stable high voltage power transmission for EV/HEV systems. The fuses in MSD7 provides overcurrent and short-circuit protection.
- Breaking structure and fuses are highly integrated inside which saves installation space and convenient for repair and maintenance.
- MSD7 is connector comprising of plug and jack. The jack is joint with cable. Back installation of socket for option.
- Current rating 250A and 300A in 30 mins, catch one pair of HVIL.
- The connectors have rotatable locking handle and secondary lock-unlock structure, it's convenient to operate and save strength.

### Technical Specification

#### Electrical property

contact resistance:

total power contact resistance  $\leq 0.5\text{m}\Omega$  (not including fuse resistance)

signal contact resistance  $\leq 5\text{m}\Omega$  (not including HVIL resistance)

current rating: 25A (300A in 30 mins) end temperature rise  $< 55\text{K}$

voltage rating: 750V DC

voltage Resistance:

3000V DC in 1 min, Leakage current  $< 0.1\text{mA}$  (in normal status except fuse)

fuse technical specification:

Insulation resistance:

5000m $\Omega$  (Normal; test environment temperature  $\leq 40^\circ\text{C}$ , humidity 50%RH)

300m $\Omega$  (humidity  $\geq 95\%$  RH)

fuse Electrical property: voltage rating: 750V DC

current rating: 100A~400A

#### Mechanical Property

Mating cycle: 75 times

Vibration: 10~55GHz, amplitude 0.75mm

Mechanical shocks: 980m/s<sup>2</sup>

plug and socket divorce:  $\leq 75\text{N}$

#### Material

Shell: thermoplastic flame-retardant

Contact: copper alloy silver plated

Seal: silicon rubber

#### Environment Property

Working temperature:  $-40^\circ\text{C} \sim +85^\circ\text{C}$

Relative humidity: 95%(40°C)

Sealing: IP68 (plug and socket Insert or state, 1 metre depth, Immerse 48h, no leakage);

plug meet IPXXB separately

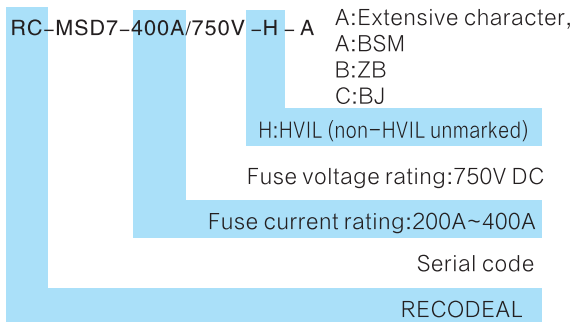


## Ordering information

The plug and socket are separate as default, if you need whole part connected with "&".

For example, RC-MSD7-400A/750V-H-A&RC-MSD7-Z-H-A means Equipped with 400A/750V fuse, with HVIL plug and socket whole part.

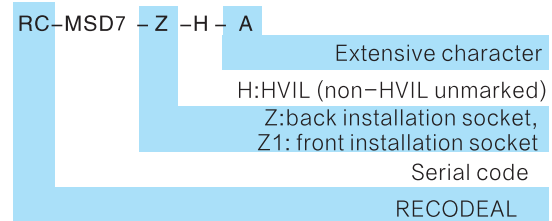
### Plug



1. 500A/500V fuse can only choose BJ and fuse voltage rating is 500V DC, 400A fuse and voltage rating 750V can choose BJ, 600V DC can choose ZB, fuse type is optional.
2. "RC-MSD7-400A/750V-H-A" means equipped with 400A/750V BSM fuse, with HVIL MSD7 plug.
3. Non-hvil without fuse: RC-MSD7-A;
4. HVIL without fuse: RC-MSD7-H-A;
5. Fuse specification;

125A 750VDC	160A 750VDC	200A 750VDC
250A 750VDC	315A 750VDC	350A 750VDC
400A 750VDC(BY)	400A 600VDC(ZB)	500A 500VDC(BY)

### Jack

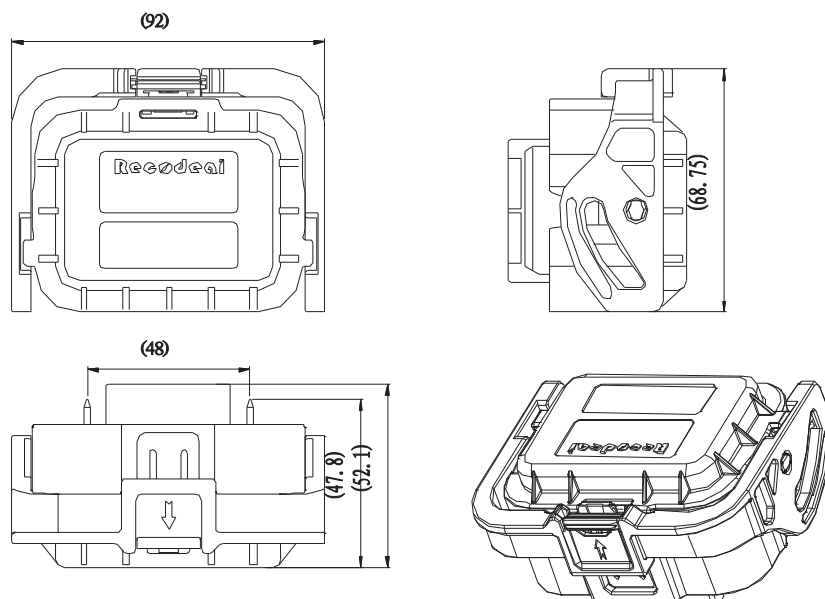


Remarks:

Plug and Jack need to have high voltage interlock at the same time to meet the functional requirements, and the high voltage interlock is 1 set;

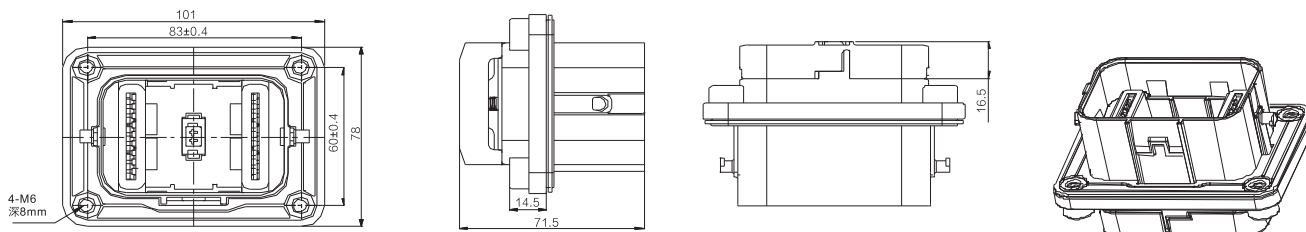
## Size

### Plug

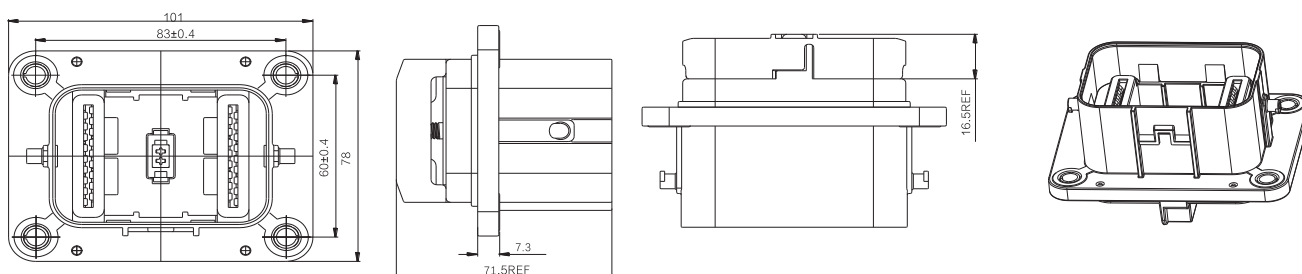




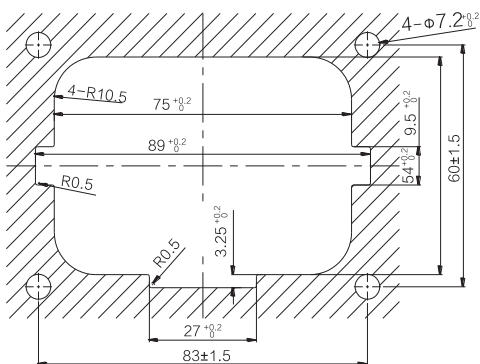
### Back installation socket



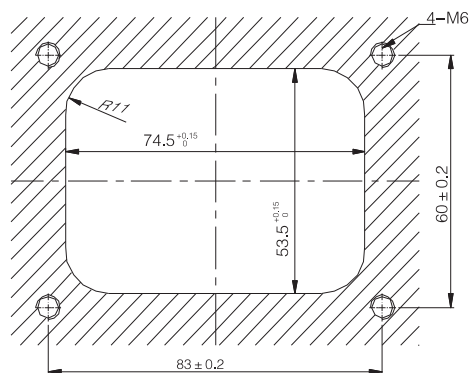
### Front installation socket



### Back installation socket size



### Front installation socket size



#### NOTE:

1. To meet protection level, the roughness of the panel should be not less than 1.6, flatness should be not less than 0.2;
2. The product socket and the panel connected to M6 is recommended 6~7 N.m.

### Special Instruction:

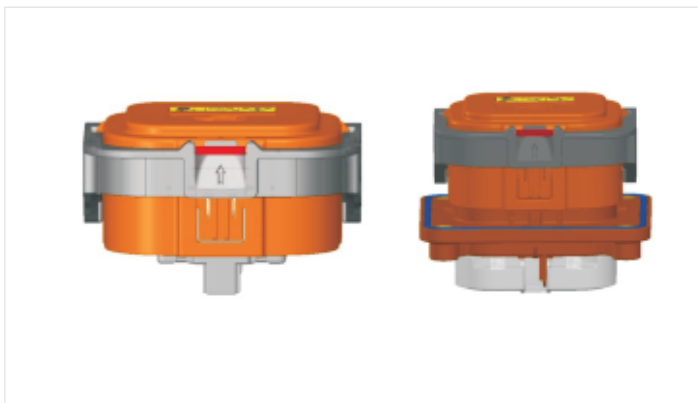
The product has Equipped fuse and Equipped copper platoon two working states, it has different Current-carrying performance when different state, pay attention when choosing.

1. Equip fuse  
current rating: 250A Max( specification  $\geq 350A$ , Temperature rise  $\geq 55K$ , specification  $< 350A$  current rating should decrease Accordingly);
2. Equip copper platoon  
current rating: 300A Max

## Manual Service Disconnect (MSD9)

## Describe

- Current Rating: 200A
- Fuse voltage up to 500 V DC
- Fuse current range :40 A—630A 500VDC
- Hand locking structure
- Anti-mis-touch design ( IPXXB )
- High protection degree: IP6K9K、IP68
- Integrated busbar
- Insert slot contact
- For battery pack, PDU equipment



## Application

- Current rating: 200A, 30min over300A
- Rated voltage : 750V DC
- HVIL: Y
- Working temperture: -40℃--+125℃

## Naming rules

## PLUG

RC-MSD9-450A/690V -H - B

Design Extension Number

HVIL(NON-HVIL unmarked

Fuse type:

C:40A~630A V:690V.AC

RECODEAI

## SOCKET

RC-MSD9-Z-H-A

Design Extension Number

HVIL(NON-HVIL unmarked

Z: Socket

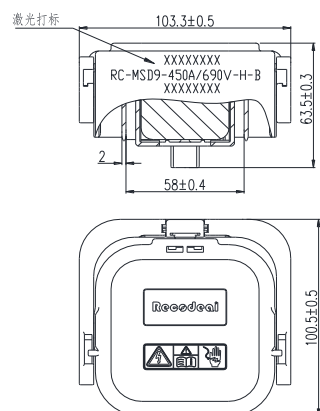
RECODEAI

Note: the plug with Busbar and the plug with different specifications fuse are equipped with the same socket.

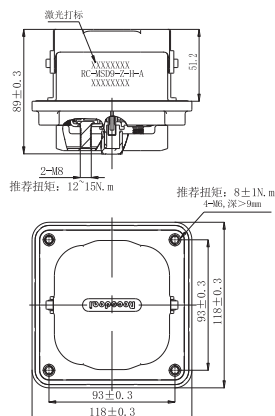
## SIZE

## MSD PLUG

(product size with fuse and copper bar is the same)



## MSD SOCKET



### Installation of hole size

