Ordering information **COSEL** AC-DC Power Supplies DIN Rail Type KHEA/KHNA3 ł F 30 Α KH -1 2 Example recommended EMI/EMC filter NAC-04-472-D KHE : Euro style I/O terminals KHN : Barrier blocks style)CE I/O terminals 06 Single output 3Output wattage4Universal input . (5)Output voltage (6)Option . High voltage pulse noise type : NAP series eco C : with Coating 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

*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.

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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

in parallel with the power supply.

SPECIFICATIONS

	MODEL		KHEA/KHNA30F-5	KHEA/KHNA30F-12	KHEA/KHNA30F-24	
	VOLTAGE[V]		AC85 - 264 1 ϕ (Output derating is r	required) or DC88 - 370 *11		
	ACIN 115V		0.45typ	0.50typ	0.55typ	
	CURRENT[A]	ACIN 230V	0.30typ	0.30typ	0.35typ	
	FREQUENCY[Hz]		50 / 60 (45 - 440) or DC			
INPUT		ACIN 115V	84.0typ	87.0typ	88.5typ	
	EFFICIENCY[%]	ACIN 230V	85.5typ	88.5typ	89.5typ	
	INRUSH CURRENT[A]	ACIN 115V	18typ (lo=100%) (at cold start Ta=25°C)			
	*1	ACIN 230V	35typ (lo=100%) (at cold start Ta=2	,		
	LEAKAGE CURRENT	[mA]	0.45 / 0.75max (ACIN 100V / 240V	60Hz, Io=100%, According to IEC609	50-1 and DEN-AN)	
	VOLTAGE[V]		5	12	24	
	CURRENT[A]		5.0	2.3	1.3	
	PEAK CURRENT[A]		-	-	-	
	LINE REGULATION[n	nV1 *2	20max	48max	96max	
	LOAD REGULATION	-	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	
		0 to +70℃	180max	180max	180max	
OUTPUT	RIPPLE NOISE[mVp-p] *3	-20 - 0°C	360max	360max	360max	
		lo=0 - 30%	360max *4	360max *4	360max *4	
		0 to +70℃	50max	120max	240max	
	TEMPERATURE REGULATION[mV]	-20 to +70°C	60max	150max	290max	
	DRIFT[mV]	*5				
	START-UP TIME[ms]	*0	20max 48max 96max 200typ (ACIN 115V, Io=100%) 48max 96max			
	HOLD-UP TIME[ms]		20typ (ACIN 115V, 10=100%)			
			4.50 to 5.50	10.80 to 13.20	22.50 to 28.50	
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		5.00 to 5.15	12.00 to 12.48	24.00 to 24.96	
PROTECTION	OUTPUT VOLTAGE SETTING[V] OVERCURRENT PROTECTION				24.00 10 24.90	
PROTECTION CIRCUIT AND	OVERVOLTAGE PROTE					
OTHERS	DC OK LAMP		LED (Green)	13.80 10 10.80	30.00 10 30.00	
OTTIENO				10mA DC500V 50MO min (At Boom	Tomporatura	
ISOLATION	INPUT-PE		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (At Room Temperature) AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (At Room Temperature)			
ISOLATION	OUTPUT-PE			,		
	OPERATING TEMP., HUMID.AND		AC500V 1minute, Cutoff current = 100mA, DC500V 50M Ω min (At Room Temperature) -20 to +70°C, 20 - 90%RH (Non condensing), Type tested for -40°C start-up (Derating is required)			
	STORAGE TEMP., HUMID.AND		-30 to +85°C, 20 - 90%RH (Non con		ip (Derating is required)	
ENVIRONMENT						
	VIBRATION *8		196.1m/s ² (20G), 11ms, once each X, Y and Z axis (Packing state)			
	IMPACT	AC innut				
SAFETY AND	AGENCY APPROVALS	AC input DC input			ISATZ. 12.01, ATEA, COMPILES WILL DEN-AN *	
NOISE	CONDUCTED NOISE		UL60950-1, C-UL (CSA60950-1), EN60950-1			
REGULATIONS	HARMONIC ATTENU		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B			
	CASE SIZE	*7	Complies with IEC61000-3-2 (Class A) *6 (Not built-in to active filter) *9			
OTHERS	WEIGHT	*1				
OTHERS	COOLING METHOD		165g max Convection			
ded The color 1				*6 Please contact us about another class.		
excluded. *2 Please con *3 This is the output term Measured Please refe	tact us about dynamic load an value that measured on measuri ninal. by 20MHz oscilloscope or Rip er to the instruction manual 2.	ing board wit pple-Noise m 7.	onse. h capacitor of 22 µ F and 0.1 µ F at 150mm from eter (Equivalent to KEISOKU-GIKEN: RM103).	 7 Case size contains neither the umbo. 8 Only as standard mounting orientation (A). Refifinstall other than standard mounting orientativibration and impact. 9 When two or more units are operating it may neither the overcurrent protection circuit operates contained and the overcurrent protection circuit operates contained an	ion (A), please fix the power supply for withstand th ot comply with the IEC61000-3-2.	
 *4 In case of e 30% load f *5 Drift is the 	actor.	emperature, ght hour peri	the value is two times of specification at 0 to od after a half-hour warm-up at 25°C, with the	the instruction manual 2.3. *11 Under low DC input voltage below DC110V, the derating -1%/V are required. * To meet the specifications. Do not operate over * A sound may occur from power supply at light	temperature derating -1°C/V or the output power -loaded condition. or peak loading.	





External view

<KHEA30F(Euro Style I/O Terminals)>

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



% Dimensions in mm, [] = inches % Screw tightening torque : 1.1N · m max

Ordering information COSEL **AC-DC Power Supplies DIN Rail Type** HEA/KHNA K 6 ł F 60 KH Α -1 2 Example recommended EMI/EMC filter NAC-04-472-D MAC-04-472-D)CE I/O terminals 0.0 Single output Output wattage
 Universal input LISTED UL508 0 (5)Output voltage (6)Option High voltage pulse noise type : NAP series eco C : with Coating 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

*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.

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

in parallel with the power supply.

SPECIFICATIONS

	MODEL		KHEA/KHNA60F-12	KHEA/KHNA60F-24	
	VOLTAGE[V]		AC85 - 264 1 ϕ (Output derating is required) or DC88 - 370 *11		
		ACIN 115V	1.00typ 1.10typ		
	CURRENT[A]	ACIN 230V	0.60typ	0.70typ	
	FREQUENCY[Hz]	1	50 / 60 (45 - 440) or DC		
INPUT		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)	01.000	
	*1	ACIN 230V	35typ (lo=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]		-	-	
		nV1 *2		- Ofmov	
	LINE REGULATION	-	48max 100max	96max 150max	
	LOAD REGULATION[
		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℃	260max	260max	
	RIPPLE NOISE[mVp-p] *3	<u> </u>	360max	360max	
		lo=0 - 30%	360max *4	360max *4	
	TEMPERATURE REGULATION[mV]	0 to +70℃	120max	240max	
		-20 to +70℃	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	CTION	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)	I	
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
ISOLATION	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50	$M\Omega$ min (At Room Temperature)	
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50/		
	OPERATING TEMPHUMID.AND	ALTITUDE	-20 to +70°C, 20 - 90%RH (Non condensing), Type tested for -40°C start-up (Derating is required)		
	STORAGE TEMP., HUMID.AND A	-	-30 to +85°C, 20 - 90%RH (Non condensing)		
ENVIRONMENT	VIBRATION	*8			
	IMPACT		196-10/2 (20G), 11ms, once each X, Y and Z axis (Packing state)		
		AC input		2 per UL1310), ANSI/ISA12.12.01, ATEX, Complies with DEN-AN *	
SAFETY AND	AGENCY APPROVALS	DC input	UL60950-1, C-UL (CSA60950-1), EN60950-1 UL60950-1, C-UL (CSA60950-1), EN60950-1		
NOISE	CONDUCTED NOISE	Dompat	Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B		
REGULATIONS	HARMONIC ATTENU	ATOR	Complies with FCC-B, VCCI-B, CISPR22-B, ENSOUTT-B, ENSOUZ2-B		
	CASE SIZE	*7			
OTHERS	WEIGHT	<u>~</u> 1	270g max		
UTIENS			5		
	COOLING METHOD		Convection		
excluded. *2 Please con *3 This is the output term Measured Please refe	tact us about dynamic load an value that measured on measuri ninal.	d input resp ing board wit pple-Noise m 7.	h capacitor of 22 µF and 0.1 µF at 150mm from vibration and impact. eter (Equivalent to KEISOKU-GIKEN: RM103). #9 When two or more ur *10 If the overcurrent pro	ither the umbo. Inting orientation (A). Refer to the instruction manual 5.1. andard mounting orientation (A), please fix the power supply for withstand th nits are operating it may not comply with the IEC61000-3-2. tection circuit operates continuously, the output voltage shut down. Refer to	

Please refer to the instruction manual 2.7. Ripple and ripple noise spec is change at lo=0 to 30% by burst operation. *4 In case of operating under 0°C ambient temperature, the value is two times of specification at 0 to 30% load factor.

the instruction manual 2.3. *11 Under low DC input voltage below DC110V, the temperature derating -1°C/V or the output power derating -1%/V are required. * To meet the specifications. Do not operate over-loaded condition. * A sound may occur from power supply at light or peak loading. 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.

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External view

<KHEA60F(Euro Style I/O Terminals)>

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



Chassis Case Internal : PD1
 Din rail attachment material : PC/ABS
 Dimensions in mm, [] = inches
 Screw tightening torque : 1N · m max

Crissis Case material : PD1
 Din rail attachment material : PC/ABS
 Dimensions in mm, [] = inches
 Screw tightening torque : 1.1N · m max



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

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

SPECIFICATIONS

	MODEL		KHEA/KHNA90F-12	KHEA/KHNA90F-24
	VOLTAGE[V]		AC85 - 264 1 ϕ (Output derating is required) or DC88-	
	ACIN 115V		0.85typ	0.95typ
	CURRENT[A]	ACIN 230V	0.45typ	0.55typ
	FREQUENCY[Hz]		50 / 60 (45 - 66) or DC	
		ACIN 115V	87.0typ	89.0typ (88.0typ for option -E)
PUT	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)	
		ACIN 230V	35typ (Io=100%) (at cold start Ta=25°C)	
	LEAKAGE CURRENT	1	0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)	
		[IIIA]	12	24
	VOLTAGE[V] CURRENT[A]		6.8	3.8
			0.0	3.0
	PEAK CURRENT[A]	1/1	-	-
	LINE REGULATION		48max	96max
	LOAD REGULATION[100max	150max
		0 to +70℃	200max	200max
	RIPPLE[mVp-p] *3	-20 - 0 ℃	300max	300max
		lo=0 - 30%	300max *4	300max *4
JTPUT		0 to +70℃	260max	260max
	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℃	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)
OTECTION	OVERCURRENT PROTE	CTION	Works over 105% of rating (101% for option -E), recover	s automatically *9
RCUIT AND	OVERVOLTAGE PROTE	CTION[V]	13.80 to 16.80	30.00 to 36.00 (26.40 to 33.60 for option -E)
THERS	DC_OK LAMP		LED (Green)	
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50	M Ω min (At Room Temperature)
OLATION	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, 20 - 90%RH (Non condensing), Type tested for -40°C start-up (Derating is required)	
	STORAGE TEMP., HUMID.AND A	LTITUDE	-30 to +85°C, 20 - 90%RH (Non condensing)	
VIRONMENT	VIBRATION	*8		
	IMPACT		196.1m/s ² (20G), 11ms, X, Y and Z axis (Packing state)	
		AC input		
FETY AND	AGENCY APPROVALS	DC input	UL60950-1, C-UL (CSA60950-1), EN60950-1	
DISE	CONDUCTED NOISE	Dompar	Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B	
GULATIONS	HARMONIC ATTENU	TOP	Complies with IEC61000-3-2 (Class A) *6	
	CASE SIZE	*7		
THERS	WEIGHT	<u>ج</u> ا	405g max	
IIIEN3				
	COOLING METHOD		Convection	
excluded. *2 Please con *3 This is the output term	tact us about dynamic load an value that measured on measuri ninal.	d input resp ng board wit	onse. *6 Please contact us ab *7 Case size contains ne capacitor of 22 µ F and 0.1 µ F at 150mm from *8 Only as standard mo	ither the umbo. unting orientation (A). Refer to the instruction manual 5.1. tandard mounting orientation (A), please fix the power supply for withsta

This is the value that measured on measuring board with capacitor of 22 p P and 0.1 p P 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.

*4

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

If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact. 19 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 2.3. 10 Under low DC input voltage below DC110V, the temperature derating -1°C/V or the output power derating -1%/V are required. 10 mode the specifications. Do not operate over-loaded condition. 20 A condet may occur upon with both or neek loading.

in parallel with the power supply.

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

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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]
- % Chassis · Case material : PBT
 ※ Din rail attachment material : PC/ABS
- Dimensions in mm, [] = inches
 Screw tightening torque : 1.1N · m max



*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 MAX OUTPUT WATTAGE[W]			KHEA / KHNA120F-24 120		
DC OUTPUT			24V 5A (Peak 7.5A)		
			24V 5A (Peak 7.5A)		
SPECIFI	CATIONS				
MODEL			KHEA / KHNA120F-24		
	VOLTAGE[V]		AC85 - 264 1 \$\phi\$ or DC88 - 370 *10		
Γ	CURRENT[A] ACIN 115V ACIN 230V		1.2typ		
			0.6typ		
	FREQUENCY[Hz]		50 / 60 (45 - 66) or DC		
	EFFICIENCY[%]		90typ		
NPUT		ACIN 230V	92typ		
	POWER FACTOR	ACIN 115V	0.98typ		
	POWER FACTOR	ACIN 230V	0.93typ		
	INRUSH CURRENT[A]	ACIN 115V	15typ (at cold start Ta=25°C)		
	*1	ACIN 230V	30typ (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]		24		
	CURRENT[A]		5		
	PEAK CURRENT[A]		7.5		
	LINE REGULATION[m	IV] *3	96max		
	LOAD REGULATION[-			
		0 to +70℃	120max		
	RIPPLE[mVp-p] *5	-25 - 0 ℃	240max		
		lo=0 - 30%	240max *4		
UTPUT		0 to +70℃	150max		
	RIPPLE NOISE[mVp-p] *5	-25 - 0 ℃	300max		
		lo=0 - 30%	300max *4		
	TEMPERATURE REGULATION/mVI		240max *4		
		-25 to +70℃	360max *4		
	DRIFT[mV] *6				
	START-UP TIME[ms]		750max (ACIN 115V, Io=100%)		
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)		
	OUTPUT VOLTAGE ADJUSTMENT R	ANGE[V]	22.5 to 28.5		
	OUTPUT VOLTAGE SETTI	NG[V]	24.0±1.0%		
	OVERCURRENT PROTE	CTION	Works over 101% of peak current and recovers automatically		
	OVERVOLTAGE PROTEC	CTION[V]	30.0 to 36.0		
	REMOTE ON/OFF (RC	;)	Provided		
THERS	DC_OK LAMP		LED (Green)		
	ALARM LAMP		LED (Red)		
	DC_OK CONTACT		Relay contact 30VDC 1A max, 30VAC 0.5A max (resistive load) (Only KHEA)		
L	INPUT-OUTPUT		AC3,000V 1 minute, 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)		
	OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
Ļ	OPERATING TEMP., HUMID. AND ALTITUDE		-25 to +70°C, 20 - 90%RH (Non condensing), Type tested for -40°C start-up (Derating is required)		
NVIRONMENT F	STORAGE TEMP., HUMID.AND A		-40 to +85°C, 20 - 90%RH (Non condensing)		
_	VIBRATION *9				
	IMPACT		196.1m/s ² (20G), 11ms, once each X, Y and Z axis (Packing state)		
AFETY AND	AGENCY APPROVALS		UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL, Complies with DEN-AN		
OISE		DC input	UL60950-1, C-UL (CSA60950-1), EN60950-1		
REGULATIONS	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B		
	HARMONIC ATTENUA		Complies with IEC61000-3-2 (Class A) *7		
H	CASE SIZE	*8	37×124×117mm (W×H×D) [1.46×4.88×4.61 inches]		
H	WEIGHT		580g 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. *1
- *2 Refer to 3, instruction manual,

*4

Heter 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 µ F and 0.1 µ F 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. *6

- Only as standard mounting orientation (A). Refer to the instruction manual 5.1 *9 If install other than standard mounting orientation (A), please fix the power
- Instant other than standard mounting orientation (A), please in the power supply for withstand the vibration and impact.
 *10 Under low DC input voltage below DC110V, the temperature derating -1 C/V or the output power derating -1%/V are required.
 * To meet the specifications. Do not operate over-loaded condition.
 * A sound may occur from power supply at light or peak loading.

*5



External view

<KHEA120F(Euro Style I/O Terminals)>

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



※ Screw tightening torque : 1N · m max

- ※ Dimensions in mm, [] = inches
- * Screw tightening torque : 1.6N · m max



*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)	
	ICATIONS			
			[
	MODEL		KHEA / KHNA240F-24	
	VOLTAGE[V]		AC85 - 264 1 φ or DC88 - 370 *10	
	CURRENT[A]	ACIN 115V	2.3typ	
	ACIN 230V		1.2typ	
	FREQUENCY[Hz]	1000 4451	50 / 60 (45 - 66) or DC	
NPUT	EFFICIENCY[%]	ACIN 115V	92typ	
NPUT		ACIN 230V ACIN 115V	94typ	
	POWER FACTOR		0.98typ	
		ACIN 230V	0.93typ	
	INRUSH CURRENT[A]	ACIN 115V ACIN 230V	20typ (more than 3 sec. to re-start)	
			40typ (more than 3 sec. to re-start) 0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60950-1 and DEN-AN)	
	LEAKAGE CURRENT	[ma]	24	
	VOLTAGE[V] CURRENT[A]		10	
	PEAK CURRENT[A]	*0	15	
	LINE REGULATION			
	LOAD REGULATION	-	150max *4	
	LOAD REGULATION		120max	
	RIPPLE[mVp-p] *5	-25 - 0°C	240max	
	hirreclingh-b] *3		240max *4	
			150max	
UTPUT	RIPPLE NOISE[mVp-p] *5	-25 - 0°C	300max	
			300max *4	
		0 to +70℃	240max *4	
	TEMPERATURE REGULATION[mV]	-	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		22.5 to 28.5	
	OUTPUT VOLTAGE SETT		24.0±1.0%	
	OVERCURRENT PROTE	<u> </u>	Works over 101% of peak current and recovers automatically	
	OVERVOLTAGE PROTEC		30.0 to 36.0	
ROTECTION	REMOTE ON/OFF (RC		Provided	
IRCUIT AND	DC_OK LAMP	,	LED (Green)	
THERS	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 50M Ω min (At Room Temperature)	
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (At Room Temperature)	
SOLATION	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50M Ω min (At Room Temperature)	
	OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50M Ω min (At Room Temperature)	
	OPERATING TEMP. HUMID. AND ALTITUDE		-25 to +70°C, 20 - 90%RH (Non condensing), Type tested for -40°C start-up (Derating is required)	
	STORAGE TEMP., HUMID.AND A	LTITUDE	-40 to +85°C, 20 - 90%RH (Non condensing)	
NVIRONMENT	VIBRATION	*9	10 - 55Hz, 19.6m/s ² (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)	
		AC input	UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL, Complies with DEN-AN	
SAFETY AND	AGENCY APPROVALS	<u> </u>	UL60950-1, C-UL (CSA60950-1), EN60950-1	
	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) *7	
	CASE SIZE	*8	50×124×117mm (W×H×D) [1.97×4.88×4.61 inches]	
	WEIGHT		900g max	
JIHERS	COOLING METHOD			

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. *1
- *2 Refer to 3, instruction manual,

*4

Heter 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 µ F and 0.1 µ F at 150mm from output terminal. *5

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. *6

- Only as standard mounting orientation (A). Refer to the instruction manual 5.1 *9 If install other than standard mounting orientation (A), please fix the power
- Instant other than standard mounting orientation (A), please in the power supply for withstand the vibration and impact.
 *10 Under low DC input voltage below DC110V, the temperature derating -1 C/V or the output power derating -1%/V are required.
 * To meet the specifications. Do not operate over-loaded condition.
 * A sound may occur from power supply at light or peak loading.



External view

<KHEA240F(Euro Style I/O Terminals)>

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



- * Case material : Stainless steel
- % DIN rail attachment material : Aluminum, Stainless steel, Nylon
- ※ Dimensions in mm, [] = inches
- ※ Screw tightening torque : 1N ⋅ m max

- * Case material : Stainless steel
- ※ DIN rail attachment material : Aluminum, Stainless steel, Nylon
- ※ Dimensions in mm, [] = inches
- % Screw tightening torque : 1.6N m max



in parallel with the power supply.

*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			your end equipment with the power supply installed in accordar KHEA / KHNA480F-24	KHEA / KHNA480F-48	
	MAX OUTPUT WATTAGE[W]		480	480	
DC OUTPUT			24V 20A (Peak 30A)	48V 10A (Peak 15A)	
SPECIF	ICATIONS				
	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	2.3typ		
	FREQUENCY[Hz]	1	50 / 60 (45 - 66) or DC		
		ACIN 115V			
INPUT	EFFICIENCY[%]	ACIN 230V	94typ		
		ACIN 115V	0.98typ		
	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		0.75 / 1.5max (ACIN 100V / 240V 60Hz, Io=100%, Acco	ording to IEC60950-1 and DEN-AN)	
	VOLTAGE[V]		24	48	
	CURRENT[A]		20	10	
	PEAK CURRENT[A]	*2	30	15	
	LINE REGULATION[n		96max (lo=30-100%) *9	192max (lo=30-100%) *9	
	LOAD REGULATION	-	150max (Io=30-100%) *9	300max (lo=30-100%) *9	
			120max	120max	
	RIPPLE[mVp-p] *4	-25 - 0°C	240max	240max	
		lo=0 - 30%	500max	750max	
		0 to +70°C	150max	150max	
OUTPUT	RIPPLE NOISE[mVp-p] *4	-25 - 0°C	300max	300max	
		lo=0 - 30%	600max	750max	
		0 to +70℃	240max	480max	
	TEMPERATURE REGULATION[mV]	-25 to +70℃	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 SETTING[V]		24.0±1.0%	48.0±1.0%	
	OVERCURRENT PROTE		Works over 101% of peak current and recovers automat		
	OVERVOLTAGE PROTE		30.0 to 36.0 57.6 to 67.2		
PROTECTION	REMOTE ON/OFF (RO		Provided		
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 50M Ω min (At Room Temperature)		
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M Ω min (At noom 10mperature)		
ISOLATION	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50M Ω min (At norm Temperature)		
	OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50M Ω min (At Room Temperature)		
	OPERATING TEMP., HUMID.AND ALTITUDE		-25 to +70 $^{\circ}$ C, 20 - 90%RH (Non condensing), Type tested for -40 $^{\circ}$ C start-up (Derating is required)		
	STORAGE TEMP., HUMID.AND		-40 to $+85^{\circ}$, $20 - 90^{\circ}$ RH (Non condensing)		
ENVIRONMENT	VIBRATION	*8			
	IMPACT		196.1m/s ² (20G), 11ms, once each X, Y and Z axis (Packing state)		
		AC input	UL60950-1, C-UL (CSA60950-1), EN60950-1, UL508, ANSI/ISA12.12.01, ATEX, GL (Only 24V), Complies with DEN-AN		
SAFETY AND	AGENCY APPROVALS	<u> </u>	UL60950-1, C-UL (CSA60950-1), EN60950-1 UL60950-1, C-UL (CSA60950-1), EN60950-1		
NOISE	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B		
REGULATIONS	HARMONIC ATTENU	ATOR	Complies with IEC61000-3-2 (Class A) *6		
			70×124×117mm (W×H×D) [2 76×4 88×4 61 inchor	1	

70×124×117mm (W×H×D) [2.76×4.88×4.61 inches]

OTHERS

CASE SIZE

COOLING METHOD

WEIGHT

1,200g max

Convection

KH series



- The value is primary surge. The current of input surge to a built-in EMI/EMC *1 Filter(0.2ms or less)is excluded
- *2 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 μ F and 0.1 μ F at 150mm from output terminal. Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
- *5
- 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
- Duput. 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. I 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.

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



External view

<KHEA480F(Euro Style I/O Terminals)>

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



※ Screw tightening torque : 1.6N · m max

Mouser Electronics

Authorized Distributor

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