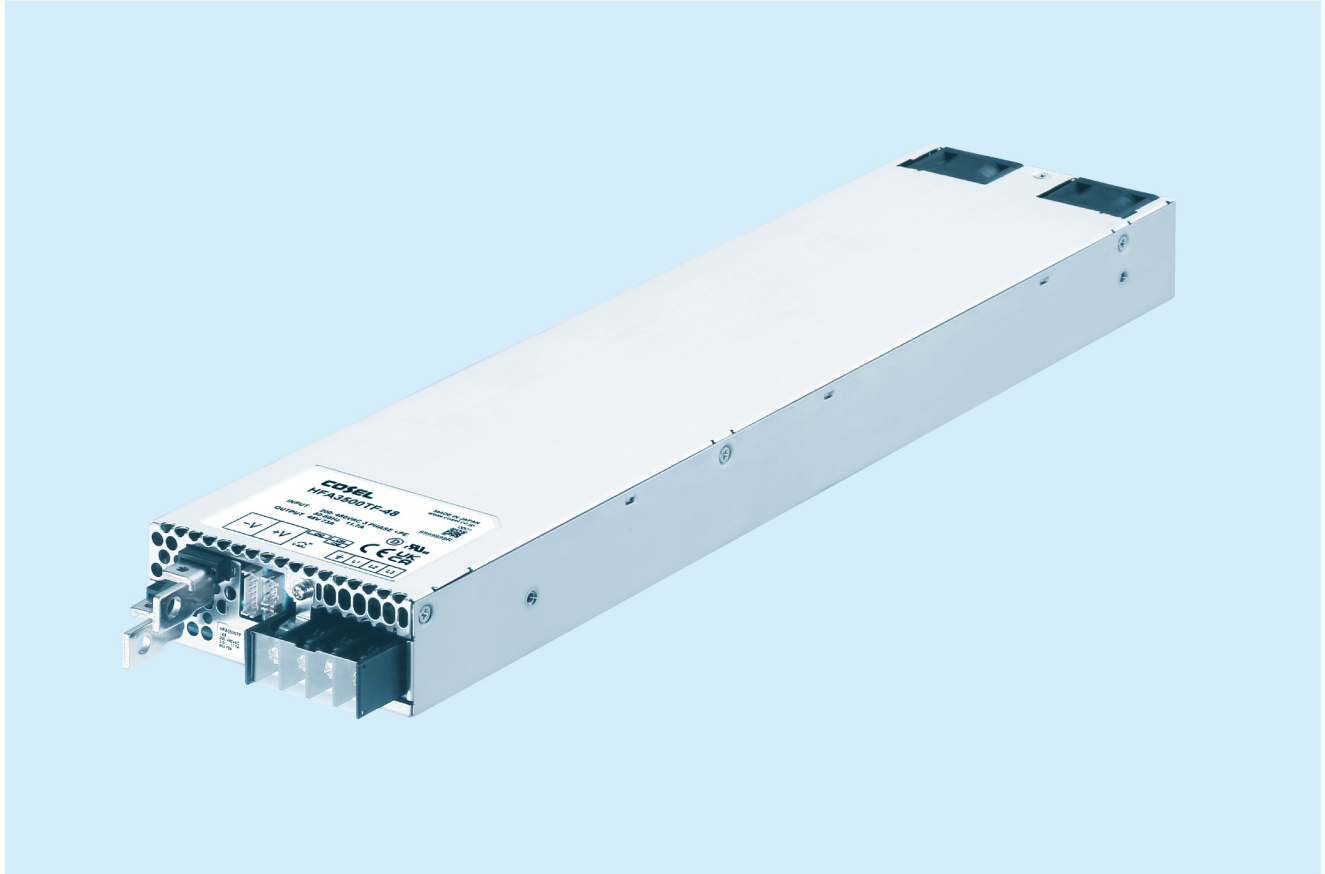




HFA-series



Feature

Low profile (41mm, 1.61 inch = Meet 1U height)
 Wide input voltage range : 3 ϕ 180 · 528VAC
 Built-in AUX power 12V 1A
 Complies with SEMI F47
 Parallel Operation / N+1 Parallel Redundancy Operation
 High efficiency 94% (at 400VAC input and 65V output)
 Built-in Alarms
 Built-in ORING MOSFET

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

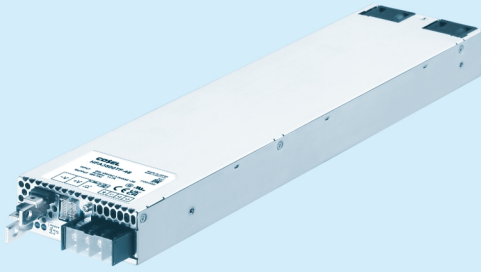
Complies with FCC Part 15-A, FCC Part18-A, CISPR11-A, CISPR32-A, EN55011-A, EN55032-A, VCCI-A

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

HFA3500TF

HF 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	HFA3500TF-48	HFA3500TF-65
MAX OUTPUT WATTAGE[W]	3504	3510
DC OUTPUT	48V 73A	65V 54A

SPECIFICATIONS

	MODEL	HFA3500TF-48	HFA3500TF-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	11.7typ
		ACIN 400V	5.9typ
	FREQUENCY[Hz]	50 / 60 (45 - 66)	
	EFFICIENCY[%]	ACIN 200V (Io=100%)	91typ
		ACIN 400V (Io=100%)	93typ
	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)(At cold start) (Ta=25℃)
		ACIN 400V *2	40 / 30 typ (Io=100%) (Primary / Secondary inrush current)(At cold start) (Ta=25℃)
	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]	0 to +70℃ *3	360max
		-10 to 0℃ *3	480max
	RIPPLE NOISE[mVp-p]	0 to +70℃ *3	600max
		-10 to 0℃ *3	720max
	TEMPERATURE REGULATION[mV]	0 to +50℃	390max
		-10 to +0℃	480max
	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%)	
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	24.00 to 55.20	32.50 to 74.75
	OUTPUT VOLTAGE SETTING[V]	48.00 to 48.48	65.00 to 65.65
	OVERCURRENT PROTECTION	Works over 105% of rating (Recovers automatically, Hiccup overcurrent)	
	OVERVOLTAGE PROTECTION[V]	57.60 to 67.20	78.00 to 91.00
	REMOTE SENSING	Provided	
	REMOTE ON/OFF	Provided	
ISOLATION	DC_OK LAMP	LED (Blue)	
	ALARM LAMP	LED (Amber)	
	Input - Output,CN1, CN2, CN3	4,243VAC 1minute, Cutoff current = 20mA, 500VDC 50MΩ min (At room temperature)	
	Input - FG	2,829VAC 1minute, Cutoff current = 20mA, 500VDC 50MΩ min (At room temperature)	
	Output, CN1, CN2 - FG	2,000VAC 1minute, Cutoff current = 10mA, 500VDC 50MΩ min (At room temperature)	
ENVIRONMENT	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)	
	OPERATING TEMP.,HUMID.AND ALTITUDE	-10 to +70℃ (Refer to "Derating"), 20 - 90%RH (Non condensing), 3,000m (10,000 feet) max	
	STORAGE TEMP.,HUMID.AND ALTITUDE	-20 to +75℃, 20 - 90%RH (Non condensing), 9,000m (30,000 feet) max	
SAFETY AND NOISE REGULATIONS	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	
	AGENCY APPROVALS	UL62368-1, EN62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1)	
OTHERS	CONDUCTED NOISE	Complies with FCC Part 15-A, FCC Part18-A, CISPR11-A, CISPR32-A, EN55011-A, EN55032-A, VCCI-A	
	CASE SIZE/WEIGHT	110 X 41 X 468mm [4.33 X 1.61 X 18.43 inches] (without terminal block and screw) (W X H X D) / 3kg max	
	COOLING METHOD	Forced cooling (internal fan)	

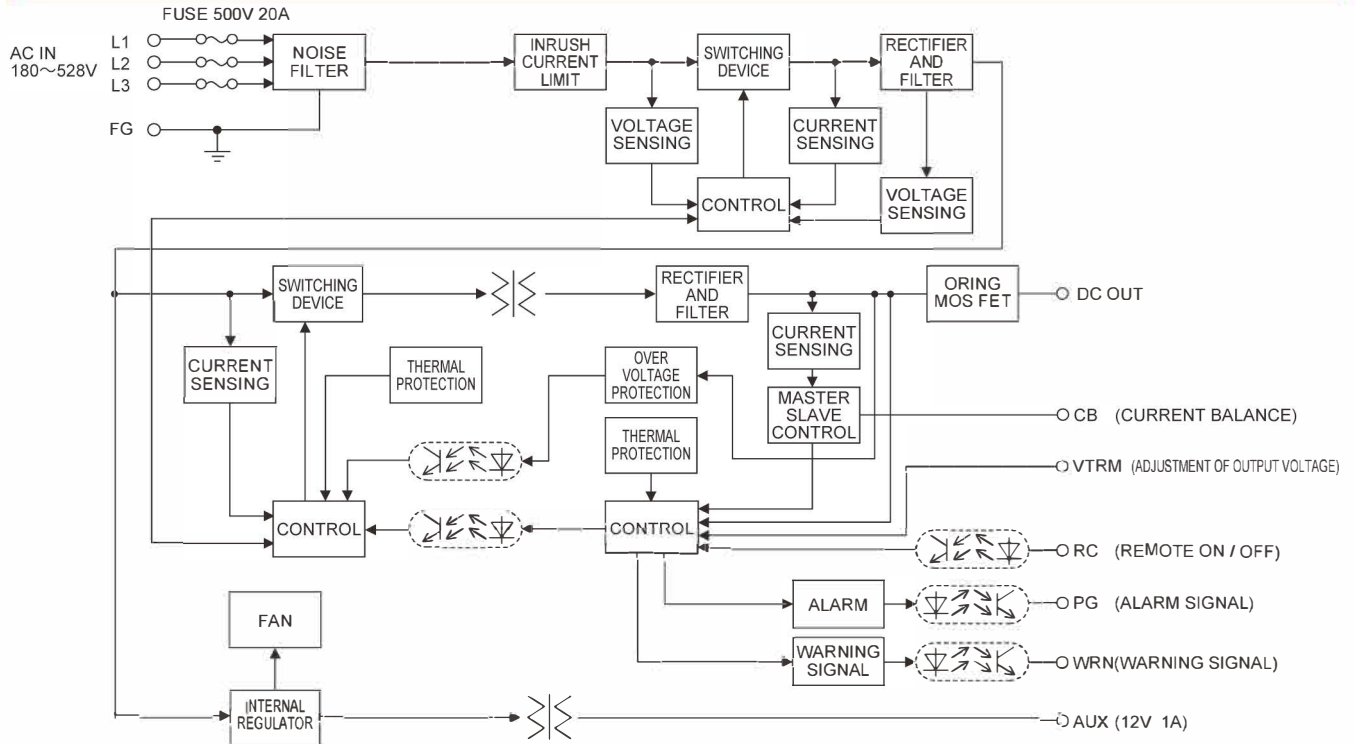
- *1 Output derating is required at 180 - 200VAC. Refer to "Derating".
*2 The value is primary surge. The current of input surge to a built-in EMI/EMS Filter (0.2ms or less) is excluded. More than 3 sec. to re-start.
*3 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKUGIKEN : RM104). Please refer to the instruction manual 1.7.
* Sound noise may be generated by power supply in case of pulse load.

Features

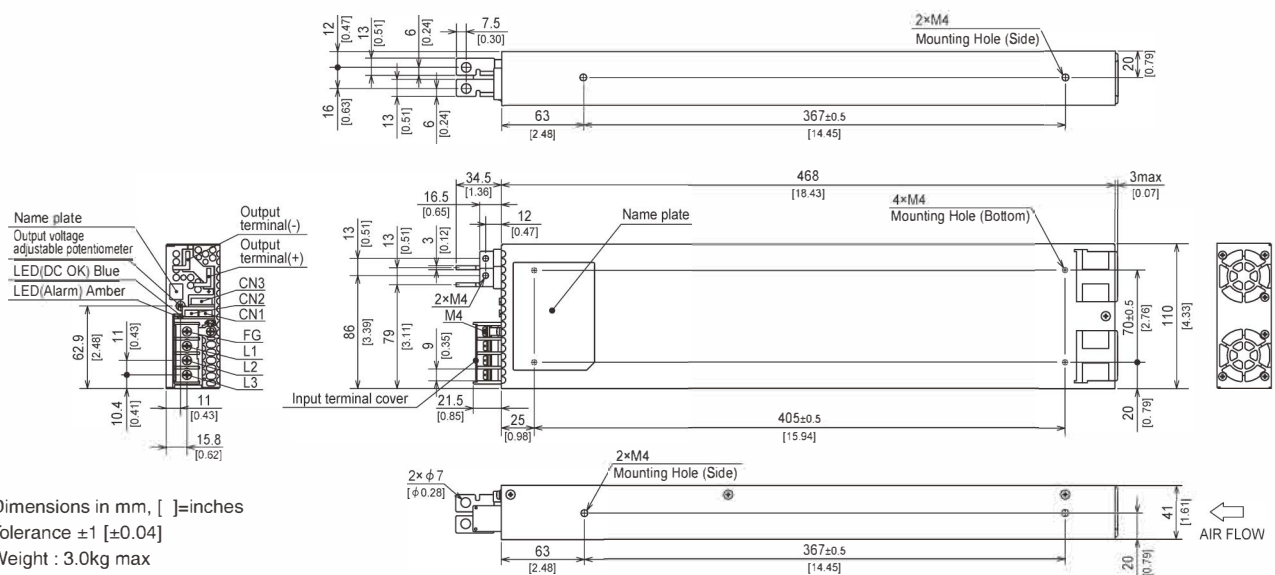
- Low profile (41mm, 1.61 inch = Meet 1U height)
- Wide input voltage range : 3 ϕ 180 – 528VAC
- Built-in AUX power 12V 1A
- Complies with SEMI F47

- 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



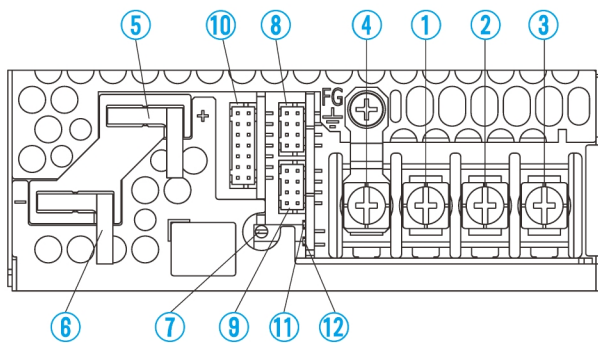
External view



- * Dimensions in mm, []=inches
- * Tolerance ± 1 [± 0.04]
- * Weight : 3.0kg max
- * PCB Material / thickness : FR-4 / 1.6mm [0.06]
- * Chassis Material : Stainless
- * Mounting torque : M4 1.2N·m max
- * Input and output terminal screw tightening torque: M4 1.6N·m max
- * Please connect safety ground to FG terminal on the unit.

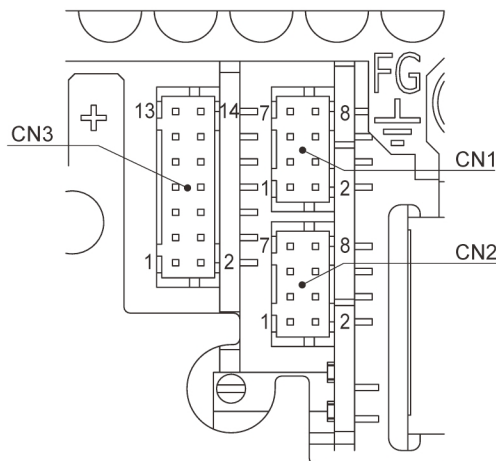
Terminal Blocks

● HFA3500TF



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

● 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.
* Do not connect anything to N.C. pins.

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

* Do not connect anything to N.C. pins.

Mating connector and terminal

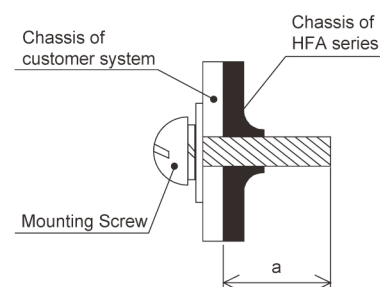
Connector	Housing	Terminal	Mfr.
CN1	S8B-PHDSS	PHDR-8VS	J.S.T.
CN2	S8B-PHDSS	PHDR-8VS	
CN3	S14B-PHDSS	PHDR-14VS	

* The manufacturer prepares only the ratchet hand.

Assembling and Installation Method

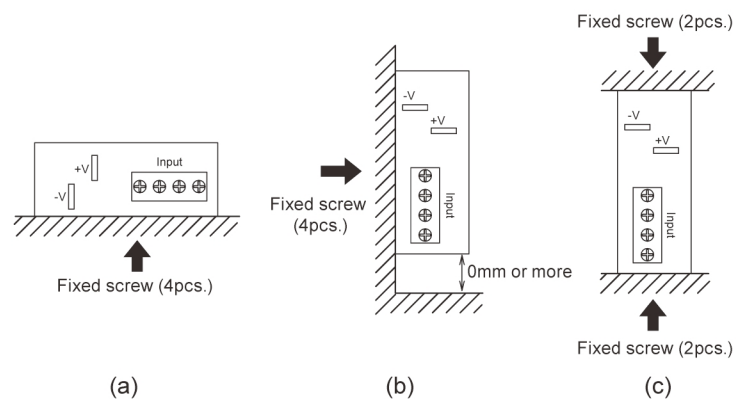
Installation Method

- Screw mounting requires considering the product weight for safety fixtures.
- To keep enough insulation distance between screws and internal components, length of the mounting screw should not exceed recommendation as shown in right figure.

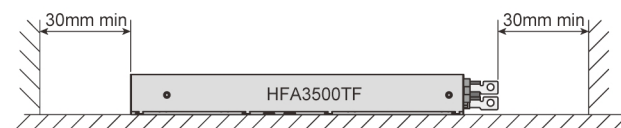


Mounting hole	a (Max penetration length)
Bottom	6mm max
Side	4.5mm max

- When mounting the power supply with screws, it is recommended that this be done as shown below.
- If other methods are used, be sure the weight of the power supply is taken into account.

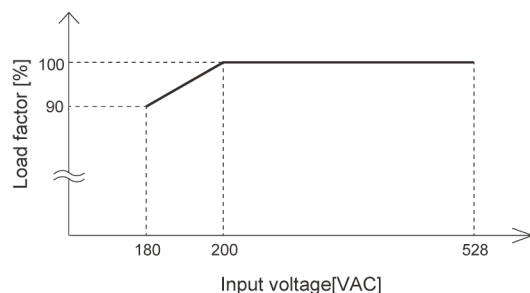


- The power supplies have a built-in forced cooling fan. Do not block ventilation at the suction side and its opposite side.
- If you use a power supply in a dusty environment, it can cause a failure. Please consider taking such countermeasures as installing an air filter near the suction area of the system to prevent a failure.



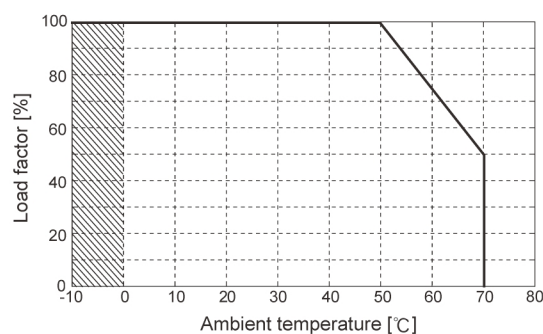
Derating

● Derating curve depends on Input voltage



● Derating curve depends on Output voltage

■ Specifications for ripple and ripple noise changes in the shaded area.



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/HFA/>
 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
HFA3500TF	Active filter	130	11.7	Thermistor + IGBT + Relay	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.