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.

000

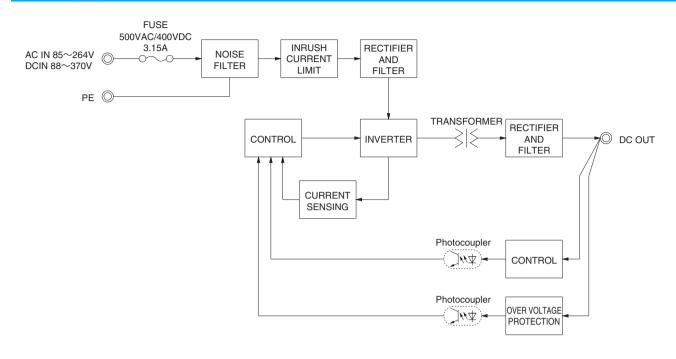
| MODEL | KHEA/KHNA30F-5 | KHEA/KHNA30F-12 | KHEA/KHNA30F-24 |
|-----------------------|----------------|-----------------|-----------------|
| MAX OUTPUT WATTAGE[W] | 25 | 27.6 | 31.2 |
| DC OUTPUT | 5V 5A | 12V 2.3A | 24V 1.3A |

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. | |

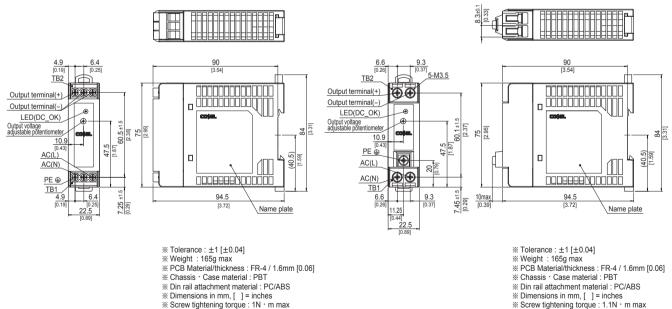




External view

<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 © 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.

(\$1.51.5)

| 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

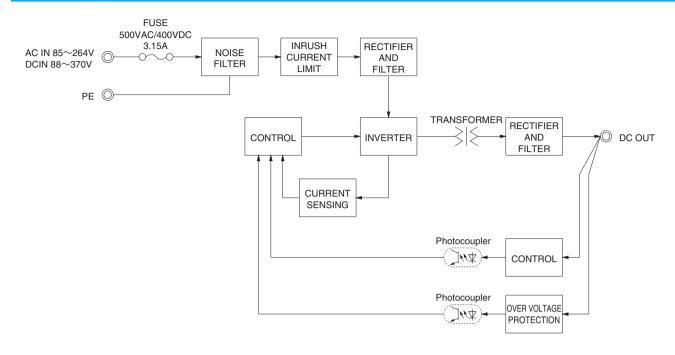
| | MODEL | | KHEA/KHNA60F-12 | KHEA/KHNA60F-24 | |
|--|---|---|--|--|--|
| | VOLTAGE[V] | | AC85 - 264 1 ϕ (Output derating is required) or DC88 - 370 *11 | | |
| | | ACIN 115V | 1.00typ 1.10typ | | |
| | CURRENT[A] | ACIN 230V | 0.60typ | 0.70typ | |
| | FREQUENCY[Hz] | 1 | 50 / 60 (45 - 440) or DC | | |
| 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.

KH series | CO\$EL

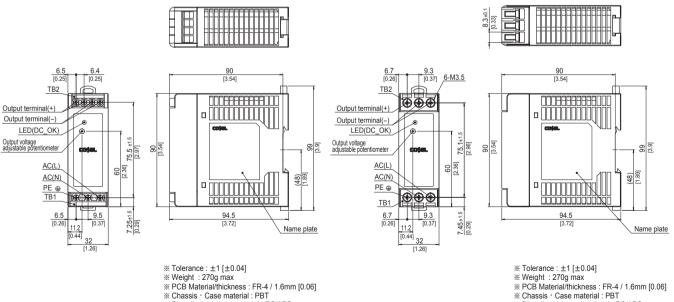




External view

<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

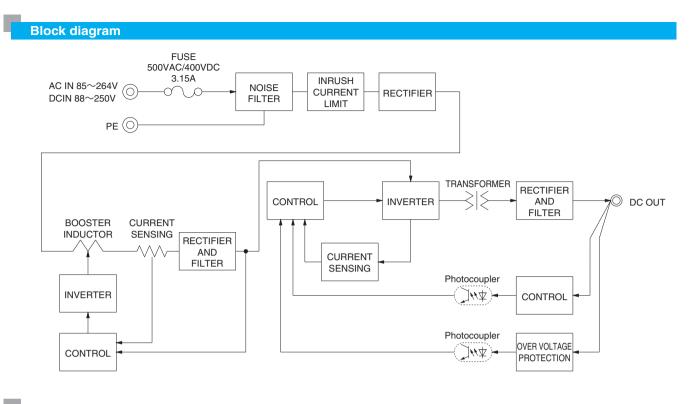
30% load factor. *5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the

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.

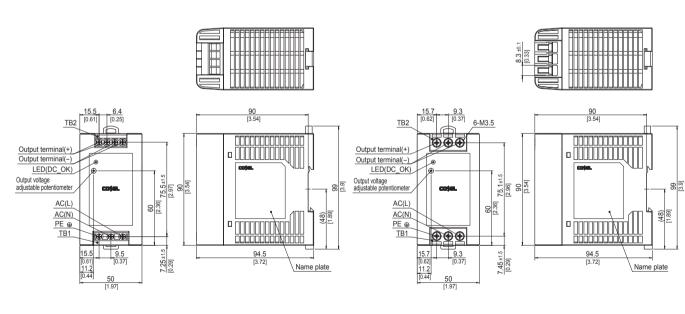
KH series | CO\$EL



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

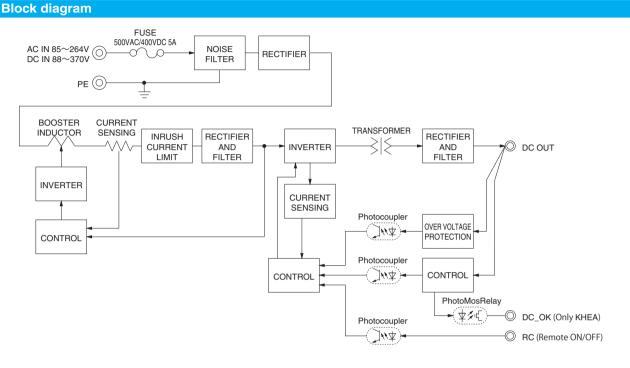
Heter to 3, instruction manual. Please contact us about dynamic load and input response. The output voltage is below 23.5V, the value is equal to three times of the specification. This is the value that measured on measuring board with capacitor of 22 µ F and 0.1 µ F at 150mm from output terminal.

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.

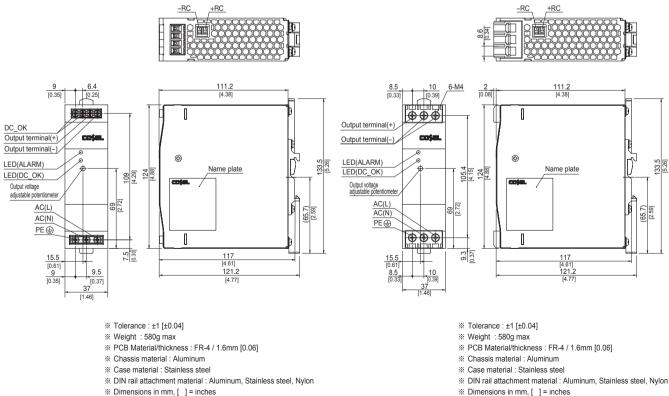
*5



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,

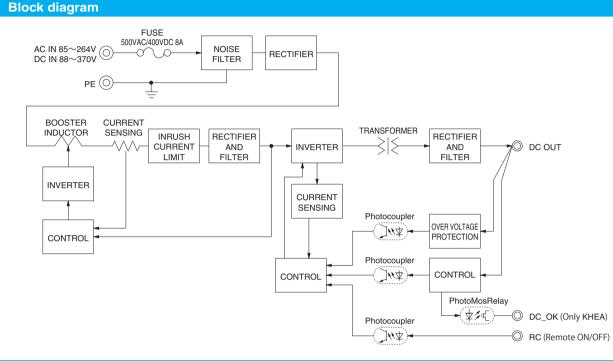
*4

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

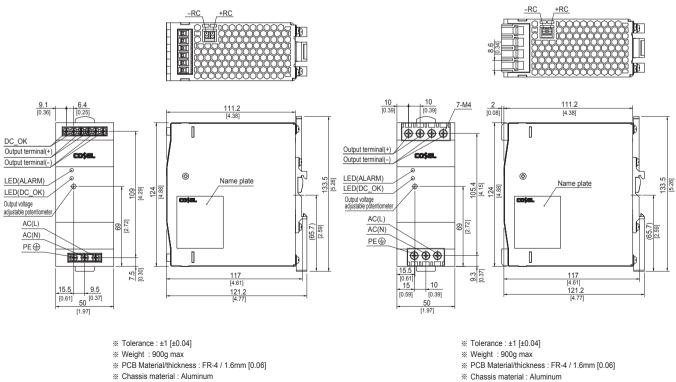
- Only as standard mounting orientation (A). Refer to the instruction manual 5.1 *9 If install other than standard mounting orientation (A), please fix the power
- Instant other than standard mounting orientation (A), please in the power supply for withstand the vibration and impact.
 *10 Under low DC 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

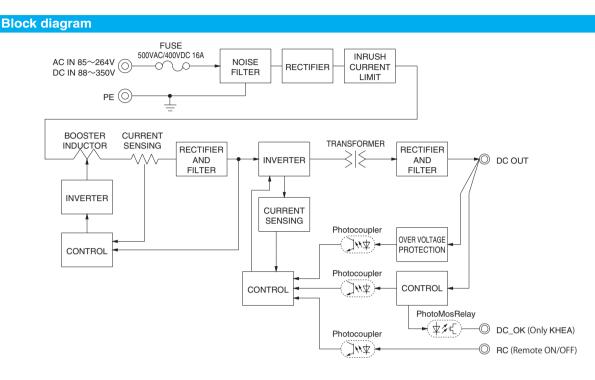
KH series



- 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.

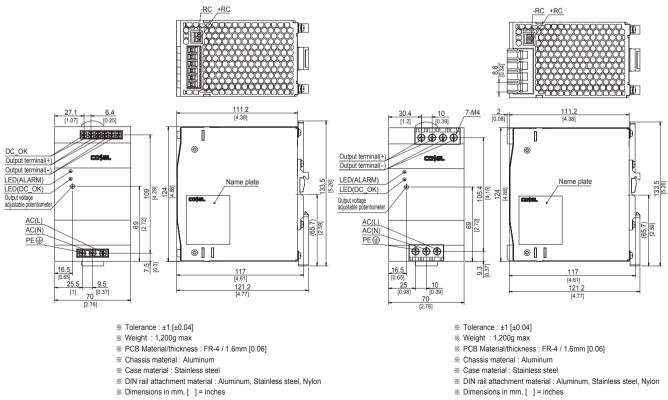
- Burst operation at 30% load or less.
 10 Under tow DC input voltage below DC110V, the temperature derating -1°C/V or the output power derating -1%/V are required.
 To meet the specifications. Do not operate over-loaded condition.
 A sound may occur from power supply at light or peak loading.



External view

<KHEA480F(Euro Style I/O Terminals)>

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



※ Screw tightening torque : 1.6N · m max