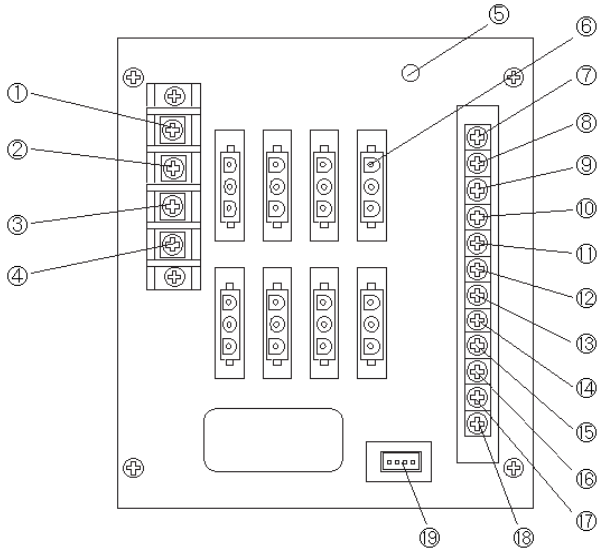
# 7. STA series

## 7.1 Overview

- STA5000T is an extremely small-sized AC front-end unit with three phase input and power factor correction for the power modules.
- Input voltage AC170V to AC264V, output 5,000W size 131.5 X144 X250 (W XH XD) [mm].
- Output sequence control unit is available as option (-R).

## 7.2 Terminal block

Fig.7.2.1
Terminal block
connection




⑦ - ⑱ are available only in STA5000T-R

① AC (R)
② AC (S)
③ AC (T)
④ Frame ground
⑤ LED
⑥ Output connector (Io=8A max each)
⑦ ALM (+)
⑧ ALM (-)
⑨ SYSTEM ON/OFF (+)
⑩ SYSTEM ON/OFF (-)
⑪ EMOTE SIGNAL1 ON/OFF (+)
⑫ REMOTE SIGNAL1 ON/OFF (-)
⑬ REMOTE SIGNAL2 ON/OFF (+)
⑭ REMOTE SIGNAL2 ON/OFF (-)
⑮ REMOTE SIGNAL3 ON/OFF (+)
⑯ REMOTE SIGNAL3 ON/OFF (-)
⑰ REMOTE SIGNAL4 ON/OFF (+)
⑱ REMOTE SIGNAL4 ON/OFF (-)
⑲ SIGNAL (AL OUT, REMOTE ON/OFF) connector

## 7.3 Function

### 7.3.1 Input voltage range

- Input voltage range is from AC175V to AC264V 3 phase.
  If AC input voltage is out of the range, the unit will not operate properly and/or may be damaged.

### 7.3.2 Inrush current limiting

- Inrush current limiting circuit is built-in.
  If a switch on the input side is installed, please consider the serge current rating of the switch.
  The thyristor method is used to protect from inrush current.
  When power is turned ON/OFF repeatedly within a short period of time, it is necessary to have enough time between power ON and OFF to operate resistance circuit for inrush current.
  Do not repeat ON and OFF with in short period of time.
  If do so, inrush current limiting might not work and cause damage.

### 7.3.3 Overcurrent protection

- The input fuse provides protection against overcurrent.
  This fuse blows when the output is short-circuited.
  Replace only with the same type and rating of fuse.

### 7.3.4 Isolation

- For a receiving inspection, such as Hi-Pot test, gradually increase (decrease) the voltage for the start (shut down).
  Avoid using Hi-Pot tester with the timer because it may generate voltage a few times higher than the applied voltage, at ON/OFF of a timer.

### 7.3.5 Thermal protection

- Inside temperature of the power unit (due to stop-page of the external fan, etc.) rises high thermal protection is activated.
  Shut off the input voltage and wait until the power unit inside has been thoroughly cooled down before turn on input to recover output.

### 7.3.6 REMOTE ON/OFF

- The power unit has a built-in REMOTE ON/OFF circuit for controlling the DC-DC modules.
  When AC input is turned on, the REMOTE ON/OFF signal turns from "H" to "L" after caudle several hundreds of millisecond.
  Under the following situations, however, the REMOTE ON/OFF signal turns from "L" to "H".
  1) 1 of 3 phases is missing.

Table 7.3.1 Specifications of REMOTE ON/OFF

| № | Item | Specifications |
|---|---|---|
| 1 | Normal operation | Voltage level "L" (0.5V max) |
| 2 | Halt | Voltage level "H" (open circuit) |

### 7.3.7 AL OUT

- STA5000T has a built-in alarm signal output.
  When it detects fail, the AL OUT (ALM for STA5000T-R) signal turns from "L" to "H".
  1) 1 of the 3 phase is missing, due to equipment failure.
  2) Activation of the thermal detection.
  Note that the output voltage will not stop even when the alarm circuit works.
  Shut off the input, otherwise the power unit may be damaged.

Table 7.3.2 Specifications of AL OUT

| № | Item | Specifications |
|---|---|---|
| 1 | Function | Normal operation "L" |
| | | Abnormal operation "H" |
| 2 | Voltage level "L" | 0.5 V max at 5mA |
| 3 | Maximum external voltage | 35V max |
| 4 | Maximum sink current | 70mA max |

## 7.4 Connecting the unit to a DBS series

### 7.4.1 Connecting method

- Pay attention to these points when connecting a DBS series unit to the STA5000T.

Fig.7.4.1 Connection for standard use

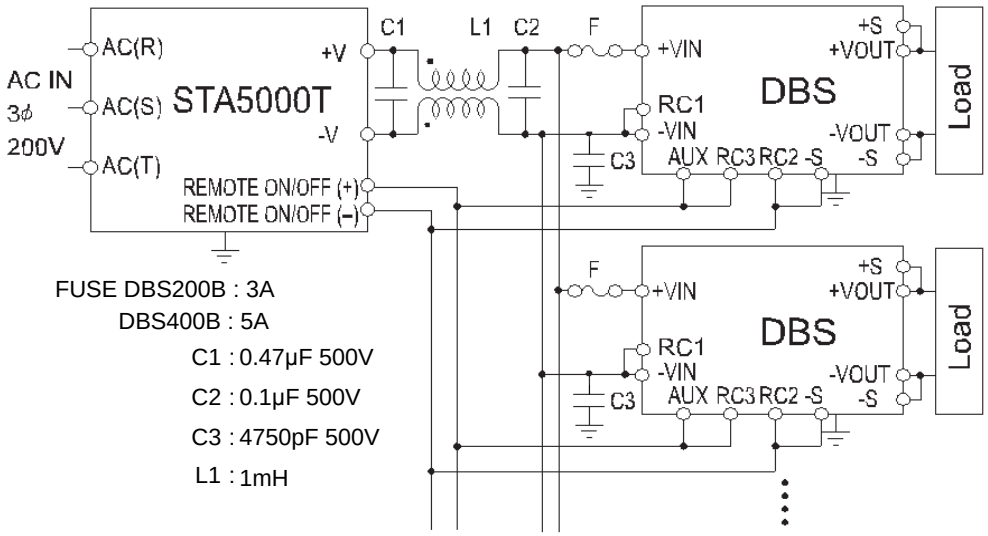
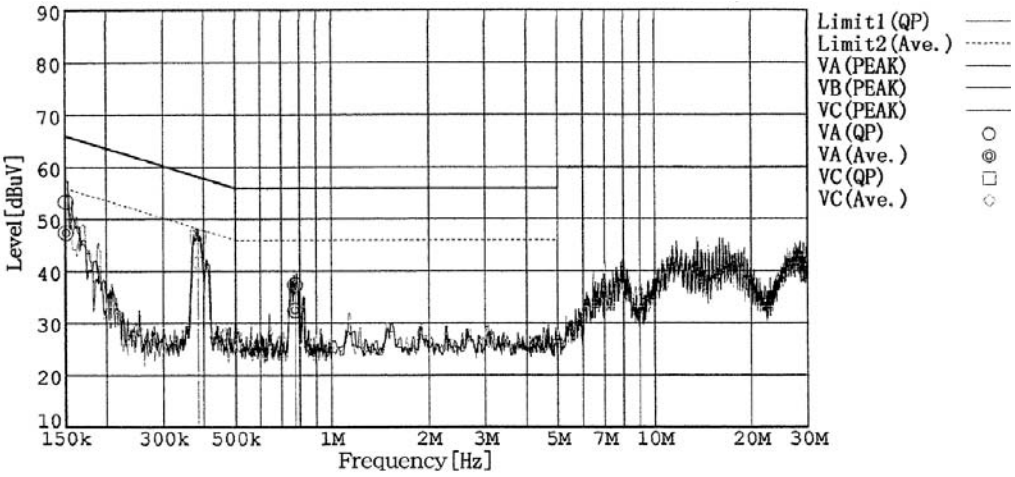


Fig.7.4.2
Conducted noise level
(CISPR22-B)




| Frequency | Measurement | | Correction factor | Level | | Line | CISPR22-B level | | Margin | |
|---|---|---|---|---|---|---|---|---|---|---|
| [MHz] | (QP) | (Ave.) | [dB] | (QP) | (Ave.) | — | (QP) | (Ave.) | (QP) | (Ave.) |
| | [dBuV] | [dBuV] | | [dBuV] | [dBuV] | | [dBuV] | [dBuV] | [dBuV] | [dBuV] |
| 0.1506 | 43.0 | 37.0 | 10.3 | 53.3 | 47.3 | VA | 66.0 | 56.0 | 12.7 | 8.7 |
| 0.7718 | 27.2 | 22.4 | 10.1 | 37.3 | 32.5 | VA | 56.0 | 46.0 | 18.7 | 13.5 |
| 0.3842 | 36.0 | 31.4 | 10.2 | 46.2 | 41.6 | VC | 58.2 | 48.2 | 12.0 | 6.6 |

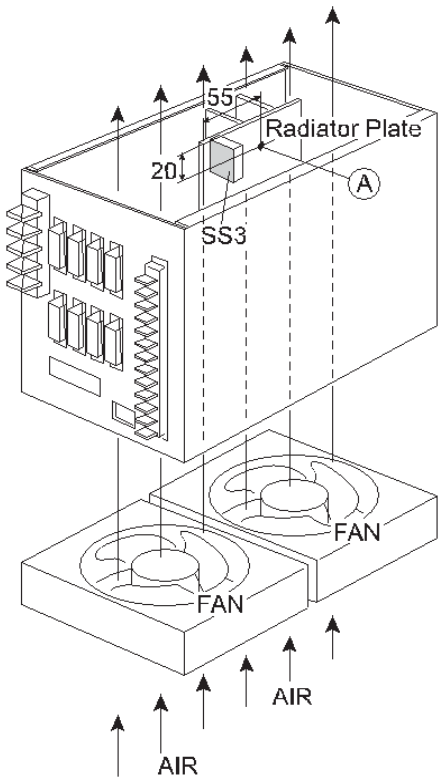
## 7.4.2 Sequence unit

- STA5000T can optionally be equipped with a sequence unit for controlling the DBS series unit's remote control circuits ON/OFF with a particular timing.
  This sequence unit enables to control 4 DBS unit (max) start and stop with time difference.
  The sequence unit operates by shorting the SYSTEM ON/OFF terminals to turn the status of the REMOTE SIGNAL 1 - 4 ON/OFF terminals from "H" to "L".
  Under the following situations, however, the signal from the REMOTE SIGNAL 1 - 4 ON/OFF terminals will change from "L" to "H".
  1) 1 of the 3 phases is missing, due to equipment failure, etc.
  2) Activation of the thermal detection.
  Power units equipped with a sequence unit have the model name "STA5000T-R".
  *1 For some users, external noise filter might be needed to meet noise regulation.
  External noise filter is recommended to install to reduce radiation noise from the wiring, especially if the wiring is long.
  *2 Be sure to connect up the REMOTE ON/OFF terminals (or the REMOTE SIGNAL ON/OFF terminals in a STA5000T-R) before running the DBS.
  Using the DBS without those terminals connected could damage the STA5000T.

## 7.5 Cooling method

- The power unit is designed for use with forced cooling by external fans.
  When the power unit is used, the temperature of part A of the unit should be below 75°C by flowing cooling-air inside of unit uniformly.

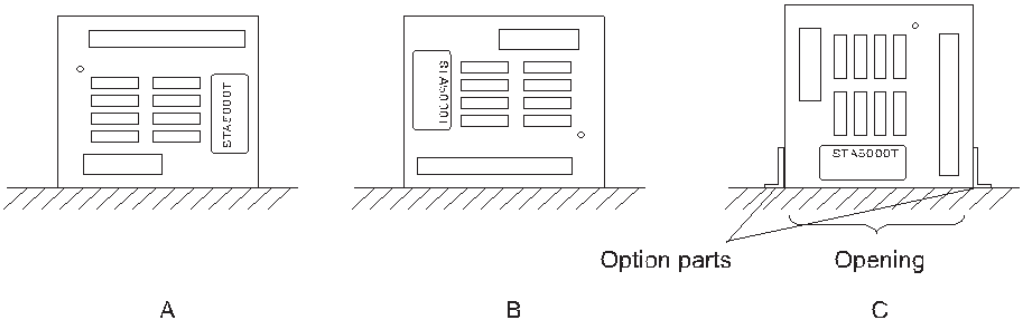
Fig.7.5.1
Cooling method




## 7.6 Installation method

(1) The mounting screw should be M4.
(2) Fix firmly, considering weight, impact and vibration.

Fig.7.6.1
Installation method



## 7.7 Options (-R)

### 7.7.1 SYSTEM ON/OFF

- REMOTE SIGNAL ON/OFF (R/S ON/OFF) can be controlled by SYSTEM ON/OFF signal.

Table 7.7.1 Specifications of SYSTEM ON/OFF

| No. | SYSTEM ON/OFF | Specifications | REMOTES SIGNAL |
|---|---|---|---|
| 1 | "L" | Short, 0-0.8V | "L" |
| 2 | "H" | Open(12v) | "H" |

### 7.7.2 REMOTE SIGNAL ON/OFF (Terminal: REMOTE SIGNAL ON/OFF open collector)

- DC/DC converter ON/OFF is controlled by REMOTE SIGNAL ON/OFF.

Table 7.7.2 Specifications of REMOTE SIGNAL ON/OFF

| No. | Item | | | Specifications |
|---|---|---|---|---|
| 1 | Function | DC-DC converter | Enable | "L" |
| | | | Disable | "H" |
| 2 | Voltage level "L" | | | 0.5V max at 5mA |
| 3 | Maximum external voltage | | | 35V max |
| 4 | Maximum sink current | | | 70mA max |

### 7.7.3 ALM (Terminal : ALM open collector)

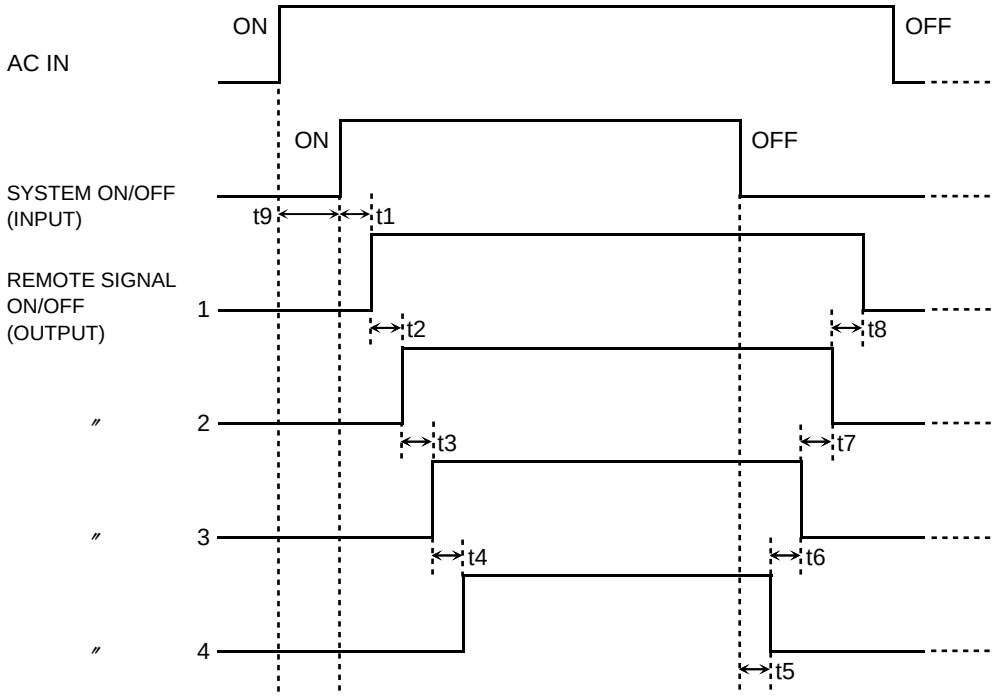
- Conditions of units are able to be monitored by ALM.
  "L" indicates normal operation (short), and 'H' ALM signal indicates operating status of power supply operation is failed as explained below (open).
  (1) ALM signal 'H' when the thermal protection is activated.
  (2) ALM signal 'H' when 1 of 3 phase is missing.
  REMOTE SIGNAL ON/OFF is turned to 'H' when ALM signal is 'H' level.

Table 7.7.3 Specifications of ALM

| No. | Item | Specifications |
|---|---|---|
| 1 | Function | Normal operation "L" |
| | | Abnormal operation "H" |
| 2 | Voltage level "L" | 0.5V max at 5mA |
| 3 | Maximum external voltage | 35V max |
| 4 | Maximum sink current | 70mA max |

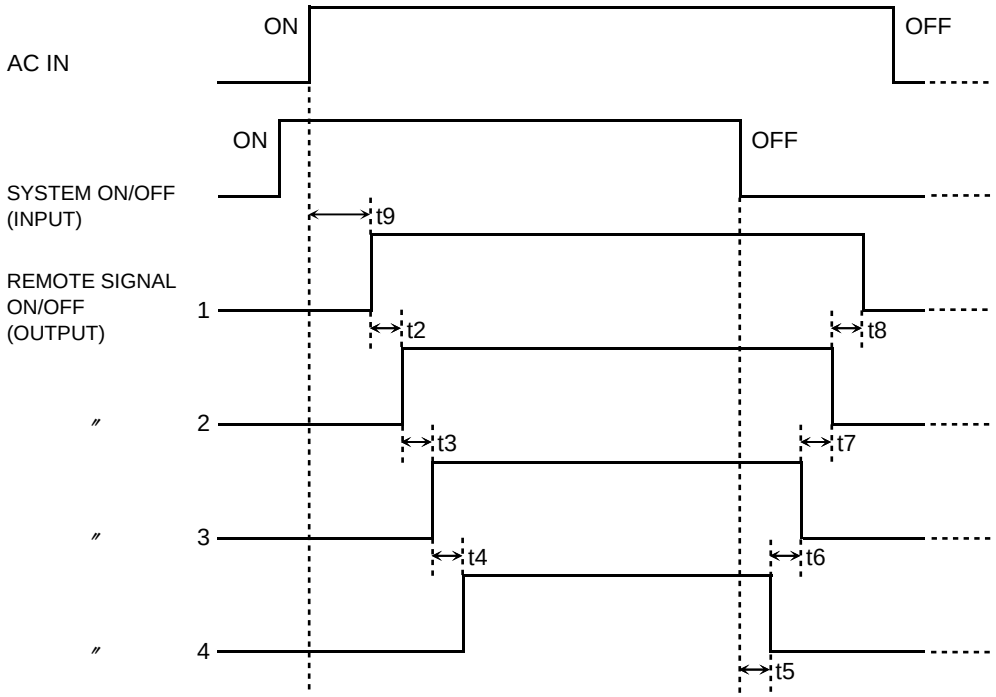
■ sequence chart (option)

Fig.7.7.1
SYSTEM ON/OFF
Input "H"




t1 : 900ms max
t5 : 450ms max
t6 - t8 : 600ms±25%
t9 : 1s max (irregular area)

Fig.7.7.2
SYSTEM ON/OFF
Input "L"



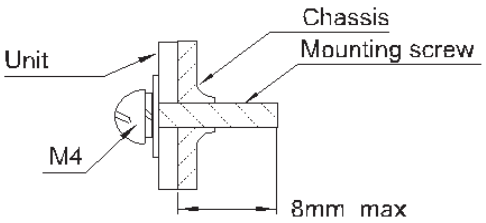

t2 - t4 : 600ms±25%
t5 : 450ms max
t6 - t8 : 600ms±25%
t9 : 1s max (irregular area)

## 7.8 Do's and Don'ts

### 7.8.1 Mounting screw

- Keep isolation distance between screw and internal components as below chart.

Fig.7.8.1
Mounting screw




### 7.8.2 Input voltage

- The input potential is three-phase AC200V (AC170 - 264V).
  Voltage shown in Fig.7.8.2 must be applied to the input terminal.
  Any phase ordering connection is acceptable.
  Use only three-phase three-wire system for the input line (Fig.7.8.2).

Fig.7.8.2
Delta connection