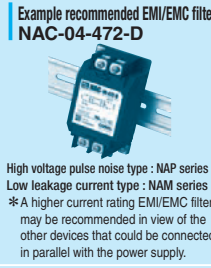


# KHEA/KHNA90F

KH  A 90 F -   -

① ② ③ ④ ⑤ ⑥



- ① Series name  
KHE : Euro style I/O terminals  
KHN : Barrier blocks style I/O terminals
- ② Single output
- ③ Output wattage
- ④ Universal input
- ⑤ Output voltage
- ⑥ Option  
C : with Coating  
E : NEC Class2 (24V)

\* Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

MODEL	KHEA/KHNA90F-12	KHEA/KHNA90F-24
MAX OUTPUT WATTAGE[W]	81.6	91.2
DC OUTPUT	12V 6.8A	24V 3.8A

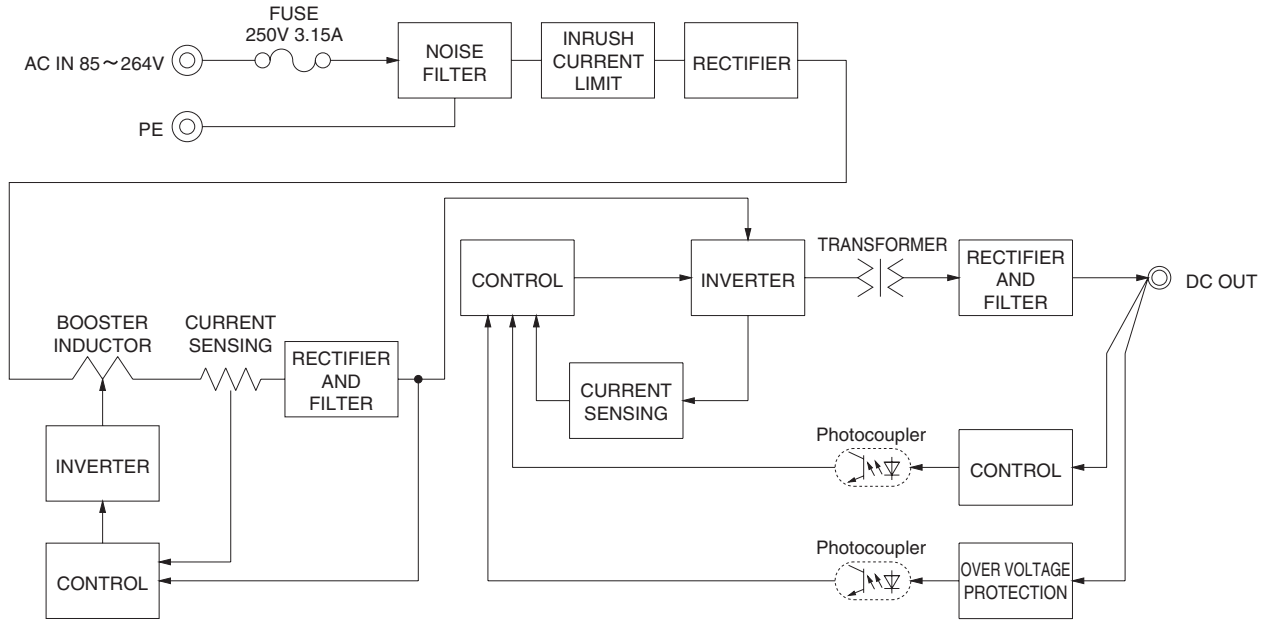
## SPECIFICATIONS

	MODEL	KHEA/KHNA90F-12	KHEA/KHNA90F-24	
INPUT	VOLTAGE[V]	AC85 - 264 1 φ (Output derating is required) or DC88-250 *10		
	CURRENT[A]	ACIN 115V	0.85typ	0.95typ
		ACIN 230V	0.45typ	0.55typ
	FREQUENCY[Hz]	50 / 60 (45 - 66) or DC		
	EFFICIENCY[%]	ACIN 115V	87.0typ	89.0typ (88.0typ for option -E)
		ACIN 230V	88.0typ	91.0typ (89.5typ for option -E)
	POWER FACTOR (Io=100%)	ACIN 115V	0.98typ	
		ACIN 230V	0.86typ	
INRUSH CURRENT[A]	ACIN 115V	18typ (Io=100%) (at cold start Ta=25°C)		
	*1 ACIN 230V	35typ (Io=100%) (at cold start Ta=25°C)		
LEAKAGE CURRENT[ma]	0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)			
OUTPUT	VOLTAGE[V]	12	24	
	CURRENT[A]	6.8	3.8	
	PEAK CURRENT[A]	-	-	
	LINE REGULATION[mV] *2	48max	96max	
	LOAD REGULATION[mV] *2	100max	150max	
	RIPPLE[mVp-p] *3	0 to +70°C	200max	200max
		-20 - 0°C	300max	300max
		Io=0 - 30%	300max *4	300max *4
	RIPPLE NOISE[mVp-p] *3	0 to +70°C	260max	260max
		-20 - 0°C	360max	360max
		Io=0 - 30%	360max *4	360max *4
	TEMPERATURE REGULATION[mV]	0 to +70°C	120max	240max
		-20 to +70°C	150max	290max
	DRIFT[mV] *5	48max	96max	
	START-UP TIME[ms]	500typ (ACIN 115V, Io=100%)		
HOLD-UP TIME[ms]	20typ (ACIN 115V, Io=100%)			
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	10.80 to 13.20	22.50 to 28.50 (Fixed for option -E)		
OUTPUT VOLTAGE SETTING[V]	12.00 to 12.48	24.00 to 24.96 (24.00 to 24.50 for option -E)		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating (101% for option -E), recovers automatically *9		
	OVERVOLTAGE PROTECTION[V]	13.80 to 16.80	30.00 to 36.00 (26.40 to 33.60 for option -E)	
	DC_OK LAMP	LED (Green)		
ISOLATION	INPUT-OUTPUT	AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
	INPUT-PE	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
	OUTPUT-PE	AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-20 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)		
	STORAGE TEMP., HUMID. AND ALTITUDE	-30 to +85°C, 20 - 90%RH (Non condensing)		
	VIBRATION *8	10 - 55Hz, 19.6m/s <sup>2</sup> (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail)		
	IMPACT	196.1m/s <sup>2</sup> (20G), 11ms, X, Y and Z axis (Packing state)		
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS (At only AC input)	UL60950-1, C-UL(CSA60950-1), EN60950-1, UL508, NEC Class2 (24V output only option -E), ANSI/ISA12.12.01 Complies with DEN-AN		
	CONDUCTED NOISE	Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B		
	HARMONIC ATTENUATOR	Complies with IEC61000-3-2 (Class A) *6		
OTHERS	CASE SIZE *7	50×90×90mm (W×H×D) [1.97×3.54×3.54 inches]		
	WEIGHT	405g max		
	COOLING METHOD	Convection		

\*1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less) is excluded.  
 \*2 Please contact us about dynamic load and input response.  
 \*3 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.  
 Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103). Please refer to the instruction manual 2.7.  
 Ripple and ripple noise spec is change at Io=0 to 30% by burst operation.  
 \*4 In case of operating under 0°C ambient temperature, the value is two times of specification at 0 to 30% load factor.  
 \*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.

\*6 Please contact us about another class.  
 \*7 Case size contains neither the umbo.  
 \*8 Only as standard mounting orientation (A). Refer to the instruction manual 5.1.  
 If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.  
 \*9 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 2.3.  
 \*10 Under low DC input voltage below DC110V, the temperature derating -1°C/V or the output power derating -1%/V are required.  
 \* To meet the specifications. Do not operate over-loaded condition.  
 \* A sound may occur from power supply at light or peak loading.

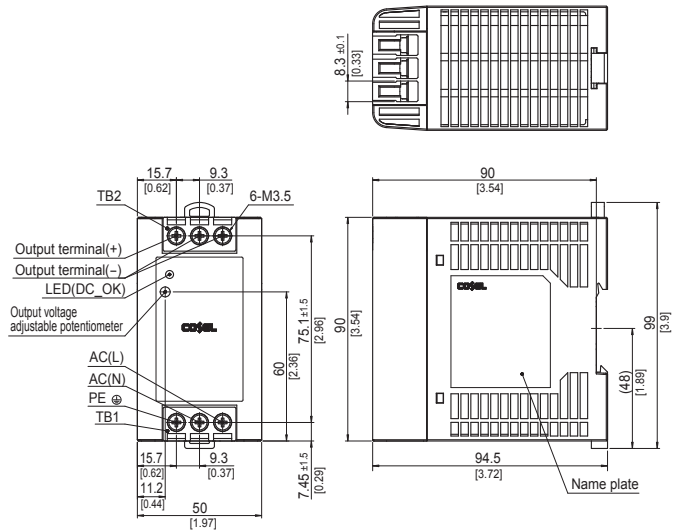
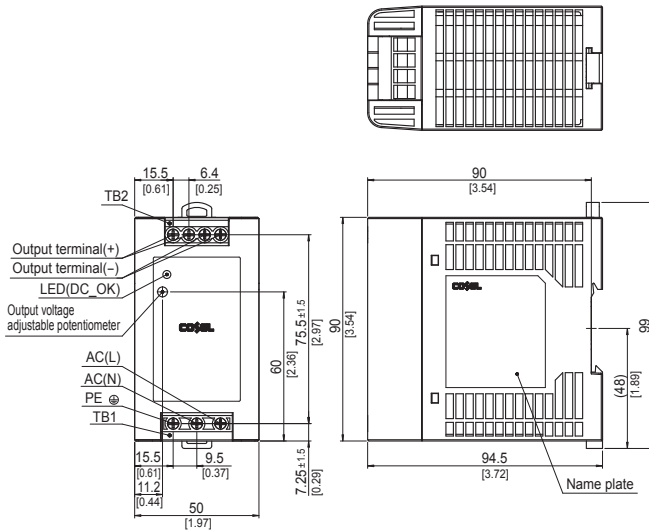
## Block diagram



## External view

<KHEA90F(Euro Style I/O Terminals)>

<KHNA90F(Barrier Blocks Style I/O Terminals)>



- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 405g max
- ※ PCB Material/thickness : FR-4 / 1.6mm [0.06]
- ※ Chassis · Case material : PBT
- ※ Din rail attachment material : PC/ABS
- ※ Dimensions in mm, [ ] = inches
- ※ Screw tightening torque : 1N · m max

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