COSEL

Power Factor Correction | World wide | Safety Approvals | EMI | Inrush current limiting | OCP | OVP | Remote ON/OFF

KH-series

Feature

For DIN (35mm) rail products
Wide operating ambient temperature range
I/O terminal has 2 types, Euro Style and Barrier Blocks Style
Built in overcurrent protection, overvoltage protection circuits

- KHEA/KHNA30F~90F
  Low power consumption at no load
  Complies with SEMI F-47 (Derating is required)

- KHEA/KHNA120F~480F
  Built in remote ON/OFF
  Built in signal output for confirming output voltage
  Complies with SEMI F-47

Safety agency approvals

EN62368-1, UL508, ATEX (All models)
UL60950-1, C-UL (CSA60950-1)
(KHEA/KHNA30F~120F, KHEA/KHNA480F)
UL62368-1, C-UL (CSA62368-1) (KHEA/KHNA240)
UL121201 (KHEA/KHNA30F~240F)
ANSI/ISA12.12.01 (KHEA/KHNA480F)
Complies with DEN-AN

5-year warranty (refer to Instruction Manual)

CE marking

Low Voltage Directive
RoHS Directive

UKCA marking

Electrical Equipment Safety Regulations
RoHS Regulations

EMI

Complies with FCC-B, CISPR22-B, EN55011-B, EN55022-B, VCCI-B

EMS Compliance : EN61204-3, EN61000-6-2

EN61000-4-2
EN61000-4-3
EN61000-4-4
EN61000-4-5
EN61000-4-6
EN61000-4-8
EN61000-4-11

COSEL AC-DC Power Supplies DIN Rail Type

KHEA/KHNA30F

Ordering information

KH□ A 30 F -□□ -□

① ② ③ ④ ⑤ ⑥

Example recommended EMI/EMC filter
NAC-04-472-D

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.

①Series name
KHE : Euro style I/O terminals
KHN : Barrier blocks style I/O terminals
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Option
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.

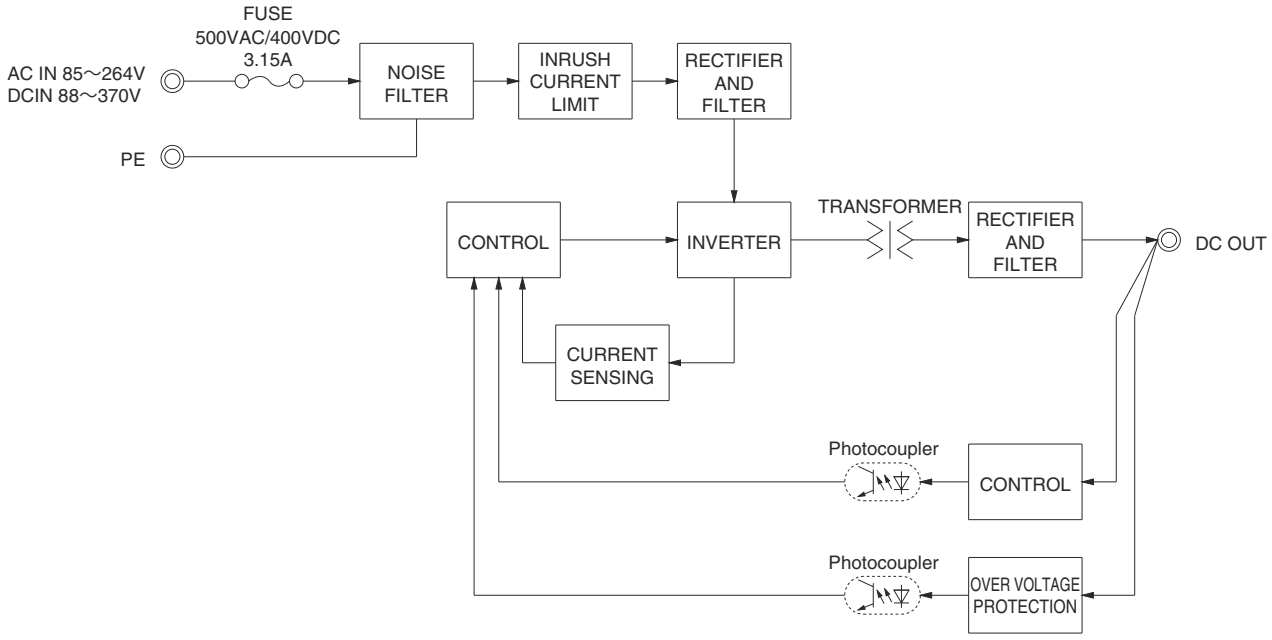
MODEL	KHEA/KHNA30F-5	KHEA/KHNA30F-12	KHEA/KHNA30F-24
MAX OUTPUT WATTAGE[W]	25	27.6	31.2
DC OUTPUT	5V 5A	12V 2.3A	24V 1.3A

SPECIFICATIONS

	MODEL		KHEA/KHNA30F-5	KHEA/KHNA30F-12	KHEA/KHNA30F-24
INPUT	VOLTAGE[V]		AC85 - 264 1φ (Refer to "Derating") or DC88 - 370 ＊11		
	CURRENT[A]	ACIN 115V	0.45typ	0.50typ	0.55typ
		ACIN 230V	0.30typ	0.30typ	0.35typ
	FREQUENCY[Hz]		50 / 60 (45 - 440) or DC		
	EFFICIENCY[%]	ACIN 115V	84.0typ	87.0typ	88.5typ
		ACIN 230V	85.5typ	88.5typ	89.5typ
	INRUSH CURRENT[A] ＊1	ACIN 115V	18typ (Io=100%) (at cold start Ta=25℃)		
		ACIN 230V	35typ (Io=100%) (at cold start Ta=25℃)		
	LEAKAGE CURRENT[mA]		0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC62368-1 and DEN-AN)		
OUTPUT	VOLTAGE[V]		5	12	24
	CURRENT[A]		5.0	2.3	1.3
	PEAK CURRENT[A]		-	-	-
	LINE REGULATION[mV] ＊2		20max	48max	96max
	LOAD REGULATION[mV] ＊2		80max	100max	150max
	RIPPLE[mVp-p] ＊3	0 to +70℃	150max	150max	150max
		-20 - 0℃	300max	300max	300max
		Io=0 - 30%	300max ＊4	300max ＊4	300max ＊4
	RIPPLE NOISE[mVp-p] ＊3	0 to +70℃	180max	180max	180max
		-20 - 0℃	360max	360max	360max
		Io=0 - 30%	360max ＊4	360max ＊4	360max ＊4
	TEMPERATURE REGULATION[mV]	0 to +70℃	50max	120max	240max
		-20 to +70℃	60max	150max	290max
	DRIFT[mV] ＊5		20max	48max	96max
	START-UP TIME[ms]		200typ (ACIN 115V, Io=100%)		
	HOLD-UP TIME[ms]		20typ (ACIN 115V, Io=100%)		
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		4.50 to 5.50	10.80 to 13.20	22.50 to 28.50
	OUTPUT VOLTAGE SETTING[V]		5.00 to 5.15	12.00 to 12.48	24.00 to 24.96
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically ＊10		
	OVERVOLTAGE PROTECTION[V]		6.30 to 7.60	13.80 to 16.80	30.00 to 36.00
	DC_OK LAMP		LED (Green)		
ISOLATION	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-20 to +70℃, 20 - 90%RH (Non condensing), Type tested for -40℃ start-up (Refer to "Derating")		
	STORAGE TEMP.,HUMID.AND ALTITUDE		-30 to +85℃, 20 - 90%RH (Non condensing)		
	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 NOISE REGULATIONS	AGENCY APPROVALS	AC input	UL60950-1, C-UL (CSA60950-1), EN62368-1, UL508 (NEC Class2 per UL1310), UL121201, ATEX, Complies with DEN-AN ＊		
		DC input	UL60950-1, C-UL (CSA60950-1), EN62368-1		
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B		
	HARMONIC ATTENUATOR		Complies with IEC61000-3-2 (Class A) ＊6 (Not built-in to active filter) ＊9		
OTHERS	CASE SIZE ＊7		22.5×75×90mm (W×H×D) [0.89×2.95×3.54 inches]		
	WEIGHT		165g max		
	COOLING METHOD		Convection		

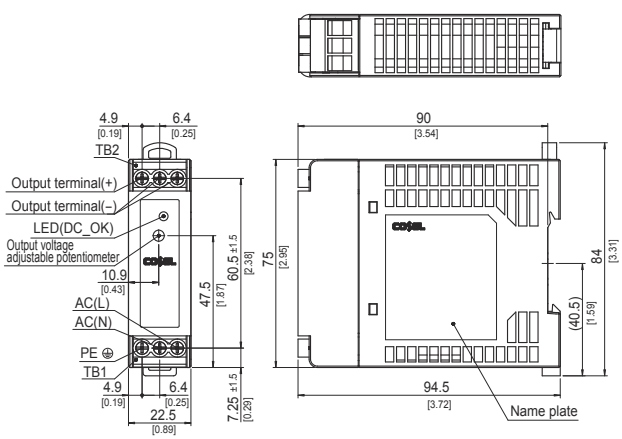
＊1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is excluded.
＊2 Please contact us about dynamic load and input response.
＊3 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.7.
Ripple and ripple noise spec is change at Io=0 to 30% by burst operation.
＊4 In case of operating under 0℃ 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℃, with the input voltage held constant at the rated input/output.
＊6 Please contact us about another class.
＊7 Case size contains neither the umbo.
＊8 Only as standard mounting orientation (A). Refer to the "Assembling and Installation Method".
If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.
＊9 When two or more units are operating it may not comply with the IEC61000-3-2.
＊10 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 1.3.
＊11 Under low DC input voltage below DC110V, the temperature derating -1℃/V or the output power derating -1%/V are required.
＊ To meet the specifications. Do not operate over-loaded condition.
＊ A sound may occur from power supply at light or peak loading.

Block diagram



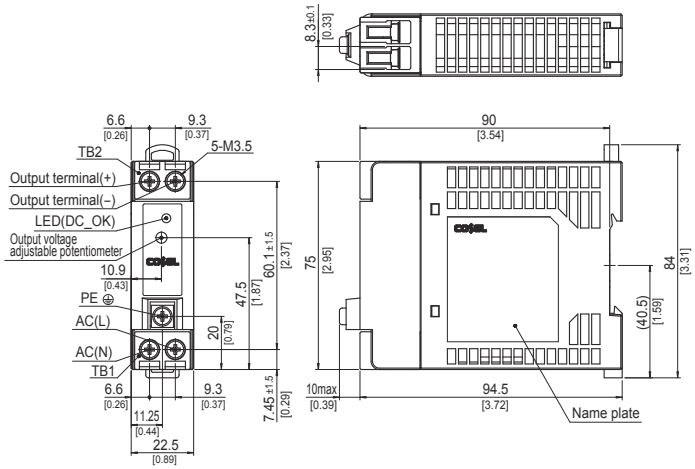
External view

<KHEA30F(Euro Style I/O Terminals)>



※ Tolerance : ±1 [±0.04]
※ Weight : 165g 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

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



※ Tolerance : ±1 [±0.04]
※ Weight : 165g 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

COSEL AC-DC Power Supplies DIN Rail Type

KHEA/KHNA60F

Ordering information

KH□ A 60 F -□□ -□

① ② ③ ④ ⑤ ⑧

Example recommended EMI/EMC filter
NAC-04-472-D

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.

①Series name
KHE : Euro style I/O terminals
KHN : Barrier blocks style I/O terminals
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Option
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.

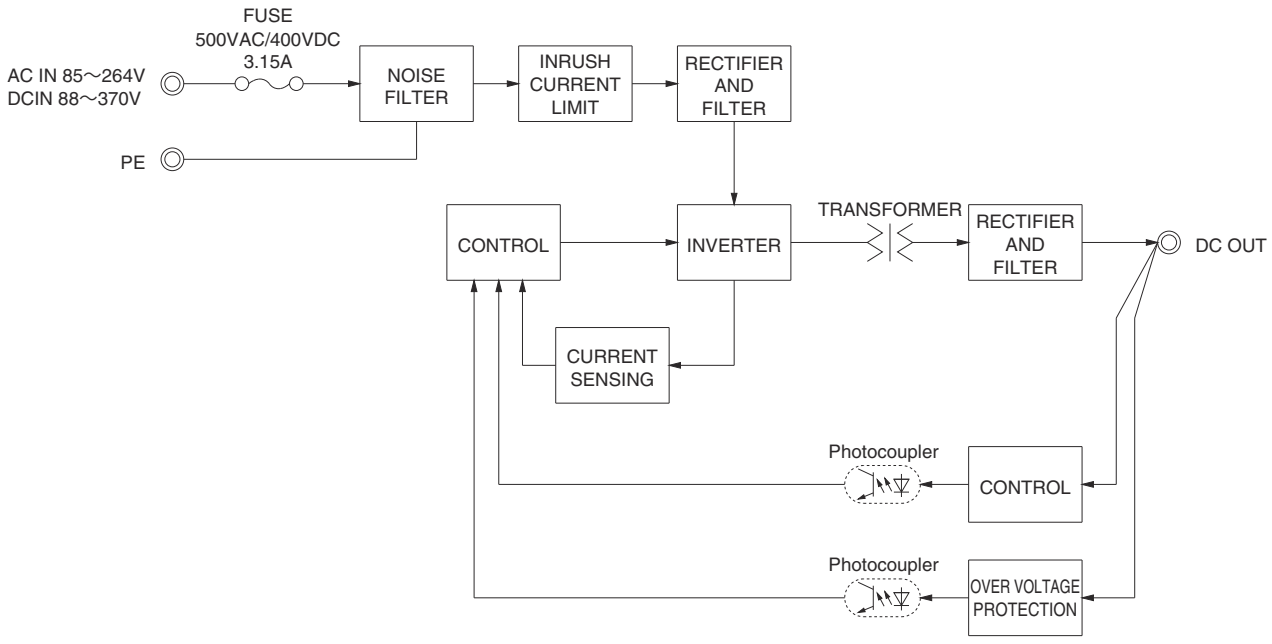
MODEL	KHEA/KHNA60F-12	KHEA/KHNA60F-24
MAX OUTPUT WATTAGE[W]	54	60
DC OUTPUT	12V 4.5A	24V 2.5A

SPECIFICATIONS

	MODEL		KHEA/KHNA60F-12	KHEA/KHNA60F-24
INPUT	VOLTAGE[V]		AC85 - 264 1φ (Refer to "Derating") or DC88 - 370 ＊11	
	CURRENT[A]	ACIN 115V	1.00typ	1.10typ
		ACIN 230V	0.60typ	0.70typ
	FREQUENCY[Hz]		50 / 60 (45 - 440) or DC	
	EFFICIENCY[%]	ACIN 115V	87.0typ	89.0typ
		ACIN 230V	88.0typ	91.0typ
	INRUSH CURRENT[A] ＊1	ACIN 115V	18typ (Io=100%) (at cold start Ta=25℃)	
		ACIN 230V	35typ (Io=100%) (at cold start Ta=25℃)	
	LEAKAGE CURRENT[mA]		0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC62368-1 and DEN-AN)	
OUTPUT	VOLTAGE[V]		12	24
	CURRENT[A]		4.5	2.5
	PEAK CURRENT[A]		-	-
	LINE REGULATION[mV] ＊2		48max	96max
	LOAD REGULATION[mV] ＊2		100max	150max
	RIPPLE[mVp-p] ＊3	0 to +70℃	200max	200max
		-20 - 0℃	300max	300max
		Io=0 - 30%	300max ＊4	300max ＊4
	RIPPLE NOISE[mVp-p] ＊3	0 to +70℃	260max	260max
		-20 - 0℃	360max	360max
		Io=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 CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically ＊10	
	OVERVOLTAGE PROTECTION[V]		13.80 to 16.80	30.00 to 36.00
	DC_OK LAMP		LED (Green)	
ISOLATION	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)	
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)	
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)	
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-20 to +70℃, 20 - 90%RH (Non condensing) , Type tested for -40℃ start-up (Refer to "Derating")	
	STORAGE TEMP.,HUMID.AND ALTITUDE		-30 to +85℃, 20 - 90%RH (Non condensing)	
	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 NOISE REGULATIONS	AGENCY APPROVALS	AC input	UL60950-1, C-UL (CSA60950-1), EN62368-1, UL508 (NEC Class2 per UL1310), UL121201, ATEX, Complies with DEN-AN ＊	
		DC input	UL60950-1, C-UL (CSA60950-1), EN62368-1	
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B	
	HARMONIC ATTENUATOR		Complies with IEC61000-3-2 (Class A) ＊6 (Not built-in to active filter) ＊9	
OTHERS	CASE SIZE ＊7		32×90×90mm (W×H×D) [1.26×3.54×3.54 inches]	
	WEIGHT		270g max	
	COOLING METHOD		Convection	

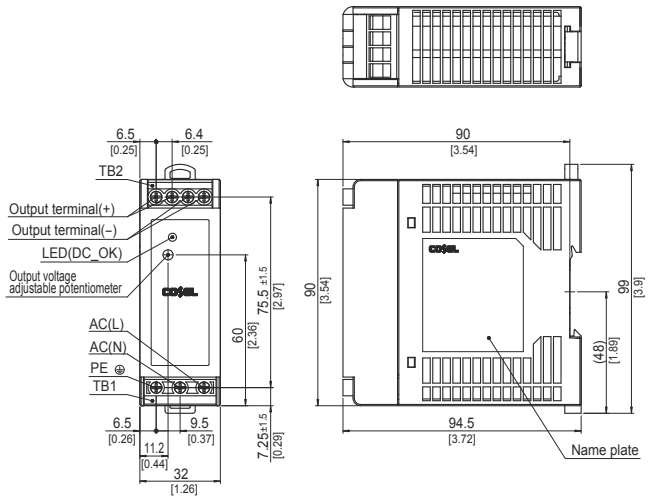
＊1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is excluded.
＊2 Please contact us about dynamic load and input response.
＊3 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.7.
Ripple and ripple noise spec is change at Io=0 to 30% by burst operation.
＊4 In case of operating under 0℃ 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℃, with the input voltage held constant at the rated input/output.
＊6 Please contact us about another class.
＊7 Case size contains neither the umbo.
＊8 Only as standard mounting orientation (A). Refer to the "Assembling and Installation Method".
If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.
＊9 When two or more units are operating it may not comply with the IEC61000-3-2.
＊10 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 1.3.
＊11 Under low DC input voltage below DC110V, the temperature derating -1℃/V or the output power derating -1%/V are required.
＊ To meet the specifications. Do not operate over-loaded condition.
＊ A sound may occur from power supply at light or peak loading.

Block diagram



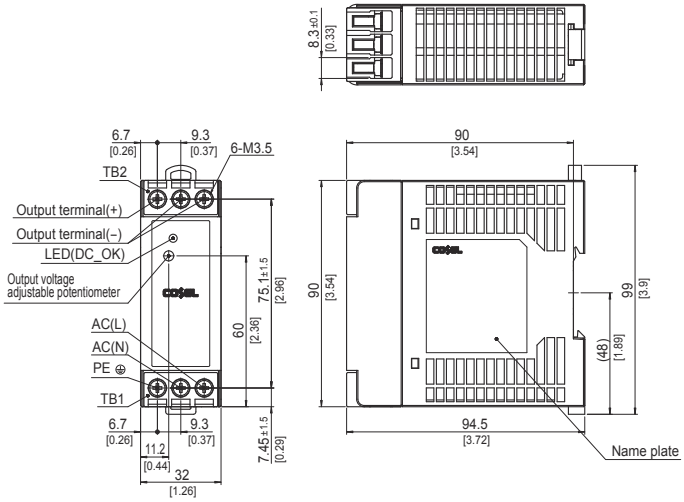
External view

<KHEA60F(Euro Style I/O Terminals)>



※ Tolerance : ±1 [±0.04]
※ Weight : 270g max
※ PCB Material/thickness : FR-4 / 1.6mm [0.06]
※ Chassis・Case material : PBT
※ Din rail attachment material : PC/ABS
※ Dimensions in mm, [ ] = inches
※ Screw tightening torque : 1N・m max

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



※ Tolerance : ±1 [±0.04]
※ Weight : 270g max
※ PCB Material/thickness : FR-4 / 1.6mm [0.06]
※ Chassis・Case material : PBT
※ Din rail attachment material : PC/ABS
※ Dimensions in mm, [ ] = inches
※ Screw tightening torque : 1.1N・m max

COSEL AC-DC Power Supplies DIN Rail Type

KHEA/KHNA90F

Ordering information

KH□ A 90 F -□□ -□

① ② ③ ④ ⑤ ⑧

Example recommended EMI/EMC filter
NAC-04-472-D

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.

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

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

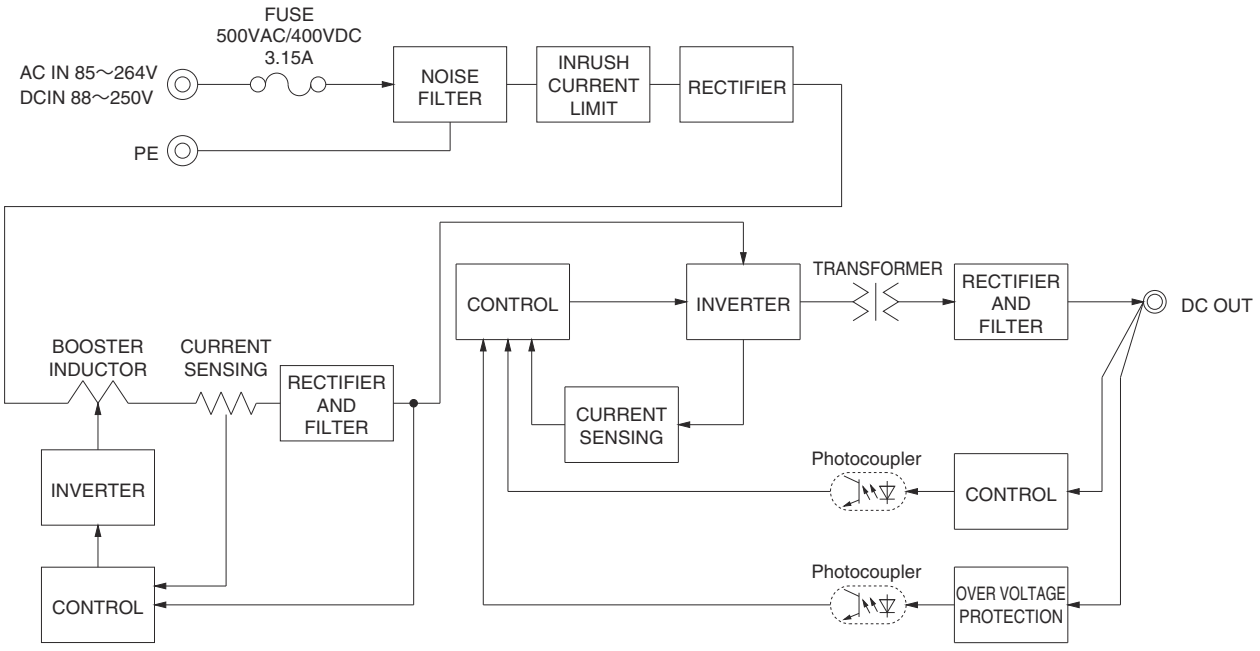
MODEL	KHEA/KHNA90F-12	KHEA/KHNA90F-24
MAX OUTPUT WATTAGE[W]	81.6	91.2
DC OUTPUT	12V 6.8A	24V 3.8A

SPECIFICATIONS

	MODEL		KHEA/KHNA90F-12	KHEA/KHNA90F-24
INPUT	VOLTAGE[V]		AC85 - 264 1φ (Refer to "Derating") or DC88-250 ＊10	
	CURRENT[A]	ACIN 115V	0.85typ	0.95typ
		ACIN 230V	0.45typ	0.55typ
	FREQUENCY[Hz]		50 / 60 (45 - 66) or DC	
	EFFICIENCY[%]	ACIN 115V	87.0typ	89.0typ (88.0typ for option -E)
		ACIN 230V	88.0typ	91.0typ (89.5typ for option -E)
	POWER FACTOR (Io=100%)	ACIN 115V	0.98typ	
		ACIN 230V	0.86typ	
	INRUSH CURRENT[A] ＊1	ACIN 115V	18typ (Io=100%) (at cold start Ta=25℃)	
		ACIN 230V	35typ (Io=100%) (at cold start Ta=25℃)	
	LEAKAGE CURRENT[mA]		0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC62368-1 and DEN-AN)	
OUTPUT	VOLTAGE[V]		12	24
	CURRENT[A]		6.8	3.8
	PEAK CURRENT[A]		-	-
	LINE REGULATION[mV] ＊2		48max	96max
	LOAD REGULATION[mV] ＊2		100max	150max
	RIPPLE[mVp-p] ＊3	0 to +70℃	200max	200max
		-20 - 0℃	300max	300max
		Io=0 - 30%	300max ＊4	300max ＊4
	RIPPLE NOISE[mVp-p] ＊3	0 to +70℃	260max	260max
		-20 - 0℃	360max	360max
		Io=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 RANGE[V]		10.80 to 13.20	22.50 to 28.50 (Fixed for option -E)
	OUTPUT VOLTAGE SETTING[V]		12.00 to 12.48	24.00 to 24.96 (24.00 to 24.50 for option -E)
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating (101% for option -E), recovers automatically ＊9	
	OVERVOLTAGE PROTECTION[V]		13.80 to 16.80	30.00 to 36.00 (26.40 to 33.60 for option -E)
	DC_OK LAMP		LED (Green)	
ISOLATION	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)	
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)	
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)	
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-20 to +70℃, 20 - 90%RH (Non condensing), Type tested for -40℃ start-up (Refer to "Derating")	
	STORAGE TEMP.,HUMID.AND ALTITUDE		-30 to +85℃, 20 - 90%RH (Non condensing)	
	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, X, Y and Z axis (Packing state)	
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS	AC input	UL60950-1, C-UL (CSA60950-1), EN62368-1, UL508, NEC Class2 (24V output only option -E), UL121201, ATEX, Complies with DEN-AN	
		DC input	UL60950-1, C-UL (CSA60950-1), EN62368-1	
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B	
	HARMONIC ATTENUATOR		Complies with IEC61000-3-2 (Class A) ＊6	
OTHERS	CASE SIZE ＊7		50×90×90mm (W×H×D) [1.97×3.54×3.54 inches]	
	WEIGHT		405g max	
	COOLING METHOD		Convection	

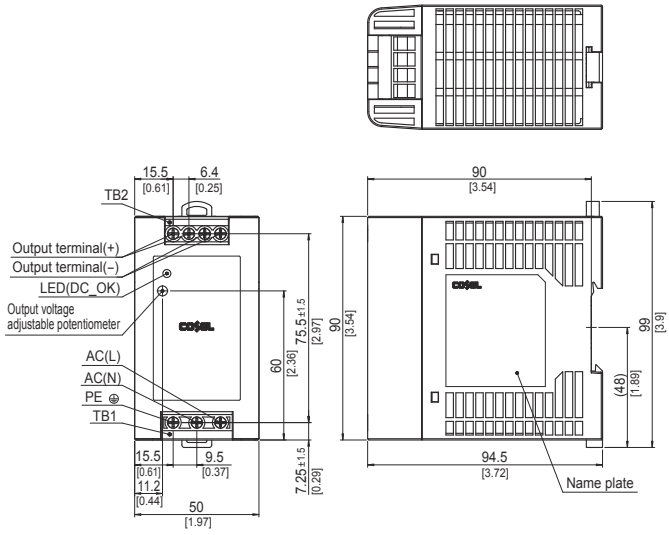
＊1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is excluded.
＊2 Please contact us about dynamic load and input response.
＊3 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.7.
Ripple and ripple noise spec is change at Io=0 to 30% by burst operation.
＊4 In case of operating under 0℃ 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℃, with the input voltage held constant at the rated input/output.
＊6 Please contact us about another class.
＊7 Case size contains neither the umbo.
＊8 Only as standard mounting orientation (A). Refer to the "Assembling and Installation Method".
If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.
＊9 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 1.3.
＊10 Under low DC input voltage below DC110V, the temperature derating -1℃/V or the output power derating -1%/V are required.
＊ To meet the specifications. Do not operate over-loaded condition.
＊ A sound may occur from power supply at light or peak loading.

Block diagram



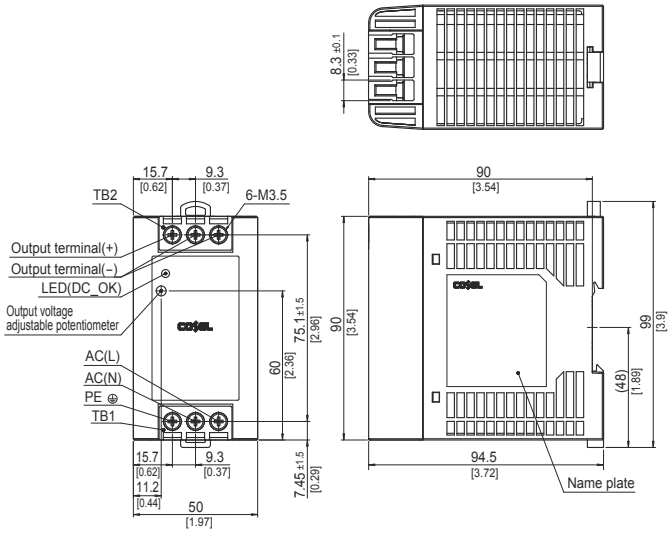
External view

<KHEA90F(Euro Style I/O Terminals)>



※ 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

<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 : 1.1N・m max

COSEL AC-DC Power Supplies DIN Rail Type

KHEA/KHNA120F

Ordering information

KH□ ① A ② -120 ③ F ④ -24 ⑤ -□ ⑥

Example recommended EMI/EMC filter
NAC-04-472-D

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.

①Series name
KHE : Euro style I/O terminals
KHN : Barrier blocks style I/O terminals
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Option
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.

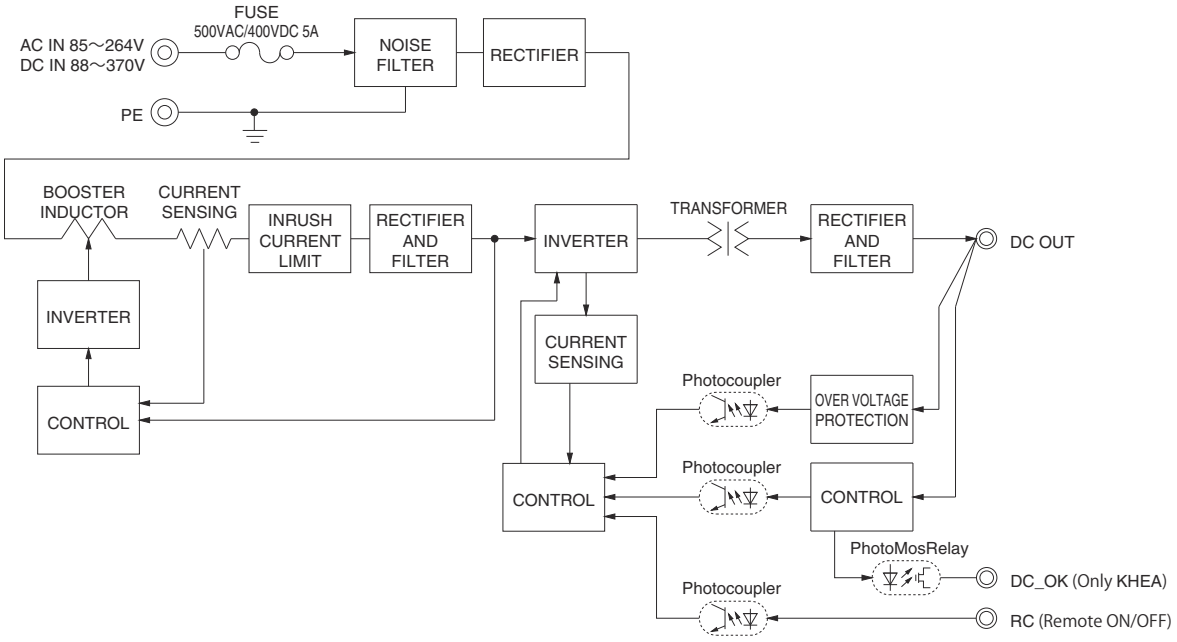
MODEL	KHEA / KHNA120F-24
MAX OUTPUT WATTAGE[W]	120
DC OUTPUT	24V 5A (Peak 7.5A)

SPECIFICATIONS

	MODEL		KHEA / KHNA120F-24
INPUT	VOLTAGE[V]		AC85 - 264 1φ or DC88 - 370 *10
	CURRENT[A]	ACIN 115V	1.2typ
		ACIN 230V	0.6typ
	FREQUENCY[Hz]		50 / 60 (45 - 66) or DC
	EFFICIENCY[%]	ACIN 115V	90typ
		ACIN 230V	92typ
	POWER FACTOR	ACIN 115V	0.98typ
		ACIN 230V	0.93typ
	INRUSH CURRENT[A] *1	ACIN 115V	15typ (at cold start Ta=25℃)
		ACIN 230V	30typ (at cold start Ta=25℃)
	LEAKAGE CURRENT[mA]		0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC62368-1 and DEN-AN)
OUTPUT	VOLTAGE[V]		24
	CURRENT[A]		5
	PEAK CURRENT[A] *2		7.5
	LINE REGULATION[mV] *3		96max
	LOAD REGULATION[mV] *3		150max *4
	RIPPLE[mVp-p] *5	0 to +70℃	120max
		-25 - 0℃	240max
		Io=0 - 30%	240max *4
	RIPPLE NOISE[mVp-p] *5	0 to +70℃	150max
		-25 - 0℃	300max
		Io=0 - 30%	300max *4
	TEMPERATURE REGULATION[mV]	0 to +70℃	240max *4
		-25 to +70℃	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 RANGE[V]		22.5 to 28.5
	OUTPUT VOLTAGE SETTING[V]		24.0±1.0%
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 101% of peak current and recovers automatically
	OVERVOLTAGE PROTECTION[V]		30.0 to 36.0
	REMOTE ON/OFF (RC)		Provided
	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)
ISOLATION	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)
	OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-25 to +70℃, 20 - 90%RH (Non condensing), Type tested for -40℃ start-up (Refer to "Derating")
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +85℃, 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)
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS	AC input	UL60950-1, C-UL (CSA60950-1), EN62368-1, UL508, UL121201, ATEX, GL, Complies with DEN-AN
		DC input	UL60950-1, C-UL (CSA60950-1), EN62368-1
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B
	HARMONIC ATTENUATOR		Complies with IEC61000-3-2 (Class A) *7
OTHERS	CASE SIZE *8		37×124×117mm (W×H×D) [1.46×4.88×4.61 inches]
	WEIGHT		580g max
	COOLING METHOD		Convection

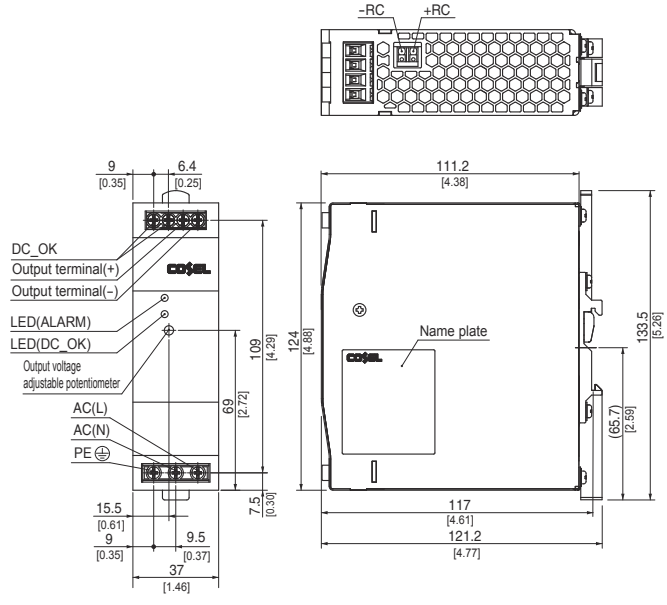
*1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is excluded.
*2 Refer to 2, instruction manual.
*3 Please contact us about dynamic load and input response.
*4 The output voltage is below 23.5V, the value is equal to three times of the specification.
*5 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.7.
*6 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃, 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.
*9 Only as standard mounting orientation (A). Refer to the "Assembling and Installation Method".
If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.
*10 Under low DC input voltage below DC110V, the temperature derating -1℃/V or the output power derating -1%/V are required.
* To meet the specifications. Do not operate over-loaded condition.
* A sound may occur from power supply at light or peak loading.

Block diagram



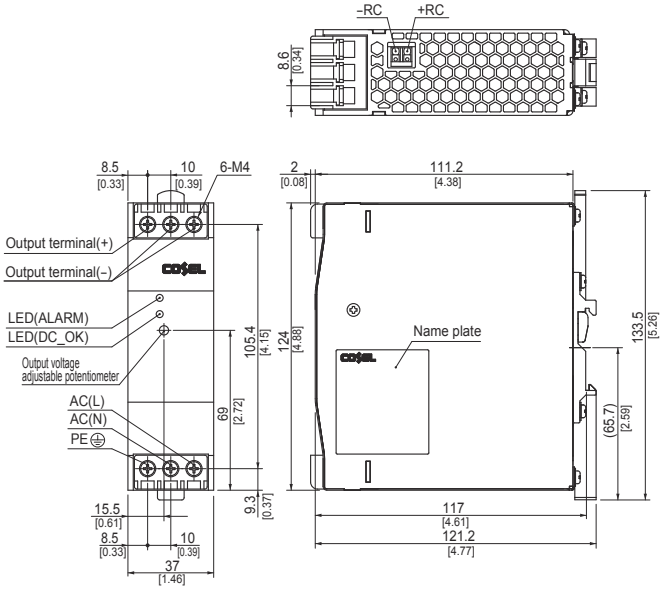
External view

<KHEA120F(Euro Style I/O Terminals)>



※ 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

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



※ 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

COSEL AC-DC Power Supplies DIN Rail Type

KHEA/KHNA240F

Ordering information

KH□ A -240 F -24 -□
① ② ③ ④ ⑤ ⑥

Example recommended EMI/EMC filter
NAC-06-472-D

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.

①Series name
KHE : Euro style I/O terminals
KHN : Barrier blocks style I/O terminals
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Option
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.

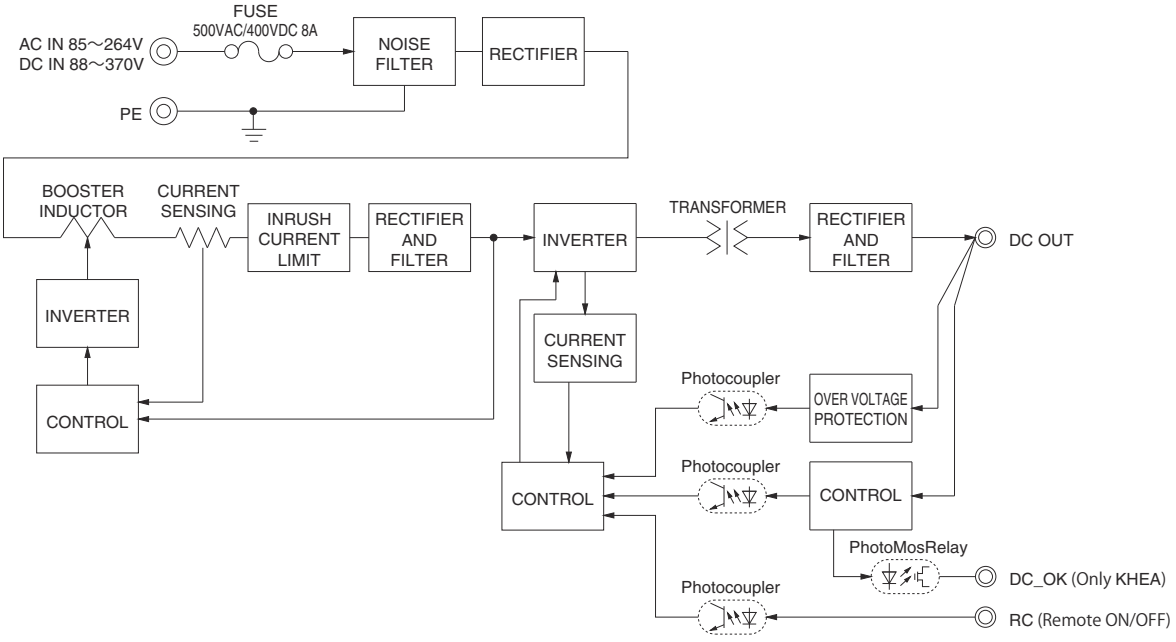
MODEL	KHEA / KHNA240F-24
MAX OUTPUT WATTAGE[W]	240
DC OUTPUT	24V 10A (Peak 15A)

SPECIFICATIONS

	MODEL		KHEA / KHNA240F-24
INPUT	VOLTAGE[V]		AC85 - 264 1φ or DC88 - 370 ＊10
	CURRENT[A]	ACIN 115V	2.3typ
		ACIN 230V	1.2typ
	FREQUENCY[Hz]		50 / 60 (45 - 66) or DC
	EFFICIENCY[%]	ACIN 115V	92typ
		ACIN 230V	94typ
	POWER FACTOR	ACIN 115V	0.98typ
		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]		0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC62368-1 and DEN-AN)
OUTPUT	VOLTAGE[V]		24
	CURRENT[A]		10
	PEAK CURRENT[A]	＊2	15
	LINE REGULATION[mV]	＊3	96max
	LOAD REGULATION[mV]	＊3	150max ＊4
	RIPPLE[mVp-p] ＊5	0 to +70℃	120max
		-25 - 0℃	240max
		Io=0 - 30%	240max ＊4
	RIPPLE NOISE[mVp-p] ＊5	0 to +70℃	150max
		-25 - 0℃	300max
		Io=0 - 30%	300max ＊4
	TEMPERATURE REGULATION[mV]	0 to +70℃	240max ＊4
		-25 to +70℃	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 RANGE[V]		22.5 to 28.5
	OUTPUT VOLTAGE SETTING[V]		24.0±1.0%
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 101% of peak current and recovers automatically
	OVERVOLTAGE PROTECTION[V]		30.0 to 36.0
	REMOTE ON/OFF (RC)		Provided
	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)
ISOLATION	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)
	OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-25 to +70℃, 20 - 90%RH (Non condensing), Type tested for -40℃ start-up (Refer to "Derating")
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +85℃, 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)
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS	AC input	UL62368-1,C-UL (equivalent to CAN/CSA-C22.2 No. 62368-1), EN62368-1, UL508, UL121201, ATEX, GL, Complies with DEN-AN
		DC input	UL62368-1,C-UL (equivalent to CAN/CSA-C22.2 No. 62368-1), EN62368-1
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B
	HARMONIC ATTENUATOR		Complies with IEC61000-3-2 (Class A) ＊7
OTHERS	CASE SIZE	＊8	50×124×117mm (W×H×D) [1.97×4.88×4.61 inches]
	WEIGHT		900g max
	COOLING METHOD		Convection

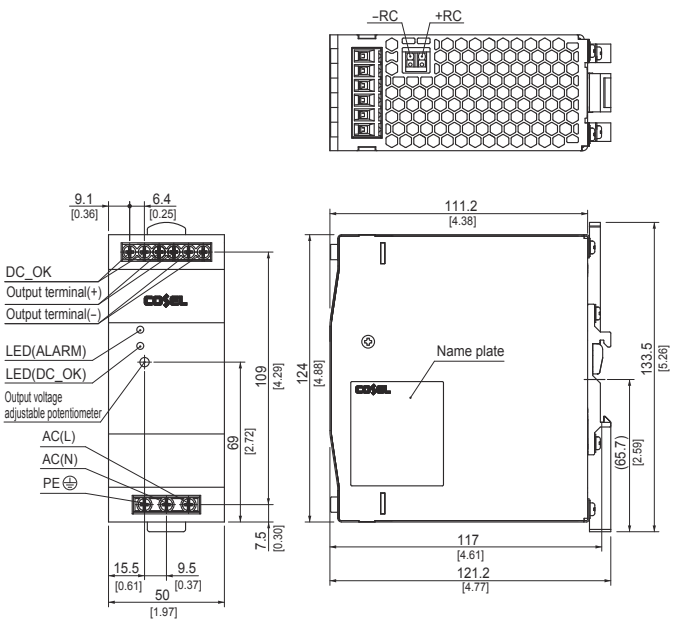
*1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is excluded.
*2 Refer to 2, instruction manual.
*3 Please contact us about dynamic load and input response.
*4 The output voltage is below 23.5V, the value is equal to three times of the specification.
*5 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.7.
*6 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃, 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.
*9 Only as standard mounting orientation (A). Refer to the "Assembling and Installation Method".
If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.
*10 Under low DC input voltage below DC110V, the temperature derating -1℃/V or the output power derating -1%/V are required.
* To meet the specifications. Do not operate over-loaded condition.
* A sound may occur from power supply at light or peak loading.

Block diagram



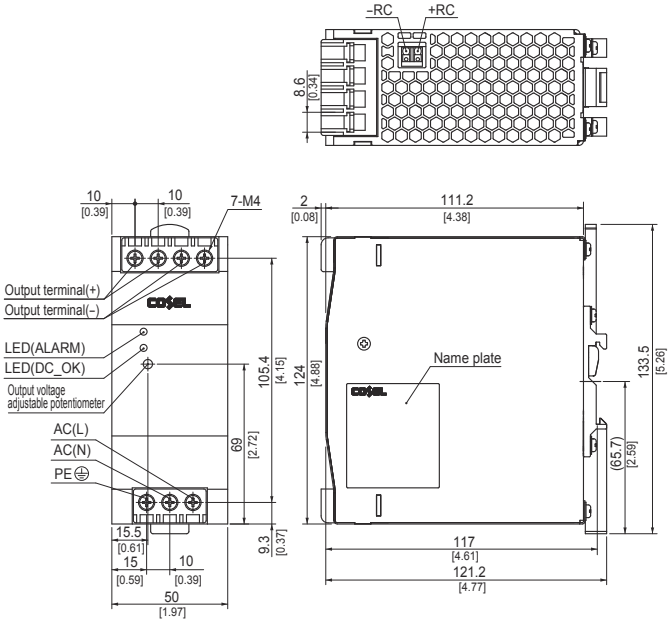
External view

<KHEA240F(Euro Style I/O Terminals)>



※ 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

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



※ 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

COSEL AC-DC Power Supplies DIN Rail Type

KHEA/KHNA480F

Ordering information

KH□ A 480 F -□□ -□

① ② ③ ④ ⑤ ⑧

Example recommended EMI/EMC filter
NAC-10-472-D

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.

①Series name
KHE : Euro style I/O terminals
KHN : Barrier blocks style I/O terminals
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Option
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.

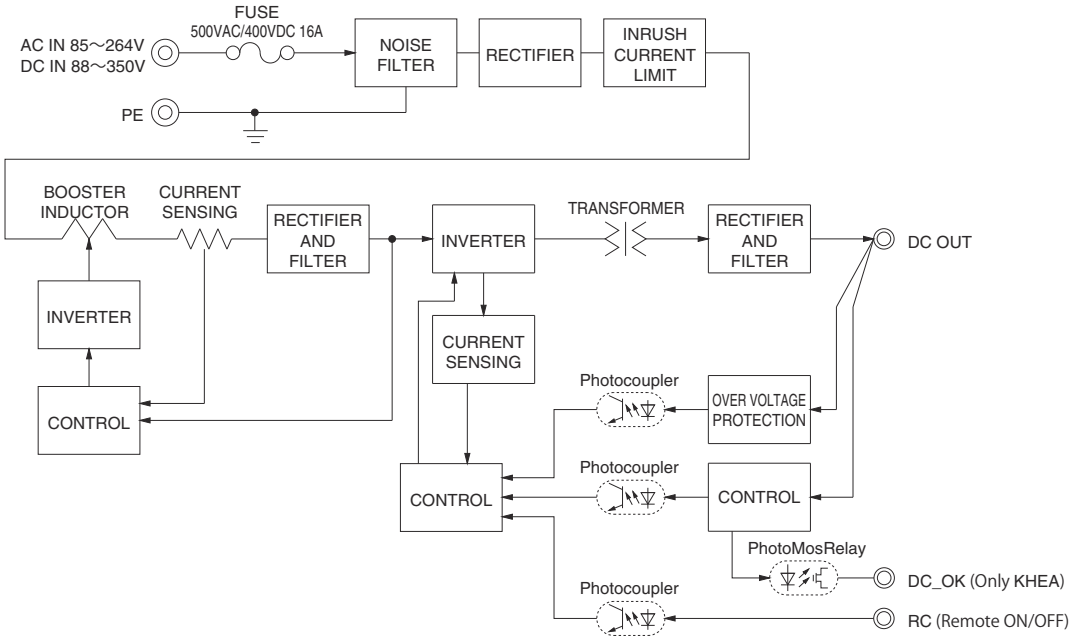
MODEL	KHEA / KHNA480F-24	KHEA / KHNA480F-48
MAX OUTPUT WATTAGE[W]	480	480
DC OUTPUT	24V 20A (Peak 30A)	48V 10A (Peak 15A)

SPECIFICATIONS

	MODEL		KHEA / KHNA480F-24	KHEA / KHNA480F-48
INPUT	VOLTAGE[V]		AC85 - 264 1φ (Output derating is required) or DC88 - 350 ＊10	
	CURRENT[A]	ACIN 115V	4.6typ	
		ACIN 230V	2.3typ	
	FREQUENCY[Hz]		50 / 60 (45 - 66) or DC	
	EFFICIENCY[%]	ACIN 115V	92typ	
		ACIN 230V	94typ	
	POWER FACTOR	ACIN 115V	0.98typ	
		ACIN 230V	0.93typ	
	INRUSH CURRENT[A] ＊1	ACIN 115V	20typ (more than 3 sec. to re-start)	
		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 IEC62368-1 and DEN-AN)	
OUTPUT	VOLTAGE[V]		24	48
	CURRENT[A]		20	10
	PEAK CURRENT[A] ＊2		30	15
	LINE REGULATION[mV] ＊3		96max (Io=30-100%) ＊9	192max (Io=30-100%) ＊9
	LOAD REGULATION[mV] ＊3		150max (Io=30-100%) ＊9	300max (Io=30-100%) ＊9
	RIPPLE[mVp-p] ＊4	0 to +70℃	120max	120max
		-25 - 0℃	240max	240max
		Io=0 - 30%	500max	750max
	RIPPLE NOISE[mVp-p] ＊4	0 to +70℃	150max	150max
		-25 - 0℃	300max	300max
		Io=0 - 30%	600max	750max
	TEMPERATURE REGULATION[mV]	0 to +70℃	240max	480max
		-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%
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 101% of peak current and recovers automatically	
	OVERVOLTAGE PROTECTION[V]		30.0 to 36.0	57.6 to 67.2
	REMOTE ON/OFF (RC)		Provided	
	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)	
ISOLATION	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)	
	INPUT-PE		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)	
	OUTPUT-PE		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)	
	OUTPUT-RC, DC_OK		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)	
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-25 to +70℃, 20 - 90%RH (Non condensing), Type tested for -40℃ start-up (Refer to "Derating")	
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +85℃, 20 - 90%RH (Non condensing)	
	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 NOISE REGULATIONS	AGENCY APPROVALS	AC input	UL60950-1, C-UL (CSA60950-1), EN62368-1, UL508, ANSI/ISA12.12.01, ATEX, GL (Only 24V), Complies with DEN-AN	
		DC input	UL60950-1, C-UL (CSA60950-1), EN62368-1	
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B	
	HARMONIC ATTENUATOR		Complies with IEC61000-3-2 (Class A) ＊6	
OTHERS	CASE SIZE ＊7		70×124×117mm (W×H×D) [2.76×4.88×4.61 inches]	
	WEIGHT		1,200g max	
	COOLING METHOD		Convection	

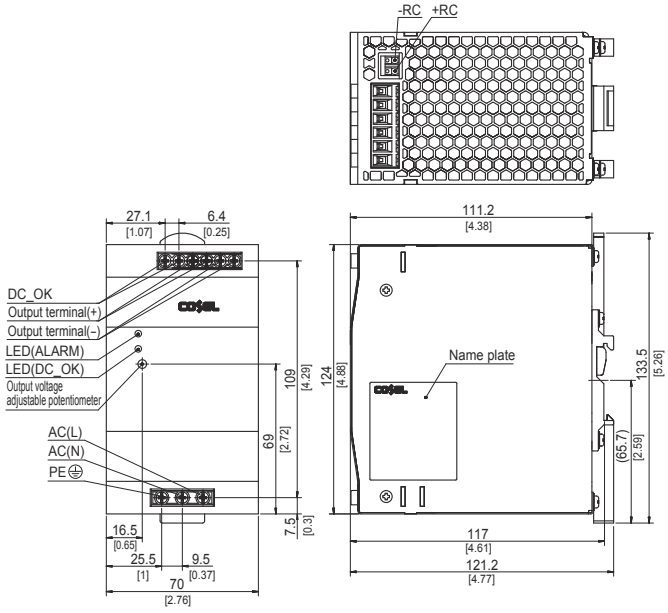
*1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is excluded.
*2 Refer to 3, instruction manual.
*3 Please contact us about dynamic load and input response.
*4 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF at 150mm from output terminal.
Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
Please refer to the instruction manual 1.7.
*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃, with the input voltage held constant at the rated input/output.
*6 Please contact us about another class.
*7 Case size contains neither the umbo.
*8 Only as standard mounting orientation (A). Refer to the "Assembling and Installation Method".
If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.
*9 Burst operation at 30% load or less.
*10 Under low DC input voltage below DC110V, the temperature derating -1℃/V or the output power derating -1%/V are required.
* To meet the specifications. Do not operate over-loaded condition.
* A sound may occur from power supply at light or peak loading.

Block diagram



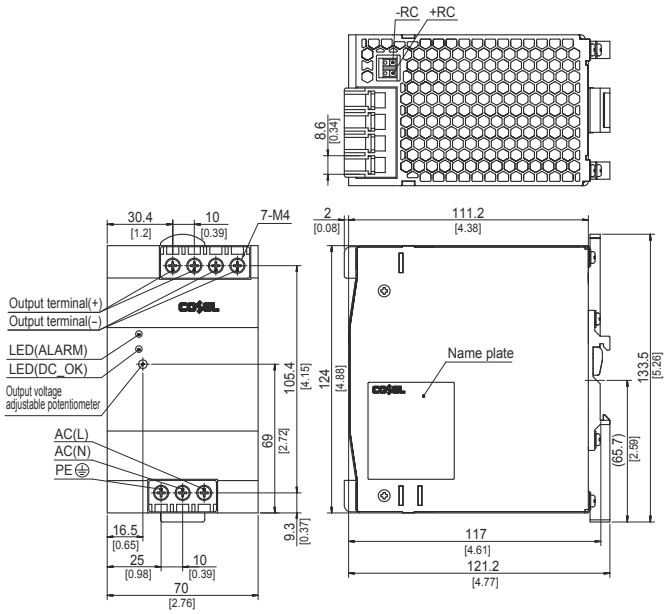
External view

<KHEA480F(Euro Style I/O Terminals)>



※ Tolerance : ±1 [±0.04]
※ 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

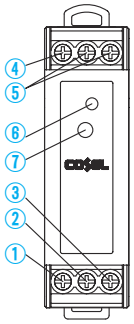
<KHNA480F(Barrier Blocks Style I/O Terminals)>



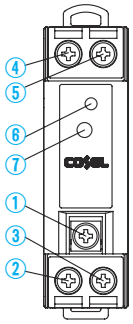
※ Tolerance : ±1 [±0.04]
※ Weight : 1,200g max
※ PCB Material/thickness : FR-4 / 1.6mm [0.06]
※ Chassis material : Aluminum
※ Case material : Stainless steel
※ DIN rail attachment material : Aluminum, Stainless steel, Nylon
※ Dimensions in mm, [ ] = inches
※ Screw tightening torque : 1.6N・m max

Terminal Blocks

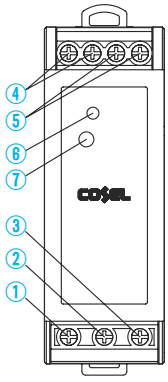
● KHEA30F



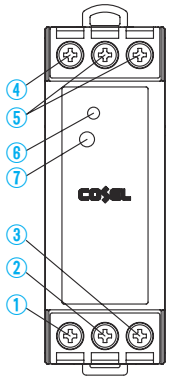
● KHNA30F



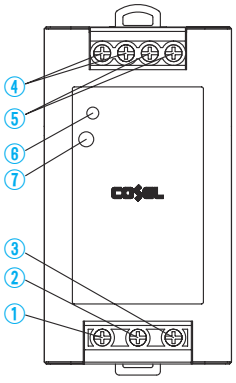
● KHEA60F



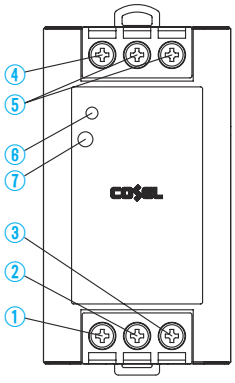
● KHNA60F



● KHEA90F



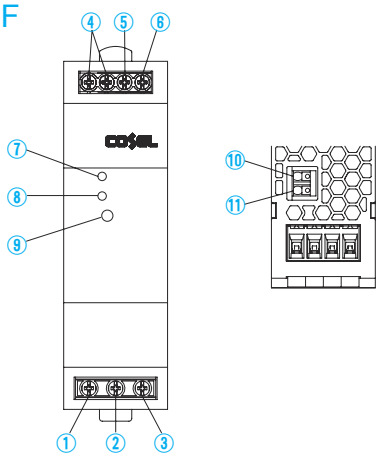
● KHNA90F



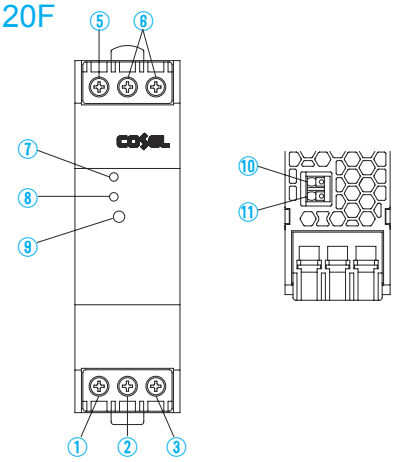
Terminal Number	Terminal Name	Function
①	PE	Protective earth Terminal
②	AC (N)	Input Terminals
③	AC (L)	
④	+VOUT	+Output Terminals
⑤	−VOUT	−Output Terminals
⑥	DC_OK	LED for output voltage confirmation
⑦	TRM	Adjustment of output voltage

Terminal Blocks

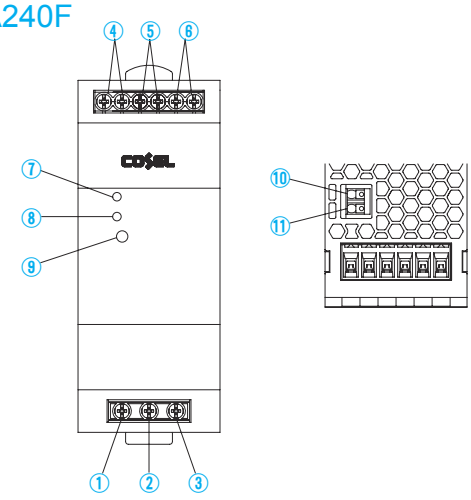
● KHEA120F



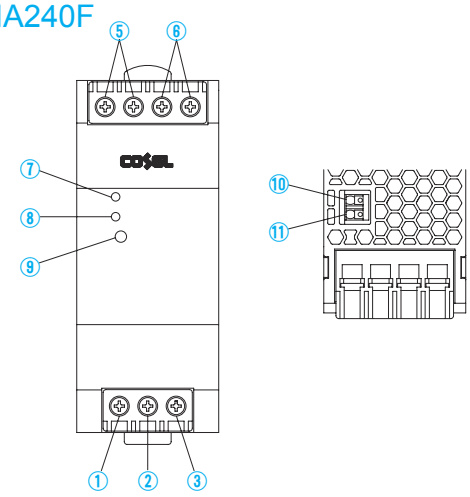
● KHNA120F



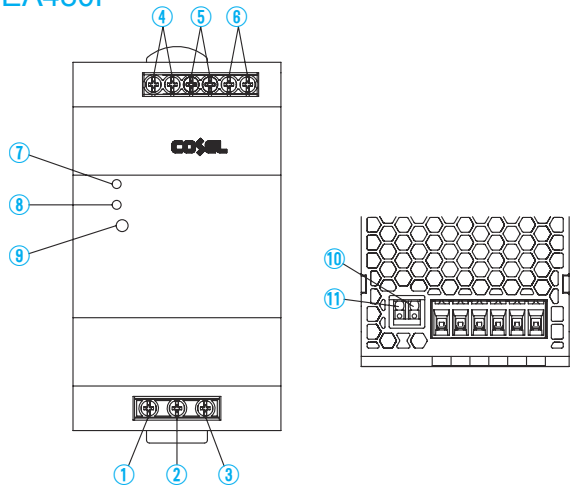
● KHEA240F



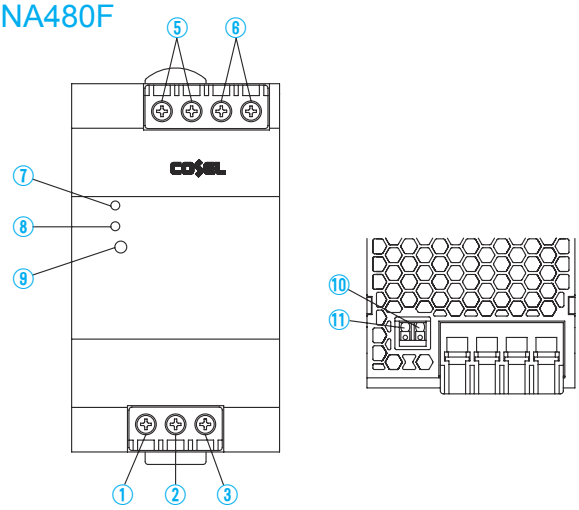
● KHNA240F



● KHEA480F



● KHNA480F



Terminal Number	Terminal Name	Function
①	PE	Protective earth Terminal
②	AC (N)	Input Terminals
③	AC (L)	
④	DC_OK	Output voltage confirmation(relay contact)
⑤	+VOUT	+Output Terminals
⑥	−VOUT	−Output Terminals

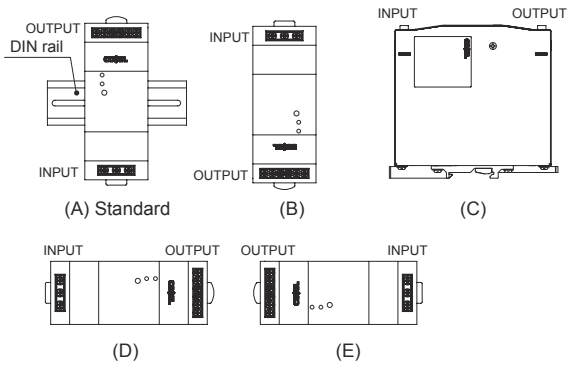
Terminal Number	Terminal Name	Function
⑦	ALARM	LED Alarm for lowered output voltage
⑧	DC_OK	LED for output voltage confirmation
⑨	TRM	Adjustment of output voltage
⑩	+RC	Remote ON/OFF Terminals
⑪	−RC	

Assembling and Installation Method

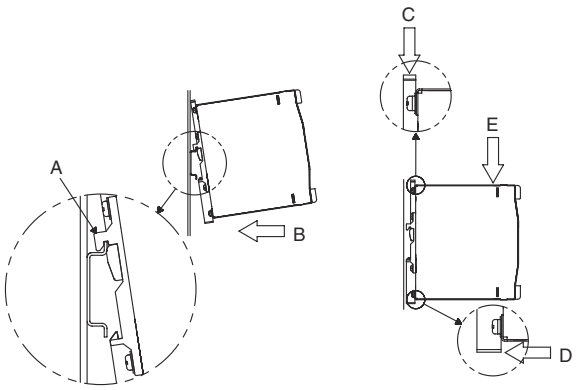
Installation method

■About DIN-Rail Attachment available with DIN EN60715 TH 35 (35×7.5mm or 35×15mm) (Top hat shaped DIN rail)

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



■When you mount a power supply on a DIN rail, have the area marked A catch one side of the rail and push the unit to the direction of B. To remove the power supply from the rail, either push down the area marked C or insert a tool such as driver to the area marked D and pull the unit apart from the rail.
When you couldn't remove the unit easily, push down the area marked C while lightly pushing the unit to the direction of E.

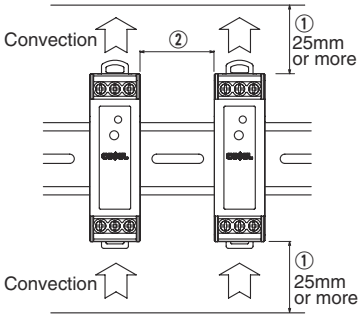


■Shown below the notes about installation clearance of a unit.

● KHEA30F/60F/90F, KHNA30F/60F/90F

① Installation clearance at above and below the unit.
Please have clearance of at least 25mm above and below the unit to avoid heat accumulation.

② Installation clearance at the side of the unit.
Please have clearance of at least 5mm side the unit to insulating the internal components. However, refer to right figure, if adjacent device of the unit (including power supply) is a heat source.



No.	Model	Adjacent device of the unit	
		Non-heat source	Heat source(∗)
1	KHEA30F, KHNA30F	5mm or more	15mm or more
2	KHEA60F, KHNA60F	5mm or more	15mm or more
3	KHEA90F, KHNA90F	5mm or more	15mm or more

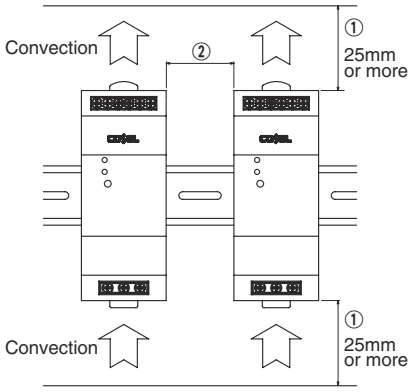
∗Reference value when same power units are adjacent.

Assembling and Installation Method

● KHEA120F/240F/480F,KHNA120F/240F/480F

① Installation clearance at above and below the unit.
Please have clearance of at least 25mm above and below the unit to avoid heat accumulation.

② Installation clearance at the side of the unit.
Please have clearance of at least 15mm side the unit to avoid interfering with heat radiation from housing. However, refer to right figure, if adjacent device of the unit (including power supply) is a heat source.



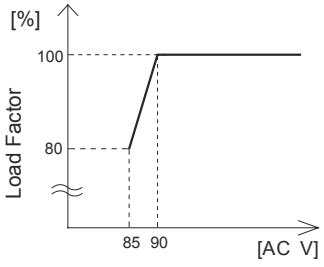
No.	Model	Adjacent device of the unit	
		Non-heat source	Heat source(＊)
1	KHEA120F, KHNA120F	15mm or more	
2	KHEA240F, KHNA240F	15mm or more	
3	KHEA480F, KHNA480F	15mm or more	50mm or more

＊Reference value when same power units are adjacent.

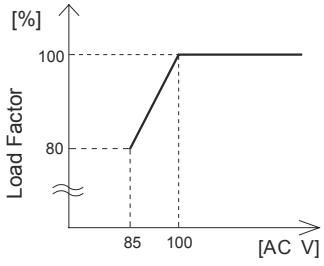
Derating

Derating curve for input voltage

● KHEA30F/60F/90F, KHNA30F/60F/90F



● KHEA480F, KHNA480F

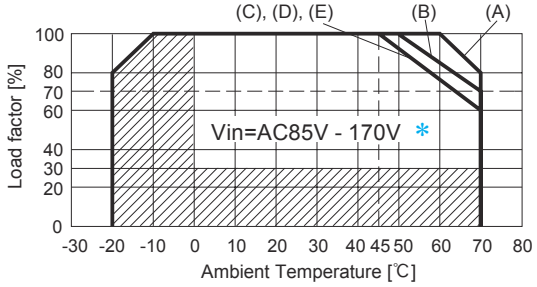


Ambient temperature derating

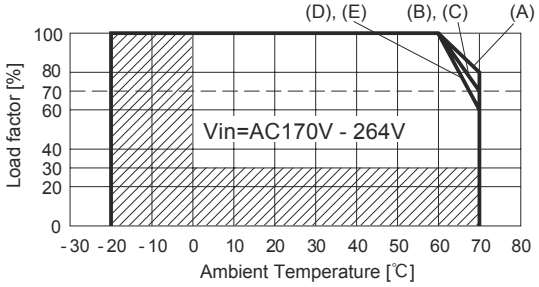
■The operative ambient temperature as different by input voltage. Derating curve is shown below.
■In the hatched area,the specification of Ripple,Ripple Noise is different from other area.

■Derating Curve (Convection)
■Refer to instruction manual 4 for Ambient temperature measurement point.

● KHEA30F, KHNA30F

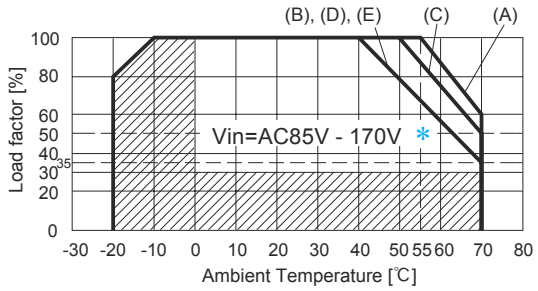


＊ Derating curve depend on input voltage is required.

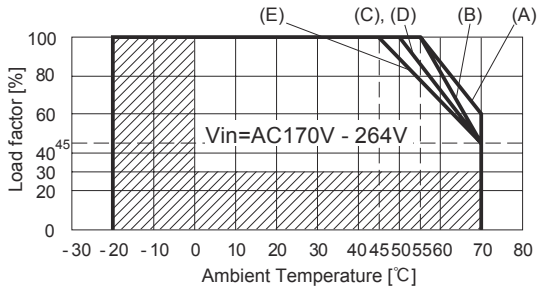


Derating

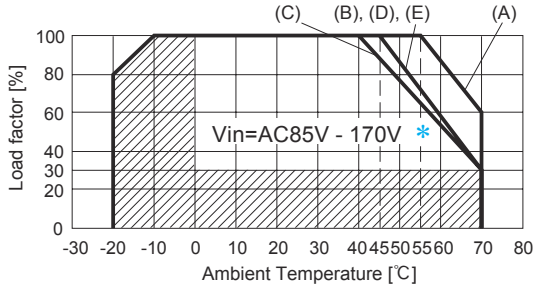
● KHEA60F, KHNA60F



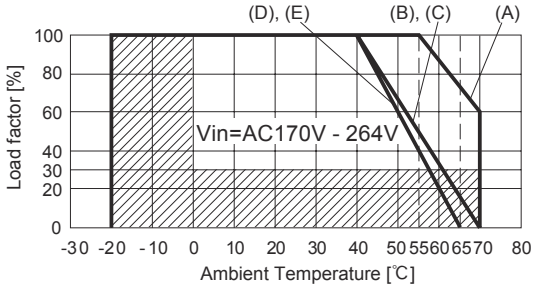
✻ Derating curve depend on input voltage is required.



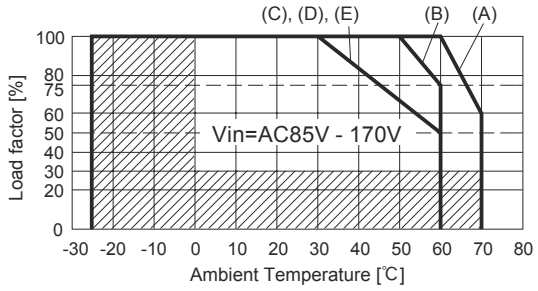
● KHEA90F, KHNA90F

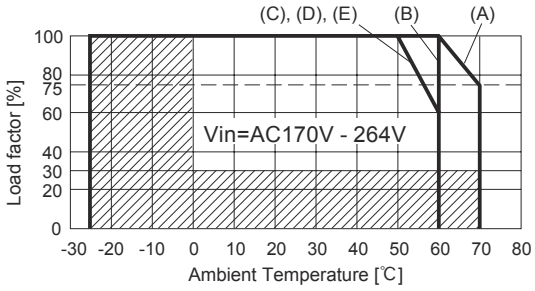


✻ Derating curve depend on input voltage is required.

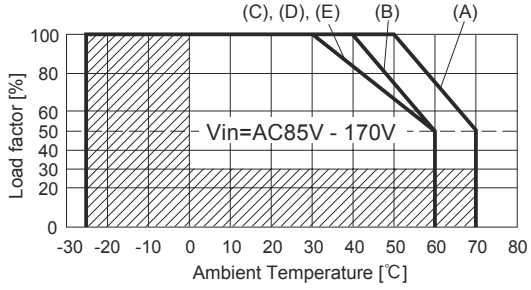


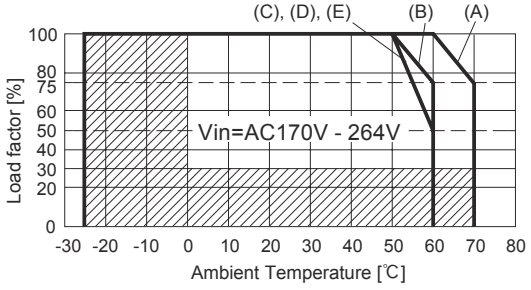
● KHEA120F, KHNA120F





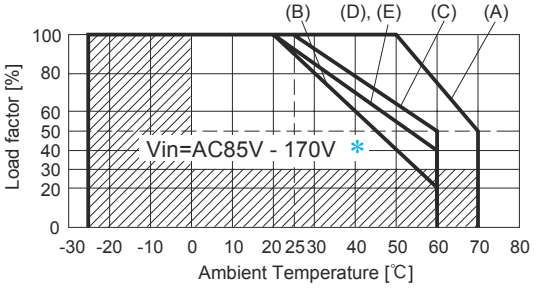
● KHEA240F, KHNA240F

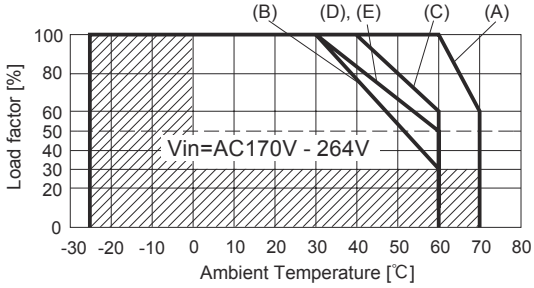




Derating

● KHEA480F, KHNA480F



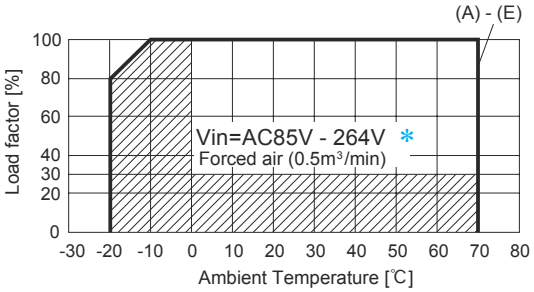


✻ Derating curve depend on input voltage is required.

■Derating Curve (Forced air)

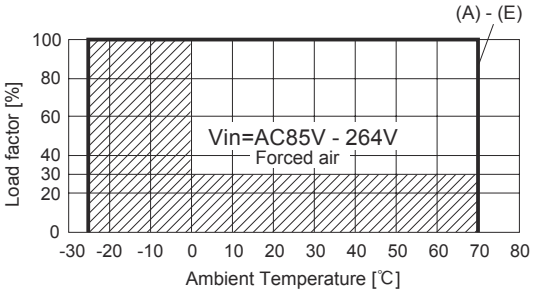
■Use the temperature measurement point as shown in instruction manual 4. Please use at the temperature dose not exceed the values in instruction manual 4.

● KHEA30F/60F/90F, KHNA30F/60F/90F

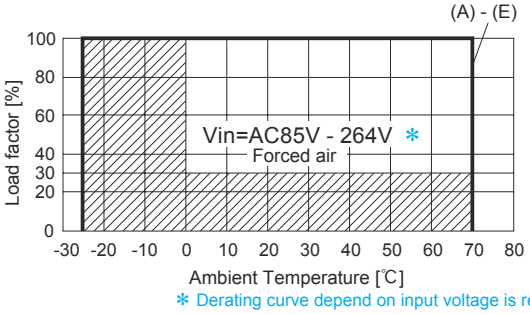


✻ Derating curve depend on input voltage is required.

● KHEA120F/240F, KHNA120F/240F



● KHEA480F, KHNA480F



✻ Derating curve depend on input voltage is required.

Instruction Manual

◆ It is neccessary to read the “Instruction Manual” and “Before using our product” before you use our product.

Instruction Manual https://www.cosel.co.jp/redirect/catalog/en/KH/
Before using our product https://en.cosel.co.jp/technical/caution/index.html

KH NOTICE

Basic Characteristics Data

Model	Circuit method	Switching frequency ∗2 [kHz]	Input current [A] ∗1	Rated input fuse	Inrush current protection circuit	PCB/Pattern			Series/Parallel operation availability	
						Material	Single sided	Double sided	Series operation	Parallel operation
KHEA30F KHNA30F	Flyback converter	50 - 200	0.55	500VAC/400VDC 3.15A	Thermistor	FR-4		Yes	Yes	No
KHEA60F KHNA60F	Flyback converter	50 - 200	1.10	500VAC/400VDC 3.15A	Thermistor	FR-4		Yes	Yes	No
KHEA90F	Active filter	20 - 500	0.95	500VAC/400VDC 3.15A	Thermistor	FR-4		Yes	Yes	No
KHNA90F	Flyback converter	50 - 200								
KHEA120F	Active filter	60 - 550	1.2	500VAC/400VDC 5A	Thermistor	FR-4		Yes	Yes	No
KHNA120F	LLC resonant converter	45 - 350								
KHEA240F	Active filter	60 - 550	2.3	500VAC/400VDC 8A	SCR	FR-4		Yes	Yes	No
KHNA240F	LLC resonant converter	45 - 350								
KHEA480F	Active filter	60 - 150	4.6	500VAC/400VDC 16A	Relay	FR-4		Yes	Yes	No
KHNA480F	LLC resonant converter	45 - 350								

∗1 The value of input current is at ACIN 115V and 100%.
∗2 Burst operation at light loading, frequency is change by use condition.
Please contact us about detail.