

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/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**

	MODEL		KHEA/KHNA30F-5	KHEA/KHNA30F-12	KHEA/KHNA30F-24	
	VOLTAGE[V]		AC85 - 264 1 φ (Output deratin	g is required) or DC120 - 370		
	CUDDENTIAL	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			
NPUT	EEEIOJENOVIO/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=25℃)		
	*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[n	nV] *2	20max	48max	96max	
	LOAD REGULATION	mV] *2	80max	100max	150max	
		0 to +70°C	150max	150max	150max	
	RIPPLE[mVp-p] *3	-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 REQUILATIONSV	0 to +70℃	50max	120max	240max	
	TEMPERATURE REGULATION[mV]	-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 SETT	ING[V]	5.00 to 5.15	12.00 to 12.48	24.00 to 24.96	
ROTECTION	OVERCURRENT PROTE	ECTION	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 curre	ent = 10mA, DC500V 50M $\Omega$ min (A	t Room 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	ALTITUDE	-30 to +85°C, 20 - 90%RH (Non condensing)			
NVIRONWENT	VIBRATION	*8	10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail)			
	IMPACT		196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis (Packing state)			
AFETY AND	AGENCY APPROVALS (At onl	y 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 EGULATIONS	CONDUCTED NOISE		Complies with FCC-B, VCCI-B,	CISPR22-B, EN55011-B, EN55022-	В	
EGULATIONS	HARMONIC ATTENU	ATOR	Complies with IEC61000-3-2 (0	Class A) *6 (Not built-in to active filter	er) *9	
	CASE SIZE	*7	22.5×75×90mm (W×H×D) [		•	
OTHERS	WEIGHT		165g max	<del>-</del>		
	COOLING METHOD		Convection / Forced air			

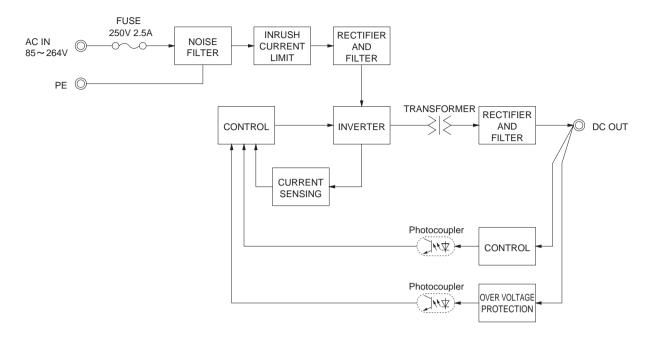
- \*1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is

- \*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.



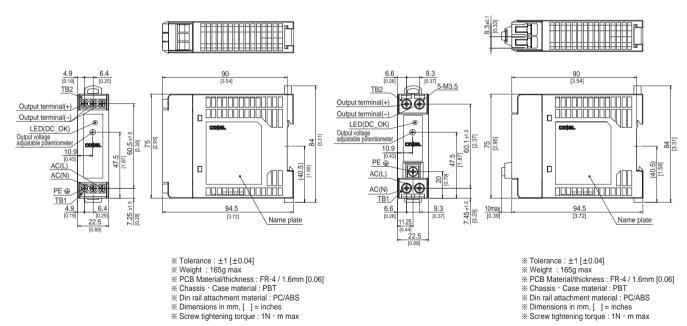
### Block diagram



#### **External view**

<KHEA30F(Euro Style I/O Terminals)>

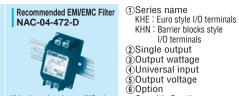
<KHNA30F(Barrier Blocks Style I/O Terminals)>











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/KHNA60F-12	KHEA/KHNA60F-24
MAX OUTPUT WATTAGE[W]	54	60
DC OUTPUT	12V 4.5A	24V 2.5A

#### **SPECIFICATIONS**

	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		
INPUT	EFFICIENCY[0/1	ACIN 115V	87.0typ	89.0typ	
	EFFICIENCY[%]		88.0typ	91.0typ	
	INRUSH CURRENT[A]	ACIN 115V	18typ (Io=100%) (at cold start Ta=25℃)		
	*1	ACIN 230V	35typ (Io=100%) (at cold start Ta=25℃)		
	LEAKAGE CURRENT[mA]		0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, Acc	cording to IEC60950-1 and DEN-AN)	
	VOLTAGE[V]		12	24	
	CURRENT[A]		4.5	2.5	
	PEAK CURRENT[A]		-	-	
	LINE REGULATION[n	nV] *2	48max	96max	
	LOAD REGULATION[	mV] *2	100max	150max	
			200max	200max	
	RIPPLE[mVp-p] *3	-20 - 0°C	300max	300max	
		lo=0 - 30%	300max *4	300max *4	
OUTPUT		0 to +70°C	260max	260max	
0011 01	RIPPLE NOISE[mVp-p] *3	-20 - 0℃	360max	360max	
		lo=0 - 30%	360max *4	360max *4	
	TEMPERATURE REGULATION[mV]	0 to +70°C	120max	240max	
	TEMP ENAPONE NEODEATION[III1]	-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 F		10.80 to 13.20	22.50 to 28.50	
	OUTPUT VOLTAGE SETT	ING[V]	12.00 to 12.48	24.00 to 24.96	
PROTECTION	OVERCURRENT PROTE		Works over 105% of rating and recovers automatically *10		
CIRCUIT AND	OVERVOLTAGE PROTE	CTION[V]	13.80 to 16.80	30.00 to 36.00	
OTHERS	DC_OK LAMP		LED (Green)		
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50N	·	
ISOLATION	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)		
	OPERATING TEMP.,HUMID.AND		-20 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)		
ENVIRONMENT	STORAGE TEMP., HUMID. AND A		-30 to +85°C, 20 - 90%RH (Non condensing)		
	VIBRATION	*8	10 Conta, Totaling (Ed), commuted period, commuted dieng Edine (Non operating, medited on Environ.)		
	IMPACT		196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis (Packing state)		
SAFETY AND NOISE	AGENCY APPROVALS (At only	y AC input)	UL60950-1, C-UL(CSA60950-1), UL508 (NEC Class2 per UL1310), ANSI/ISA12.12.01, EN60950-1, EN50178 Complies with DEN-AN		
REGULATIONS	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B,		
	HARMONIC ATTENU	ATOR	Complies with IEC61000-3-2 (Class A) *6 (Not built-in to	o active filter) *9	
	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.
- 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 operation 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 patter the contains.
- 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 to vibration and impact.

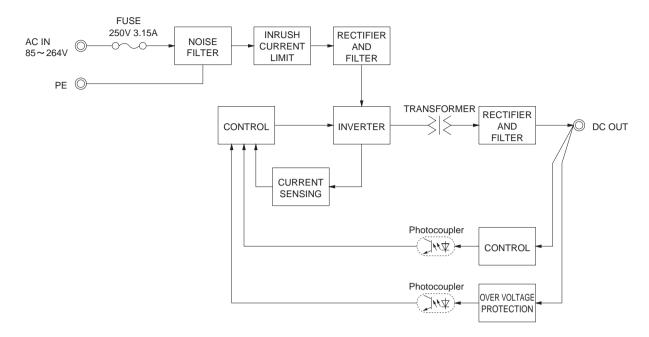
  \*9 When two or more units are operating it may not comply with the IEC61000-3-2.

  \*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.



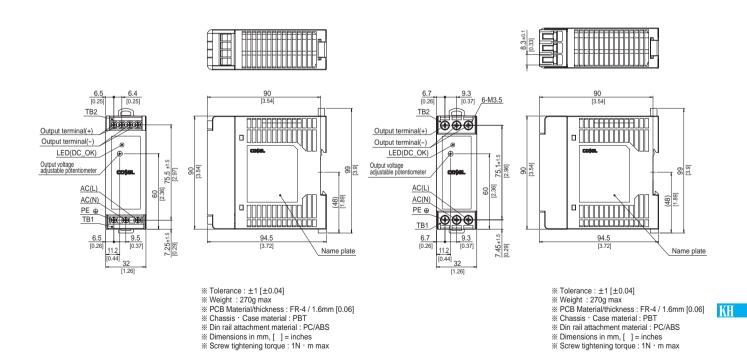
### Block diagram



### **External view**

<KHEA60F(Euro Style I/O Terminals)>

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



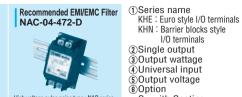
## KHEA/KHNA9(

90









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

⑤Output voltage ® Option

C: with Coating E: NEC Class2 (24V)

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		
	VOLTAGE[V]		AC85 - 264 1 ¢ (Output derating is required) *10			
		ACIN 115V	0.85typ 0.95typ			
	CURRENT[A]	ACIN 230V	0.45typ	0.55typ		
	FREQUENCY[Hz]		50 / 60 (47 - 63)			
		ACIN 115V	87.0typ 89.0typ (88.0typ for option -E)			
INPUT	EFFICIENCY[%]	ACIN 230V	88.0typ	91.0typ (89.5typ for option -E)		
PO	POWER FACTOR	ACIN 115V	0.98typ	2		
	(lo=100%)	ACIN 230V	0.86typ			
	INRUSH CURRENT[A]	ACIN 115V	18typ (Io=100%) (at cold start Ta=25°C)			
	*1	ACIN 230V	35typ (lo=100%) (at cold start Ta=25°C)			
	LEAKAGE CURRENT		0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, A	ccording to IEC60950-1 and DEN-AN)		
	VOLTAGE[V]	[III]	12	24		
	CURRENT[A]		6.8	3.8		
	PEAK CURRENT[A]		-	-		
	LINE REGULATION[n	nV1 *2	48max	96max		
	LOAD REGULATION			150max		
	LOAD KLOOLATION	·	200max	200max		
	RIPPLE[mVp-p] *3	-20 - 0℃	300max	300max		
	KIPPLE[IIIVP-p]		300max *4	300max *4		
		0 to +70°C	260max	260max		
OUTPUT	RIPPLE NOISE[mVp-p] *3		360max	360max		
	KIPPLE NOISE[IIIVP-P]		360max *4			
				360max *4		
	TEMPERATURE REGULATION[mV]		120max 150max	240max 290max		
	DDIETI\/I					
	DRIFT[mV] *5			96max		
	START-UP TIME[ms]		500typ (ACIN 115V, Io=100%)			
	HOLD-UP TIME[ms]	DANOFRA	20typ (ACIN 115V, Io=100%)	00 F0 to 00 F0 (Fixed for eating F)		
	OUTPUT VOLTAGE ADJUSTMENT		10.80 to 13.20	22.50 to 28.50 (Fixed for option -E)		
	OUTPUT VOLTAGE SETT		12.00 to 12.48	24.00 to 24.96 (24.00 to 24.50 for option -E)		
PROTECTION	OVERCURRENT PROTE		Works over 105% of rating (101% for option -E), recove			
CIRCUIT AND	OVERVOLTAGE PROTE	CHON[V]	13.80 to 16.80	30.00 to 36.00 (26.40 to 33.60 for option -E)		
OTHERS	DC_OK LAMP		LED (Green)	DAAC (At Daars Taranaustura)		
1001 47101:	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50			
ISOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)			
	OUTPUT-PE	ALTITUDE	AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)			
	OPERATING TEMP.,HUMID.AND		-20 to +70°C (Required to Derating), 20 - 90%RH (Nor	n condensing)		
ENVIRONMENT	STORAGE TEMP.,HUMID.AND		-30 to +85°C, 20 - 90%RH (Non condensing)			
	VIBRATION	*8				
	IMPACT		196.1m/s² (20G), 11ms, X, Y and Z axis (Packing state			
SAFETY AND NOISE	AGENCY APPROVALS (At onl	y AC input)	UL60950-1, C-UL(CSA60950-1), EN60950-1, EN50178 ANSI/ISA12.12.01 Compliies with DEN-AN			
REGULATIONS	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-	B, EN55022-B		
	HARMONIC ATTENU	ATOR	Complies with IEC61000-3-2 (Class A) *6			
	CASE SIZE	*7	50×90×90mm (W×H×D) [1.97×3.54×3.54 inches]			
OTHERS	WEIGHT		405g 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.
- 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 update with capacitor of 22 pr and 0.1pr at 100mm. 5... 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 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 feature.
- 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.
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  Only as standard mounting orientation (A). Refer to the instruction manual 5.1.

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- It 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.

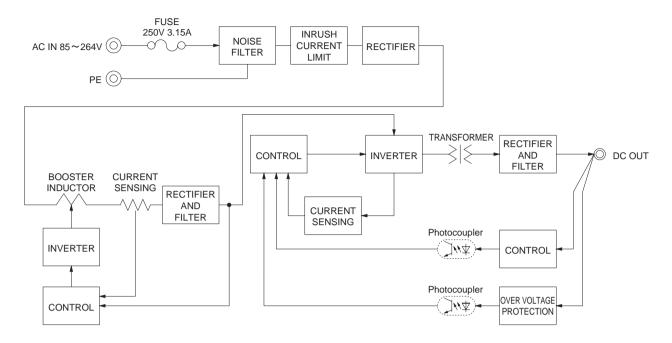
  \*10 Please contact us about DC input voltage.

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

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



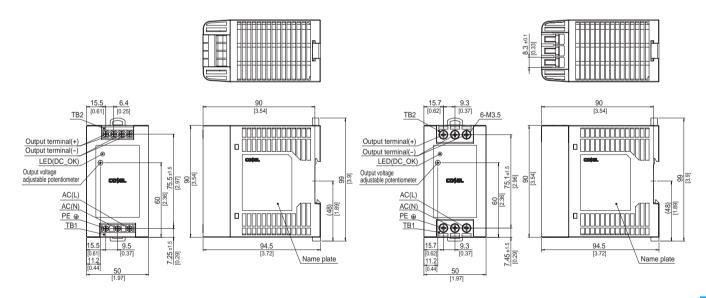
### Block diagram



#### **External view**

<KHEA90F(Euro Style I/O Terminals)>

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



※ Tolerance: ±1 [±0.04]

※ Chassis · Case material : PBT Din rail attachment material : PC/ABS
 Dimensions in mm, [ ] = inches
 Screw tightening torque : 1N · m max

Weight: 405g max

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

- % Tolerance : ±1 [±0.04]
- Weight: 405g max
  PCB Material/thickness: FR-4 / 1.6mm [0.06]

- ※ Screw tightening torque: 1N ⋅ m max

#### Ordering information

# **KHEA** series

-24





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



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
2-D	4 Universal input

⑤Output voltage ®Option 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**

	MODEL		KHEA120F-24	KHEA240F-24	KHEA480F-24
	VOLTAGE[V]		AC85 - 264 1 φ or DC120 - 370		AC85 - 264 1 \$\phi\$ *11 *12
		ACIN 115V	1.2typ	2.3typ	4.6typ
	CURRENT[A]	ACIN 230V	0.6typ	1.2typ	2.3typ
	FREQUENCY[Hz]		50 / 60 (47 - 63) or DC		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 115V	15typ (at cold start Ta=25°C)	20typ (more than 3 sec. to re-start)	0.00135
		ACIN 230V	30typ (at cold start Ta=25°C)	40typ (more than 3 sec. to re-start)	
		AOIIT 2001	0.45 / 0.75max		0.75 / 1.5max
	LEAKAGE CURRENT	[mA]		According to IEC60950-1 and DEN-A	
	VOLTAGE[V]		24	24	24
	CURRENT[A]		5	10	20
	PEAK CURRENT[A]	*2	7.5	15	30
				15	
	LINE REGULATION		96max 150max *4		96max (Io=30-100%) *10 150max (Io=30-100%) *10
	LOAD REGULATION[	mvj *3 0 to +70℃	120max *4		150max (10=30-100%) *10
	DIDDI EtasVa al ac				1 1
	RIPPLE[mVp-p] *5	-25 - 0°C	240max		240max
		lo=0 - 30%			500max
DUTPUT		0 to +70°C	150max		150max
	RIPPLE NOISE[mVp-p] *5		300max		300max
		lo=0 - 30%			600max
	TEMPERATURE REGULATION[mV]	0 to +70℃	240max *4		240max
		-25 to +70℃			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		22.5 to 28.5		22.5 to 26.4
	OUTPUT VOLTAGE SETT		24.0±1.0%		24.0±1.0%
	OVERCURRENT PROTE		Works over 101% of peak current and recovers automatically		
PROTECTION	OVERVOLTAGE PROTE	CTION[V]	30.0 to 36.0		
CIRCUIT AND	DC_OK LAMP		LED (Green)		
OTHERS	ALARM LAMP		LED (Red)		
	DC_OK CONTACT		Relay contact 30VDC 1A max, 30VA		
	INPUT-OUTPUT			10mA, DC500V 50M $\Omega$ min (At Room	•
SOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)		
JOLATION	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
	OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
	OPERATING TEMP., HUMID. AND	ALTITUDE	-25 to +70°C (Required to Derating),	20 - 90%RH (Non condensing)	
NVIRONMENT	STORAGE TEMP., HUMID. AND A	ALTITUDE	-40 to +85°C, 20 - 90%RH (Non condensing)		
TIA A IL/O IAINIEIN I	VIBRATION	*9	10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail)		
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)		
SAFETY AND	AGENCY APPROVALS (At only	y AC input)	UL60950-1, C-UL (CSA60950-1), EN	60950-1, EN50178, UL508, ANSI / IS	A12.12.01 Complies with DEN-AN
NOISE	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISP	R22-B, EN55011-B, EN55022-B	
REGULATIONS	HARMONIC ATTENUA	ATOR	Complies with IEC61000-3-2 (Class	A) *7	
	CACE CIZE	*8	37×124×117mm (W×H×D)	50×124×117mm (W×H×D)	70×124×117mm (W×H×D)
OTHERS	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		

- 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.
  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.

  \*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 input 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(N)

PE⊕

[2.72]

**⊗** [ ]

[4.61] 121.2

1000

#### -RC +RC ■KHEA120F 111.2 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) [2.59] \* 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 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 **100 100 100** \* 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 AC(L) ※ PCB Material/thickness : FR-4 / 1.6mm [0.06]

**KH-9** 

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

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

% DIN rail attachment material : Aluminum, Nylon

#### Ordering information

# KHNA series







Recommended EMI/E KHNA120F NAC-0 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.

EMC Filter	①Series name
4-472-D	②Single output
6-472-D	3 Output wattag
0 472 D	(4)Universal inp

- Single output Output wattage Jniversal 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**

N	MODEL		KHNA120F-24	KHNA240F-24	KHNA480F-24	
١	VOLTAGE[V]		AC85 - 264 1 φ or DC120 - 370		AC85 - 264 1 \$\phi\$ *11 *12	
	ΔCIN 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 115V	90typ	92typ	92typ	
I .	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	
	NRUSH CURRENT[A]	ACIN 115V	15typ (at cold start Ta=25℃)	20typ (more than 3 sec. to re-start)	0.00136	
"	*1	ACIN 230V	30typ (at cold start Ta=25℃)			
			0.45 / 0.75max	Totyp (more than 6 doc. to 16 dtart)	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	
_	LOAD REGULATION		150max *4		150max (I0=30-100%) *10	
-	LOAD KEGULATION[	0 to +70°C			120max (10=30-100%) *10	
١.	RIPPLE[mVp-p] *5	-25 - 0°C	240max		240max	
'	KIFFE[IIIVP-P]				500max	
-			240max *4			
UTPUT .	DIDDLE HOLDER V. 1	0 to +70°C			150max	
"	RIPPLE NOISE[mVp-p] *5		300max *4		300max	
-		lo=0 - 30%			600max	
Т	TEMPERATURE REGULATION[mV]	0 to +70°C	240max *4		240max	
-	DRIFTIMVI *6				360max	
	DRIFT[mV]		96max		96max	
<del>-</del>	START-UP TIME[ms]		750max (ACIN 115V, Io=100%)		750max (ACIN 115V, Io=100%)	
<u> </u>	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)		20typ (ACIN 115V, Io=100%)	
_	DUTPUT VOLTAGE ADJUSTMENT F		22.5 to 28.5		22.5 to 26.4	
	OUTPUT VOLTAGE SETT		24.0±1.0% 24.0±1.0%			
<u> </u>	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)			
<b>⊢</b>	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 50MΩ min (At Room Temperature)			
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)			
	OUTPUT-RC		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)			
V RONMFNT	STORAGE TEMP.,HUMID.AND A		-40 to +85°C, 20 - 90%RH (Non condensing)			
	VIBRATION	*9	10 cone; retention (Ea); entiretes period; commutees along 2 and (non-operating; meaning on 2nd rian)			
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)			
	AGENCY APPROVALS (At only	AC input)	UL60950-1, C-UL (CSA60950-1), EN		A12.12.01 Complies with DEN-AN	
<u> </u>	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPI			
GULATIONS	HARMONIC ATTENUA	ATOR	Complies with IEC61000-3-2 (Class A			
	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]	
_ v	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.

- rise output voltage is below 25.54, 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.

  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 input voltage.

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

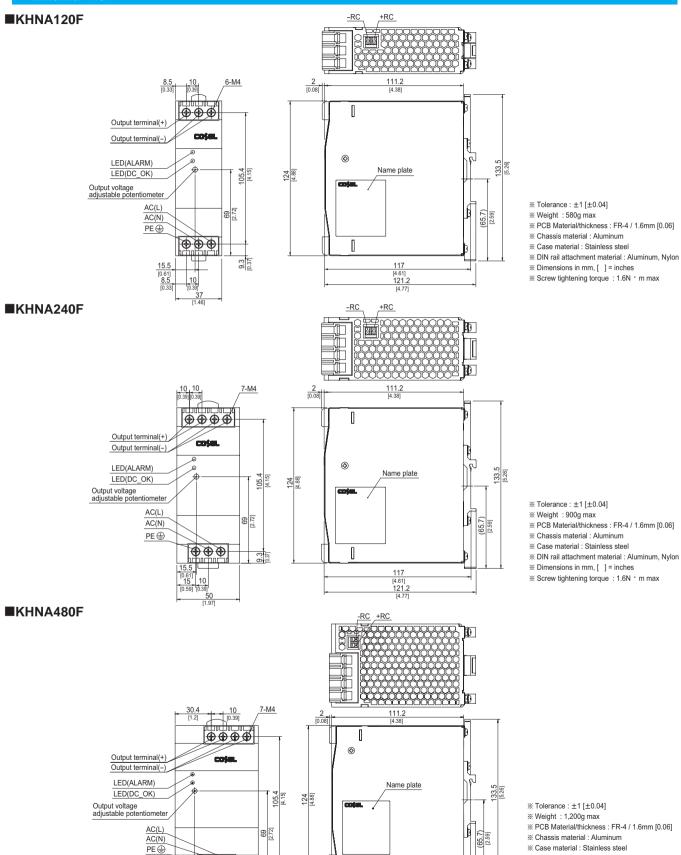
  A sound may occur from power supply at light or peak loading.











**(9** ]

 $\oplus \oplus \oplus$ 

9.3

% Case material : Stainless steel

※ Dimensions in mm, [ ] = inches

Screw tightening torque: 1.6N • m max

\* DIN rail attachment material : Aluminum, Nylon

### **Mouser Electronics**

**Authorized Distributor** 

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### Cosel:

<u>KHEA60F-24 KHEA240F-24 KHEA480F-24 KHEA30F-24 KHEA120F-24 KHNA120F-24 KHNA240F-24 KHEA60F-12 KHEA90F-12</u>