eco









High voltage pulse noise type: NAP series Low leakage current type: NAM series

\*The EMI/EMC Filter is recommended to connect with several devices

- - I/O terminals
- ②Single output
- 3 Output wattage Universal input
- (5) Output voltage (6) Option
- C : with Coating

MODEL	★KHEA/KHNA30F-5	★KHEA/KHNA30F-12	KHEA/KHNA30F-24
MAX OUTPUT WATTAGE[W]	25	27.6	31.2
DC OUTPUT	5V 5A	12V 2.3A	24V 1.3A

### **SPECIFICATIONS**

Please contact us about ★ marked models.

	MODEL		KHEA/KHNA30F-5	KHEA/KHNA30F-12	KHEA/KHNA30F-24	
	VOLTAGE[V]		AC85 - 264 1 $\phi$ (Output derating is required) or DC120 - 370			
	OUDDENITE AT	ACIN 115V	0.45typ	0.50typ	0.55typ	
	CURRENT[A]	ACIN 230V	0.30typ	0.30typ	0.35typ	
	FREQUENCY[Hz]		50 / 60 (47 - 440) or DC			
INPUT	EEEIGIENGVI9/1	ACIN 115V	84.0typ	87.0typ	88.5typ	
	EFFICIENCY[%]	ACIN 230V	85.5typ	88.5typ	89.5typ	
	INRUSH CURRENT[A]	ACIN 115V	18typ (Io=100%) (at cold start Ta=2		·	
	*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)			
	VOLTAGE[V]		5	12	24	
	CURRENT[A]		5.0	2.3	1.3	
	PEAK CURRENT[A]		-	-	-	
	LINE REGULATION[m	ıV] *2	20max	48max	96max	
	LOAD REGULATION[	mV] *2	80max	100max	150max	
Ī		0 to +70°C	150max	150max	150max	
		-20 - 0°C	300max	300max	300max	
		lo=0 - 30%	300max *4	300max *4	300max *4	
UTPUT		0 to +70°C	180max	180max	180max	
UIPUI	RIPPLE NOISE[mVp-p] *3	-20 - 0°C	360max	360max	360max	
		lo=0 - 30%	360max *4	360max *4	360max *4	
	TEMPERATURE REGULATION[mV]	0 to +70°C	50max	120max	240max	
		-20 to +70°C	60max	150max	290max	
	DRIFT[mV] *5		20max	48max	96max	
	START-UP TIME[ms]		200typ (ACIN 115V, Io=100%)			
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)			
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		4.50 to 5.50	10.80 to 13.20	22.50 to 28.50	
	OUTPUT VOLTAGE SETTING[V]		5.00 to 5.15	12.00 to 12.48	24.00 to 24.96	
ROTECTION	OVERCURRENT PROTE	CTION	Works over 105% of rating and recovers automatically *10			
IRCUIT AND	OVERVOLTAGE PROTE	CTION[V]	6.30 to 7.60	13.80 to 16.80	30.00 to 36.00	
THERS	DC_OK LAMP		LED (Green)		·	
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current =	10mA, DC500V 50MΩ min (At Ro	oom Temperature)	
SOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)			
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)			
	OPERATING TEMP., HUMID. AND	ALTITUDE	-20 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)			
NVIRONMENT	STORAGE TEMP., HUMID. AND A	LTITUDE	-30 to +85°C, 20 - 90%RH (Non condensing)			
NVIHONWENT	VIBRATION	*8				
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)			
AFETY AND	AGENCY APPROVALS (At only	/ AC input)	UL60950-1, C-UL(CSA60950-1), UL508 (NEC Class2 per UL1310), ANSI/ISA12.12.01, EN60950-1, EN50178 Complies with DEN-AN			
OISE	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISF	PR22-B, EN55011-B, EN55022-B		
EGULATIONS	HARMONIC ATTENUA	ATOR	Complies with IEC61000-3-2 (Class	A) *6 (Not built-in to active filter)	*9	
	CASE SIZE	*7	22.5×75×90mm (W×H×D) [0.89			
OTHERS	WEIGHT		165g max	-		
	COOLING METHOD		Convection / Forced air			

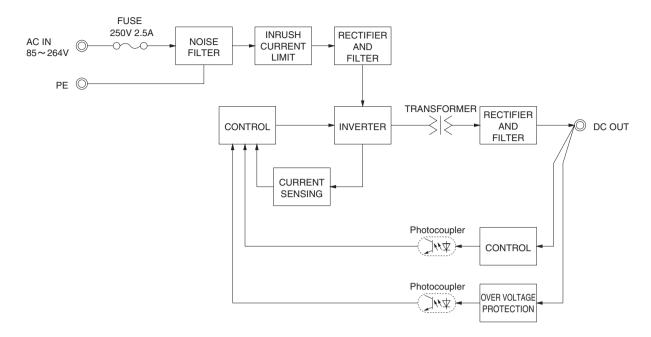
- \*1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is

- \*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 22 μF and 0.1 μF 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.
  \*4 In case of operating under 0°C ambient temperature, the value is two times of specification at 0 to 30% load factor.
  \*5 Petities the between in DC output for an elect hour provided of the a helf hour warm up at 45°C with the
- \*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 pairber 45
- Case size contains neither the umbo.

  Only as standard mounting orientation (A). Refer to the instruction manual 5.1. Willy 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.
   When two or more units are operating it may not comply with the IEC61000-3-2.
   If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 2.3.
   To meet the specifications. Do not operate over-loaded condition.
   A sound may occur from power supply at light or peak loading.



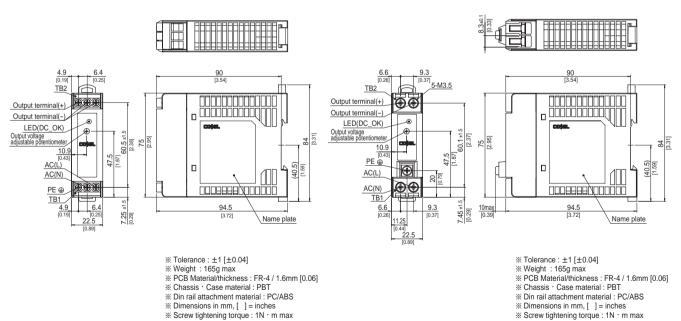
### Block diagram



### **External view**

<KHEA30F(Euro Style I/O Terminals)>

<KHNA30F(Barrier Blocks Style I/O Terminals)>

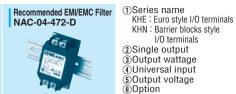


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High voltage pulse noise type: NAP series Low leakage current type: NAM series

\*The EMI/EMC Filter is recommended to connect with several devices

I/O terminals

②Single output 3 Output wattage 4 Universal input

(5) Output voltage (6) Option

C : with Coating

MAX OUTPUT WATTAGE[W] 54 60	DEL 7	★KHEA/KHNA60F-12	KHEA/KHNA60F-24
DC OUTPUT 12V 4.5A	X OUTPUT WATTAGE[W] 5	54	60
DC 001F01   12V 4.5A   24V 2.5A	OUTPUT 1	12V 4.5A	24V 2.5A

#### **SPECIFICATIONS**

Please contact us about ★ marked model.

	MODEL		KHEA/KHNA60F-12	KHEA/KHNA60F-24	
	VOLTAGE[V]		AC85 - 264 1 φ (Output derating is required) or DC120 - 370		
	OUDDENITAL	ACIN 115V	1.00typ	1.10typ	
	CURRENT[A]	ACIN 230V	0.60typ	0.70typ	
	FREQUENCY[Hz]		50 / 60 (47 - 440) or DC		
NPUT		ACIN 115V	86.0typ	89.0typ	
	EFFICIENCY[%]	ACIN 230V	88.0typ	91.0typ	
	INRUSH CURRENT[A]	ACIN 115V	18typ (Io=100%) (at cold start Ta=25°C)		
		ACIN 230V			
	LEAKAGE CURRENT[mA]		0.45 / 0.75max (ACIN 100V / 240V 60Hz, lo=100%, According to IEC60950-1 and DEN-AN)		
	VOLTAGE[V]		12 24		
	CURRENT[A]		4.5	2.5	
	PEAK CURRENT[A]		-	-	
	LINE REGULATION[m	1V] *2	48max	96max	
	LOAD REGULATION	mV] *2	100max	150max	
		0 to +70°C	200max	200max	
	RIPPLE[mVp-p] *3	-20 - 0°C	300max	300max	
		lo=0 - 30%	300max *4	300max *4	
		0 to +70℃	260max	260max	
DUTPUT	RIPPLE NOISE[mVp-p] *3	-20 - 0℃	360max	360max	
	l	lo=0 - 30%	360max *4	360max *4	
		0 to +70℃	120max	240max	
		-20 to +70°C	150max	290max	
	DRIFT[mV] *5		48max	96max	
	START-UP TIME[ms]		200typ (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	
	OUTPUT VOLTAGE SETTING[V]		12.00 to 12.48	24.00 to 24.96	
ROTECTION	OVERCURRENT PROTE	CTION	Works over 105% of rating and recovers automatically *10		
IRCUIT AND	OVERVOLTAGE PROTE	CTION[V]	13.80 to 16.80	30.00 to 36.00	
THERS	DC OK LAMP		LED (Green)		
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 5	OMΩ min (At Room Temperature)	
SOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)		
	OPERATING TEMP., HUMID. AND	ALTITUDE	-20 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)		
	STORAGE TEMP., HUMID. AND A	ALTITUDE	-30 to +85°C, 20 - 90%RH (Non condensing)		
NVIRONMENT	VIBRATION	*8	, , , , , , , , , , , , , , , , , , , ,		
	IMPACT		196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis (Packing state)		
AFETY AND	AGENCY APPROVALS (At only AC input)		UL60950-1, C-UL(CSA60950-1), UL508 (NEC Class2 per UL1310), ANSI/ISA12.12.01, EN60950-1, EN50178 Complies with DEN-AN		
IOISE	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B		
REGULATIONS	HARMONIC ATTENUA	ATOR	Complies with IEC61000-3-2 (Class A) *6 (Not built-in	,	
	CASE SIZE	*7	32×90×90mm (W×H×D) [1.26×3.54×3.54 inches	,	
OTHERS	WEIGHT		270g max	-	
	COOLING METHOD		Convection / Forced air		

- 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 22 µF and 0.1 µF at 150mm from
- \*3 This is the value that measured on measuring operations of Early and the 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 10=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 20% Lead 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.
- Case size contains neither the umbo.

  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
- If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.

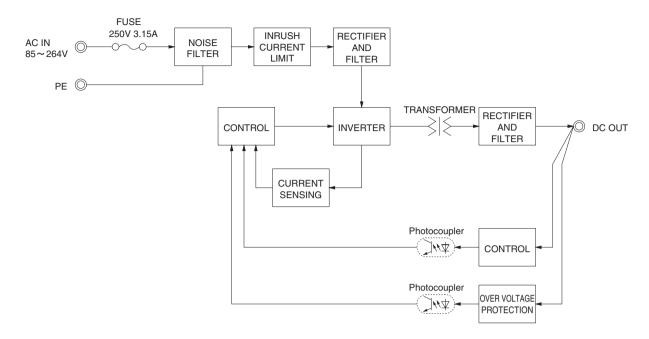
  \*9 When two or more units are operating it may not comply with the IEC61000-3-2.

  \*10 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 2.3.

  \* To meet the specifications. Do not operate over-loaded condition.
- A sound may occur from power supply at light or peak loading.



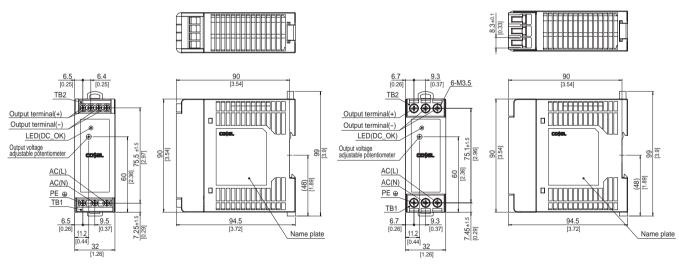
### Block diagram



### **External view**

<KHEA60F(Euro Style I/O Terminals)>

<KHNA60F(Barrier Blocks Style I/O Terminals)>



- % Tolerance : ±1 [±0.04]
- \* Weight : 270g 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

- % Tolerance :  $\pm 1$  [ $\pm 0.04$ ] % Weight : 270g max
- PCB Material/thickness : FR-4 / 1.6mm [0.06]
   Chassis · Case material : PBT
   Win rail attachment material : PC/ABS

- Dimensions in mm, [ ] = inches
   Screw tightening torque: 1N · m max









High voltage pulse noise type: NAP series Low leakage current type: NAM series

\*The EMI/EMC Filter is recommended to connect with several devices

I/O terminals

②Single output 3 Output wattage 4 Universal input

(5) Output voltage (6) Option

C : with Coating

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

#### **SPECIFICATIONS**

Please contact us about ★ marked model

	MODEL		KHEA/KHNA90F-12	KHEA/KHNA90F-24	
	VOLTAGE[V]		AC85 - 264 1 $\phi$ (Output derating is required) *10		
	OUDDENITAL	ACIN 115V	0.85typ	0.95typ	
	CURRENT[A]	ACIN 230V	0.45typ	0.55typ	
	FREQUENCY[Hz]		50 / 60 (47 - 63)		
	EEEIOJENIOVIO/ I	ACIN 115V	87.0typ	89.0typ	
NPUT	EFFICIENCY[%]	ACIN 230V	88.0typ	91.0typ	
	POWER FACTOR	ACIN 115V	0.98typ		
	(lo=100%)	ACIN 230V	0.86typ		
	INRUSH CURRENT[A]	ACIN 115V	7		
	*1	ACIN 230V			
	LEAKAGE CURRENT	[mA]	0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, Ac	cording to IEC60950-1 and DEN-AN)	
	VOLTAGE[V]		12	24	
	CURRENT[A]		6.8	3.8	
	PEAK CURRENT[A]		-	-	
	LINE REGULATION[m	ıV] *2	48max	96max	
	LOAD REGULATION[	mV] *2	100max	150max	
		0 to +70°C		200max	
	RIPPLE[mVp-p] *3	-20 - 0℃	300max	300max	
OUTPUT			300max *4	300max *4	
	RIPPLE NOISE[mVp-p] *3		260max	260max	
011 01			360max	360max	
			360max *4	360max *4	
	TEMPERATURE REGIII ATTONIMVIE		120max	240max	
			150max	290max	
	DRIFT[mV]	*5	Tomax		
	START-UP TIME[ms]		500typ (ACIN 115V, Io=100%)		
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)		
	OUTPUT VOLTAGE ADJUSTMENT F		10.80 to 13.20	22.50 to 28.50	
	OUTPUT VOLTAGE SETT		12.00 to 12.48	24.00 to 24.96	
ROTECTION	OVERCURRENT PROTE		Works over 105% of rating and recovers automatically	*9	
IRCUIT AND	OVERVOLTAGE PROTE	CTION[V]		30.00 to 36.00	
THERS	DC_OK LAMP		LED (Green)	****	
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)		
SOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)		
	OUTPUT-PE	ALTITUDE	AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
	OPERATING TEMP., HUMID. AND		-20 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)		
NVIRONMENT	STORAGE TEMP., HUMID. AND A		-30 to +85°C, 20 - 90%RH (Non condensing)		
	VIBRATION	*8			
LEETIV ****	ACENCY ADDROVALS (At only	, AC innut	196.1m/s <sup>2</sup> (20G), 11ms, X, Y and Z axis (Packing state) UL60950-1, C-UL(CSA60950-1), EN60950-1, EN50178		
AFETY AND DISE	AGENCY APPROVALS (At only CONDUCTED NOISE	AC Input)	Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B	•	
EGULATIONS		ATOP.		D, ENDOUZZ-D	
LGOLATIONS	CASE SIZE	*7	Complies with IEC61000-3-2 (Class A) *6 50×90×90mm (W×H×D) [1.97×3.54×3.54 inches]		
THERS	WEIGHT	*/	405g max		
THENS	COOLING METHOD		Convection / Forced air		
	COOLING ME I HOD		OUTIVECTION / LOTGER WIL		

- The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is
- excluded.
- excluded. Please contact us about dynamic load and input response. This is the value that measured on measuring board with capacitor of 22 µF and 0.1 µF at 150mm from
- \*3 This is the value that measured on measuring operations of Early and the 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 10=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 20% Lead 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.
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  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
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  \*9 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 2.3.

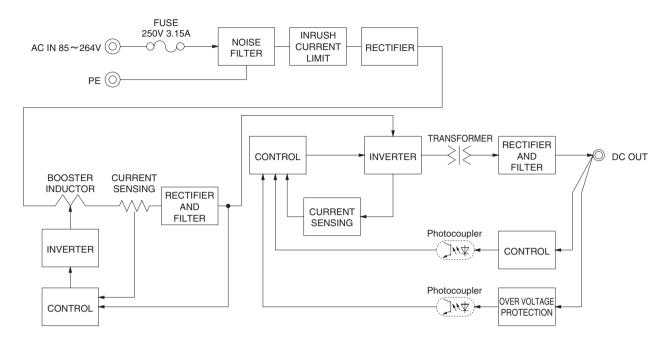
  \*10 Please contact us about DC input voltage.

  \* To meet the specifications. Do not operate over-loaded condition.

  \* A sound may occur from power supply at light or neak loading.



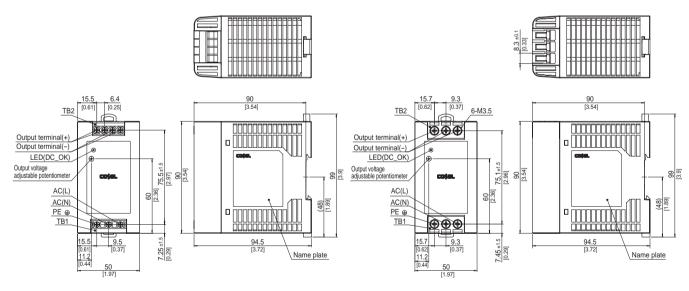
### Block diagram



#### **External view**

<KHEA90F(Euro Style I/O Terminals)>

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



- % Tolerance : ±1 [±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

- % Tolerance : ±1 [±0.04]
- Weight: 405g max

  PCB Material/thickness: FR-4 / 1.6mm [0.06]
- \*\* Cob Material Interiess : 1 10-47 (John W. Chassis · Case material : PBT 
   \*\* Din rail attachment material : PC/ABS 
   \*\* Dimensions in mm, [ ] = inches
- ※ Screw tightening torque: 1N ⋅ m max







Recommended EMI/EMC Fil KHEA120F NAC-04-472 KHEA240F NAC-06-472 KHEA480F NAC-10-472-D



High voltage pulse noise type : NAP series Low leakage current type : NAM series

\*The EMI/EMC Filter is recommended to connect with several devices.

lter	<ol> <li>Series name</li> </ol>
2-D	②Single output
2-D	3 Output wattage

(4) Universal input ⑤Output voltage ⑥Option

C: with Coating N2: Screw mounting

MODEL	KHEA120F-24	KHEA240F-24	KHEA480F-24
MAX OUTPUT WATTAGE[W]	120	240	480
DC OUTPUT	24V 5A (Peak 7.5A)	24V 10A (Peak 15A)	24V 20A (Peak 30A)

#### **SPECIFICATIONS**

T I	MODEL		KHEA120F-24	KHEA240F-24	KHEA480F-24	
١	VOLTAGE[V]		AC85 - 264 1 ¢ or DC120 - 370	AC85 - 264 1 ¢ *11 *12		
	ACIN 115V		1.2typ 2.3typ		4.6typ	
'	CURRENT[A]	ACIN 230V	0.6typ	1.2typ	2.3typ	
F	FREQUENCY[Hz]		50 / 60 (47 - 63) or DC	31	50 / 60 (47 - 63)	
	ACIN 115		90typ	92typ	92typ	
	EFFICIENCY[%]	ACIN 230V	92typ	94typ	94typ	
IPUT -		ACIN 115V	0.98typ	0.98typ	0.98typ	
F	POWER FACTOR	ACIN 230V	0.93typ	0.93typ	0.93typ	
ļ.	INRUSH CURRENT[A]	ACIN 115V	15typ (at cold start Ta=25℃)	20typ (more than 3 sec. to re-start)	- 0.00 стур	
Ι.	*1	ACIN 230V	30typ (at cold start Ta=25℃)	40typ (more than 3 sec. to re-start)		
			0.45 / 0.75max		0.75 / 1.5max	
	LEAKAGE CURRENT	[mA]	(ACIN 100V / 240V 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)			
1	VOLTAGE[V]		24	24	24	
_	CURRENT[A]		5	10	20	
_	PEAK CURRENT[A]	*2	7.5	15	30	
_	LINE REGULATION[n		96max	10	96max (Io=30-100%) *10	
_	LINE REGULATION [1		150max *4		150max (I0=30-100%) *10	
-	LOAD REGULATION	0 to +70℃			120max (10=30-100%) *10	
١,	RIPPLE[mVp-p] *5	-25 - 0°C	240max		240max	
'	MIPPLE[IIIVP-P] *				500max	
$\vdash$		0 to +70°C	240max *4 150max		150max	
UTPUT ,	DIDDLE NOICEIV1 *5		300max		300max	
'	RIPPLE NOISE[mVp-p] *5					
F		lo=0 - 30%			600max	
1	TEMPERATURE REGULATION[mV]	0 to +70°C			240max	
-	-25 to +70°C		360max *4 96max		360max 96max	
	DRIFT[mV] *6					
<u> </u>	START-UP TIME[ms]		750max (ACIN 115V, Io=100%)		750max (ACIN 115V, Io=100%)	
_	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)		20typ (ACIN 115V, Io=100%)	
<u> </u>	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		22.5 to 28.5		22.5 to 26.4	
	OUTPUT VOLTAGE SETT		<u> </u>		24.0±1.0%	
H-	OVERCURRENT PROTE		Works over 101% of peak current and recovers automatically			
	OVERVOLTAGE PROTE	CTION[V]	30.0 to 36.0			
. –	DC_OK LAMP		LED (Green) LED (Red)			
H-	ALARM LAMP					
	DC_OK CONTACT		Relay contact 30VDC 1A max, 30VAC 0.5A max (resistive load)			
_	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)			
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)			
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)			
	OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)			
_	OPERATING TEMP.,HUMID.AND		-25 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)			
IVIRONMENT ⊢	STORAGE TEMP.,HUMID.AND A		-40 to +85°C, 20 - 90%RH (Non condensing)			
	VIBRATION	*9	10 conz, relente (20), entirated period, commuted dieng 2 and (ren operating, meaning on 2 train)			
	IMPACT		196.1m/s² (20G), 11ms, once each X	, ,		
	AGENCY APPROVALS (At only		UL60950-1, C-UL (CSA60950-1), EN		A12.12.01 Complies with DEN-AN	
_	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPI			
GULATIONS	HARMONIC ATTENU	ATOR	Complies with IEC61000-3-2 (Class A			
1	CASE SIZE	*8	37×124×117mm (W×H×D)	50×124×117mm (W×H×D)	70×124×117mm (W×H×D)	
THERE			[1.46×4.88×4.61 inches]	[1.97×4.88×4.61 inches]	[2.76×4.88×4.61 inches]	
	WEIGHT		580g max	900g max	1,200g max	
	COOLING METHOD		Convection / Forced air			

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

- Refer to 3, instruction manual.
  Please contact us about dynamic load and input response.
  The output voltage is below 23.5V, the value is equal to three times of the specification.
  This is the value that measured on measuring board with capacitor of 22 µF and 0.1 µF 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.

  6 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.
- output.

  \*7 Please contact us about another class.

  \*8 Case size contains neither the umbo.
- 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.

  Burst operation at 30% load or less.

  Output derating is required. Please refer to the instruction manual 5.2.

  Please contact us about DC imput voltage.

  To meet the specifications. Do not operate over-loaded condition.

  A sound may occur from power supply at light or peak loading.



### **External view**

AC(L)

AC(N)

PE⊕

[2.72]

**⊗** [ ]

[4.61] 121.2

1000

#### -RC +RC ■KHEA120F 111.2 (M. M. M.) DC OK Output terminal(+) Output terminal(-) LED(ALARM) Name plate 124 LED(DC\_OK) 109 Output voltage adjustable potentiometer % Tolerance : ±1 [±0.04] AC(L) (65.7) \* Weight : 580g max AC(N) ※ PCB Material/thickness : FR-4 / 1.6mm [0.06] PE ⊕ ※ Chassis material : Aluminum 1000 % Case material : Stainless steel \* DIN rail attachment material : Aluminum, Nylon ※ Dimensions in mm, [ ] = inches [4.61] 121.2 [4.77] Screw tightening torque: 1N • m max **■KHEA240F** +RC èle 111.2 (XXXXXX) DC\_OK Output terminal(+) cote. Output terminal(-) LED(ALARM) 33.5 [5.26] Name plate 124 LED(DC\_OK) 109 Output voltage adjustable potentiometer % Tolerance : ±1 [±0.04] AC(L) \* Weight : 900g max AC(N) \* PCB Material/thickness : FR-4 / 1.6mm [0.06] ※ Chassis material : Aluminum PE⊕ % Case material : Stainless steel **BBB** \* DIN rail attachment material : Aluminum, Nylon 7.5 ※ Dimensions in mm, [ ] = inches 117 \* Screw tightening torque: 1N · m max 50 **■KHEA480F** DC\_OK coţa Output terminal(+) Output terminal(-) LED(ALARM) LED(DC OK) Name plate 124 109 [4.29] % Tolerance : ±1 [±0.04] Output voltage adjustable potentiometer Weight : 1,200g max

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

% DIN rail attachment material : Aluminum, Nylon

※ Chassis material : Aluminum \* Case material : Stainless steel

※ Dimensions in mm, [ ] = inches Screw tightening torque: 1N • m max

eco

#### Ordering information

# KHNA series





Recommended EMI/EMC Fi KHNA120F NAC-04-47 KHNA240F NAC-06-472-D KHNA480F NAC-10-472-D



High voltage pulse noise type : NAP series Low leakage current type : NAM series

\*The EMI/EMC Filter is recommended to connect with several devices.

	@Coulos sous
ilter	<ol> <li>Series name</li> </ol>
2-D	②Single output
2-D	③Output wattage
2-D	(4) Universal input

⑤Output voltage ® Option C: with Coating N2: Screw mounting

MODEL	KHNA120F-24	KHNA240F-24	KHNA480F-24
MAX OUTPUT WATTAGE[W]	120	240	480
DC OUTPUT	24V 5A (Peak 7.5A)	24V 10A (Peak 15A)	24V 20A (Peak 30A)

#### **SPECIFICATIONS**

	MODEL		KHNA120F-24	KHNA240F-24	KHNA480F-24
	VOLTAGE[V]		AC85 - 264 1 φ or DC120 - 370		AC85 - 264 1 ¢ *11 *12
	ACIN 115V		1.2typ	2.3typ	4.6typ
	CURRENT[A]	ACIN 230V	0.6typ	1.2typ	2.3tvp
	FREQUENCY[Hz]		50 / 60 (47 - 63) or DC	1.1.294	50 / 60 (47 - 63)
		ACIN 115V	90typ 92typ		92typ
	EFFICIENCY[%]	ACIN 230V	92typ	94typ	94typ
NPUT		ACIN 115V	0.98typ	0.98typ	0.98typ
	POWER FACTOR	ACIN 230V	0.93typ	0.93typ	0.93typ
	INRUSH CURRENT[A]	ACIN 230V	15typ (at cold start Ta=25℃)	20typ (more than 3 sec. to re-start)	0.93 (ур
	INNUSTI CUNNENT[A]	ACIN 113V	30typ (at cold start Ta=25°C)	40typ (more than 3 sec. to re-start)	
	ACIN 230V		, , ,	40typ (more than 5 sec. to re-start)	0.75 / 1.5may
	LEAKAGE CURRENT	[mA]	0.45 / 0.75 max		
	VOLTAGE[V]		24	24	24
			5	10	20
	CURRENT[A]	40		15	30
	PEAK CURRENT[A]	*2		10	
	LINE REGULATION[n				96max (Io=30-100%) *10
	LOAD REGULATION[				150max (Io=30-100%) *10
		0 to +70℃			120max
	RIPPLE[mVp-p] *5	-25 - 0°C	240max		240max
		lo=0 - 30%	= 10111011		500max
UTPUT		0 to +70°C			150max
OUIPUI			300max		300max
		lo=0 - 30%			600max
	TEMPERATURE REGULATION[mV]	0 to +70°C			240max
	TEMP ENAPORE REGOLATION[IIIV]	-25 to +70°C			360max
	DRIFT[mV] *6		96max		96max
	START-UP TIME[ms]		750max (ACIN 115V, Io=100%)		750max (ACIN 115V, Io=100%)
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)		20typ (ACIN 115V, Io=100%)
	OUTPUT VOLTAGE ADJUSTMENT F	RANGE[V]	22.5 to 28.5		22.5 to 26.4
	OUTPUT VOLTAGE SETT	ING[V]	24.0±1.0%		24.0±1.0%
	OVERCURRENT PROTE	CTION	Works over 101% of peak current ar	d recovers automatically	•
ROTECTION	OVERVOLTAGE PROTE	CTION[V]	'		
IRCUIT AND	DC_OK LAMP		LED (Green)		
THERS	ALARM LAMP		LED (Red)		
	DC OK CONTACT		-		
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)		
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)		
SOLATION	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
	OUTPUT-RC		AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)		
	OPERATING TEMP., HUMID. AND	ALTITUDE	-25 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)		
	STORAGE TEMP., HUMID.AND A		-40 to +85°C, 20 - 90%RH (Non condensing)		
NVIRONMENT	VIBRATION	*9			
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)		
AFETY AND	AGENCY APPROVALS (At only	v AC input)		160950-1, EN50178, UL508, ANSI / IS	A12.12.01 Complies with DFN-AN
IOISE	CONDUCTED NOISE	,put)	Complies with FCC-B, VCCI-B, CISP		
EGULATIONS	HARMONIC ATTENUA	ATOR	Complies with IEC61000-3-2 (Class		
			37×124×117mm (W×H×D)	50×124×117mm (W×H×D)	70×124×117mm (W×H×D)
	CASE SIZE	*8	[1.46×4.88×4.61 inches]	[1.97×4.88×4.61 inches]	[2.76×4.88×4.61 inches]
OTHERS	WEIGHT		580g max	900g max	1,200g max
	COOLING METHOD		Convection / Forced air	Joog max	1,2009 11100
	COOLING METHOD		OUTIVECTION / TOTARU AN		

- The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is excluded. Refer to 3, instruction manual. Please contact us about dynamic load and input response. The output voltage is below 23.5V, the value is equal to three times of the specification.
- rise output voltage is below 23.54, the value is equal to three times of the specification.

  This is the value that measured on measuring board with capacitor of 22 µF and 0.1 µF 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.
  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.
  Please contact us about another class.
  Case size contains neither the umbo.
- 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.

  Burst operation at 30% load or less.

  Output derating is required. Please refer to the instruction manual 5.2.

  Please contact us about DC input voltage.

  To meet the specifications. Do not operate over-loaded condition.

  A sound may occur from power supply at light or peak loading.

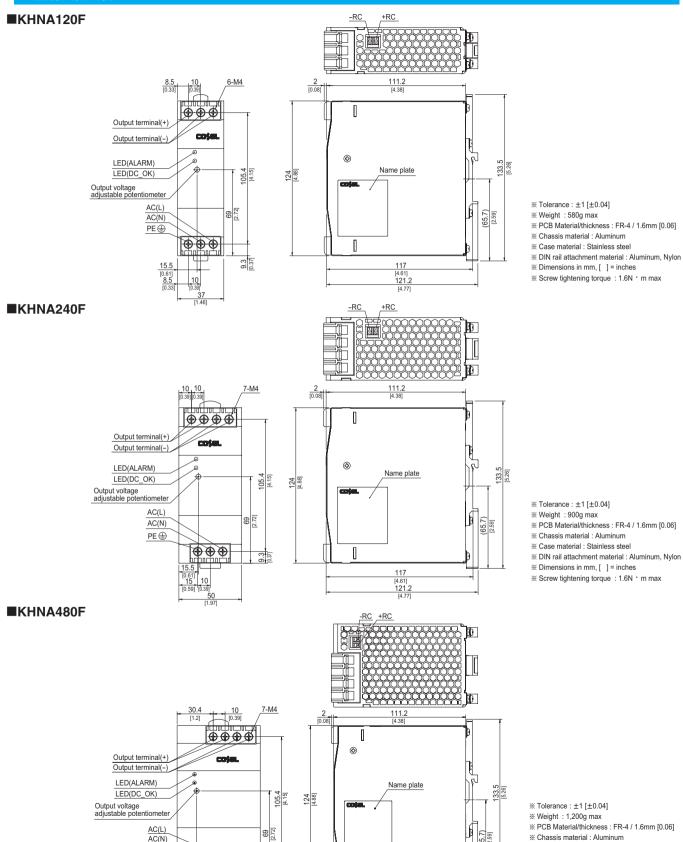




AC(N) PE ⊕

 $\oplus \oplus \oplus$ 

9.3



**(9** ]

% Case material : Stainless steel

※ Dimensions in mm, [ ] = inches

Screw tightening torque: 1.6N • m max

\* DIN rail attachment material : Aluminum, Nylon

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## Cosel:

KHEA90F-24 KHEA30F-12 KHEA30F-5



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