

## Why use a Projoy solar isolator?

### True DC Isolators

With more than thirty years designing and manufacturing experiences of electrical connectors and switches, also based on the latest photovoltaic power generation regulation and combined structural features of electrical sockets and switches, Projoy Electric Co., Ltd. has designed and developed a DC isolators of rotation and insert type, which is an isolator truly specialized for DC power. The waveform of AC power is standard sine wave and pass through the zero point in every cycle with 0 Vac, while the DC power keeps straight line with a constant voltage and current without passing through the zero point. Therefore, it will be easier to break a current with zero voltage point than a current with constant non-zero voltage in operation-demanding a smaller breaking mechanical force and causing smaller electric arcing and shorter arc period. There are higher requirements with DC isolators than with AC isolators-larger on/off switching speed, stronger arcing-distinguishing abilities, better flame-retardant properties and higher stability.



Figure 1 Projoy DC Isolator

### Bridge Contacts

General switch spring contacting mechanism adopts point-to-point, point-to-surface or line-to-surface contact methods. By using a third elastic component to increase or keep the pressure between contact pairs, contact performance can be improved such as AC contactors and RCCB (residual-current circuit breaker). When the switch turns off and buffer from the elastic

components, the turn-off time is prolonged and hence the arcing time too, which increases the ablation risk and influence the later contact performance. Considering that issue, we have made special treatments and multiple trials for the structure design of the movable and static springs. As for contact pairs, they are in an insertion contact method instead of a touching contact method. Based on the blade design from electric insertion components, the start point of static spring blades has an angle and curve transition, which requires a lower insertion force and more stable contacting. Movable spring adopts clamp-on design, so it can clamp the static spring without using a third elastic component. When the two springs bounce off each other, the action is quick and sharp, so that the time for arcing is shortened. Meanwhile, based on bridge-type springs' double breaking method, the movable spring is given double insertion socket, allowing it closed with or disconnected with two static springs simultaneously so that one circuit can have two breaking points to ensure the contacting stability and the steadiness of the disconnected circuit.

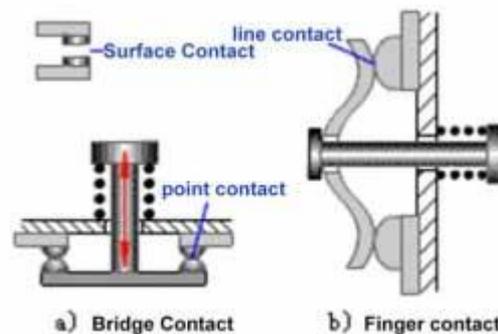


Figure 2 contacts design

## Independent Switching Action Interacts with a Spring Mechanism

Comparing to the linear motion in the AC contactor, Projoy DC isolator adopts rotation switching structure. Switch button has no direct connection with strings,

so the operator's turning speed and strength will not influence the strings movement directly and further will not influence the switch from ON to OFF or from OFF to ON. There is a energy storage part inside the switch. When operating the button manually, the spring collects energy and active the "trigger" in a certain angle, the movable spring will be flicked immediately and accomplish the switching process, which takes only 5ms while AC contactor takes around 100ms. Shorter switching time contributes to a shorter arcing time length, which improve the physical properties and contact properties of the contact pairs.

## Reduce and Extinguish the Arc Effects

It is inevitable to produce arc when the isolator is switched, moreover, the arc of DC isolator is stronger and more persistent. Design of structure of contact pairs and improvement of speed of isolator switch can reduce the produce and existing time of arc, structure design of blade spring also have advantage as follow:

Self-cleaning contact design, as using revolving contact mode, contact pairs revolve when touching so that touch area can be scrub clean, this design can clean the dirt produced by arc, keeping the renew of the contact, ensuring the function of contact.

Arc occur area is not coinciding with contact area. Socket of movable spring structure and edge type static spring structure, arc is produced on the socket of movable spring and the edge of stable spring so that the arc will not be produced in the middle of contact area, so that the arc influence less to the conduction, to avoid contact pairs heat increase quickly caused by contact area burn and resistance increase.



Figure 3 DC isolator parts

## Stringent Electrical Specification

1. Working voltage can be as high as 1500V
2. Working current can be as high as 58A
3. Level 2-12 design, can satisfied inverter with 6 MPPT tracking design maximum.
4. Using V-0 standard insulation martial.
5. With high conduction copper, activities and wire contact point is copper plate zinc.

## Higher Protection Level

Build-in isolator, adding soft gasket after the installation of panel, adding mechanical steal structure on the rotate. installing seal rings on the screw which is installed on the panel, installing in the case so that the protection level can get IP66, moreover, the seal rings ensure the solidness of isolator, outstanding water proof especially for panel with textured and waved, the protection level can reach IP 66.

External isolator, with mechanical steal between shell and revolving button

rotate (patent), surrounded by stainless steel screw, with import steal rings between revolving button and move axle, ensuring IP66 protection for the hole of enclosure DC isolator.

## Flexible wiring

1. Built-in jumper, convenient for series and parallel wiring, saving space, more beautiful.
2. Space wiring, easy to find.
3. 45° angle design for terminal with different face-con contact, making sure AC isolator can be wired in small space.
4. Enough space of the shell of external isolator so that wiring is convenient.
5. External switch is available for multi connectors(M25, M20, M16, M12), possible to choose water proof wire connector or MC4 connector.

## Anti-mis-operation Design

1. Possible to choose padlock or gate lock to avoid disoperation.
2. On/Off position is different from the limit of isolator way, to avoid the disoperation caused by not sure the situation of isolator.

## Strong Environment Adaptability

1. Enough space for external isolator makes sure it can work well with the environment of 25°C~70°C, the build-in isolator can also work with this environment.
2. 1500V insulation voltage testing standard, available to use safely in the AC system as high as 1500V, satisfied over or under voltage I~III standard, and pollution standard level 2.

## Others

1. 10 years free warranty.
2. Enclosure DC isolator with anti-fake label.
3. With TUV, UL etc. international certifications.
4. Market application
  - a) Enclosure DC isolator has already widely used in Australia and up House PV system.
  - b) Build-in DC isolator is also widely used by Chinese mainstream string inverter company.