

Technical literature



DC Distribution Box and AC Distribution Box

RSS India

CONTROL PANELS



RELIABLE SOURCE AND SOLUTIONS INDIA LLP
REG. OFFICE: FARIDABAD, DELHI NCR REGION



Solar ACDB

ACDB is an important part of SPV system. It gives extra protection to the system in case of failures on load side. ACDB is made up of breaker, isolators, voltage and current monitoring etc. To ensure maximum protection to the sophisticated electronic equipment, it has provision for surge protection in the box along with fuses. Also ACDB have energy meter which help you to know how much energy you are using or withdrawing from the solar energy.

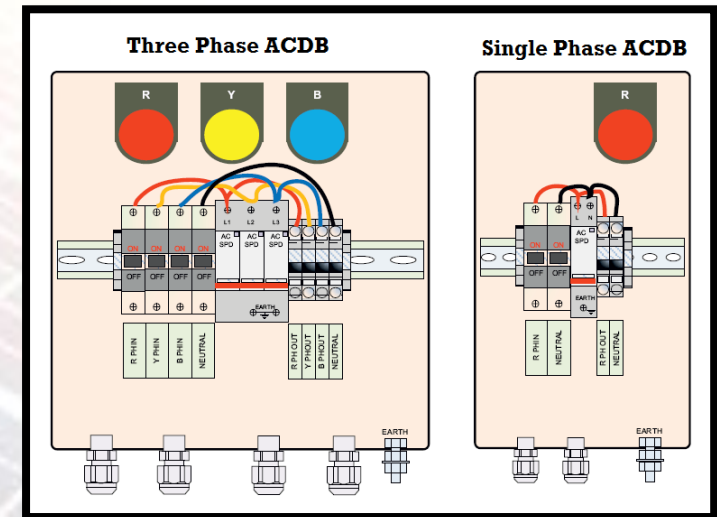
AC Distributed Panel for high DC/AC current Application. These panel are customized as per the design of the solar plant.



Outdoor Type CRCA IP65 ACDB Panel with stand



Indoor Type CRCA IP54 ACDB Wall Mounted Panel



1Kw-50Kw 1 IN 1 OUT ACDB Panel Design

IN ACDB (LT Panels) we do have an expertise to design and provide for residential rooftop project 230V to Industrial rooftop and sheds 415V AC distribution panels. On request we can deliver high voltage 600V-800V AC Distribution panels which generally needed for Ground mounted projects.

Solar DCDB

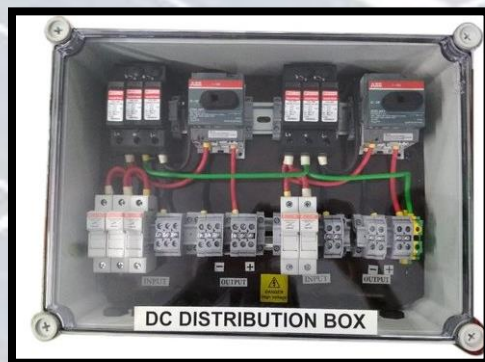
DCDB is used where DC current rating is very high and incoming and outgoing of the DC current is need to be fused. High Quality DC fuses are used for incoming and outgoing through Buss bar. Surge Protection is provided in this panel in order to absorb excess surges in the system.

DCDB used to protect the system if there is any fault during failure on DC side. A very crucial part of SPV system as there should be adequate protection on DC side. The DCDB incorporates isolator/Breaker to switch off the system during fault, there is a meter which tells you exact PV array voltage and current you are getting. It also has surge protection to save your system from any surges occurred due to fault or other phenomenon.

Array Junction Boxes [AJB], is referred to as solar PV generator junction boxes and combiner boxes. It collects DC power from PV strings (generally 4 to 16). Collected power is then transferred either directly or through a main junction box [MJB] to power inverter. The Power inverter converts the DC power to AC which after metering is used for captive consumption in off grid application or supplied to the grid in On Grid solution.

Array Junction Boxes are provided with following accessories for improvement of their functionality.

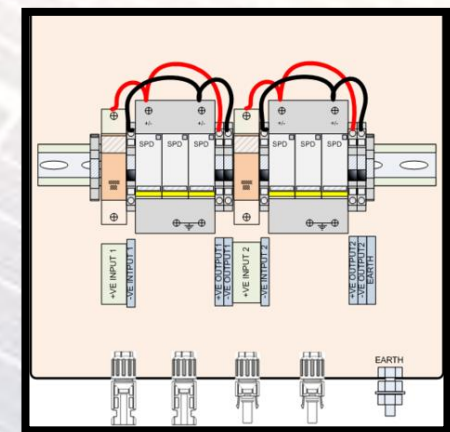
- ✚ Fuse / MCB for over load protection on each string
- ✚ Fuse / MCB Over load protection on output side
- ✚ Dis connector / isolator on the output side to isolate the AJB from the MJB / Inverter
- ✚ Plug in [plug out] type PV string input connectors: these special connectors enable quick yet reliable connection and disconnection of the PV string from the array junction box. This is useful during maintenance and site up gradation work.
- ✚ Blocking DIODES for reverse current flow protection



DCDB IP65 PC Enclosure with DC Isolator and Glands



DCDB IP65 PC Enclosure with MC4 Connectors



2 IN 2 OUT DCDB Panel Design



Standard Bill of Material of DC Distribution Box

1. Solar Grade Fuse >15A 1000V +ve Side
2. Fuse Base 1000VDC
3. Surge Arrester Device 1000V DC Class-C Type 2
4. Terminal Block > 10Sqmm
5. PG glands for cable entry
6. Polycarbonate IP 65 Enclosure
7. DC wire grade 1
8. DC MCB 500V an above (Optional, On request)
9. MC4 connectors (Optional, On request)
10. DC Isolator (Optional, On request)



Below given **MAKES** is being use to assure good quality:



Standard Bill of Material of AC Distribution Box

1. MCB 230V AC 10A-63A
2. MCCB 415V AC ≥63A-800A
3. MCCB 800V AC (Optional, For Ground Mounted High Voltage Project)
4. Surge Arrester Device 415V AC 40KA Type 2
5. Indication Lamp 230V
6. Terminal Blocks ≤ 35Sqmm (upto 50Kw)
7. Aluminum Busbar (Rating as per designed)
8. Copper Busbar (Optional, Provided on request)
9. CRCA Powder coated Enclosure (Use for Busbar Panel)
10. Polycarbonate IP 65 Enclosure
11. PG/Metal glands for cable entry
12. Multifunction Meter (Optional, Provided on request)
13. AC Wire grade 1
14. Vent and Louver (Optional, for CRCA enclosure)
15. ACB ≥800V Panel



Below given **MAKES** is being use to assure good quality:





Panel Characteristics

A. DESIGN

1. All our panels are designed using best practices recommended by the switchgear manufacturer. Our key personnel have undergone training for "Electrical Design of Switchgear Assembly" at M/s L&T Electricals (now L&T Electric).
2. Bus bars are designed as per the short circuit current carrying capacity, as given in client's enquiry as well as normal current load after taking into account the safety factor. If not mentioned all equipment in our panels for solar applications have switchgear minimum short circuit rated at 10ka, except mcbs which will be at a minimum of 3ka. **Rss follows** a busbar selection criteria. Client is free to ask for the same for cross checking.
3. For critical applications starters are designed as per type 2 coordination so that there is no loss of material or any danger to humans in case of a fault.
4. Adequate care is taken so that the panel is maintainable easily.

B. ENCLOSURES

Metal Enclosures

These are available from 300 x 300 mm x 120 mm to 5000 mm x 2200 mm x 1500 mm sizes. These are made out of CRCA sheets and then powder coated to a thickness of 50 to 70 micron. The normal colour is RAL7035 and any change in colour can be done but it will impact the delivery and cost.

1. **IP-54 Enclosures.** Totally enclosed free standing, vermin proof, cubicle type, 14/16 swg. CRCA sheet steel fabrication. Our enclosures are certified upto IP54 from CPRI, Bhopal, a government Testing Lab. Made in our own factory in Noida. Please note IP certification is for the enclosure only and any cut made in it for Meters or Indication Lights will reduce the protection class to IP42.
2. **IP-65 Enclosures.** On client request we can also supply enclosures certified to IP65. (Client to check our offer for confirmation of IP class). Normally upto IP65 Class Enclosure can be given upto 1200 Height x 800 Width. Higher sizes with IP65 certifications are available on request, but the lead times are more than 75 days. And the prices are special too.



These enclosures are having special construction so the sheet thickness is less than 1.2mm. Please note IP certification is for the empty enclosure only and any cut made in it on the outer body for Meters or Indication Lights or Glands etc reduce the protection class to IP42 or less.

Non-Metal Enclosures

These are available from 150mm x 150mm x 80mm to 700mm x 700mm x 300mm sizes. These may be made out of Polycarbonate / FRP or similar material. The normal colour of base is RAL7032, the top may be opaque or transparent depending on availability at our works. Bigger sizes in Non-Metal Enclosures are also available, but delivery will be a little late.

We may at our discretion and after informing client, use Non-Metal enclosures, which are light in weight, having transparent / non transparent cover.

Compartmentalization (Applicable to all kind of Enclosures)

All our enclosures are *non*-compartmentalized, conforming to Form Factor 1 as per IEC-60 439-1, meaning they are without any separations between any components fitted inside of the enclosures.

All connections accessible from the front, with no separate bus bar or cable alley chambers. There are no canopies or double doors provided in any of our panels, except if clearly shown in our drawings and mentioned in our BOM. Back opening and double door panels are also made, on request.

1. No ventilation Louvers / exhaust Blowers are provided unless specifically shown in BOM *and* drawings. Also client is advised that normal louvers / blowers reduce the IP Class to IP20.
2. 12 swg base channel of 75mm height is provided for floor mounting type panels. Wall mounted panels have 'Z' shaped supports at the back. These will be provided only if shown in drawing or mentioned in BOM.

C. ASSEMBLY

1. *Hardware*. All the equipment's are mounted with the help of standard metric screws, nuts, bolts, spring washers & plain washers. Only zinc passivated or cadmium plated hardware is used.



2. *Bus bars* as a standard are of aluminum and of adequate cross-section (Current density is never allowed to exceed 125 amps. Per sq. cm.) Bus bars are mounted on non-hygroscopic SMC / DMC supports. In case the client desires Copper Bus Bar, our drawing or BOM will say it clearly. And the current density is never allowed to exceed 160 amps. per sq. cm.)
3. Bus bar is suitably insulated and color-coded with insulating heat shrinkable sleeves. And in short stretches where Heat Shrinkable sleeves cannot be fitted, color coded Electrical Insulating Tape will be used. Acrylic sheets will be provided for insulation / safety from live parts.
4. The minimum distance maintained between phase to phase of bus bars is 32 mm and between phase to neutral and earth is 26 mm. No phase separators are possible in MCB. But will be given in MCCB.
5. All equipment's are mounted in parallel rows, with enough space in between for easy maintenance.

D. WIRING

1. All wires are run in neat bunches, secured by wiring harness, parallel / perpendicular to the rows of equipment & each other as far as possible.
2. All power wires are upto 6 sq.mm are color coded, sleeved, ferruled. For wires greater than 6sq.mm size, we will use non color coded wires with color coded tape at both ends.
3. All wires will have thimbles on both the ends. But we can also choose to terminate, if acceptable to the manufacturer of the switchgear, directly without thimbles.
4. Properly calculated ratings of wire are used and are based on manufacturer's recommendation and our own experience. Please ask for our rating chart, if you wish to know more.
5. Only standard wires with ISI approval are used. Solar Grade DC wires are used in DCDB or AJB Box.

E. TERMINATION

1. We use terminals blocks for internal panel wire termination. We do not supply cable glands as a standard supply, unless clearly written in our order acceptance, BOM *and* drawings.
2. All terminals will carry proper terminal number, in accordance with the drawings.
3. A Terminal End Plate and End Clamp is fitted at both ends of Terminal Block.



F. TESTING

All panels are routinely tested in the following sequential manner-

1. Visual inspection and dimension check.
2. BoM Check
3. Megger test
4. H.V test.
5. Control circuit test with single phase.
6. Functional test with 3 phases, 415V, 50 Hz. Supply.

G. EARTHING

1. Earthing wire termination provision will be provided in each panel.
2. It may be in form of a bolt on each side of the panel or
3. a terminal inside the panel or
4. in case of floor mounted panels a Earthing bus bar will be provided.
5. In Panels having greater than 1800mm height, an aluminium earthing bus 25 x 3 is provided.

H. IDENTIFICATION & INFORMATION LABELS

1. All push buttons, indication lights and all selector switches carry suitably engraved identification labels.
2. At least 1 No. Danger sign is fixed at suitable place.
3. We provide the common Legends like ACDB Box, ACCB Box, Metering Box, Metering Panel, DCDB etc. for easy Identifications.

I. PACKING

1. All our panels are packed before dispatch, after client inspection.
2. All Plastic Boxes of size 300 x 300 mm or 300 x 600 mm will additionally be packed in a Cardboard Box.



3. Our standard packing is 1 Layer of cling film, 1 Layer of Bubble Wrap (or foam) and 1 layer of Corrugated Paper. Unless written in the order and accepted by us in writing, any other type of packing, if desired by client, will be charged extra. RSS will get estimate from local packer and take approval of client for the charges and then proceed for packing. Client is free to use his own packer. Options for Packing available are - wooden packing - Crate Type or Box Type.
4. While all care will be taken during packing operations, RSS will not be responsible for any damage to the panels during transit. We have no control over the transportation, so we cannot extend this facility to client.

J. LOADING AND TRANSPORTATION

1. RSS will ensure loading of material in the transportation vehicle, free of cost. However, unless specifically mentioned in order acceptance, Transportation is not in RSS 's scope.
2. During Unloading, even if eye bolts are given on top of panel, client is advised not to lift panels using the eye bolts. The correct way, recommended by RSS, to lift any panel is by running two safety non-metallic slings around the panel, vertically and hook the slings to a crane for lifting. RSS will not be responsible in anyway, if the loading is not done in any other way.

Please feel free to contact us for any clarifications or assistance.

Thanks & Regards,

Reliable Source and Solutions India LLP

Solution Provider

Solar DG Sync Solution | Zero Export Device | ACDB | DCDB | SMB | RMS | WMS | SCADA

Grid-tie Inverters | Hybrid Inverters | Off-grid Inverters | Schneider/FIMER/Polycab/Growatt/Solis

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