KHEA/KHNA30F

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

*A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

I/O terminals

②Single output

3 Output wattage Universal input

©Output voltage ® Option

C : with Coating

*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/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

	MODEL		KHEA/KHNA30F-5	KHEA/KHNA30F-12	KHEA/KHNA30F-24	
	VOLTAGE[V]		AC85 - 264 1 φ (Output derating is r	required) or DC120 - 370		
		ACIN 115V	0.45typ	0.50typ	0.55typ	
INPUT	CURRENT[A]	ACIN 230V	0.30typ	0.30typ	0.35typ	
	FREQUENCY[Hz]		50 / 60 (45 - 440) or DC			
	EEEIQIENQV(Q)	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	5°C)		
	*1	ACIN 230V	35typ (Io=100%) (at cold start Ta=25°C)			
	LEAKAGE CURRENT	[mA]	0.45 / 0.75max (ACIN 100V / 240V 60Hz, lo=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℃	150max	150max	150max	
	RIPPLE[mVp-p] *3	-20 - 0°C	300max	300max	300max	
		lo=0 - 30%	300max *4	300max *4	300max *4	
ОИТРИТ		0 to +70°C	180max	180max	180max	
OUTPUT	RIPPLE NOISE[mVp-p] *3	-20 - 0°C	360max	360max	360max	
		lo=0 - 30%	360max *4	360max *4	360max *4	
	TEMPERATURE REQUIRATIONS AS	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 F	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	
PROTECTION	OVERCURRENT PROTE	CTION	Works over 105% of rating and reco	vers automatically *10	•	
CIRCUIT AND	OVERVOLTAGE PROTE	CTION[V]	6.30 to 7.60	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 50M Ω min (At Room	Temperature)	
ISOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω 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)			
ENVIRONMENT	STORAGE TEMP., HUMID. AND A	ALTITUDE	-30 to +85°C, 20 - 90%RH (Non condensing)			
ENVIRONMENT	VIBRATION	*8	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 AC input)		UL60950-1, C-UL(CSA60950-1), UL508 (NEC Class2 per UL1310), ANSI/ISA12.12.01, EN60950-1, Complies with DEN-AN			
NOISE	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISP	R22-B, EN55011-B, EN55022-B		
REGULATIONS	HARMONIC ATTENUATOR		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) [0.893	×2.95×3.54 inches]		
OTHERS	WEIGHT		165g 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
- 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 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.

 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 pairber 45
- Case size contains neither the umbo.

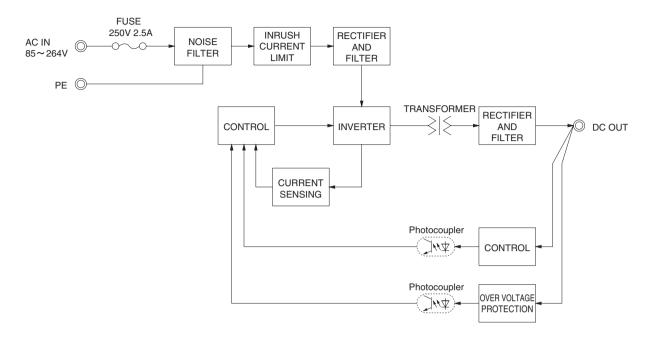
 Only as standard mounting orientation (A). Refer to the instruction manual 5.1. When two or more units are operating it may not comply with the IEC61000-3-2.
 If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.
 When two or more 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.





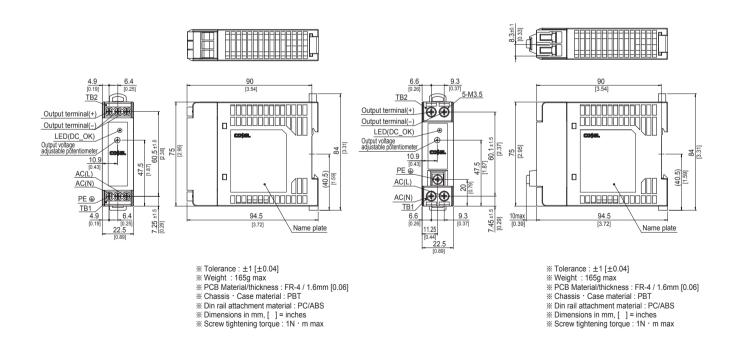
Block diagram



External view

<KHEA30F(Euro Style I/O Terminals)>

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



KHEA/KHNA60F

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

*A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

I/O terminals

②Single output

3 Output wattage Universal input ©Output voltage

® Option C : with Coating

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

	MODEL		KHEA/KHNA60F-12	KHEA/KHNA60F-24	
	VOLTAGE[V]		AC85 - 264 1 \(\phi \) (Output derating is required) or DC120 - 370		
	OUDDENTIAL	ACIN 115V	1.00typ	1.10typ	
	CURRENT[A]	ACIN 230V	0.60typ	0.70typ	
	FREQUENCY[Hz]	•	50 / 60 (45 - 440) or DC		
NPUT	EEEIOIENOVIO/1	ACIN 115V	87.0typ	89.0typ	
	EFFICIENCY[%]	ACIN 230V	88.0typ	91.0typ	
	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)		
	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	
		0 to +70°C	200max	200max	
	RIPPLE[mVp-p] *3	-20 - 0°C	300max	300max	
		Io=0 - 30%	300max *4	300max *4	
NUTDUT		0 to +70°C	260max	260max	
DUTPUT	RIPPLE NOISE[mVp-p] *3	-20 - 0°C	360max	360max	
		lo=0 - 30%	360max *4	360max *4	
	TEMPERATURE REGULATION[mV]	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	
PROTECTION	OVERCURRENT PROTE	ECTION	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	
THERS	DC_OK LAMP		LED (Green)		
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
SOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω 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	ALTITUDE	-30 to +85°C, 20 - 90%RH (Non condensing)		
NVIKONWENT	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 ² (20G), 11ms, once each X, Y and Z axis (Packing state)		
AFETY AND	AGENCY APPROVALS (At only	y AC input)	UL60950-1, C-UL(CSA60950-1), UL508 (NEC Class2 per UL1310), ANSI/ISA12.12.01, EN60950-1, Complies with DEN-AN		
IOISE	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B	, EN55022-B	
REGULATIONS	HARMONIC ATTENUATOR		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]		
H	WEIGHT		270g max		
	COOLING METHOD		Convection		

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

- 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 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.

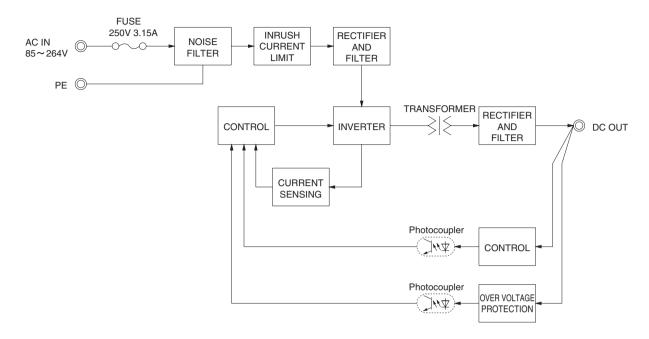
 In case of operating under 0°C ambient temperature, the value is two times of specification at 0 to 30% load factor.
- *5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- *6 Please contact us about another class.
 *7 Case size contains pairber 45
- Case size contains neither the umbo.

 Only as standard mounting orientation (A). Refer to the instruction manual 5.1. When two or more units are operating it may not comply with the IEC61000-3-2.
 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.



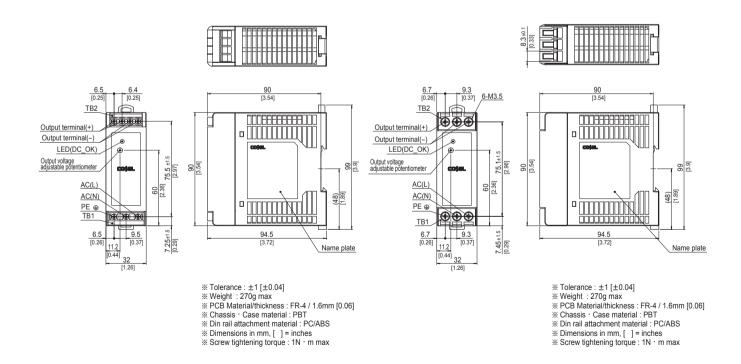
Block diagram



External view

<KHEA60F(Euro Style I/O Terminals)>

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



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High voltage pulse noise type : NAP series Low leakage current type : NAM series *A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

KHE : Euro style I/O terminals KHN : Barrier blocks style

I/O terminals

②Single output

3 Output wattage Universal input

©Output voltage ® 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

	MODEL		KHEA/KHNA90F-12	KHEA/KHNA90F-24
	VOLTAGE[V]		AC85 - 264 1 φ (Output derating is required) or DC88-250 *10	
	OUDDENTIAL	ACIN 115V	0.85typ	0.95typ
	CURRENT[A]	ACIN 230V	0.45typ	0.55typ
	FREQUENCY[Hz]		50 / 60 (45 - 66) or DC	
	EFFICIENCY[0/]	ACIN 115V	87.0typ	89.0typ (88.0typ for option -E)
INPUT	EFFICIENCY[%]	ACIN 230V	88.0typ	91.0typ (89.5typ for option -E)
	POWER FACTOR	ACIN 115V	0.98typ	
	(lo=100%)	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℃)	
	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[n	nV] *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
OUTPUT		0 to +70°C	260max	260max
OUIPUI	RIPPLE NOISE[mVp-p] *3	-20 - 0°C	360max	360max
		lo=0 - 30%	360max *4	360max *4
	TEMPERATURE REGULATION[mV]	0 to +70°C	120max	240max
	TEMPERATURE REGULATION[IIIV]	-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 F	RANGE[V]	10.80 to 13.20	22.50 to 28.50 (Fixed for option -E)
	OUTPUT VOLTAGE SETT	ING[V]	12.00 to 12.48	24.00 to 24.96 (24.00 to 24.50 for option -E)
PROTECTION	OVERCURRENT PROTE	CTION	Works over 105% of rating (101% for option -E), recover	s automatically *9
CIRCUIT AND	OVERVOLTAGE PROTE	CTION[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)	
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (At Room Temperature)	
ISOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω 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℃ (Required to Derating), 20 - 90%RH (Non condensing)	
ENVIRONMENT	STORAGE TEMP., HUMID. AND A	ALTITUDE	-30 to +85℃, 20 - 90%RH (Non condensing)	
LITTINONIMEIT	VIBRATION	*8	· · · · · · · · · · · · · · · · · · ·	
	IMPACT		196.1m/s ² (20G), 11ms, X, Y and Z axis (Packing state)	
SAFETY AND	AGENCY APPROVALS (At only	y AC input)	UL60950-1, C-UL(CSA60950-1), EN60950-1, UL508, NEC Class2 (24V output only option -E), ANSI/ISA12.12.01 Compliies with DEN-AN	
NOISE 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	

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

- 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 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.
 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.
- Please contact us about another class.
- 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.

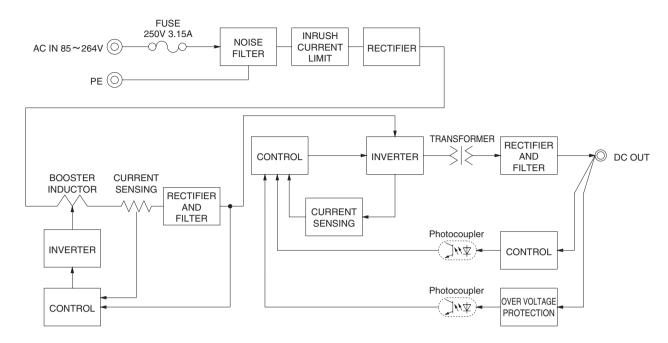
 If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.

 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction propul 2.3.
- **10 Under low DC input voltage selow DC110V, the temperature derating -1°C/V or the output power derating -1°C/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.





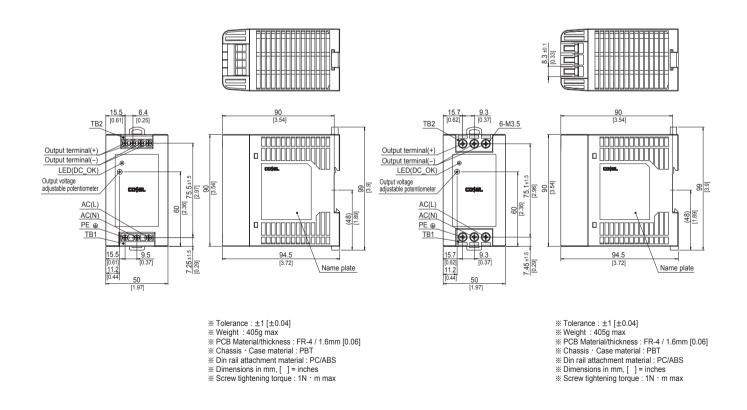
Block diagram



External view

<KHEA90F(Euro Style I/O Terminals)>

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











High voltage pulse noise type : NAP series Low leakage current type : NAM series *A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply. I/O terminals

②Single output 3 Output wattage
4 Universal input
5 Output voltage
6 Option

C: with Coating
N2: Screw mounting

*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 / KHNA120F-24
MAX OUTPUT WATTAGE[W]	120
DC OUTPUT	24V 5A (Peak 7.5A)

3F LCII	ICATIONS		
	MODEL		KHEA / KHNA120F-24
	VOLTAGE[V]		AC85 - 264 1 φ or DC88 - 370 *10
	CURRENT[A]	ACIN 115V	1.2typ
	COMMENTIA	ACIN 230V	0.6typ
	FREQUENCY[Hz]		50 / 60 (45 - 66) or DC
	EFFICIENCY[%]	ACIN 115V	90typ
INPUT	EFFICIENCI[/8]	ACIN 230V	92typ
	POWER FACTOR	ACIN 115V	0.98typ
	POWER FACIOR	ACIN 230V	0.93typ
	INRUSH CURRENT[A]	ACIN 115V	15typ (at cold start Ta=25℃)
	*1	ACIN 230V	30typ (at cold start Ta=25℃)
	LEAKAGE CURRENT	[mA]	0.45 / 0.75max (ACIN 100V / 240V 60Hz, lo=100%, According to IEC60950-1 and DEN-AN)
	VOLTAGE[V]		24
	CURRENT[A]		5
	PEAK CURRENT[A]	*2	7.5
	LINE REGULATION[n		96max
	LOAD REGULATION[mV] *3	150max *4
	_	0 to +70°C	120max
	RIPPLE[mVp-p] *5	-25 - 0°C	240max
		lo=0 - 30%	240max *4
		0 to +70°C	150max
OUTPUT	RIPPLE NOISE[mVp-p] *5	-25 - 0°C	300max
		lo=0 - 30%	300max *4
		0 to +70°C	240max *4
	TEMPERATURE REGULATION[mV]	-25 to +70°C	360max *4
	DRIFT[mV] *6		96max
	START-UP TIME[ms]		750max (ACIN 115V, Io=100%)
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)
	OUTPUT VOLTAGE ADJUSTMENT F	RANGE[V]	22.5 to 28.5
	OUTPUT VOLTAGE SETT	ING[V]	24.0±1.0%
	OVERCURRENT PROTE	CTION	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, 30VAC 0.5A max (resistive load) (Only KHEA)
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)
ICOL ATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)
ISOLATION	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℃ (Required to Derating), 20 - 90%RH (Non condensing)
ENVIDONMENT	STORAGE TEMP., HUMID. AND A	ALTITUDE	-40 to +85°C, 20 - 90%RH (Non condensing)
ENVIRONMENT	VIBRATION	*9	10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail)
	IMPACT		196.1m/s ² (20G), 11ms, once each X, Y and Z axis (Packing state)
SAFETY AND	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL Complies with DEN-AN UL60950-1, C-UL (CSA60950-1), EN60950-1
NOISE	CONDUCTED NOISE	1 what	Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B
REGULATIONS	HARMONIC ATTENU	ATOR	Complies with IEC61000-3-2 (Class A) *7
	CASE SIZE	*8	
OTHERS	WEIGHT		580g max
J.11E110	COOLING METHOD		Convection
	J COOLING METHOD		Convocation

KH series



- 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.
- 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 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.

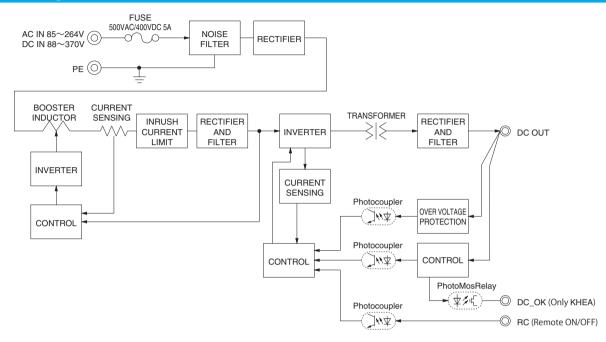
- Only as standard mounting orientation (A). Refer to the instruction manual 5.1 If install other than standard mounting orientation (A), please fix the power
- in install other than standard mounting orientation (A), please if it the powe supply for withstand the vibration and impact.

 *10 Under low DC input voltage below DC110V, the temperature derating -1°5/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.

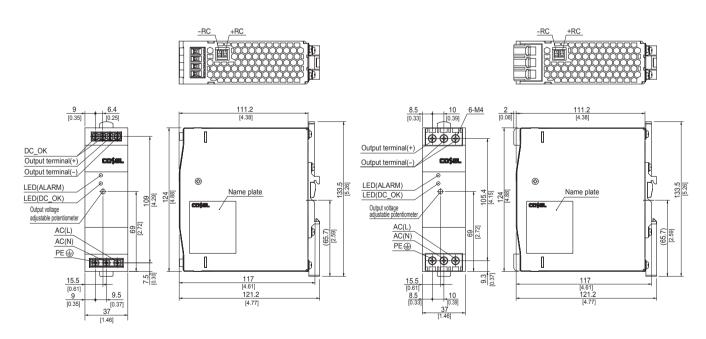
Block diagram



External view

<KHEA120F(Euro Style I/O Terminals)>

<KHNA120F(Barrier Blocks Style I/O Terminals)>



- X Tolerance: ±1 [±0.04]
- Weight: 580g max
- PCB Material/thickness: FR-4 / 1.6mm [0.06]
- Chassis material: Aluminum
- * Case material : Stainless steel
- * DIN rail attachment material : Aluminum, Stainless steel, Nylon
- ※ Dimensions in mm, [] = inches
- Screw tightening torque: 1N · m max

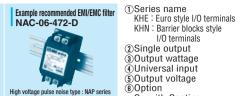
- ** Tolerance : ±1 [±0.04]
- ※ Weight : 580g max
- PCB Material/thickness: FR-4 / 1.6mm [0.06]
- ※ Chassis material : Aluminum
- ※ Case material : Stainless steel
- * DIN rail attachment material : Aluminum, Stainless steel, Nylon
- * Dimensions in mm, [] = inches
- Screw tightening torque: 1.6N · m max

-240









Low leakage current type : NAM series ** A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

I/O terminals ②Single output

3 Output wattage
4 Universal input
5 Output voltage
6 Option

C: with Coating
N2: Screw mounting

*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 / KHNA240F-24
MAX OUTPUT WATTAGE[W]	240
DC OUTPUT	24V 10A (Peak 15A)

MODEL KHEA / KNINA2QF-24 Company Compa	31 LOII	ICATIONS		
NPUT FREQUENCY[Hz] 50 / 50 (45 - 66) or DC 50 / 50 / 50 / 50 / 50 / 50 / 50 / 50		MODEL		KHEA / KHNA240F-24
NPUT FFICUENCY[14] FFICUENCY[15] A08 197 50 (45 - 66) or DC FFICUENCY[15] A08 197 50 (45 - 66) or DC FFICUENCY[15] A08 197 50 (45 - 66) or DC FFICUENCY[15] A08 197 50 (45 - 66) or DC FFICUENCY[15] A08 197 50 (45 - 66) or DC FRIPLE CURRATION A08 197 50 (45 - 66) or DC FRIPLE CURRATION A08 197 50 (45 - 66) or DC FRIPLE REGULATION A08 197 50 (45 - 66) or DC FRIPLE REGULATION 1 (45 - 66) or DC FRIPLE REGULA		• •		·
NPLOTE FREQUENCY[Hz] So / 60 (45 - 66) or DC		CURRENTIAL		
NPUT FFICIENCY(%)			ACIN 230V	
POWER FACTOR ACM 200		FREQUENCY[Hz]		
NPUT		EEEICIENCV[%]		92typ
POWER FACTOR DOUBZEW D. 0.933/p	INPUT	LITICILITO I[70]	ACIN 230V	94typ
IRRUSH CURRENT[A] ACM 1597 2010pr (more than 3 sec. to re-start)		DOWER EACTOR	ACIN 115V	0.98typ
CASE SIZE Mark Course Complex Course Complex Course		FOWERTACION	ACIN 230V	71
LEAKAGE CURRENT[mA] 0.45 / 0.75max (ACIN 100V / 240V 60Hz, lo=100%, According to IEC60950-1 and DEN-AN)		INRUSH CURRENT[A]	ACIN 115V	20typ (more than 3 sec. to re-start)
VOLTAGE[V]		*1	ACIN 230V	40typ (more than 3 sec. to re-start)
CURRENT[A] 15 15 LINE REGULATION[mV] 15 96max LOAD REGULATION[mV] 15 15 15 25 - 0C 240max 26 - 0C 240max 26 - 0C 240max 26 - 0C 300max 26 - 30% 240max 26 - 30% 240max 26 - 30% 240max 26 - 30% 240max 27 - 27 300max 28 - 30 300max 29 - 30 300max 20 - 30% 300max 30 - 30% 30% 300max 30 - 30% 300max 30 - 30% 300max 30 -		LEAKAGE CURRENT	[mA]	0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)
PEAK CURRENT[A]		VOLTAGE[V]		24
LINE REGULATION[mV]		CURRENT[A]		10
COUTPUT COU		PEAK CURRENT[A]	*2	15
Net		LINE REGULATION[m	1 V] *3	96max
OUTPUT File 19 19 19 19 19 19 19 1		LOAD REGULATION[mV] *3	150max *4
International Part Intern		_	0 to +70°C	120max
OUTPUT RIPPLE NOISE[mVp-p] 5 0 to +70°C 150 max 25 - 0°C 30 0 max 25 - 0°C 240 max 25 - 0°C		RIPPLE[mVp-p] *5	-25 - 0°C	240max
OUTPUT RIPPLE NOISE[mVp-p] 5 0 to +70°C 150 max 25 - 0°C 30 0 max 25 - 0°C 240 max 25 - 0°C			lo=0 - 30%	240max *4
RIPPLE NOISE[m/pp.] \$ 25 - 0 C S00max			0 to +70℃	150max
TemPerature regulation(mm) 0 to 470C 240max #4	OUTPUT	RIPPLE NOISE[mVp-p] *5	-25 - 0°C	300max
TEMPERATURE REGULATION(MI) 25 to +70C 360max s4				300max *4
PRIFT[mV] 360 Mmax START-UP TIME[ms] 750 max (ACIN 115V, Io=100%) HOLD-UP TIME[ms] 20typ (ACIN 115V, Io=100%) OUTPUT VOLTAGE ADJUSTMENT RANGE[V] 24.0 ± 1.0% OUTPUT VOLTAGE SETTING[V] 24.0 ± 1.0% PROTECTION OVERCURRENT PROTECTION Works over 101% of peak current and recovers automatically PROTECTION OVERVOLTAGE PROTECTION Works over 101% of peak current and recovers automatically OUTPUT VOLTAGE SETTING[V] 24.0 ± 1.0% OUTPUT VOLTAGE PROTECTION Works over 101% of peak current and recovers automatically OVERCURRENT PROTECTION Works over 101% of peak current and recovers automatically OVERVOLTAGE PROTECTION[V] 30.0 to 36.0 OLO K LAMP			0 to +70℃	240max *4
START-UP TIME[ms] 750max (ACIN 115V, Io=100%)		TEMPERATURE REGULATION[mV]	-25 to +70°C	360max *4
HOLD-UP TIME[ms] 20typ (ACIN 115V, Io=100%)		DRIFT[mV] *6		96max
OUTPUT VOLTAGE ADJUSTMENT RANSE[V] 22.5 to 28.5		START-UP TIME[ms]		750max (ACIN 115V, Io=100%)
OUTPUT VOLTAGE SETTING[V] 24.0±1.0%		HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)
OVERCURRENT PROTECTION Works over 101% of peak current and recovers automatically		OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		22.5 to 28.5
PROTECTION OVERVOLTAGE PROTECTION[V] 30.0 to 36.0		OUTPUT VOLTAGE SETT	ING[V]	24.0±1.0%
CIRCUIT AND OTHERS DC_OK LAMP LED (Green)		OVERCURRENT PROTE	CTION	Works over 101% of peak current and recovers automatically
OTHERSALARM LAMPLED (Red)DC_OK CONTACTRelay contact 30VDC 1A max, 30VAC 0.5A max (resistive load) (Only KHEA)INPUT-OUTPUTAC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)INPUT-PEAC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OPERATINGTEMP,HUMID.AND ALTITUDE-25 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)STORAGETEMP,HUMID.AND ALTITUDE-40 to +85°C, 20 - 90%RH (Non condensing)VIBRATION*9 10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail)IMPACT196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)SAFETY AND NOISEAC input UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL Complies with DEN-ANDC input UL60950-1, C-UL (CSA60950-1), EN60950-1CONDUCTED NOISEComplies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-BHARMONIC ATTENUATORComplies with IEC61000-3-2 (Class A) *7CASE SIZE*8 50×124×117mm (W×H×D) [1.97×4.88×4.61 inches]OTHERS	PROTECTION	OVERVOLTAGE PROTEC	CTION[V]	30.0 to 36.0
DC_OK CONTACT Relay contact 30VDC 1A max, 30VAC 0.5A max (resistive load) (Only KHEA)	CIRCUIT AND	DC_OK LAMP		LED (Green)
INPUT-OUTPUTAC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)INPUT-PEAC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC,	OTHERS	ALARM LAMP		LED (Red)
ISOLATIONINPUT-PEAC2,000V 1 minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1 minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1 minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)ENVIRONMENTOPERATINGTEMP,HUMID.AND ALTITUDE-25 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)STORAGE TEMP,HUMID.AND ALTITUDE-40 to +85°C, 20 - 90%RH (Non condensing)VIBRATION*9 10 - 55Hz, 19.6m/s² (2G), 3 minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail)IMPACT196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)SAFETY AND NOISEAGENCY APPROVALSAC input UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL Complies with DEN-ANNOISECONDUCTED NOISEComplies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-BHARMONIC ATTENUATORComplies with IEC61000-3-2 (Class A) *7CASE SIZE*8 50×124×117mm (W×H×D) [1.97×4.88×4.61 inches]OTHERSWEIGHT900g max		DC_OK CONTACT		Relay contact 30VDC 1A max, 30VAC 0.5A max (resistive load) (Only KHEA)
OUTPUT-PEAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)OUTPUT-RC, DC_OKAC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)DPERATINGTEMP,HUMIDAND ALTITUDE-25 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)STORAGE TEMP,HUMIDAND ALTITUDE-40 to +85°C, 20 - 90%RH (Non condensing)VIBRATION*910 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail)IMPACT196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)SAFETY AND NOISEAGENCY APPROVALSAC input UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL Complies with DEN-ANDO Input UL60950-1, C-UL (CSA60950-1), EN60950-1CONDUCTED NOISEComplies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-BHARMONIC ATTENUATORComplies with IEC61000-3-2 (Class A) *7CASE SIZE*850×124×117mm (W×H×D) [1.97×4.88×4.61 inches]OTHERS	_	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (At Room Temperature)
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) ENVIRONMENT SOPRATINGTEMP,HUMID.AND ALTITUDE -25 to +70°C (Required to Derating), 20 - 90%RH (Non condensing) STORAGE TEMP,HUMID.AND ALTITUDE -40 to +85°C, 20 - 90%RH (Non condensing) VIBRATION *9 10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail) MPACT 196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state) MEGNCY APPROVALS AC input UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL Complies with DEN-AN DC input UL60950-1, C-UL (CSA60950-1), EN60950-1 CONDUCTED NOISE Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B HARMONIC ATTENUATOR Complies with IEC61000-3-2 (Class A) *7 CASE SIZE *8 50×124×117mm (W×H×D) [1.97×4.88×4.61 inches] OTHERS	ICOL ATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (At Room Temperature)
OPERATING TEMP,HUMID.AND ALTITUDE -25 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)	ISOLATION	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50M Ω min (At Room Temperature)
STORAGE TEMP, HUMID. AND ALTITUDE		OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50M Ω min (At Room Temperature)
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)		OPERATING TEMP., HUMID. AND	ALTITUDE	-25 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)
VIBRATION *9 10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail)	ENVIDONMENT	STORAGE TEMP., HUMID. AND A	LTITUDE	-40 to +85°C, 20 - 90%RH (Non condensing)
AGENCY APPROVALS AC input UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL Complies with DEN-AN	ENVIRONMENT	VIBRATION	*9	10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail)
NOISE CONDUCTED NOISE Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B		IMPACT		
DC input UL60950-1, C-UL (CSA60950-1), EN60950-1	CAFETY AND	AGENCY ADDROVALS	AC input	UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL Complies with DEN-AN
REGULATIONS CONDUCTED NOISE Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B HARMONIC ATTENUATOR Complies with IEC61000-3-2 (Class A) *7 CASE SIZE *8 50×124×117mm (W×H×D) [1.97×4.88×4.61 inches] OTHERS WEIGHT 900g max		AGENCI AFFROVALS	DC input	
HARMONIC ATTENUATOR Complies with IEC61000-3-2 (Class A) *7		CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B
OTHERS WEIGHT 900g max		HARMONIC ATTENUATOR		Complies with IEC61000-3-2 (Class A) *7
· · ·		CASE SIZE	*8	50×124×117mm (W×H×D) [1.97×4.88×4.61 inches]
COOLING METHOD Convection	OTHERS	WEIGHT		900g max
		COOLING METHOD		Convection

KH series



- 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.
- 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
- 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.

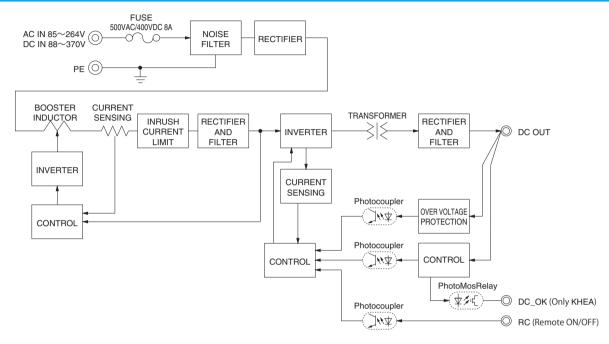
- Only as standard mounting orientation (A). Refer to the instruction manual 5.1 If install other than standard mounting orientation (A), please fix the power
- in install other than standard mounting orientation (A), please if it the powe supply for withstand the vibration and impact.

 *10 Under low DC input voltage below DC110V, the temperature derating -1°5/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.

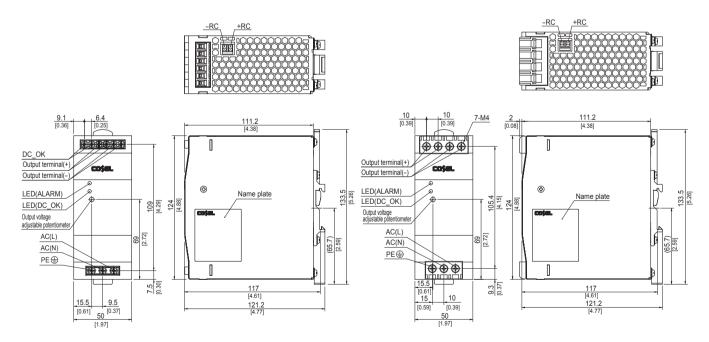
Block diagram



External view

<KHEA240F(Euro Style I/O Terminals)>

<KHNA240F(Barrier Blocks Style I/O Terminals)>



- X Tolerance: ±1 [±0.04]
- * Weight: 900g max
- PCB Material/thickness: FR-4 / 1.6mm [0.06]
- * Chassis material : Aluminum
- * Case material : Stainless steel
- ※ DIN rail attachment material : Aluminum, Stainless steel, Nylon
- ※ Dimensions in mm, [] = inches
- % Screw tightening torque : 1N · m max

- ※ Tolerance : ±1 [±0.04]
- ※ Weight : 900g max
- * PCB Material/thickness : FR-4 / 1.6mm [0.06]
- * Chassis material : Aluminum
- Case material: Stainless steel
- ※ DIN rail attachment material : Aluminum, Stainless steel, Nylon
- ※ Dimensions in mm, [] = inches
- Screw tightening torque: 1.6N m max









High voltage pulse noise type : NAP series Low leakage current type : NAM series ** A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

I/O terminals

②Single output 3 Output wattage
4 Universal input
5 Output voltage
6 Option

C: with Coating
N2: Screw mounting

*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 / KHNA480F-24	KHEA / KHNA480F-48
MAX OUTPUT WATTAGE[W]	480	480
DC OUTPUT	24V 20A (Peak 30A)	48V 10A (Peak 15A)

	MODEL		KHEA / KHNA480F-24	KHEA / KHNA480F-48	
	VOLTAGE[V]		AC85 - 264 1 φ (Output derating is required) or DC88 -	350 *10	
		ACIN 115V	4.6typ		
	CURRENT[A] ACIN 230V				
	FREQUENCY[Hz]		50 / 60 (45 - 66) or DC		
	ACIN 115V				
INPUT	EFFICIENCY[%]	ACIN 230V	94typ		
	ACIN 115V				
	POWER FACTOR	ACIN 230V	0.93typ		
	INRUSH CURRENT[A]	ACIN 115V	20typ (more than 3 sec. to re-start)		
	*1	ACIN 230V	40typ (more than 3 sec. to re-start)		
	LEAKAGE CURRENT	[mA]	0.75 / 1.5max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)		
-	VOLTAGE[V]	<u> </u>	24 48		
	CURRENT[A]		20	10	
	PEAK CURRENT[A]	*2	30	15	
	LINE REGULATION[n	1V] *3	96max (Io=30-100%) *9	192max (Io=30-100%) *9	
	LOAD REGULATION		150max (Io=30-100%) *9	300max (Io=30-100%) *9	
		0 to +70℃	120max	120max	
	RIPPLE[mVp-p] *4	-25 - 0 ℃	240max	240max	
		lo=0 - 30%	500max	750max	
		0 to +70℃	150max	150max	
OUTPUT	RIPPLE NOISE[mVp-p] *4	-25 - 0 ℃	300max	300max	
		lo=0 - 30%	600max	750max	
	TEMPERATURE REQUILATIONS AND	0 to +70℃	240max	480max	
	TEMPERATURE REGULATION[mV]	-25 to +70°C	360max	600max	
	DRIFT[mV] *5		96max	192max	
	START-UP TIME[ms]		750max (ACIN 115V, Io=100%)		
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)		
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		22.5 to 26.4	45.0 to 55.2	
	OUTPUT VOLTAGE SETT	ING[V]	24.0±1.0%	48.0±1.0%	
	OVERCURRENT PROTE	CTION	Works over 101% of peak current and recovers automat	tically	
PROTECTION	OVERVOLTAGE PROTE	CTION[V]	30.0 to 36.0	57.6 to 67.2	
CIRCUIT AND	DC_OK LAMP		LED (Green)		
OTHERS	ALARM LAMP		LED (Red)		
	DC_OK CONTACT		Relay contact 30VDC 1A max, 30VAC 0.5A max (resistive load) (Only KHEA)		
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50N	MΩ min (At Room Temperature)	
ISOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (At Room Temperature)		
ISOLATION	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50M Ω min (At Room Temperature)		
	OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
	OPERATING TEMP., HUMID. AND		-25 to +70°C (Required to Derating), 20 - 90%RH (Non	condensing)	
ENVIRONMENT	STORAGE TEMP., HUMID. AND A		-40 to +85℃, 20 - 90%RH (Non condensing)		
	VIBRATION *8		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)		
SAFETY AND	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ UL60950-1, C-UL (CSA60950-1), EN60950-1	ISA12.12.01, ATEX, GL (Only 24V) Complies with DEN-AN	
NOISE REGULATIONS	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B		
nEGULATIONS	HARMONIC ATTENUATOR		Complies with IEC61000-3-2 (Class A) *6		
	CASE SIZE	*7	70×124×117mm (W×H×D) [2.76×4.88×4.61 inches	[5]	
OTHERS	WEIGHT		1,200g max		
	COOLING METHOD		Convection		
	·				

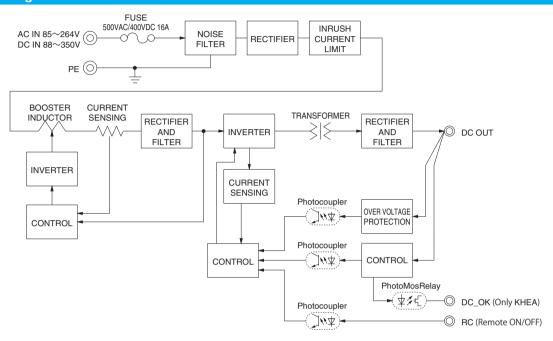
KH series C



- 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.
- Refer to 3, instruction manual. 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 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/ outnut

- 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.
- #99 Burrst operation at 30% load or less.
 #10 Under low DC input voltage below DC110V, the temperature derating
 -1°C/V or the output power derating -1°S/V are required.
 #10 meet the specifications. Do not operate over-loaded condition.
 #10 A sound may occur from power supply at light or pack loading.

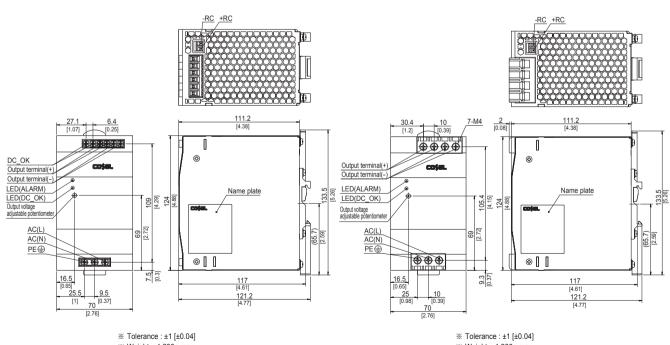
Block diagram



External view

<KHEA480F(Euro Style I/O Terminals)>

<KHNA480F(Barrier Blocks Style I/O Terminals)>



- * Weight : 1,200g max
- * PCB Material/thickness : FR-4 / 1.6mm [0.06]
- Chassis material: Aluminum
- ※ Case material : Stainless steel
- * DIN rail attachment material : Aluminum, Stainless steel, Nylon
- ※ Dimensions in mm, [] = inches
- ※ Screw tightening torque: 1N ⋅ m max

- * Weight : 1,200g max
- * PCB Material/thickness : FR-4 / 1.6mm [0.06]
- Chassis material : Aluminum
- ※ Case material : Stainless steel
- * DIN rail attachment material : Aluminum, Stainless steel, Nylon
- ※ Dimensions in mm, [] = inches
- Screw tightening torque: 1.6N m max

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