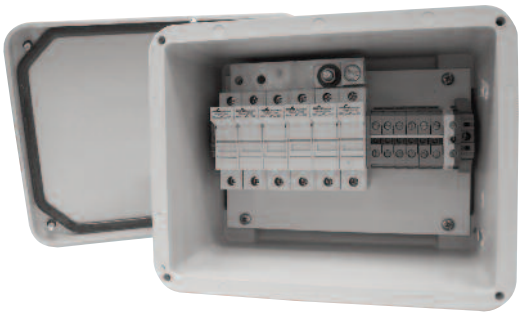
# Photovoltaic Combiner Boxes

## BCBCT Series Compact Combiner Boxes

### Features

- UL Listed to UL1741 Standard
- cUL Certified to CSA Standard C22.2 No. 107.1-01
- 2 to 6 Input circuits
- Continuous duty rated at 600Vdc
- 600Vdc Midget fuses* for overcurrent protection
- Finger-safe Cooper Bussmann modular fuse holders**
- NEMA 4X Fiberglass enclosure
- Ground blocks included
- Operating temperature -40°C to 50°C
- Common configurations in stock for fast shipment†
- Negative pass-through (number of inputs = number of circuits)



BCBCT Series Compact Box

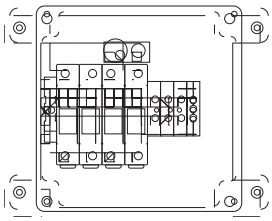
| Specifications†† | | | |
|---|---|---|---|
| **Number of Input Circuits** | **2 to 3** | **4** | **5 to 6** |
| Input conductor range | 10AWG | 10-14AWG | 14-16AWG |
| Number of output conductors | 1 | 1 | 1 |
| Output conductor range | 4-10AWG | 3-10AWG | 4-14AWG |
| Max rated current (DC continuous) | 50A for 2 Circuits<br>75A for 3 Circuits | 80A | 60A for 5 Circuits<br>72A for 6 Circuits |
| Max fuse size | 25A | 20A | 12A |
| Enclosure dimensions (in), Weight | 7.6x7.5x4.9, 4 lbs | 7.6x7.5x4.9, 4 lbs | 9.6x7.5x4.9, 5 lbs |

### Part Number System Compact Combiner Box Part Number System

*Example*: BCBCT-04-XXF = B C B C T - 0 4 - 0 0 F

| | |
|---|---|
| **Series Prefix** | BCBCT – Compact Combiner Box |
| **Number of Poles** | 02 03 04 05 06 |
| **Fuses (Amps)‡** | 00 – No Fuses Included |
| | 01 02 03 04 05 06 07 08 09 |
| | 10 12 15 20 25 (see Max fuse size in table) |
| **NEMA Enclosure** | F – 4X (fiberglass) |

### Typical Layout



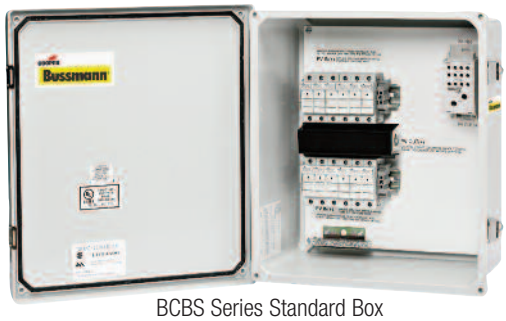
**Compact BCBCT Series**
2 to 6 Circuits
BCBCT-04-00F Pictured

* See DCM Data Sheet 2038 for details.
** See Data Sheet 2053 for details.
† Please verify stocked configurations with your Cooper Bussmann sales representative.
†† Certain specifications may be modified to meet requirements, please consult factory.
‡ When fuses are specified, 600Vdc midget fuses are installed in holders. When ordering without fuses, the combiner box should be fused according to the local AHJ.

# BCBS 600Vdc and 1000Vdc Series Standard Combiner Boxes

**Features**

- 600Vdc UL Listed to UL1741 Standard+
- 100Vdc Self certified
- 4 to 24 Input circuits
- 600Vdc or 1000Vdc Rated units
- Finger-safe Cooper Bussmann modular fuse holders*
- Configured for both positive and negative grounded arrays
- Single or dual 90°C output terminals
- Negative input terminal blocks
- Steel or fiberglass NEMA 3R, 4 or 4X enclosures with seamless door gaskets
- Operating temperature -40°C to 50°C
- Common configurations in stock for fast shipment**



BCBS Series Standard Box

| Specifications*** | | | | | | |
|---|---|---|---|---|---|---|
| **Voltage** | **600Vdc Series** | | | **1000Vdc Series** | | |
| Rating standard | Listed to UL1741<br>cUL Listed to CSA Standard C22.2 No. 107.1-01 | | | IEC Rated Components<br>Self-Certified Fuse Gear | | |
| Fuse type | 600Vdc Midget fuses† | | | 1000Vdc PV fuses† | | |
| Number of input circuits | 4 to 12 | 16 | 20 to 24 | 4 to 12 | 16 | 20 to 24 |
| Input conductor range | 10-14AWG | 10-14AWG | 10-14AWG | 10-14AWG | 10-14AWG | 10-14AWG |
| Number of output conductors | 1†† | 2 | 2 | 1 | 2 | 2 |
| Output conductor range | 300kcmil-1AWG | 3/0AWG | 300kcmil-4/0AWG | 300kcmil-1AWG | 3/0AWG | 300kcmil-4/0AWG |
| Max fuse size | 25A for 4-8 Circuits<br>20A for 12 Circuits | 20A | 20A | 20A | 20A | 20A |
| Max rated current (DC continuous) | 100A for 4 Circuits<br>200A for 8 Circuits<br>240A for 12 Circuits | 320A | 400A for 20 Circuits<br>480A for 24 Circuits | 100A for 4 Circuits<br>200A for 8 Circuits<br>240A for 12 Circuits | 320A | 400A for 20 Circuits<br>480A for 24 Circuits |
| Steel enclosure dimensions (in), weight | 16x12x6, 30 lbs | 16x16x6, 36 lbs | 20x16x6, 40 lbs | 16x12x6, 30 lbs | 16x16x6, 36 lbs | 20x16x6, 40 lbs |
| Fiberglass enclosure dim. (in), weight | 18x16x6, 20 lbs | 18x16x9, 30 lbs | 22x18x9, 31 lbs | 18x16x6, 20 lbs | 18x16x9, 30 lbs | 22x18x9, 31lbs |

## Part Number System Standard Combiner Box Part Number System

***Example*: BCBSK-12-XXFS06R = B C B S K - 1 2 - 1 0 F S 0 6 R M**

**Series Prefix** BCBS – Standard Combiner Box
Blank – for 600Vdc systems
K – for 1000Vdc systems

**Number of Poles** 04 08 12 16 20 24

**Fuses (amps)** ‡ 00 – No Fuses Included
*600Vdc fuses* 01 02 03 04 05 06 07 08 09 10 12 15 20 25 (see Max fuse size in table)
*1000Vdc fuses* 01 02 03 04 05 06 08 10 12 15 20 (see Max fuse size in table)

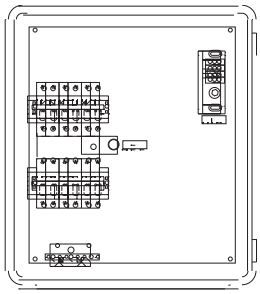
**NEMA Enclosure** R – 3R
4 – 4 (powder coated steel)
F – 4X (fiberglass)

**Surge Protective Device (SPD)**‡‡ S06 – 600Vdc
S10 – 1000Vdc
Blank – No SPD

**SPD Remote Contact Signaling** R – With remote signaling
Blank – No remote contact

**Current Monitoring Device** M – With current monitoring device
Blank – Without current monitoring device

**Typical Layout**



**Standard BCBS Series**
4 to 24 Circuits
BCBS-12-00F Pictured

+ Excludes SPD and current monitoring options.
* See Data Sheet 2053 for details.
** Please verify stocked configurations with your Cooper Bussmann sales representative. Ordering surge protective device and/or current monitoring options may require a custom product. Consult factory for specific size before ordering.
*** Certain specifications may be modified to meet requirements, please consult factory.
† See DCM Data Sheet 2038 for for 600Vdc fuses details and Solar PV Data Sheet 720110 for 1000Vdc fuse details.
†† Two (2) for 12 string (+) output only.
‡ When fuses are specified for 600Vdc combiner boxes, midget fuses are installed in the holders, for 1000Vdc combiner boxes, Solar PV fuses are installed in holders. When ordering without fuses, the combiner box should be fused according to the local AHJ.
‡‡ See Data Sheet 2055 for details.

## BCBD Series with Integrated Disconnect

### Features

- UL Listed to UL1741 Standard+
- cUL Certified to CSA Standard C22.2 No. 107.1-01
- 150 and 245A Integrated disconnect switches
- 4 to 24 Input circuits
- Continuous duty rated at 600Vdc
- 600Vdc Midget fuses* for overcurrent protection
- Finger-safe Cooper Bussmann modular fuse holders**
- Configured for both positive and negative grounded arrays
- Single or dual 90°C output terminals
- Negative input terminal blocks
- Steel or fiberglass NEMA 3R, 4 or 4X enclosures with seamless door gaskets
- Operating temperature -40°C to 50°C
- Common configurations in stock for fast shipment***

BCBD Series Integrated Disconnect Box

| Specifications† | | | | |
|---|---|---|---|---|
| **Disconnect Rating (Amps)** | **150A** | | **245A** | |
| Number of input circuits | 4 to 12 | 16 to 24 | 4 to 12 | 16 to 24 |
| Input conductor range | 8 - 14AWG | 14AWG | 8 - 10AWG | 14AWG |
| Number of output conductors | 1 | 1 | 1 | 1 |
| Output conductor range | 2/0-2AWG | 2/0-1/0AWG | 300kcmil - 2AWG | 300kcmil - 4/0AWG |
| Max fuse size/number of circuits | 30A for 4 Circuits<br>15A for 8 Circuits<br>12A for 12 Circuits | 8A for 16 Circuits<br>6A for 20 Circuits<br>6A for 24 Circuits | 30A for 4 Circuits<br>30A for 8 Circuits<br>20A for 12 Circuits | 12A for 16 Circuits<br>12A for 20 Circuits<br>10A for 24 Circuits |
| Max rated current (DC continuous) | 120A for 4 or 8 Circuits<br>144A for 12 Circuits | 128A for 16 Circuits<br>120A for 20 Circuits<br>144A for 24 Circuits | 120A for 4 Circuits<br>240A for 8 or 12 Circuits | 192A for 16 Circuits<br>240A for 20 or 24 Circuits |
| Steel enclosure dimensions (in), weight | 20x16x6, 50lbs | 24x20x6, 62lbs | 24x20x6, 62lbs | 24x24x6, 72lbs |
| Fiberglass enclosure dimensions (in), weight | 22x18x9, 38lbs | 27x21x10, 60lbs | 27x21x10, 60lbs | 27x25x12, 61lbs |

### Part Number System Combiner Box with Disconnect Part Number System

*Example*: BCBD150-12-XXFS06R = B C B D 1 5 0 - 1 2 - 2 0 F S 0 6 R M

**Series Prefix** BCBD – Combiner Box w/ Disconnect

**Disconnect Ampacity** 150A 245A

**Number of Poles** 04 08 12 16 20 24

**Fuses (Amps)‡‡** 00 – No Fuses Included
01 02 03 04 05 06 07 08 09 10
12 15 20 25 30 (see Max fuse size in table)

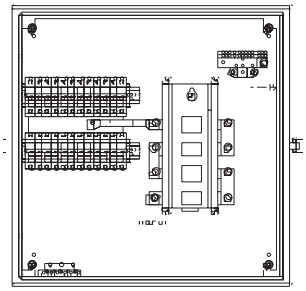
**NEMA Enclosure** R – 3R
4 – 4 (powder coated steel)
F – 4X (fiberglass)

**Surge Protective Device (SPD)‡‡‡** S06 – 600Vdc
Blank – No SPD

**SPD Remote Contact Signaling** R – With remote signaling
Blank – No remote contact

**Current Monitoring Device** M – With current monitoring
Blank – Without current monitoring device

### Typical Layout



**Integral Disconnect on BCBD Series**
4 to 24 Circuits
BCBD245-24-00R Pictured

+ Excludes current monitoring options and 24-pole circuit with SPD.
* See DCM Data Sheet 2038 for details.
** See Data Sheet 2053 for details.
*** Please verify stocked configurations with your Cooper Bussmann sales representative. Ordering surge protective device and/or current monitoring options may require a custom product. Consult factory for specific size before ordering.
† Certain specifications may be modified to meet requirements, please consult factory.
‡‡ When fuses are specified, 600Vdc midget fuses are installed in holders. When ordering without fuses, the combiner box should be fused according to the local AHJ.
‡‡‡ See Data Sheet 2055 for details.

## Recombiner (Array Combiner) Boxes

### Features

- Self certified to UL1741 Standard
- 4 to 12 Input circuits
- Continuous duty rated at 600Vdc
- 600Vdc PVS-R Fuses* for overcurrent protection
- 100A and 200A Fuse case sizes
- 70A – 200A Fuse ampacity configurations
- Steel or fiberglass NEMA 3R, 4 or 4X rated enclosures with seamless door gaskets
- Operating temperature -40°C to 50°C

| Specifications** | | | | | | |
|---|---|---|---|---|---|---|
| **Fuse Case Size** | **100** | | | **200** | | |
| Number of input circuits | 4 | 8 | 12 | 4 | 8 | 12 |
| Number of output conductors | 2 | 4 | 4 | 2 | 4 | 4 |
| Input conductor range | 1/0-8AWG | 1/0-8AWG | 1/0-8AWG | 250MCM-6AWG | 250MCM-6AWG | 250MCM-6AWG |
| Output conductor range | 4-500kcmil | 4-500kcmil | 4-500kcmil | 4-500kcmil | 4-500kcmil | 4-500kcmil |
| Max fuse rating | up to 100A | up to 100A | up to 100A | up to 200A | up to 200A | up to 200A |
| Max rated current (DC continuous) | 760A | 1520A | 1520A | 760A | 1520A | 1520A |
| Steel Enclosure dimensions (in), weight | 24x24x8, 65 lbs | 36x30x8, 125 lbs | 42x36x8, 175 lbs | 36x30x12, 140 lbs | 36x30x12, 160 lbs | 48x36x12, 220 lbs |
| Fiberglass Enclosure dimensions (in), weight | 24x24x10, 34 lbs | 36x30x8, 94 lbs | 48x36x12, 110 lbs | 36x30x12, 94 lbs | 36x30x12, 135 lbs | 48x36x12, 160 lbs |

### Recombiner Box Part Number System

*Example*: BCBR1-08-125RS06R = B C B R 1 - 0 8 - 1 2 5 R S 0 6 R M

**Series Prefix** BCBR – Recombiner Box

**Fuse Case Size** 1 – 100A
2 – 200A

**Number of Circuits** 04 08 12

**Fuses (Amps)*****
000 – No Fuses Included
070 080 090 100 (100 amp fuse case size)
125 150 175 200 (200 amp fuse case size)

**NEMA Enclosure** R – 3/3R
4 – 4 (powder coated steel)
F – 4X (fiberglass)

**Surge Protective Device (SPD)†** S06 – 600Vdc
Blank – No SPD

**SPD Remote Contact Signaling** R – With remote signaling
Blank – no remote contact

**Current Monitoring Device** M – With current monitoring
Blank – No current monitoring device

* See Data Sheet 4203 for details.
** Certain specifications may be modified to meet requirements, please consult factory.
*** Fuse ampacity must coincide with fuse case size specified e.g., 100A or 200A. When ordering without fuses, the combiner box should be fused according to the local AHJ.
† See Data Sheet 2055 for details.

## Integrated Surge Protective Device*

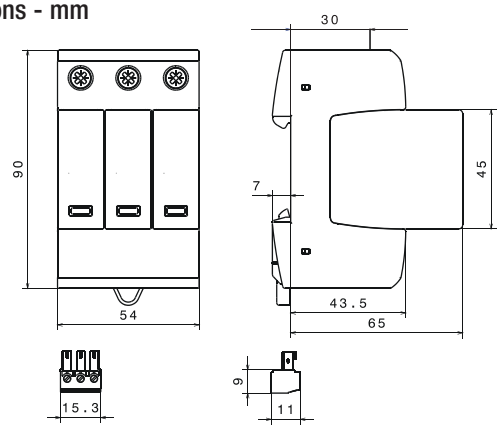
### Features

- Only true UL 1449 3rd Edition (Type 2)
- IEC 61643-11 Type 2, IEC 61643-1 Class II
- Available in standard and disconnect combiner boxes**
- UL 94V0 Thermoplastic material
- IP20 Finger-safe
- 600Vdc, 1000Vdc configurations
- *easy*ID™ Visual status indication
- Available with remote contact signaling
- Operating temperature -40°C to 80°C
- Five year warranty†

**BSPH_____YPV(R)**

5 YEAR WARRANTY

### Dimensions - mm

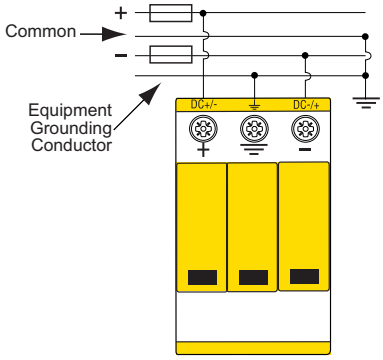



***easy*ID™**
Visual Status Indication

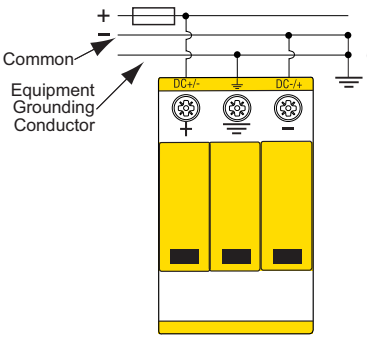
Remote Signal
Contact Available

| Specifications | | |
|---|---|---|
| **Max Continuous Operating Voltage** | **600Vdc** | **1000Vdc** |
| Total Discharge Current | 40kA | 40kA |
| Voltage Protection Level | ≤2.5kV | ≤4.0kV |
| Voltage Protection Level at 5kA | ≤2.0kV | ≤3.5kV |
| Integrated Fuse Breaking Capacity | 30kA | 30kA |
| Nominal Discharge Current | 12.5kA | 12.5kA |
| Max Discharge Current | 25kA | 25kA |
| Response time | ≤25ns | ≤25ns |
| Min Conductor Ratings | 60/75°C 14AWG | |
| Max Conductor Ratings | 60/75°C 2AWG Stranded 4AWG Flexible | |

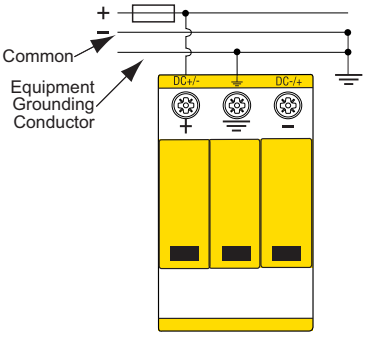
### Typical Application Schematics



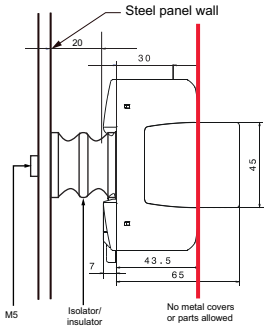

Application A
Two energized poles/modes
600 & 1000Vdc systems




Application B
One energized pole/mode
600Vdc & 1000Vdc** systems only




Application C
One energized pole/mode
600Vdc & 1000Vdc†† systems only
(Max. system discharge current
(8/20 µs) [$I_{max}$] 25kA)




1000Vdc One energized pole/
mode mounting detail.

* See Data Sheet 2055 for additional details.
** Surge module may increase the enclosure size requirement, please see factory for specific sizes.
† See Cooper Bussmann SPD Limited Warranty Statement (3A1502) for details at www.cooperbussmann.com/surge.
†† BSPH31000YPV(R) 1000Vdc one energized pole/mode requires the following: 1. Use a suitable electrical insulator to keep a 10mm min. safety distance from the PV-SPD and other grounded parts in the housing as shown. 2. No metal covers are in the area of the module release buttons as shown.

## Current Monitoring Device

### Features

- Available in standard and disconnect combiner boxes*
- Uses Obvius Solar Current Monitor (SCM) unit
- Unique “Mesh” technology optimizes routing communications with no configuration
- Twisted pair output or wireless communication
- 8 or 16 Input circuit monitoring units
- Monitors 4 to 24 input circuits

| Specifications | |
|---|---|
| **Processor** | 60MHz Arm7 embedded CPU processor |
| **LEDs** | 3 x RF, 2 x RS 485, 2 x pulse, alive, alarm |
| **Protocol** | Modbus RTU |
| **Address Setting** | Modbus address may be set from 1 to 247 via DIP switch |
| **Inputs** | - 2 pulse inputs, dry contact |
| | - Monitor consumption/rate/min/max |
| | - Pulse rate/width user selectable to 10Hz, 50Hz, 100Hz, or 250Hz. |
| | - Pulse rate option: 10Hz, minimum pulse width 50ms |
| | - Pulse rate option: 50Hz, minimum pulse width 10ms |
| | - Pulse rate option: 100Hz, minimum pulse width 5ms |
| | - Pulse rate option: 250Hz, minimum pulse width 2ms |
| | - Contact closure threshold 100W to 2.5kW user selectable |
| | - Pulse count values are stored in non-volatile memory. |
| **Communications** | 1 RS-485 (+,-, S), 9600/19200 baud, N, 8, 1, two wire. Supports up to 32 external devices per ModHopper (expandable) |
| **RF** | Frequency Hopping, ISM band, -SN Option: 400MHz Receive Only (Sensor Network) |
| **Environmental** | North America: Temperature 0º – 50ºC, 0 – 95% humidity, non-condensing. Pollution degree 2, altitude up to 2000M |
| **EMC** | FCC CFR 47 Part 15, Class A |
| **Size** | 6.5x4.5x2” (260x64x45mm) |
| **Weight** | 1.25lbs (0.67 kg) |
| **Power Input** | 9-30Vdc, 200mA |

*Monitoring module may increase the enclosure size requirement, please consult factory for specific sizes.

The only controlled copy of this Data Sheet is the electronic read-only version located on the Cooper Bussmann Network Drive. All other copies of this document are by definition uncontrolled. This bulletin is intended to clearly present comprehensive product data and provide technical information that will help the end user with design applications. Cooper Bussmann reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Cooper Bussmann also reserves the right to change or update, without notice, any technical information contained in this bulletin. Once a product has been selected, it should be tested by the user in all possible applications.

© 2012 Cooper Bussmann
www.cooperbussmann.com