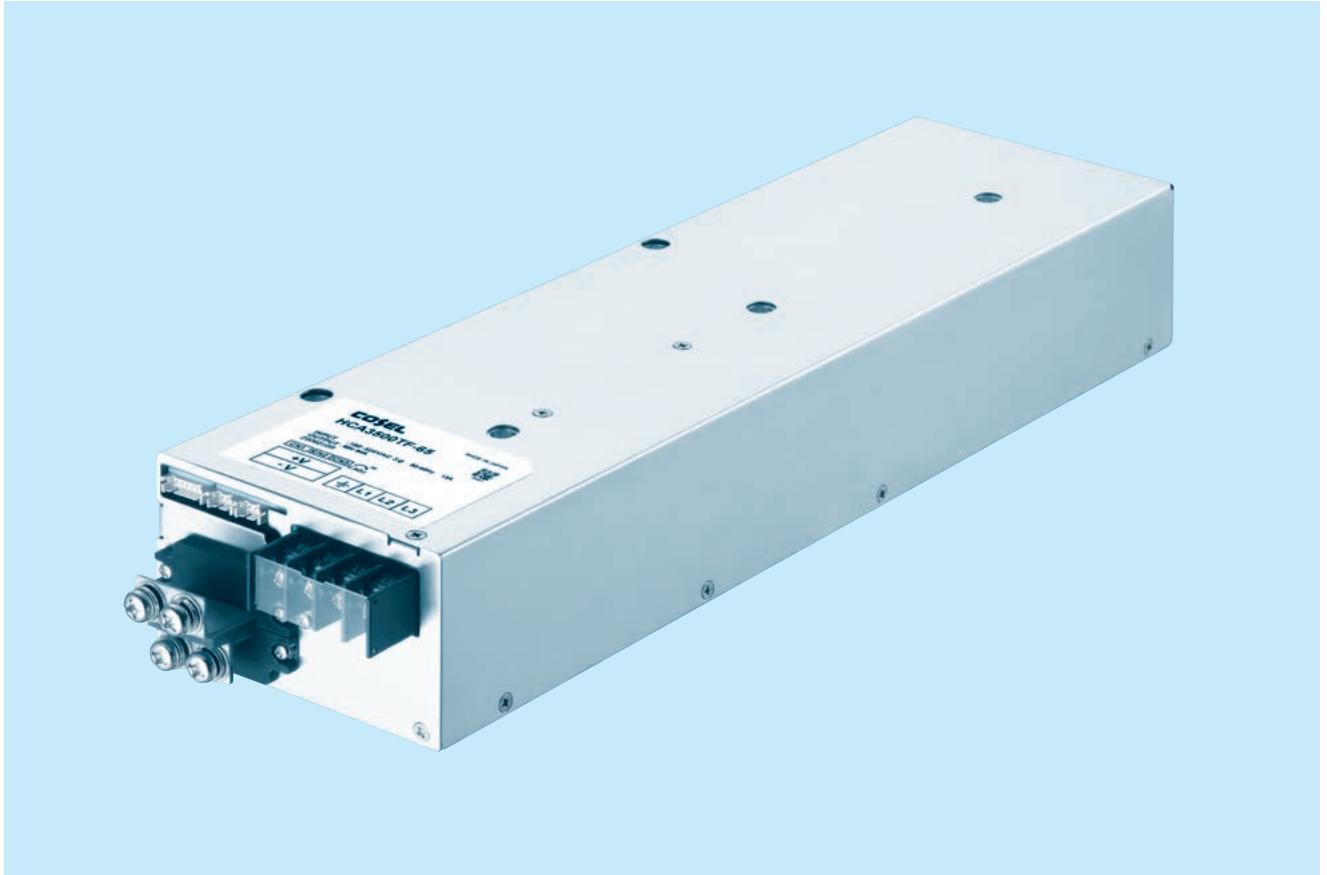




HCA-series



Feature

- Fanless (Conduction cooling)
- Low profile (Meets 1.5U height.)
- Wide input voltage range
- High efficiency
- Parallel Operation / N+1 Parallel Redundancy Operation
- Built-in AUX (12V1A)
- Built-in Alarms
- Remote ON / OFF function

Safety agency approvals

UL62368-1, C-UL (CSA62368-1), EN62368-1

5-year warranty (Refer to Instruction Manual)

CE marking

- Low voltage Directive
- RoHS Directive

UKCA marking

- Electrical Equipment Safety Regulations
- RoHS Regulations

EMI

- Complies with FCC Part 15-A, CISPR32-A, EN55011-A, EN55032-A, VCCI-A

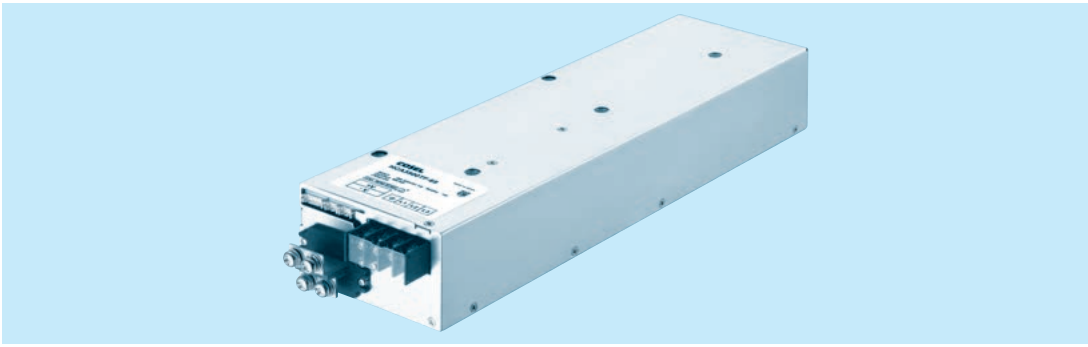
EMS Compliance : EN61204-3, EN61000-6-2

- EN61000-4-2
- EN61000-4-3
- EN61000-4-4
- EN61000-4-5
- EN61000-4-6
- EN61000-4-8
- EN61000-4-11

HCA3500TF

HC A 3500 TF -□□ -□

① ② ③ ④ ⑤ ⑥



- ① Series name
- ② Single output
- ③ Output wattage
- ④ 3 phase full range input
- ⑤ Output voltage
- ⑥ Optional
- R: with Remote ON/OFF
Positive logic control
- G: Low leakage current

| | | |
|-----------------------|--------------|--------------|
| MODEL | HCA3500TF-48 | HCA3500TF-65 |
| MAX OUTPUT WATTAGE[W] | 3504 | 3510 |
| DC OUTPUT | 48V 73A | 65V 54A |

SPECIFICATIONS

| | MODEL | HCA3500TF-48 | HCA3500TF-65 | |
|-------------------------------|---|--|----------------|----------------|
| INPUT | VOLTAGE[VAC] | *1 180 - 528 3 φ 3-wire (Available to 3 φ 4-wire as well (without N phase)) | | |
| | CURRENT[A] | ACIN 200V | 11.5typ | |
| | | ACIN 400V | 5.7typ | |
| | FREQUENCY[Hz] | 50 / 60 (45 - 66) | | |
| | EFFICIENCY[%] | ACIN 200V (Io=100%) | 91typ | 92typ |
| | | ACIN 400V (Io=100%) | 93typ | 94typ |
| | POWER FACTOR | ACIN 200V (Io=100%) | 0.95typ | |
| | | ACIN 400V (Io=100%) | 0.94typ | |
| INRUSH CURRENT[A] | ACIN 200V *2 | 20 / 30 typ (Io=100%) (Primary / Secondary inrush current) (More than 3 sec. to re-start) | | |
| | ACIN 400V *2 | 40 / 30 typ (Io=100%) (Primary / Secondary inrush current) (More than 3 sec. to re-start) | | |
| LEAKAGE CURRENT[mA] | 3 max (ACIN 480V 60Hz, Io=100%, Complies with IEC62368-1) | | | |
| OUTPUT | VOLTAGE[V] | 48 | 65 | |
| | CURRENT[A] | 73 | 54 | |
| | LINE REGULATION[mV] | 192max | 260max | |
| | LOAD REGULATION[mV] | 300max | 450max | |
| | RIPPLE[mVp-p] | *3 480max | 650max | |
| | RIPPLE NOISE[mVp-p] | *3 720max | 950max | |
| | TEMPERATURE REGULATION[mV] | 480max | 650max | |
| | START-UP TIME[ms] | 400 typ (ACIN 200/400V, Io=100%) | | |
| | HOLD-UP TIME[ms] | 20 typ (ACIN 200V, Io=55%) / 10 typ (ACIN 200V, Io=100%) | | |
| | OUTPUT VOLTAGE ADJUSTMENT RANGE[V] *4 | | 33.60 to 55.20 | 45.50 to 74.75 |
| OUTPUT VOLTAGE SETTING[V] | | 48.00 to 48.48 | 65.00 to 65.65 | |
| PROTECTION CIRCUIT AND OTHERS | OVERCURRENT PROTECTION | Works over 105% of rating (Recovers automatically, Hiccup overcurrent) | | |
| | OVERVOLTAGE PROTECTION[V] | 59.04 to 67.20 | 79.95 to 91.00 | |
| | Remote sensing | Provided | | |
| | REMOTE ON/OFF | Provided | | |
| | DC_OK LAMP | LED (Blue) | | |
| ALARM LAMP | LED (Amber) | | | |
| ISOLATION | Input - Output, CN1, CN2, CN3 | 4,243VAC 1minute, Cutoff current = 15mA, 500VDC 50MΩ min (At room temperature) | | |
| | Input - FG | 2,829VAC 1minute, Cutoff current = 15mA, 500VDC 50MΩ min (At room temperature) | | |
| | Output, CN1, CN2 - FG | 2,000VAC 1minute, Cutoff current = 10mA, 500VDC 50MΩ min (At room temperature) | | |
| | Output, CN1, CN2 - CN3 | 500VAC 1minute, Cutoff current = 10mA, 500VDC 50MΩ min (At room temperature) | | |
| | CN3 - FG | 500VAC 1minute, Cutoff current = 10mA, 500VDC 50MΩ min (At room temperature) | | |
| ENVIRONMENT | OPERATING TEMP., HUMID. AND ALTITUDE | 0 to +55°C (Baseplate temperature), -10 to +70°C (Ambient temperature), 20 - 90%RH (Non condensing), 3,000m (10,000feet) max | | |
| | STORAGE TEMP., HUMID. AND ALTITUDE | -20 to +75°C, 20 - 90%RH (Non condensing), 9,000m (30,000 feet) max | | |
| | VIBRATION | 10 - 55Hz, 19.6m/s ² (2G), 3minutes period, 60minutes each along X, Y and Z axis | | |
| | IMPACT | 196.1m/s ² (20G), 11ms, once each along X, Y and Z axis | | |
| SAFETY AND NOISE REGULATIONS | AGENCY APPROVALS | UL62368-1, EN62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1) | | |
| | CONDUCTED NOISE | Complies with FCC Part 15-A, FCC Part18-A, CISPR11-A, CISPR32-A, EN55011-A, EN55032-A, VCCI-A | | |
| OTHERS | CASE SIZE/WEIGHT | 110 X 65 X 420mm [4.33 X 2.65 X 16.54 inches] (without terminal block and screw) (W X H X D) / 5kg max | | |
| | COOLING METHOD | Conduction cooling (Water-cooled) | | |

*1 Output derating is required at 180 - 200VAC. Refer to "Derating".

*2 The value is primary surge. The current of input surge to a built-in EMI/EMS Filter (0.2ms or less) is excluded.

*3 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKUGIKEN : RM104). Please refer to the instruction manual 1.7.

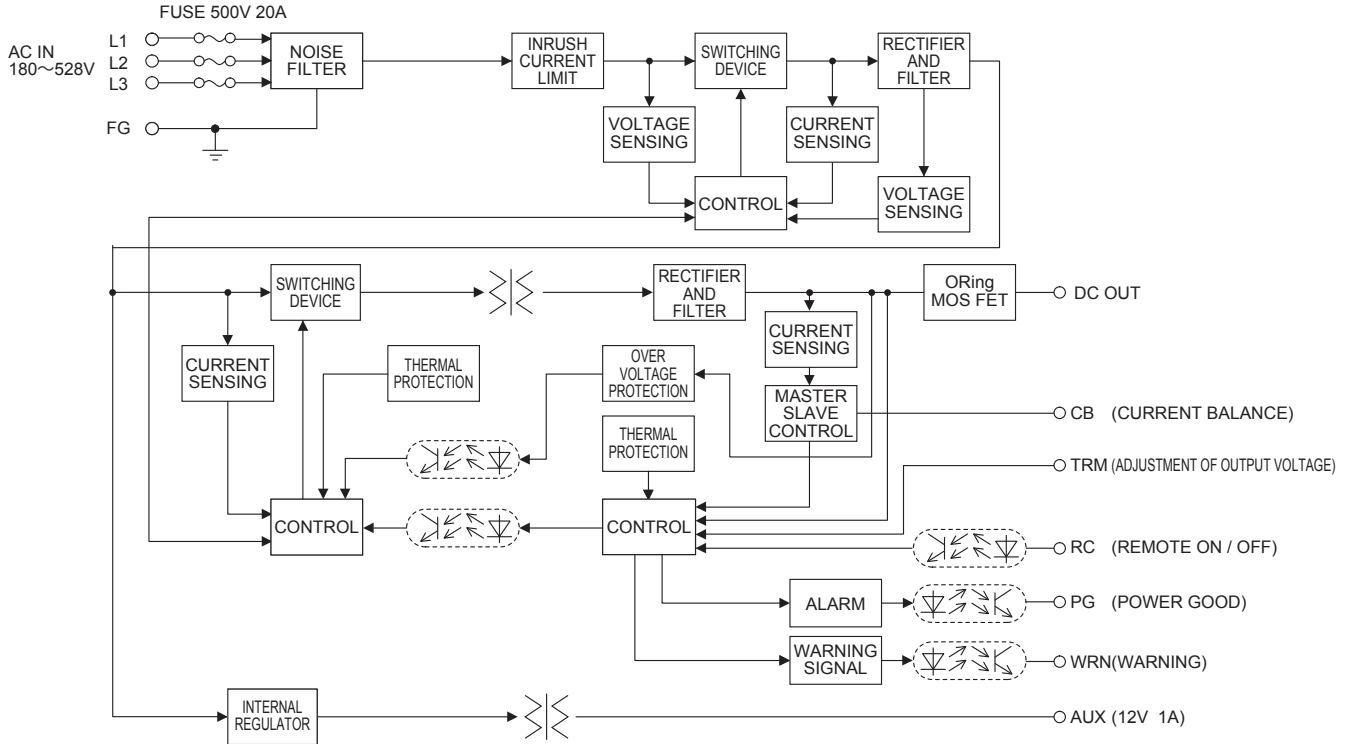
*4 Output derating is required more than 52.8V (HCA3500TF-48) / 71.5V (HCA3500TF-65). Refer to "Derating"

Features

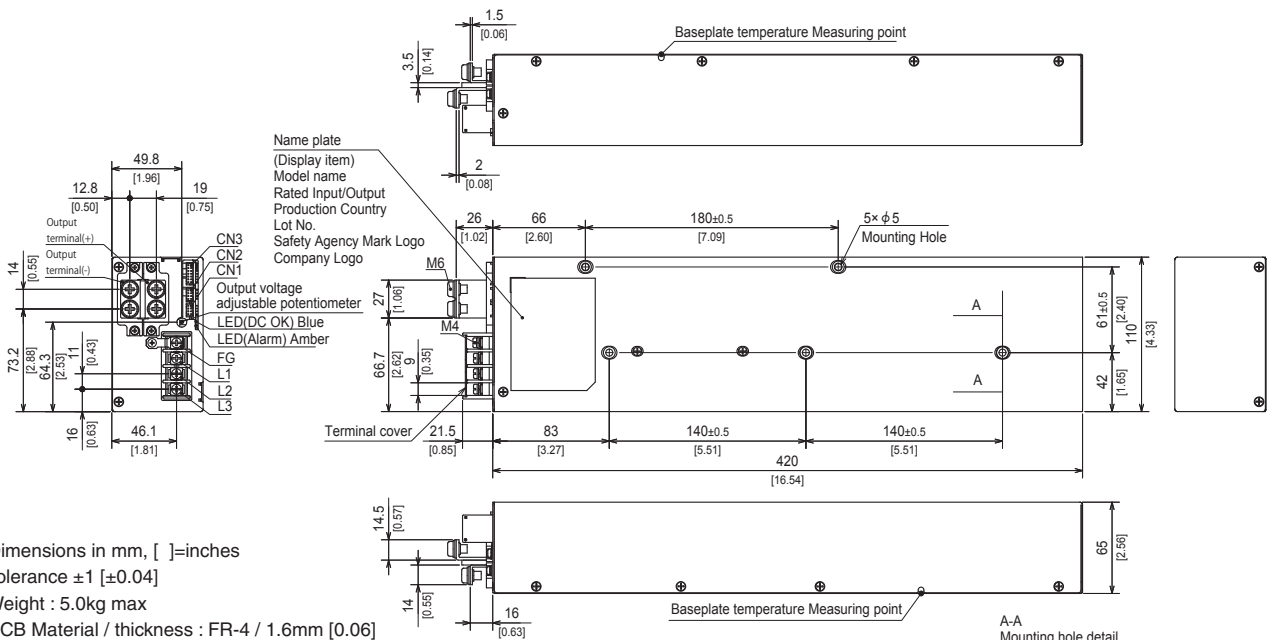
- Fanless (Conduction cooling)
- Low profile (65mm, 2.65 inch = Meet 1.5U height)
- Wide input voltage range : 3 φ 180–528VAC
- Built-in AUX power 12V 1A

- Parallel Operation / N+1 Parallel Redundancy Operation
- High efficiency 94% (at 400VAC input and 65V output)
- Built-in Alarms
- Built-in Oring MOSFET

Block diagram



External view



* Dimensions in mm, []=inches

* Tolerance ± 1 [± 0.04]

* Weight : 5.0kg max

* PCB Material / thickness : FR-4 / 1.6mm [0.06]

* Chassis Material : Stainless

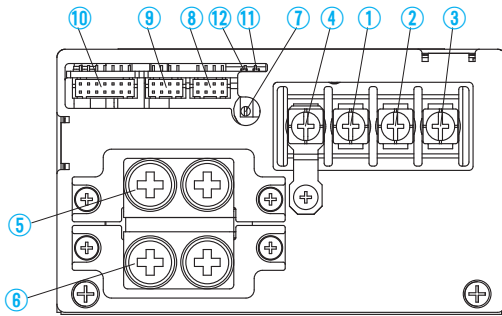
* Baseplate Material : Alminum

* Input and output terminal screw tightening torue
: M4 1.6N · m max
M6 4.3N · m max

* Please connect safety ground to FG terminal on the unit.

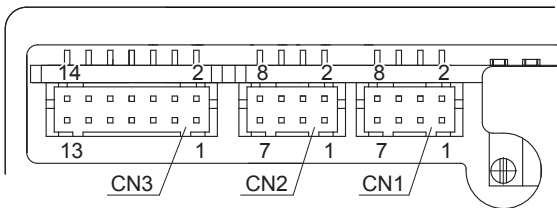
Terminal Blocks

● HCA3500TF



- ① AC (L1)
- ② AC (L2)
- ③ AC (L3)
- ④ Frame ground (M4)
- ⑤ + Output (M6)
- ⑥ - Output (M6)
- ⑦ Output voltage adjustable potentiometer
- ⑧ CN1
- ⑨ CN2
- ⑩ CN3
- ⑪ LED for output voltage confirmation (DC_OK) Color : Blue
- ⑫ LED for fault condition detection (ALARM) Color : Orange

● Pin Configuration and Functions



Pin Configuration and Functions of CN1, CN2

| Pin No. | Function | Ground level |
|---------|-------------------------------------|--------------|
| 1 | +S : +Remote sensing | COM |
| 2,3 | N.C. : No connection | - |
| 4 | -S : -Remote sensing | COM |
| 5 | CB : Current Balance | COM |
| 6 | N.C. : No connection | - |
| 7 | VTRM : Adjustment of output voltage | COM |
| 8 | COM : Common ground (for signal) | COM |

* Each terminal of CN1 and CN2 are connected inside the power supply

Pin Configuration and Functions of CN3

| Pin No. | Function | Ground level |
|---------|------------------------------------|--------------|
| 1 | AUXG : Auxiliary output ground | AUXG |
| 2 | SLV_ENG : Enable Slave mode ground | SLV_ENG |
| 3 | AUX : Auxiliary output | AUXG |
| 4,5,6,8 | N.C. : No connection | - |
| 7 | SLV_EN : Enable Slave mode | SLV_ENG |
| 9 | RC : Remote ON/OFF | RCG |
| 10 | RCG : Remote ON/OFF ground | RCG |
| 11 | WRN : Warning signal | WRNG |
| 12 | WRNG : Warning signal ground | WRNG |
| 13 | PG : Alarm signal | PGG |
| 14 | PGG : Alarm signal ground | PGG |

Mating connector and terminal

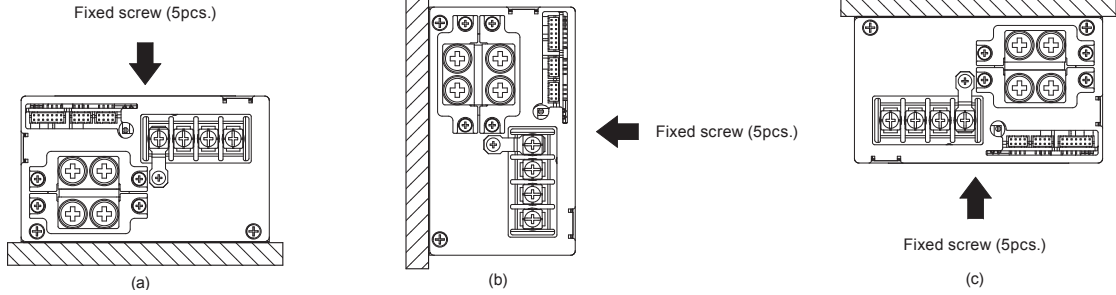
| Connector | Housing | Terminal | Mfr. |
|-----------|------------|-----------|--------------------------|
| CN1 | S8B-PHDSS | PHDR-8VS | Reel : SPHD-002T-P0.5 |
| CN2 | S8B-PHDSS | PHDR-8VS | Loose : BPHD-001T-P0.5 * |
| CN3 | S14B-PHDSS | PHDR-14VS | BPHD-002T-P0.5 * |

* The manufacturer prepares only the ratchet hand.

Assembling and Installation Method

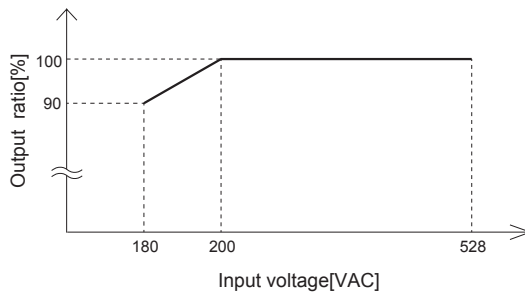
- Use with the conduction cooling (e.g. heat dissipation from the aluminum base plate to the attached water-cooled plate).
- Recommended screw is M4. Select a screw length that allows the effective thread to be fastened to the water-cooled plate at least 4 mm.
- The recommended torque for the mounting screws is 0.94–1.25Nm (when the male screw is iron and the water-cooled plate is aluminum or copper).
- The aluminum base plate should be cooled uniformly.
- Use TIM (Thermal interface material) between the aluminum base plate and the water-cooled plate.
It is recommended to use TIM with a thermal conductivity of 1 W/mK or more.
- The unit can be mounted in any direction. When two or more power supplies are used side by side, position them with proper intervals to allow enough air ventilation. Aluminum base plate temperature of each power supply should not exceed the temperature range shown in “derating”.

Assembling and Installation Method



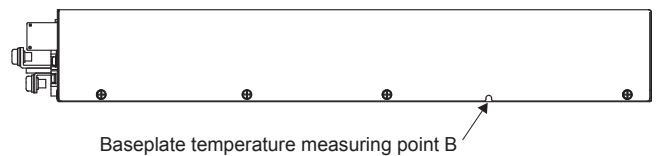
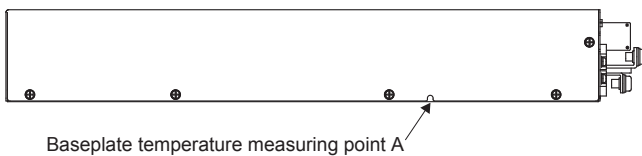
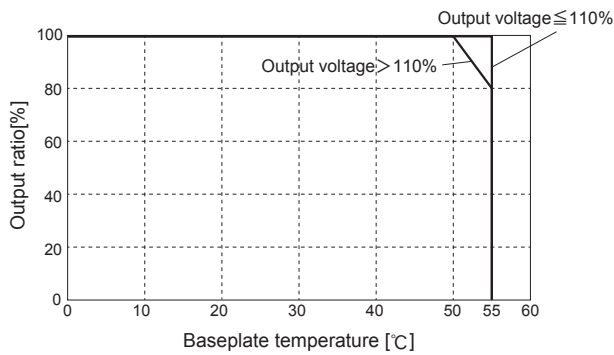
Derating

● Derating curve depends on Input voltage



● Derating curve depends on Output voltage

- The unit should be used by the conduction cooling such as the water-cooled plate.
- The temperature of both points A and B has to be within the derating curve.
- Ambient temperature must keep between -10°C and 70°C.



Instruction Manual

◆ It is necessary to read the "Instruction Manual" and "Before using our product" before you use our product.

Instruction Manual <https://www.cosel.co.jp/redirect/catalog/en/HCA/>
 Before using our product <https://en.cosel.co.jp/technical/caution/index.html>



Basic Characteristics Data

| Model | Circuit method | Switching frequency [kHz] | Input current [A] * | Inrush current protection | PCB/Pattern | | | Series/Parallel operation availability | |
|-----------|-----------------------------------|---------------------------------|---------------------|---------------------------|-------------|--------------|--------------|--|--------------------|
| | | | | | Material | Single sided | Double sided | Series operation | Parallel operation |
| HCA3500TF | Active filter | 130 | 11.5 | IGBT | FR-4 | | Yes | Yes | Yes |
| | Phase-shift Full-bridge converter | (Primary) 95 (Secondary) 190 | | | | | | | |

* The value of input current is at 200VAC input and rated load.