#### Ordering information

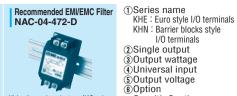
# KHEA/KHNA30F

30









High voltage pulse noise type: NAP series Low leakage current type: NAM series \*The EMI/EMC Filter is recommended to connect with several devices

I/O terminals

②Single output

3 Output wattage Universal input

(5) Output voltage (6) Option

C : with Coating

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

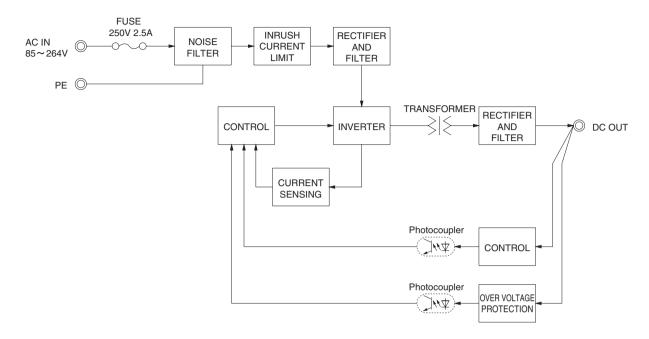
|             | MODEL                       |              | KHEA/KHNA30F-5  | KHEA/KHNA30F-12                        | KHEA/KHNA30F-24                 |
|-------------|-----------------------------|--------------|---|--|---------------------------------|
|             | VOLTAGE[V]                  |              | AC85 - 264 1 φ (Output derating is i  | required) or DC120 - 370               | •                               |
|             | ACIN 115V C                 |              | 0.45typ   | 0.50typ                                | 0.55typ                         |
|             | CURRENT[A]                  | ACIN 230V    | 0.30typ   | 0.30typ                                | 0.35typ                         |
|             | FREQUENCY[Hz]               |              | 50 / 60 (45 - 440) or DC  |  |                                 |
| NPUT        | EEEIOJENOVIO/1              | ACIN 115V    | 84.0typ   | 87.0typ                                | 88.5typ                         |
|             | EFFICIENCY[%]               | ACIN 230V    | 85.5typ   | 88.5typ                                | 89.5typ                         |
|             | INRUSH CURRENT[A]           | ACIN 115V    | 18typ (Io=100%) (at cold start Ta=2   | .5℃)                                   |                                 |
|             | *1                          | ACIN 230V    | 35typ (Io=100%) (at cold start Ta=25°C)   |  |                                 |
|             | LEAKAGE CURRENT             | [mA]         | 0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60950-1 and DEN-AN) |  |                                 |
|             | VOLTAGE[V]                  |              | 5   | 12                                     | 24                              |
|             | CURRENT[A]                  |              | 5.0   | 2.3                                    | 1.3                             |
|             | PEAK CURRENT[A]             |              | -   | -                                      | -                               |
|             | LINE REGULATION[n           | nV] *2       | 20max   | 48max                                  | 96max                           |
|             | LOAD REGULATION[            | mV] *2       | 80max   | 100max                                 | 150max                          |
|             |                             | T            | 150max  | 150max                                 | 150max                          |
|             | RIPPLE[mVp-p] *3            | -20 - 0°C    | 300max  | 300max                                 | 300max                          |
|             |                             | lo=0 - 30%   | 300max *4   | 300max *4                              | 300max *4                       |
| UTPUT       |                             | 0 to +70°C   | 180max  | 180max                                 | 180max                          |
| UIPUI       | RIPPLE NOISE[mVp-p] *3      | -20 - 0°C    | 360max  | 360max                                 | 360max                          |
|             |                             | lo=0 - 30%   | 360max *4   | 360max *4                              | 360max *4                       |
|             | TEMPERATURE REGULATION[mV]  | 0 to +70°C   | 50max   | 120max                                 | 240max                          |
|             |                             | -20 to +70°C | 60max   | 150max                                 | 290max                          |
|             | DRIFT[mV] *5                |              | 20max   | 48max                                  | 96max                           |
|             | START-UP TIME[ms]           |              | 200typ (ACIN 115V, Io=100%)   |  |                                 |
|             | HOLD-UP TIME[ms]            |              | 20typ (ACIN 115V, Io=100%)  |  |                                 |
|             | OUTPUT VOLTAGE ADJUSTMENT F | RANGE[V]     | 4.50 to 5.50  | 10.80 to 13.20                         | 22.50 to 28.50                  |
|             | OUTPUT VOLTAGE SETT         | ING[V]       | 5.00 to 5.15  | 12.00 to 12.48                         | 24.00 to 24.96                  |
| ROTECTION   | OVERCURRENT PROTE           | CTION        | Works over 105% of rating and reco  | overs automatically *10                | •                               |
| IRCUIT AND  | OVERVOLTAGE PROTE           | CTION[V]     | 6.30 to 7.60  | 13.80 to 16.80                         | 30.00 to 36.00                  |
| THERS       | DC_OK LAMP                  |              | LED (Green)   |  |                                 |
|             | INPUT-OUTPUT                |              | AC3,000V 1minute, Cutoff current =  | 10mA, DC500V 50M $\Omega$ min (At Room | Temperature)                    |
| OLATION     | INPUT-PE                    |              | AC2,000V 1minute, Cutoff current =  | 10mA, DC500V 50M $\Omega$ min (At Room | Temperature)                    |
|             | OUTPUT-PE                   |              | AC500V 1minute, Cutoff current = 1  | 00mA, DC500V 50M $\Omega$ min (At Room | Temperature)                    |
|             | OPERATING TEMP., HUMID. AND | ALTITUDE     | -20 to +70°C (Required to Derating)   | , 20 - 90%RH (Non condensing)          |                                 |
| UVIDONIMENT | STORAGE TEMP., HUMID. AND A | ALTITUDE     | -30 to +85°C, 20 - 90%RH (Non condensing)   |  |                                 |
| NVIRONMENT  | 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 2  | X, Y and Z axis (Packing state)        |                                 |
| AFETY AND   | AGENCY APPROVALS (At only   | y AC input)  | UL60950-1, C-UL(CSA60950-1), UL<br>EN50178 Complies with DEN-AN                     | 508 (NEC Class2 per UL1310), ANSI/I    | SA12.12.01, EN60950-1,          |
| DISE        | CONDUCTED NOISE             |              | Complies with FCC-B, VCCI-B, CISF   | PR22-B, EN55011-B, EN55022-B           |                                 |
| EGULATIONS  | HARMONIC ATTENUA            | ATOR         | Complies with IEC61000-3-2 (Class   |  |                                 |
|             | CASE SIZE                   | *7           | 22.5×75×90mm (W×H×D) [0.89  | ×2.95×3.54 inches]                     |                                 |
| THERS       | WEIGHT                      |              | 165g max  |  |                                 |
|             | COOLING METHOD              |              | Convection / Forced air   |  |                                 |

- \*1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is
- \*1 The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less) is excluded.
  \*2 Please contact us about dynamic load and input response.
  \*3 This is the value that measured on measuring board with capacitor of 22 μF and 0.1 μF at 150mm from output terminal.
  Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103). Please refer to the instruction manual 2.7.
  \*4 In case of operating under 0°C ambient temperature, the value is two times of specification at 0 to 30% load factor.
  \*5 Petities the between in DC output for an elect hour provided of the a helf hour warm up at 45°C with the
- \*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- \*6 Please contact us about another class.
  \*7 Case size contains pairber 45
- Case size contains neither the umbo.

  Only as standard mounting orientation (A). Refer to the instruction manual 5.1. Willy as standard mounting orientation (A). Refer to the instruction manual 5.1.
   If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact.
   When two or more units are operating it may not comply with the IEC61000-3-2.
   If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 2.3.
   To meet the specifications. Do not operate over-loaded condition.
   A sound may occur from power supply at light or peak loading.



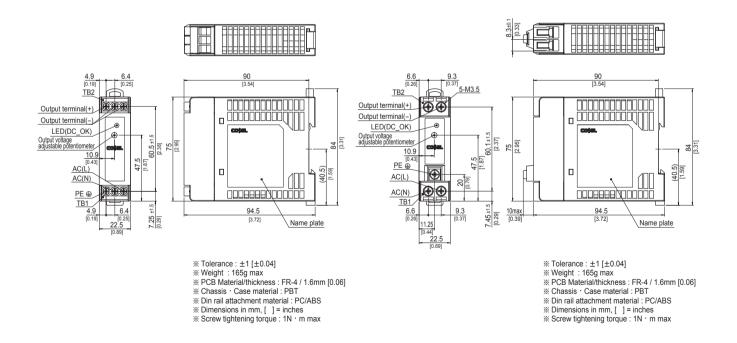




# **External view**

<KHEA30F(Euro Style I/O Terminals)>

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



# KHEA/KHNA60F

60









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

\*The EMI/EMC Filter is recommended to connect with several devices

I/O terminals

②Single output

3 Output wattage 4 Universal input (5) Output voltage (6) Option

C : with Coating

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

|                      | MODEL                       |              | KHEA/KHNA60F-12   | KHEA/KHNA60F-24                   |
|----------------------|-----------------------------|--------------|---|-----------------------------------|
|                      | VOLTAGE[V]                  |              | AC85 - 264 1 $\phi$ (Output derating is required) or DC120  | - 370                             |
|                      | CUDDENTIAL                  | ACIN 115V    | 1.00typ   | 1.10typ                           |
|                      | CURRENT[A]                  | ACIN 230V    | 0.60typ   | 0.70typ                           |
|                      | FREQUENCY[Hz]               |              | 50 / 60 (45 - 440) or DC  |                                   |
| INPUT                | EFFICIENCY[9/]              | 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℃)  |                                   |
|                      | *1                          | ACIN 230V    | 35typ (Io=100%) (at cold start Ta=25℃)  |                                   |
|                      | LEAKAGE CURRENT[mA]         |              | 0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, Acc   | cording to IEC60950-1 and DEN-AN) |
|                      | VOLTAGE[V]                  |              | 12  | 24                                |
|                      | CURRENT[A]                  |              | 4.5   | 2.5                               |
|                      | PEAK CURRENT[A]             |              | -   | -                                 |
|                      | LINE REGULATION[n           | nV] *2       | 48max   | 96max                             |
|                      | LOAD REGULATION[            | mV] *2       | 100max  | 150max                            |
|                      |                             | 0 to +70℃    | 200max  | 200max                            |
|                      | RIPPLE[mVp-p] *3            | -20 - 0°C    | 300max  | 300max                            |
|                      |                             | lo=0 - 30%   | 300max *4   | 300max *4                         |
| OUTDUT               |                             | 0 to +70°C   | 260max  | 260max                            |
| OUTPUT               | RIPPLE NOISE[mVp-p] *3      | -20 - 0°C    | 360max  | 360max                            |
|                      |                             | lo=0 - 30%   | 360max *4   | 360max *4                         |
|                      | TEMPERATURE REGULATION[mV]  | 0 to +70℃    | 120max  | 240max                            |
|                      |                             | -20 to +70°C | 150max  | 290max                            |
|                      | DRIFT[mV] *5                |              | 48max   | 96max                             |
|                      | START-UP TIME[ms]           |              | 200typ (ACIN 115V, Io=100%)   |                                   |
|                      | HOLD-UP TIME[ms]            |              | 20typ (ACIN 115V, Io=100%)  |                                   |
|                      | OUTPUT VOLTAGE ADJUSTMENT F | RANGE[V]     | 10.80 to 13.20  | 22.50 to 28.50                    |
|                      | OUTPUT VOLTAGE SETT         | ING[V]       | 12.00 to 12.48  | 24.00 to 24.96                    |
| PROTECTION           | OVERCURRENT PROTE           | 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)   |                                   |
|                      | INPUT-OUTPUT                |              | AC3,000V 1minute, Cutoff current = 10mA, DC500V 50N   | MΩ min (At Room Temperature)      |
| ISOLATION            | INPUT-PE                    |              | AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)                                |                                   |
|                      | OUTPUT-PE                   |              | AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)   |                                   |
|                      | OPERATING TEMP., HUMID. AND |              | -20 to +70℃ (Required to Derating), 20 - 90%RH (Non   | condensing)                       |
| ENVIRONMENT          | STORAGE TEMP., HUMID. AND A | ALTITUDE     | -30 to +85°C, 20 - 90%RH (Non condensing)   |                                   |
| LIVIIIONWLIVI        | VIBRATION                   | *8           | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   |                                   |
|                      | IMPACT                      |              | 196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis (Packing state)  |                                   |
| SAFETY AND           | AGENCY APPROVALS (At only   | y AC input)  | UL60950-1, C-UL(CSA60950-1), UL508 (NEC Class2 per UL1310), ANSI/ISA12.12.01, EN60950-1, EN50178 Complies with DEN-AN |                                   |
| NOISE<br>REGULATIONS | CONDUCTED NOISE             |              | Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B,  | , EN55022-B                       |
|                      | HARMONIC ATTENUA            | ATOR         | Complies with IEC61000-3-2 (Class A) *6 (Not built-in to  | active filter) *9                 |
|                      | CASE SIZE                   | *7           | 32×90×90mm (W×H×D) [1.26×3.54×3.54 inches]  |                                   |
| OTHERS               | WEIGHT                      |              | 270g max  |                                   |
|                      | COOLING METHOD              |              | Convection / Forced air   |                                   |
|                      |                             |              |   |                                   |

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

  2 Please contact us about dynamic load and input response.

  3 This is the value that measured on measuring board with capacitor of 22 µF and 0.1 µF at 150mm from output terminal.

  Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103). Please refer to the instruction manual 2.7.

  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.
- \*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- \*6 Please contact us about another class.
  \*7 Case size contains patter the contains.
- Only as standard mounting orientation (A). Refer to the instruction manual 5.1.

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

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

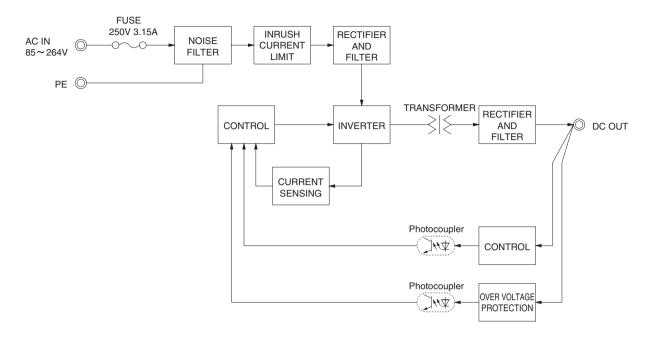
  \*10 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 2.3.

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

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



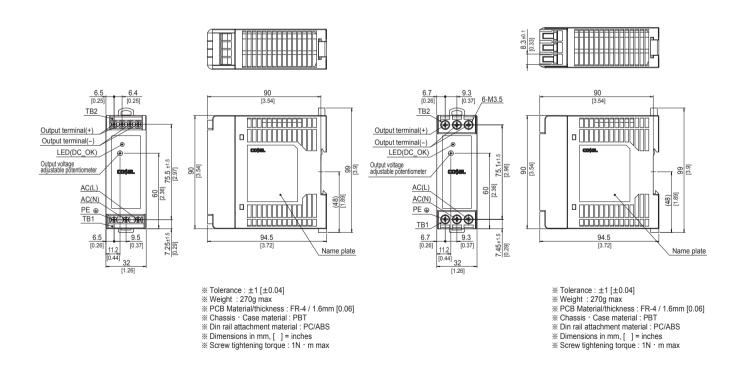




# **External view**

<KHEA60F(Euro Style I/O Terminals)>

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



#### Ordering information

# KHEA/KHNA9(

90









High voltage pulse noise type: NAP series Low leakage current type: NAM series \*The EMI/EMC Filter is recommended

to connect with several devices

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

I/O terminals

②Single output 3 Output wattage Universal input ⑤Output voltage

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

|             | MODEL                       |              | KHEA/KHNA90F-12   | KHEA/KHNA90F-24                               |
|-------------|-----------------------------|--------------|---|---|
|             | VOLTAGE[V]                  |              | AC85 - 264 1 φ (Output derating is required) or DC88-2                                    | 250 *10                                       |
|             |                             | 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)               |
| INPUT       | EFFICIENCY[%]               | ACIN 230V    | 88.0typ   | 91.0typ (89.5typ for option -E)               |
|             | POWER FACTOR                | ACIN 115V    | 0.98typ   | 1 2 h ( 3 h h )                               |
|             | (lo=100%)                   | ACIN 230V    | 0.86typ   |   |
|             | INRUSH CURRENT[A]           | ACIN 115V    | 18typ (Io=100%) (at cold start Ta=25°C)   |   |
|             | *1                          | ACIN 230V    | 35typ (Io=100%) (at cold start Ta=25°C)   |   |
|             | LEAKAGE CURRENT             | [mA]         | 0.45 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, Ac  | cording to IEC60950-1 and DEN-AN)             |
|             | VOLTAGE[V]                  |              | 12  | 24  |
|             | CURRENT[A]                  |              | 6.8   | 3.8   |
|             | PEAK CURRENT[A]             |              | -   | -   |
|             | LINE REGULATION[n           | nV1 *2       | 48max   | 96max   |
|             | LOAD REGULATION             |              | 100max  | 150max  |
|             |                             |              | 200max  | 200max  |
|             | RIPPLE[mVp-p] *3            | -20 - 0°C    | 300max  | 300max  |
|             | [                           |              | 300max *4   | 300max *4                                     |
|             |                             | 0 to +70°C   | 260max  | 260max  |
| OUTPUT      | RIPPLE NOISE[mVp-p] *3      |              | 360max  | 360max  |
|             | im i zz itoloz[im p p]      |              | 360max *4   | 360max *4                                     |
|             |                             | 0 to ±70°C   | 120max  | 240max  |
|             | TEMPERATURE REGULATION[mV]  | -20 to +70°C | 150max  | 290max  |
|             | DRIFT[mV]                   | *5           | 48max   | 96max   |
|             | START-UP TIME[ms]           |              | 500typ (ACIN 115V, Io=100%)   |   |
|             | HOLD-UP TIME[ms]            |              | 20typ (ACIN 115V, Io=100%)  |   |
|             | OUTPUT VOLTAGE ADJUSTMENT   | RANGEIVI     | 10.80 to 13.20  | 22.50 to 28.50 (Fixed for option -E)          |
|             | OUTPUT VOLTAGE SETT         |              | 12.00 to 12.48  | 24.00 to 24.96 (24.00 to 24.50 for option -E) |
| PROTECTION  | OVERCURRENT PROTE           |              | Works over 105% of rating (101% for option -E), recovers                                  |   |
| CIRCUIT AND | OVERVOLTAGE PROTE           | -            | 13.80 to 16.80  | 30.00 to 36.00 (26.40 to 33.60 for option -E) |
| OTHERS      | DC OK LAMP                  | •            | LED (Green)   | 00:00 to 00:00 (20:10 to 00:00 to: 0p:0:: 2)  |
|             | INPUT-OUTPUT                |              | AC3,000V 1minute, Cutoff current = 10mA, DC500V 50I                                       | MΩ min (At Room Temperature)                  |
| ISOLATION   | INPUT-PE                    |              | AC2,000V 1minute, Cutoff current = 10mA, DC500V 50I                                       |   |
|             | OUTPUT-PE                   |              | AC500V 1minute, Cutoff current = 100mA, DC500V 50N  |   |
|             | OPERATING TEMP., HUMID. AND | ALTITUDE     | -20 to +70°C (Required to Derating), 20 - 90%RH (Non                                      | ·   |
|             | STORAGE TEMP., HUMID. AND   |              | -30 to +85°C, 20 - 90%RH (Non condensing)   | ··•   |
| ENVIRONMENT | VIBRATION *8                |              |   |   |
|             | IMPACT                      |              | 196.1m/s² (20G), 11ms, X, Y and Z axis (Packing state)                                    |   |
| SAFETY AND  | AGENCY APPROVALS (At onl    | y AC input)  | UL60950-1, C-UL(CSA60950-1), EN60950-1, EN50178,<br>ANSI/ISA12.12.01 Complies with DEN-AN |   |
| NOISE       | CONDUCTED NOISE             |              | Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B   | . EN55022-B                                   |
| REGULATIONS | HARMONIC ATTENU             |              | Complies with IEC61000-3-2 (Class A) *6   | ,   |
|             | CASE SIZE                   | *7           | 50×90×90mm (W×H×D) [1.97×3.54×3.54 inches]  |   |
| OTHERS      | WEIGHT                      |              | 405g max  |   |
|             | COOLING METHOD              |              | Convection / Forced air   |   |
|             | LOOLING ME I HOD            |              | GOTIVECTION / FOICEU AN   |   |

- The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less)is
- excluded.
- excluded. Please contact us about dynamic load and input response. This is the value that measured on measuring board with capacitor of 22 µF and 0.1 µF at 150mm from
- \*3 This is the value that measured on measuring operations of Early and the terminal.

  Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103). Please refer to the instruction manual 2.7.

  Ripple and ripple noise spec is change at 10=0 to 30% by burst operation.

  \*4 In case of operating under 0°C ambient temperature, the value is two times of specification at 0 to 20% Lead factor.
- \*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- Please contact us about another class.
- Case size contains neither the umbo.
- Case size contains refine the unino.

  Only as standard mounting orientation (A). Refer to the instruction manual 5.1.

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

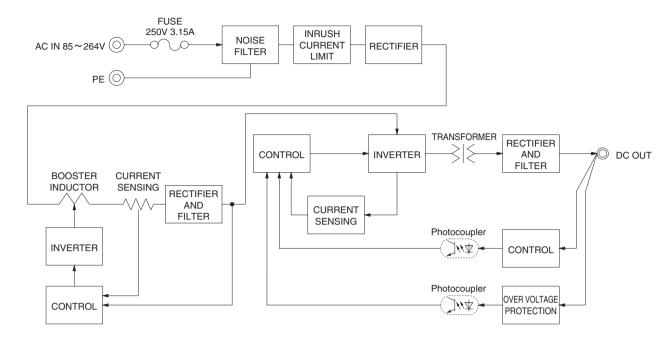
  \*9 If the overcurrent protection circuit operates continuously, the output voltage shut down. Refer to the instruction manual 2.3.

  \*10 Under low DC input voltage below DC110V, the temperature derating -1°C/V or the output power derating -1°6/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.



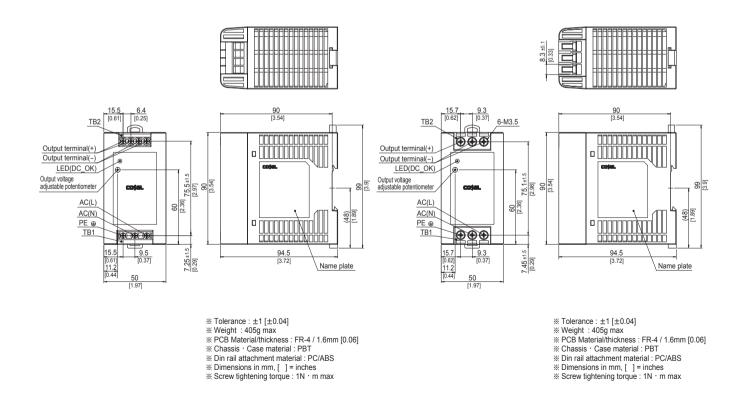




#### **External view**

<KHEA90F(Euro Style I/O Terminals)>

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



# KHEA/KHNA120F

A -120 F -24 ®









High voltage pulse noise type: NAP series Low leakage current type: NAM series \*The EMI/EMC Filter is recommended to connect with several devices.

| r | (1)Series name                 |
|---|--------------------------------|
|   | KHE : Euro style I/O terminals |
|   | KHM : Barrier blocks style     |

- rier blocks style I/O terminals ②Single output
- 3 Output wattage Universal input ⑤Output voltage ® Option
- C : with Coating N2: Screw mounting

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

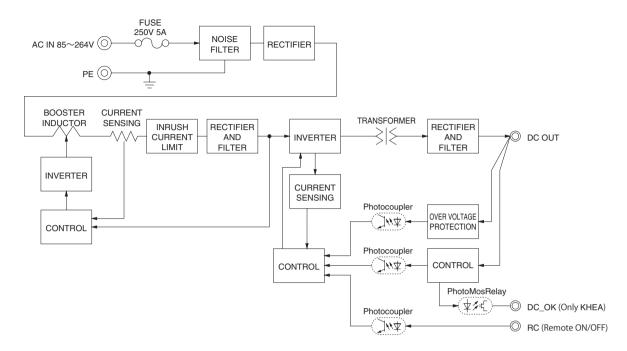
|                    | MODEL                              |                  | KHEA / KHNA120F-24  |
|--------------------|------------------------------------|------------------|---|
|                    | VOLTAGE[V]                         |                  | AC85 - 264 1 ¢ or DC88 - 370 *10  |
|                    | OUDDENITE AT                       | ACIN 115V        | 1.2typ  |
|                    | CURRENT[A]                         | ACIN 230V        | 0.6typ  |
|                    | FREQUENCY[Hz]                      |                  | 50 / 60 (45 - 66) or DC   |
|                    | EFFICIENCY[9/1                     | ACIN 115V        | 90typ   |
| INPUT              | EFFICIENCY[%]                      | ACIN 230V        | 92typ   |
|                    | DOWED FACTOR                       | ACIN 115V        | 0.98typ   |
|                    | POWER FACTOR                       | ACIN 230V        | 0.93typ   |
|                    | INRUSH CURRENT[A]                  | 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 IEC60950-1 and DEN-AN)                     |
|                    | VOLTAGE[V]                         |                  | 24  |
|                    | CURRENT[A]                         |                  | 5   |
|                    | PEAK CURRENT[A]                    | *2               | 7.5   |
|                    | LINE REGULATION[n                  | nV] *3           | 96max   |
|                    | LOAD REGULATION[                   | mV] *3           | 150max *4   |
|                    |                                    | 0 to +70°C       | 120max  |
|                    | RIPPLE[mVp-p] *5                   | <b>-25 - 0</b> ℃ | 240max  |
|                    |                                    | lo=0 - 30%       | 240max *4   |
| OUTPUT             |                                    | 0 to +70°C       | 150max  |
| OUIPUI             | RIPPLE NOISE[mVp-p] *5             | -25 - 0°C        | 300max  |
|                    |                                    | lo=0 - 30%       | 300max *4   |
|                    | TEMPEDATURE RECUI ATIONSVI         | 0 to +70°C       | 240max *4   |
|                    | TEMPERATURE REGULATION[mV]         | -25 to +70°C     | 360max *4   |
|                    | DRIFT[mV]                          | *6               | 96max   |
|                    | START-UP TIME[ms]                  |                  | 750max (ACIN 115V, Io=100%)   |
|                    | HOLD-UP TIME[ms]                   |                  | 20typ (ACIN 115V, Io=100%)  |
|                    | OUTPUT VOLTAGE ADJUSTMENT RANGE[V] |                  | 22.5 to 28.5  |
|                    | OUTPUT VOLTAGE SETTING[V]          |                  | 24.0±1.0%   |
|                    | OVERCURRENT PROTE                  | CTION            | Works over 101% of peak current and recovers automatically  |
| PROTECTION         | OVERVOLTAGE PROTE                  | CTION[V]         | 30.0 to 36.0  |
| CIRCUIT AND        | DC_OK LAMP                         |                  | LED (Green)   |
| OTHERS             | ALARM LAMP                         |                  | LED (Red)   |
|                    | DC_OK CONTACT                      |                  | Relay contact 30VDC 1A max, 30VAC 0.5A max (resistive load) (Only KHEA)                                 |
|                    | INPUT-OUTPUT                       |                  | AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)                  |
| ISOLATION          | INPUT-PE                           |                  | AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)                  |
| COLATION           | OUTPUT-PE                          |                  | AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)                   |
|                    | OUTPUT-RC, DC_OK                   |                  | AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)                   |
|                    | OPERATING TEMP., HUMID. AND        |                  | -25 to +70℃ (Required to Derating), 20 - 90%RH (Non condensing)   |
| ENVIRONMENT        | STORAGE TEMP., HUMID. AND A        |                  | -40 to +85°C, 20 - 90%RH (Non condensing)   |
|                    | VIBRATION                          | *9               | 10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail) |
|                    | IMPACT                             |                  | 196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)  |
| SAFETY AND         | AGENCY APPROVALS (At only          | AC input)        | UL60950-1, C-UL (CSA60950-1), EN60950-1, EN50178, UL508, ANSI / ISA12.12.01, GL Complies with DEN-AN    |
| NOISE              | CONDUCTED NOISE                    |                  | Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B  |
| REGULATIONS        | HARMONIC ATTENU                    |                  | Complies with IEC61000-3-2 (Class A) *7   |
|                    | CASE SIZE                          | *8               | erverziverrimm (treatmess) [tree-messerner mense]   |
| OTHERS             | WEIGHT                             |                  | 580g max  |
|                    | COOLING METHOD                     |                  | Convection / Forced air   |
| did The control to |                                    |                  | to FMICHO   |

- The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less))s excluded.
  Refer to 3, instruction manual.
  Please contact us about dynamic load and input response.
  The output voltage is below 23.5V, the value is equal to three times of the specification.

- specification.

  This is the value that measured on measuring board with capacitor of 22 µF \*7 and 0.1 µF at 150mm from output terminal. \*8
- Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to
- Please contact us about another class. \*8 Case size contains neither the umbo.
- Measured by Committee Costinoscope on Implies Measured (Capacity Residence Residence)
  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 25C, with the input voltage held constant at the rated input/ output.
- Only as standard mounting orientation (A). Refer to the instruction manual 5.1. If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact. 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.

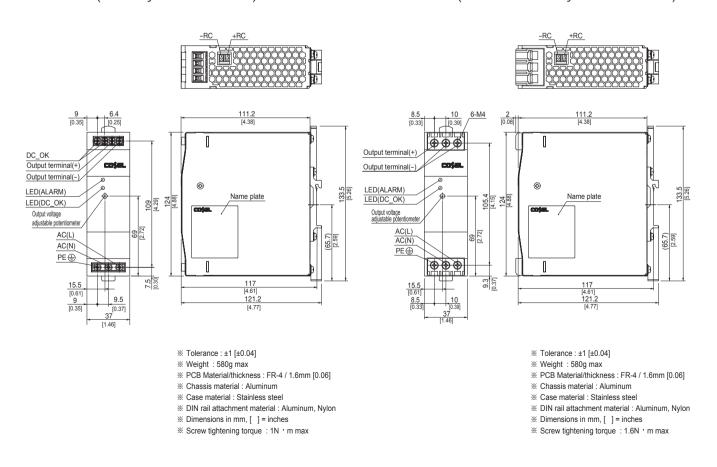




#### **External view**

# <KHEA120F(Euro Style I/O Terminals)>

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



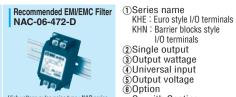
# KHEA/KHNA240

-240 F -24 s









High voltage pulse noise type: NAP series Low leakage current type: NAM series \*The EMI/EMC Filter is recommended to connect with several devices.

I/O terminals ②Single output

3 Output wattage 4 Universal input ⑤Output voltage ® Option

C : with Coating N2: Screw mounting

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

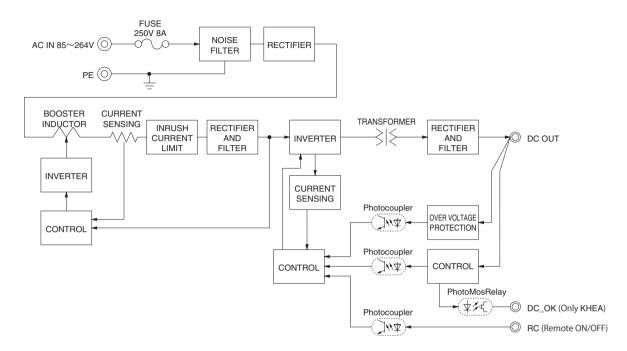
|             | MODEL                       |             | KHEA / KHNA240F-24  |
|-------------|-----------------------------|-------------|---|
|             | VOLTAGE[V]                  |             | AC85 - 264 1 φ or DC88 - 370 *10  |
|             | OUDDENTIAL                  | ACIN 115V   | 2.3typ  |
|             | CURRENT[A]                  | ACIN 230V   | 1.2typ  |
|             | FREQUENCY[Hz]               |             | 50 / 60 (45 - 66) or DC   |
|             | ACIN 11                     |             | 92typ   |
| 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             | [mA]        | 0.45 / 0.75max (ACIN 100V / 240V 60Hz, lo=100%, According to IEC60950-1 and DEN-AN)                     |
|             | VOLTAGE[V]                  |             | 24  |
|             | CURRENT[A]                  |             | 10  |
|             | PEAK CURRENT[A]             | *2          | 15  |
|             | LINE REGULATION[n           | nV] *3      | 96max   |
|             | LOAD REGULATION             | mV] *3      | 150max *4   |
|             |                             | 0 to +70℃   | 120max  |
|             | RIPPLE[mVp-p] *5            | -25 - 0°C   | 240max  |
|             |                             | lo=0 - 30%  | 240max *4   |
|             |                             | 0 to +70℃   | 150max  |
| OUTPUT      | RIPPLE NOISE[mVp-p] *5      |             | 300max  |
|             |                             | lo=0 - 30%  | 300max *4   |
|             | TEMPERATURE                 |             | 240max *4   |
|             | 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 I | RANGE[V]    | 22.5 to 28.5  |
|             | OUTPUT VOLTAGE SETT         |             | 24.0±1.0%   |
|             | OVERCURRENT PROTE           |             | Works over 101% of peak current and recovers automatically  |
| PROTECTION  | OVERVOLTAGE PROTE           | CTION[V]    | 30.0 to 36.0  |
| CIRCUIT AND | DC OK LAMP                  |             | LED (Green)   |
| OTHERS      | ALARM LAMP                  |             | LED (Red)   |
|             | DC OK CONTACT               |             | Relay contact 30VDC 1A max, 30VAC 0.5A max (resistive load) (Only KHEA)                                 |
|             | INPUT-OUTPUT                |             | AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)                  |
|             | INPUT-PE                    |             | AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)                  |
| ISOLATION   | OUTPUT-PE                   |             | AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)                   |
|             | OUTPUT-RC, DC_OK            |             | AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)                           |
|             | OPERATING TEMP., HUMID. AND | ALTITUDE    | -25 to +70℃ (Required to Derating), 20 - 90%RH (Non condensing)   |
|             | STORAGE TEMP., HUMID.AND    |             | -40 to +85°C, 20 - 90%RH (Non condensing)   |
| ENVIRONMENT | VIBRATION                   | *9          | 10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60 minutes along Z axis (Non operating, mounted on DIN Rail) |
|             | IMPACT                      |             | 196.1m/s² (20G), 11ms, once each X, Y and Z axis (Packing state)  |
| SAFETY AND  | AGENCY APPROVALS (At only   | y AC input) | UL60950-1, C-UL (CSA60950-1), EN60950-1, EN50178, UL508, ANSI / ISA12.12.01, GL Complies with DEN-AN    |
| NOISE       | CONDUCTED NOISE             | . 1.7       | 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]  |
| OTHERS      | WEIGHT                      |             | 900g max  |
|             | COOLING METHOD              |             | Convection / Forced air   |
|             | 1                           |             |   |

- The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less))s excluded. Refer to 3, instruction manual. Please contact us about dynamic load and input response. The output voltage is below 23.5V, the value is equal to three times of the repositions.

- specification.

  This is the value that measured on measuring board with capacitor of 22 µF \*7 and 0.1 µF at 150mm from output terminal. \*8
- Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to
- MedSureu by Coming Social Soci output.
- Please contact us about another class. Case size contains neither the umbo.
- Only as standard mounting orientation (A). Refer to the instruction manual 5.1. If install other than standard mounting orientation (A), please fix the power supply for withstand the vibration and impact. 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.

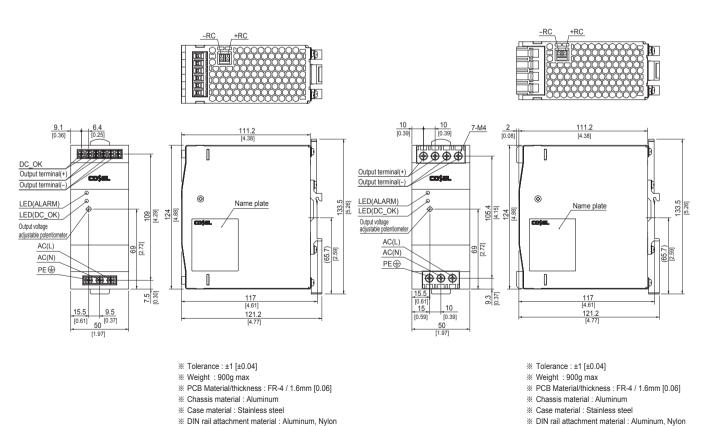




#### **External view**

# <KHEA240F(Euro Style I/O Terminals)>

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



Screw tightening torque: 1N · m max

% Dimensions in mm, [ ] = inches

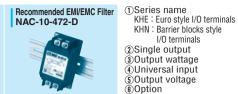
Screw tightening torque: 1.6N • m max

480









High voltage pulse noise type: NAP series Low leakage current type: NAM series \*The EMI/EMC Filter is recommended

to connect with several devices.

C : with Coating N2: Screw mounting

②Single output 3 Output wattage Universal input ⑤Output voltage ® Option

I/O terminals

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

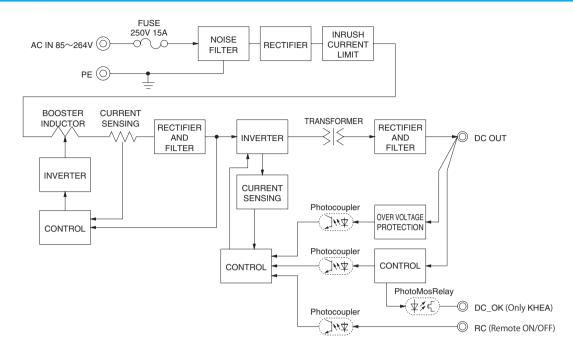
|                                     | MODEL                               |                  | KHEA / KHNA480F-24  | KHEA / KHNA480F-48     |  |
|-------------------------------------|-------------------------------------|------------------|---|------------------------|--|
| OUTPUT                              | VOLTAGE[V]                          |                  | AC85 - 264 1 $\phi$ (Output derating is required) or DC88 -   | 350 *10                |  |
|                                     | ACIN 115V                           |                  | 4.6typ  |                        |  |
|                                     | CURRENT[A]                          | ACIN 230V        | 2.3typ  |                        |  |
|                                     | FREQUENCY[Hz]                       |                  | 50 / 60 (47 - 63) or DC   |                        |  |
|                                     | EFFICIENCY[%]                       | ACIN 115V        | 92typ   |                        |  |
|                                     |                                     | ACIN 230V        | 94typ   |                        |  |
|                                     | POWER FACTOR INRUSH CURRENT[A]      | ACIN 115V        | 0.98typ   |                        |  |
|                                     |                                     | ACIN 230V        | 0.93typ   |                        |  |
|                                     |                                     | ACIN 115V        | 20typ (more than 3 sec. to re-start)  |                        |  |
|                                     | *1                                  | ACIN 230V        | 40typ (more than 3 sec. to re-start)  |                        |  |
|                                     | LEAKAGE CURRENT[mA]                 |                  | 0.75 / 1.5max (ACIN 100V / 240V 60Hz, lo=100%, According to IEC60950-1 and DEN-AN)                              |                        |  |
|                                     | 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 |  |
|                                     |                                     | 0 to +70°C       | 120max  | 120max                 |  |
|                                     |                                     | -25 - 0°C        | 240max  | 240max                 |  |
|                                     |                                     | lo=0 - 30%       | 500max  | 750max                 |  |
|                                     | RIPPLE NOISE[mVp-p] *4              | 0 to +70°C       | 150max  | 150max                 |  |
|                                     |                                     | <b>-25 - 0</b> ℃ | 300max  | 300max                 |  |
|                                     |                                     | lo=0 - 30%       | 600max  | 750max                 |  |
|                                     | TEMPERATURE<br>REGULATION[mV]       | 0 to +70°C       | 240max  | 480max                 |  |
|                                     |                                     | -25 to +70°C     | 360max  | 600max                 |  |
|                                     | DRIFT[mV] *5                        |                  | 96max   | 192max                 |  |
|                                     | START-UP TIME[ms]                   |                  | 750max (ACIN 115V, Io=100%)   |                        |  |
|                                     | HOLD-UP TIME[ms]                    |                  | 20typ (ACIN 115V, Io=100%)  |                        |  |
|                                     | OUTPUT VOLTAGE ADJUSTMENT RANGE[V]  |                  | 22.5 to 26.4  | 45.0 to 55.2           |  |
|                                     | OUTPUT VOLTAGE SETTING[V]           |                  | 24.0±1.0%   | 48.0±1.0%              |  |
| PROTECTION<br>CIRCUIT AND<br>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   |                        |  |
|                                     | 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 50M $\Omega$ min (At Room Temperature)                          |                        |  |
|                                     | INPUT-PE                            |                  | AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (At Room Temperature)                          |                        |  |
|                                     | OUTPUT-PE                           |                  | AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)                           |                        |  |
|                                     | OUTPUT-RC, DC_OK                    |                  | AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (At Room Temperature)                           |                        |  |
|                                     | OPERATING TEMP.,HUMID.AND ALTITUDE  |                  | -25 to +70°C (Required to Derating), 20 - 90%RH (Non condensing)  |                        |  |
| ENVIRONMENT                         | STORAGE TEMP.,HUMID.AND ALTITUDE    |                  | -40 to +85°C, 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                          | AGENCY APPROVALS (At only AC input) |                  | UL60950-1, C-UL (CSA60950-1), EN60950-1, EN50178, UL508, ANSI / ISA12.12.01, GL (Only 24V) Complies with DEN-AN |                        |  |
| NOISE                               | CONDUCTED NOISE                     |                  | Complies with FCC-B, VCCI-B, CISPR22-B, EN55011-B, EN55022-B  |                        |  |
| REGULATIONS                         | HARMONIC ATTENUA                    |                  | 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 / Forced air   |                        |  |

- The value is primary surge. The current of input surge to a built-in EMI/EMC Filter(0.2ms or less) is excluded.
  Refer to 3, instruction manual.
  Please contact us about dynamic load and input response.
  This is the value that measured on measuring board with capacitor of 22 µF and 0.1 µF at 150mm from output terminal.
  Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).
- Please refer to the instruction manual 2.7.
- \*\*S Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.

  \*6 Please contact us about another class.
- Case size contains neither the umbo.
  Only as standard mounting orientation (A). Refer to the instruction manual 5.1. If install other than standard mounting orientation (A), please fix the power

- supply for withstand the vibration and impact.
  Burst operation at 30% load or less.
  Under low DC input voltage below DC110V, the temperature derating -1°C/V or the output power derating -1°W/N 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)>

