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Safety caution

Please read carefully before product being taken into service to ensure safety and proper operation of GIPAM2200.

• Please keep the safety caution to prevent any accident may happen by using the products incorrectly.

• Safety caution is classified with caution and danger and indication of them as follows.

⚠ Caution	Not following the instruction may result in serious injury or even death
⚠ Danger	Not following the instruction may result in serious injury or property damage

• Symbols used in this manual indicate as follows;

⚠	This symbol is for warning the hazardousness under the specific condition.
⚡	This symbol is for warning the electric shocks or any accidents under the specific condition.

• This instruction shall be kept in the nearest place of GIPAM2200.

⚠ Caution

• Please do not wiring when applied with power or on the operation; it may result in electric shock.

• Please do not all the wiring operation with the live bus bar; it may result in electric shock or fire and property damage by charging voltage of current transformer.

• Please put to earth; it may result in electric shock.

• Please do not attempt to disassemble even when the power not applied; it may result in electric shock by charging current remained in the product.

• Please do not wire or operate with wet hands; it may result in electric shock.

• Please do not use any damaged cable; it may result in electric shock.

• Please use the ring terminal when wiring the cable; it may result in electric shock by bare wire.

⚠ Caution

■ Safety caution for installation & terminal wiring

- Apply the rated voltage to the power supply terminal; it may result in property damage or fire.
- Please keep away product from screws, metals, water, or oil; it may result in fire.
- Please keep the rated load and polarity of input & output contacts; it may result in property damage or fire.
- Please wire to the terminal block after checking the terminal number; it may result in property damage or fire.
- Specialist help shall be sought for the installation and maintenance of product; it may result in malfunction or accident.

■ Inspection item before power supply being applied

- Check the voltage or polarity of control power supply.
- Check the wiring condition of input/output terminal.
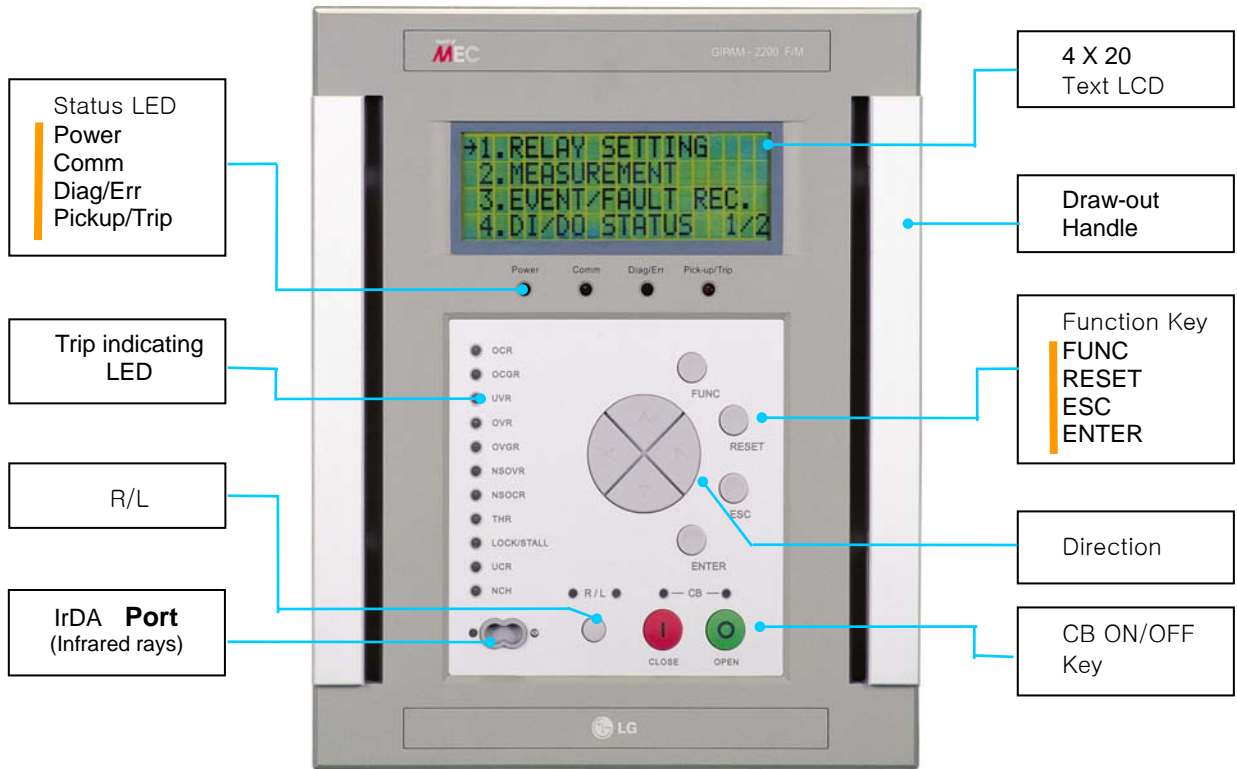
■ Caution for storage & handling

- Please store at dry & clean place.
- Please do not throw or put force on it during transport; It may result in malfunction or wrong operation
- Please stock the products in the way of FIFO (First-in First-out).
- Please do not load over 10 stories.

■ Caution for disposal

- Please dispose of it in accordance with industrial waste regulation.

1. The Layout of MMI

1.1 The External View

Status LED
Power
Comm
Diag/Err
Pickup/Trip

Trip indicating LED

R/L

IrDA **Port**
(Infrared rays)

4 X 20
Text LCD

Draw-out
Handle

Function Key
FUNC
RESET
ESC
ENTER

Direction

CB ON/OFF
Key

FUCTION
Using with ESC key when clearing Data. No use of it during normal operation.

FUNC

The Restoration of Trip
The indication of LED after faults,
The restoration of LCD

RESET

ESC
The cancel of selected item & change of setting values

ESC

ENTER
The selection of item
The confirmation of setting

ENTER

R/L

The switching of Remote/Local

DIRECTION

The move of item & position

The decrement / Increment of setting values & Item setting

1.2 The configuration of GIPAM-2200

GIPAM-2200 has a 20 x 4 Character LCD to display various measurement data, event, and faults for the user's convenience. Furthermore, it provides the 15~19 of LEDs for the user's interface to inform the customers of current status more easily. Each LED has its own characteristics and indicates the condition of CB and faults, etc.

11 function keys are on the surface of GIPAM-2200 for the input of user's information and it can be entered much easier and faster via PC. G2200 Manager, web-based program, enables to set & analyze the data of GIPAM-2200 as well as it can do 9600 high communication with the infrared communication LED on the surface of GIPAM-2200.

1) The basic function & operation of Key on GIPAM-2200

The key on the surface of GIPAM-2200 has its own function according to each menu.

The type of key	Applicable menu	Basic function
Direction Key (Up & Down)	Menu tree	Move between menus with cursor
	Correcting & setting menu	Move to the data which will be set
	Password setting	The change of Password
Direction Key (Left & Right)	Correcting & setting menu	The change of data where cursor is on
	Password setting	The move of cursor
ENTER Key	Correcting & setting menu	The storage of changed data
	Menu tree	Move to the menu where cursor is on
	Saving confirmation menu	The storage of changed data
ESC Key	Correcting & setting menu	The cancel of changed data
	Menu tree	Move to upper menu
	Saving confirmation menu	The cancel of saving changed data
RESET Key	Trip of protection relay	Trip RESET of protection relay
	Alarming of Diag	Self-diagnostic of protection relay
CLOSE Key OPEN Key	All menus	The control of CB or CC Close Key is for the close of CB or CC Open Key is for the open of CB or CC
R/L Key	All menus	The switching of Remote and Local
FUNC Key	Pre-setting Key	For manufacturer's setting

2) The basic function & operation of LED on GIPAM-2200

The LED embedded on GIPAM-2200 is different to the model. There are 19 LEDs for F type and 15 LEDs for T type and they are divided according to function into Status indicating LED & Trip indicating LED. In case of Status indicating LED, F&T type has same function but for Trip indicating LED it has different function according to type.

LED type	Basic function
Power supply LED	It is with green and indicates the status of power supply of GIPAM-2200. For normal operation it is kept with green light ON but for the abnormal operation it is blinking every second.
Communication LED	It is with orange and indicates the status of remote communication. The LED is blinking while transmitting or receiving data under normal correspondence of communication card.
DIAG/ERR	It is with yellow but it is blinking if problem has found with hardware or program while it is being under self-diagnosis. Under normal operation it is in OFF. Please contact the official A/S centre in case of blinking of LED.
PICK-UP/TRIP	It is with red and indicates the protection relay of GIPAM-2200. It is blinking every second if protection relay is in the condition of Pick-up by systematic faults. It is kept with red light ON if it is tripped by the operation of protection relay. This LED can be cancelled only by RESET KEY of protection relay or reset of it with remote communication.
TRIP indicating LED	It is with yellow and installed on the left side of device, 11 LEDs for F type and 7 LEDs for T type. The LED which corresponds to detected faults is ON when GIPAM-2200 is tripped due to systematic faults. However, In case of notching relay it is ON only when motor is unable to be started. The LED for protection relay can be cancelled only by RESET KEY like the PICK-UP/TRIP LED.
REMOTE/LOCAL	It is on the upper side of R/L KEY with green & red and indicates the present control status of GIPAM-2200. It is with GREEN light ON under REMOTE control and with RED light ON under LOCAL control. These two LEDs shall not be ON or OFF at the same time.
CB CLOSE/OPEN	It is on the upper side of CLOSE/OPEN KEY with green & red and indicates the present status of circuit breaker which is connected to GIPAM-2200.

1.3 The display window of MMI

1) Initial window

The initial window will be displayed as shown below after applying the power supply to the device. Different measured values are displayed on the initial window of F/T type according to the model of GIPAM-2200.

```
V  a  b  :  0  .  0              I  a  :  0  .  0
V  b  c  :  0  .  0              I  b  :  0  .  0
V  c  a  :  0  .  0              I  c  :  0  .  0
       P      :         0  .  0  0  0  W
```

```
V  a  :  0  .  0                 I  a  :  0  .  0
V  b  :  0  .  0                 I  b  :  0  .  0
V  c  :  0  .  0                 I  c  :  0  .  0
       Q      :         0  .  0  0  0  V  a  r
```

(PIC 2-1 : Initial window of 3P 4W)

The initial window of F type for 3P 4W is shown in the PIC 2-1. The value of Ia, Ib, Ic are basically displayed and Va, Vb, Vc, Vab, Vbc, Vca, active power and reactive power are on in turn every 3secs. The value of voltage and current on the initial window are displayed to the first decimal place.

Va	:	0.0
Vb	:	0.0
Vc	:	0.0
f	:	0.0

(A)

Ia	:	0.0
Ib	:	0.0
Ic	:	0.0
PF	:	0.0

(B)

P	:	0.0
Q	:	0.0
PE	:	0.0
QE	:	0.0

(C)

(PIC 2-2 : Initial window of 3P 4W)

The initial window of IG type for 3P 4W is shown in the PIC 2-2. The value of Va, Vb, Vc,f are basically displayed and Ia, Ib, Ic, PF, active power(P), reactive power(Q), active electric power(PE), reactive electric power(QE) are on in turn every 3secs. The measured values on the initial window are displayed to the first decimal place.

For the T type of GIPAM-2200 the voltage value is not displayed as it does not receive the voltage input but display the current value of each phase of secondary winding and the current difference between the primary and secondary calculated current.
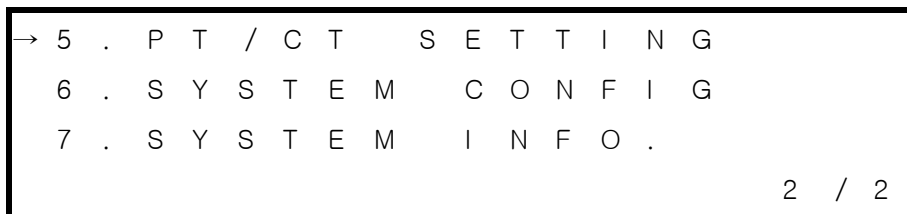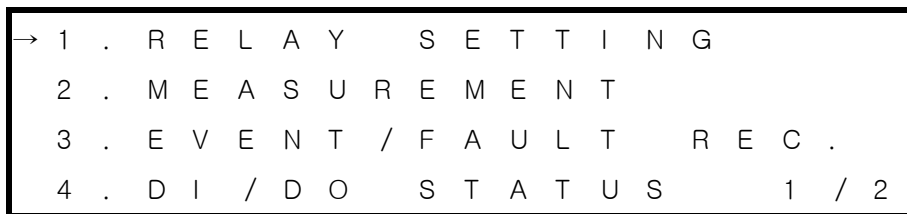
```
W  2      I  a  :         0  .  0  0  0  A
W  2      I  b  :         0  .  0  0  0  A
W  2      I  c  :         0  .  0  0  0  A
    I  d  _  a  :         0  .  0  0  0  I  n
```

(PIC 2-2: Initial window of T type)

The initial window of T type is shown in the PIC 2-2. The value of Ia, Ib, Ic from the secondary part of transformer are basically displayed and Id_a, Id_b, Id_c are on in turn every 3secs. The current value is displayed on initial window to the first decimal place. The precise measured values are available from Measurement menu.

2) The display of basic menu

If pressing ESC or ENTER KEY from initial window, move to basic menu window. It is the most fundamental window which displays the list of menu. For the move of different menu Up & Down KEY are used and the detailed menu is available by pressing ENTER KEY.

```
→ 1 .  R E L A Y    S E T T I N G
  2 .  M E A S U R E M E N T
  3 .  E V E N T / F A U L T   R E C .
  4 .  D I / D O   S T A T U S    1 / 2
```

```
→ 5 .  P T / C T   S E T T I N G
  6 .  S Y S T E M   C O N F I G
  7 .  S Y S T E M   I N F O .
                       2 / 2
```

(PIC 11-5 : The basic menu window of GIPAM-2200 F type)

The basic menu window of F type is shown in the PIC 11-5. The menu is selected if pressing ENTER KEY after moving to the desirable place by Up & Down KEY.

3) The subordinate menu of basic menu

 ¬) Relay setting

If pressing ENTER KEY from 1. RELAY SETTING, which is in the basic menu, after setting the device with single phase 3 wire, the window is displayed as shown below in the picture of 2-3. The only available protection relays for single phase 3 wire are as followings: OCR (50/51) for over current, OCGR (50/51G) for over current ground fault, UVR (27) for under voltage, OVR (59) for over voltage and other relays are unavailable.

```
1 . [    ]  O  C  R     ( 5 0 / 5 1 )
2 . [    ]  O  C  G  R  ( 5 0 / 5 1 G )
3 . [    ]  U  V  R     ( 2 7 )
4 . [    ]  O  V  R     ( 5 9 )
```

(PIC 2-3: The RELAY SETTING menu of single phase 3 wire)

   From above menu the protection relays can be selected/cleared. If using the right & left direction key after moving to the desirable place with up & down direction key, the window which asks whether to select/clear the relay is displayed. Under this circumstance, ENTER key is for the confirmation of change of relays and ESC key is for cancellation. This menu is used for setting the relay to protect the device.

   For the detailed setting of relay move to the desirable place with up & down key and press the ENTER key and then move to the setting value change and setting menu. The relay setting menu of GIPAM-2200 F for 3 phase 3 or 4 wire is as shown below in the picture of 2-4 and it has the same operating method with single phase 3 wire. The available relay of GIPAM-2200 F for 3 phase 3 wire or 4 wire is as followings: OCR (50/51) for over current, OCGR (50/51G) for over current ground fault , UVR (27) for under voltage, OVR (59) for over voltage, OVGR (64) for over voltage ground fault, NSOVR (47) for negative sequence over voltage, NSOCR (46) for negative sequence over current, THR (49) for thermal overload, STALL / LOCK (48/51LR), UCR (37) for under current, NCH (66) for notching relay.

   There are 12 types of protection relay for GIPAM-2200 IG, OCR (50/51) for over current, OCGR (50/51G) for over current ground fault, UVR (27) for under voltage, OVR (59) for over voltage, DPR(32P) for over active power, UPR(37P) for under active power, DQR(32Q) for directional reactive power, UFR(81U) for low frequency, OFR(81O) for high frequency, NSOCR (46) for negative sequence over current, THR (49) for thermal overload, SYNC CHK(25) for synchronizing, GIPAM-2200 IG is same with F type in that setting method and KEY input.

   There are 7 types of protection relay for GIPAM-2200 T, DFRP (87P) for differential ratio relay, DFRG (87G) for differential ratio ground fault, OCR(50/51) for over current, OCGR(50/51G) for over current ground fault and last two of them can be set in the primary part and secondary part of transformer. The relay setting menu of GIPAM-2200 T is as shown below in the picture of 2-5.
   GIPAM-2200 T is same with F type in that setting method and KEY input.

```
1 . [    ]  O  C  R     ( 5 0 / 5 1 )
2 . [    ]  O  C  G  R  ( 5 0 / 5 1 G )
3 . [    ]  U  V  R     ( 2 7 )
4 . [    ]  O  V  R     ( 5 9 )          1 / 3
```

```
5 .  [    ]  O  V  G  R     (  6  4  )
6 .  [    ]  N  S  O  V  R  (  4  7  )
7 .  [    ]  N  S  O  C  R  (  4  6  )
8 .  [    ]  T  H  R      (  4  9  )      2  /  3
```

```
 9 .  [    ]  S  /  L  (  4  8  /  5  1  L  R  )
1 0 . [    ]  U  C  R  (  3  7  )
1 1 . [    ]  N  C  H  (  6  6  )
                                         3  /  3
```

(PIC 2-4: RELAY SETTING MENU of GIPAM-2200 F for 3P 3W, 3P 4W)

```
1 .  [    ]  D  F  R  P      (  8  7  T  P  )
2 .  [    ]  D  F  R  G  w  1  (  8  7  T  G  )
3 .  [    ]  O  C  R  w  1     (  5  0  /  5  1  )
4 .  [    ]  O  C  G  R  W  1             1  /  2
```

```
5 .  [    ]  O  C  R  w  2     (  5  0  /  5  1  )
6 .  [    ]  O  C  G  R  w  2  (  5  0  /  5  1  N  )
7 .  [    ]  O  V  G  R  w  1  (  6  4  )
                                         2  /  2
```

(PIC 2-5: RELAY SETTING MENU of GIPAM-2200 T)

1.4 The detail of each menu

The detail of each menu for F type

1) Relay Setting

  OCR

```
→ 1 .  R  E  L  A  Y     S  E  T  T  I  N  G
  2 .  M  E  A  S  U  R  E  M  E  N  T
  3 .  E  V  E  N  T  /  F  A  U  L  T    R  E  C  .
  4 .  D  I  /  D  O    S  T  A  T  U  S    1  /  2
```

```
1 .  [    ]  O  C  R     (  5  0  /  5  1  )
2 .  [    ]  O  C  G  R  (  5  0  /  5  1  G  )
```

```
3 .  [    ]  U  V  R    ( 2 7 )
4 .  [    ]  O  V  R    ( 5 9 )           1 / 3
```

PIC 1-1

The PIC 1-1 shows the step to the display of 1. OCR.

```
O  C  R          I  N  S  T        <  H  I  G  H  >
O  N  /  O  F  F    S  E  L        <      O  N      >
I  >  >  >    :        1 . 0        I  n
                                         1 / 2
```

PIC 1-2

The initial window of OCR for correction is shown in PIC 1-2.

The blinking part in the window indicates that it is being corrected.

```
O  C  R          I  N  S  T        <  H  I  G  H  >
O  N  /  O  F  F    S  E  L        <      O  N      >
I  >  >  >    :        1 . 0        I  n
                                         1 / 2
```

```
O  C  R          I  N  S  T        <      L  O  W  >
O  N  /  O  F  F    S  E  L        <      O  N      >
I  >  >    :        1 . 0        I  n
T  d      :        0 . 0  5      s       1 / 2
```

PIC 1-3

It is possible to display OCR Instantaneous HIGH window or OCR Instantaneous LOW window by pressing left & right key only when the window is displayed as shown above in PIC 1-3.

It is possible to display instantaneous window or time delay window by pressing up & down key.

```
S  E  T  T  I  N  G    C  H  A  N  G  E  ?


     E  N  T  E  R      -      Y  E  S
     E  S  C            -      N  O
```

PIC 1-4

If setting is changed, the setting change window is displayed as shown above in PIC 1-4 to confirm the setting change. From this window, press ENTER key to save the setting and ESC key to cancel it.

The setting items from each window are changed by left & right key.

The setting items which will be changed are as followings;

OCR INST HIGH

ON/OFF Select

I>>>

```
┌─────────────────────────────────────────┐
│  O  C  R        I  N  S  T      <  H  I  G  H  >  │
│  O  N  /  O  F  F     S  E  L       <     O  N      >  │
│ I  >  >  >     :        1  .  0      I  n  │
│                                    1  /  2  │
└─────────────────────────────────────────┘
```

PIC 1-5

OCR INST LOW

ON/OFF Select

I>>, Time Delay

```
┌─────────────────────────────────────────┐
│  O  C  R        I  N  S  T      <     L  O  W  >  │
│  O  N  /  O  F  F     S  E  L       <     O  N      >  │
│  I  >  >     :        1  .  0      I  n  │
│  T  d        :        0  .  0  5      s        1  /  2  │
└─────────────────────────────────────────┘
```

PIC 1-6

OCR Time delay

Definite time : I>, Time delay <PIC 1-7>

Inverse time : I>, Time Lever, Time delay <PIC 1-8>

```
┌─────────────────────────────────────────┐
│  O  C  R        T  /  D  L  Y     <     D  T      >  │
│  I  >        :        0  .  1  0      I  n  │
│  T  d        :        0  .  0  5      s  │
│                                    2  /  2  │
└─────────────────────────────────────────┘
```

PIC 1-7

```
┌─────────────────────────────────────────┐
│  O  C  R        T  /  D  L  Y     <     S  I      >  │
│  I  >        :        0  .  1  0      I  n  │
│  T  /  L     :        0  .  0  5  │
│  T  d        :        0  .  0  0      S        2  /  2  │
└─────────────────────────────────────────┘
```

PIC 1-8

The setting method of other relays are same with above.

2) Measurement

Voltage

```
  1 . R E L A Y   S E T T I N G
→ 2 . M E A S U R E M E N T
  3 . E V E N T / F A U L T   R E C .
  4 . D I / D O   S T A T U S     1 / 2
```

```
→ 1 . V O L T A G E
  2 . C U R R E N T
  3 . P H A S E
  4 . P O W E R               1 / 2
```

PIC 2-1

The PIC 2-1 shows the step to the display of 1. Voltage.

```
        L I N E   V O L T A G E
  V a b   :       0 . 0 0 0 V
  V b c   :       0 . 0 0 0 V
  V c a   :       0 . 0 0 0 V     1 / 3
```

```
        P H A S E   V O L T A G E
    V a   :       0 . 0 0 0 V
    V b   :       0 . 0 0 0 V
    V c   :       0 . 0 0 0 V     2 / 3
```

```
        V o   /   V 2
    V o     :       0 . 0 0 0 V
  V o _ m   :       0 . 0 0 0 V
    V 2     :       0 . 0 0 0 V     3 / 3
```

PIC 2-2

The voltage measurement window displays Vab, Vbc, Vca at the first window, Va, Vb, Vc at the second window and Vo, Vo Max, V2 at the third window as shown above in PIC 2-2.

The setting method of other items are same with above.

3) Event/ Fault Record
Event List

The maximum of 800 events are recorded at Event List which displays event type, event occurred time, and the detail of event.

```
  1 . R E L A Y    S E T T I  N G
  2 . M E A S U R E M E N T
→ 3 . E V E N T / F A U L T   R E C .
  4 . D I / D O   S T A T U S    1 / 2
```

```
→ 1 . E V E N T   L I S T           1
  2 . F A U L T   L I S T           0
  3 . E V E N T   C L E A R
  4 . F A U L T   C L E A R
```

PIC 3-1

The PIC 3-1 shows the step to the display of 1. Event List.

```
    1   C H A N G E   S Y S .   V A R
        2 0 0 3 .   0 5 .   2 9 .
        2 3 : 1 2 : 2 1 . 9 5 7
P R E S S   L E F T / R I G H T   K E Y
```

PIC 3-2

The order of selected Event, Event type, and Event occurred time is displayed at the initial window of Event List as shown above in PIC 3-2.

```
L - W I R I N G


```

PIC 3-3

If pressing left & right key from the initial window, the detail of event is displayed as shown in PIC 3-3 and displayed up to 8 events in one window at the same time.

If pressing up & down key, move to the following event.

```
     1     C H A N G E     S Y S .     V A R
           2 0 0 3 .       0 5 .       2 9 .
           2 3 : 1 2 : 2 1 . 9 5 7
 P R E S S     L E F T / R I G H T     K E Y
```

PIC 3-4

The order of each event is renewed every hour as shown in PIC 3-4.

Fault List

The maximum of 200 faults occurred recently are recorded at Fault List.

The Fault type, Fault occurred time, the detail of Fault, and the Fault values are displayed at Fault List.

```
   1 . R E L A Y     S E T T I N G
   2 . M E A S U R E M E N T
 → 3 . E V E N T / F A U L T     R E C .
   4 . D I / D O     S T A T U S       1 / 2
```

```
   1 . E V E N T     L I S T                 1
 → 2 . F A U L T     L I S T                 1
   3 . E V E N T     C L E A R
   4 . F A U L T     C L E A R
```

PIC 3-5

The PIC 3-5 shows the step to the display of Fault List.

```
     1       F A U L T     E V E N T
             2 0 0 3 .       0 5 .       2 9 .
             2 3 : 1 2 : 2 1 . 9 5 7
 P R E S S     L E F T / R I G H T     K E Y
```

PIC 3-6

The order of selected Fault, Fault type, and Fault occurred time are displayed at the first window of Fault List as shown in PIC 3-6.

15

```
U  V  R  -  a  b  c
```

PIC 3-7

If pressing left & right key from initial window, the detail of fault is displayed as shown in PIC 3-7 and displayed up to 8 faults in one window at the same time. If pressing left & right key at the second window, the fault value is displayed.

```
1        F  A  U  L  T     V  A  L  U  E
V  a     :           0  .  0  0  0  V
V  b     :           0  .  0  0  0  V
V  c     :           0  .  0  0  0  V
```

```
1        F  A  U  L  T     V  A  L  U  E
V  o     :           0  .  0  0  0  V
V  2     :           0  .  0  0  0  V
```

```
1        F  A  U  L  T     V  A  L  U  E
I  a     :           0  .  0  0  0  A
I  b     :           0  .  0  0  0  A
I  c     :           0  .  0  0  0  A
```

```
1        F  A  U  L  T     V  A  L  U  E
I  o     :           0  .  0  0  0  A
I  2     :           0  .  0  0  0  A
```

PIC 3-8

The fault values, Va, Vb, Vc, Vo, V2, Ia, Ib, Ic, Io, I2, are displayed as shown in PIC 3-8 for the 3P 3W, 3P 4W.

If pressing up & down key, move to the following fault.

```
1        F  A  U  L  T     E  V  E  N  T
```

```
          2 0 0 3 .    0 5 .    2 9 .
          2 3 : 1 2 : 2 1 . 9 5 7
P  R  E  S  S     L  E  F  T  /  R  I  G  H  T     K  E  Y
```
PIC 3-9

The order of each fault is renewed every hour as shown in PIC 3-9.

The setting method of other faults are same with above.

4) DI/DO Status

4-1) DI/DO Status

```
    1 .  R E L A Y     S E T T I N G
    2 .  M E A S U R E M E N T
    3 .  E V E N T / F A U L T    R E C .
→  4 .  D I / D O     S T A T U S      1 / 2
```

```
→  1 .  D I / D O        S T A T U S
    2 .  C B / C C        S T A T U S
    3 .  S Y S T E M      S T A T U S
    4 .  C B / D O        C O U N T
```
PIC 4-1

The PIC 4-1 shows the step to the display of DI / DO Status.

```
              D I     S T A T U S        1 / 3
D I  1 :     o p e n     D I  4 :  c l o s e
D I  2 :     o p e n     D I  5 :  c l o s e
D I  3 :     o p e n     D I  6 :  c l o s e
```
PIC 4-2

The initial window of DI / DO Status is shown in PIC 4-2.

It shows the present state of DI and is displayed as open when the contact of DI is opened or as close when it is closed.

The setting method of other status are same with above.

5) PT, CT setting

5-1) PT Ratio

```
→ 5 .  P T / C T    S E T T I N G
  6 . S Y S T E M    C O N F I G
  7 . S Y S T E M    I N F O .
                                2  /  2
```

```
→ 1 .  P T       R A T I O
  2 . G P T       R A T I O
  3 . C T         R A T I O
  4 . N C T       R A T I O
```

PIC 5-1

The PIC 5-1 shows the step to the display of PT Ratio.

```
             P T    R A T I O
P R I .   :   1 1 0 . 0 0    V
S  E  C .    :   1 1 0 . 0 0    V
```

PIC 5-2

The Primary value of PT Ratio in PIC 5-2 only can be set in the range of 110 – 154kV.

The setting method of the others are same with above.

6) System Config

6-1) Wiring Select

```
  5 .  P T / C T    S E T T I N G
→ 6 .  S Y S T E M   C O N F I G
  7 .  S Y S T E M    I N F O .
                                2  /  2
```
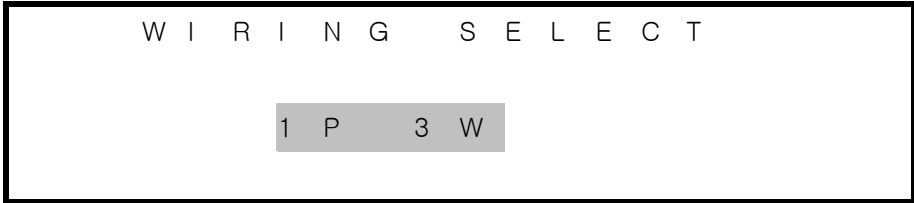
```
→ 1 .  W I R I N G    S E L E C T
  2 .  C O M M .    S E T
```

```
┌─────────────────────────────────────────┐
│  3  .  S  E  R  I  A  L      I  D        │
│  4  .  W  A  V  E      R  E  C    S  E  T      1  /  2  │
└─────────────────────────────────────────┘
```
PIC 6-1

The PIC 6-1 shows the step to the display of Wiring Select.

```
┌─────────────────────────────────────────┐
│        W  I  R  I  N  G      S  E  L  E  C  T     │
│                                          │
│              █1  P      3  W█             │
│                                          │
└─────────────────────────────────────────┘
```
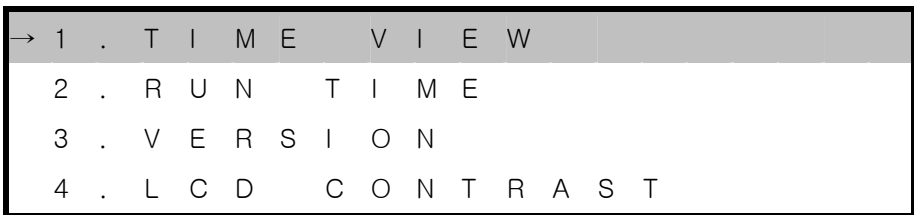PIC 6-2

The 3 types of wiring method (1P 3W, 3P 3W, 3P 4W) are available in PIC 6-2.

※ **1P 3W is unavailable for FZ type.**
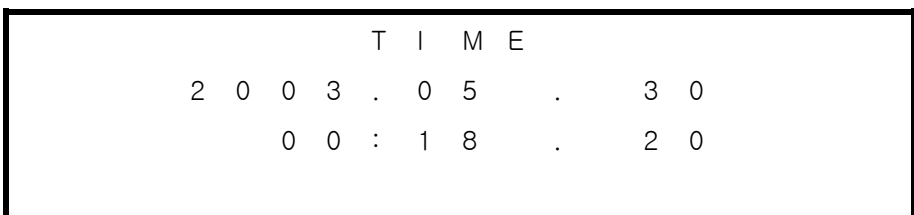
The setting method of the others are same with above.

7) System Info

7-1) Time View

```
┌─────────────────────────────────────────┐
│  5  .  P  T  /  C  T      S  E  T  T  I  N  G     │
│  6  .  S  Y  S  T  E  M      C  O  N  F  I  G     │
│→ 7  .  S  Y  S  T  E  M      I  N  F  O  .        │
│                                    2  /  2  │
└─────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│→ 1  .  T  I  M  E      V  I  E  W           │
│  2  .  R  U  N      T  I  M  E              │
│  3  .  V  E  R  S  I  O  N                  │
│  4  .  L  C  D      C  O  N  T  R  A  S  T     │
└─────────────────────────────────────────┘
```
PIC 7-1

The PIC 7-1 shows the step to the display of Time View.

```
┌─────────────────────────────────────────┐
│              T  I  M  E                   │
│      2  0  0  3  .  0  5    .    3  0      │
│            0  0  :  1  8    .    2  0      │
│                                          │
└─────────────────────────────────────────┘
```
PIC 7-2

The current time is displayed as shown in PIC 7-2.

The setting method of the others are same with above.

The detail of each menu for T type

1) Relay Setting

```
→ 1 . R E L A Y    S E T T I N G
  2 . M E A S U R E M E N T
  3 . E V E N T / F A U L T   R E C .
  4 . D I / D O   S T A T U S     1 / 2
```

```
  1 . [   ] D F R P     ( 8 7 T P )
  2 . [   ] D F R G w 1 ( 8 7 T G )
  3 . [   ] O C R w 1   ( 5 0 / 5 1 )
  4 . [   ] O C G R W 1         1 / 2
```

PIC 1-1

The setting & operating method are same for F and T type.

2) Measurement

Line Current

```
  1 . R E L A Y    S E T T I N G
→ 2 . M E A S U R E M E N T
  3 . E V E N T / F A U L T   R E C .
  4 . D I / D O   S T A T U S     1 / 2
```

```
→ 1 . L I N E   C U R R E N T
  2 . D I F F / R E S T   C U R R E N T
  3 . Z E R O   C U R R E N T
  4 . I o   D I F F / R E S T .   1 / 2
```

PIC 1-2

Event/Fault List

The setting & operating method of Event/Fault List are same for F and T type.

Please refer to "The detail of each menu for F type> Event/Fault List" for the use of KEY.

The fault values saved at Fault List for T type are as followings; Ia1, Ib1, Ic1, Ia2, Ib2, Ic2, Io1, Io2, Vo, Ida, Idb, Idc, Ira, Irb, Irc, Ido, Iro.

```
  1      F  A  U  L  T      V  A  L  U  E
I  a  1   :         8  2  .  6  4  k  A
I  b  1   :            0  .  0  0  0  A
I  c  1   :            0  .  0  0  0  A
```

```
  1      F  A  U  L  T      V  A  L  U  E
I  a  2   :            0  .  0  0  0  A
I  b  2   :            0  .  0  0  0  A
I  c  2   :            0  .  0  0  0  A
```

```
  1      F  A  U  L  T      V  A  L  U  E
I  o  1   :            0  .  0  0  0  A
I  o  2   :            0  .  0  0  0  A
V  o     :            0  .  0  0  0  V
```

```
  1      F  A  U  L  T      V  A  L  U  E
I  d  a   :            9  .  1  8  5  I  n
I  d  b   :            0  .  0  0  0  I  n
I  d  c   :            0  .  0  0  0  I  n
```

```
  1      F  A  U  L  T      V  A  L  U  E
I  r  a   :            9  .  1  8  5  I  n
I  r  b   :            0  .  0  0  0  I  n
I  r  c   :            0  .  0  0  0  I  n
```

```
  1      F  A  U  L  T      V  A  L  U  E
I  d  o   :            0  .  0  0  0  I  n
I  r  o   :            0  .  0  0  0  I  n
```

PIC 1-3

3) DI/DO Status

The window and operating method of DI/DO Status are same for F and T type.

Please refer to "The detail of each menu for F type > DI/DO Status for the use of KEY.

2. The ratings

The rating of GIPAM-2200

The table as shown below is for the rating of GIPAM-2200.

ITEM		SPEC
Wiring connection		3P3W, 3P4W, 1P3W*
Input	Frequency	60Hz (50Hz)
	Voltage	PT : 110V
		GPT : 190, 190/√3
	Current	CT : 5A
		ZCT : 1.5mA
	Control power supply	AC/DC : 110V
	Power consumption	Normal : less than 30W, Operation : less than 70W
	Input burden	PT : 0.5VA
		CT : 1.0VA
	Input contact	Digital Input : AC/DC 110V
Output contact	POWER 2EA	AC 250V 16A / DC 30V 16A Resistive Load
		4000VA, 150W
	ALARM 10EA	AC 250V 5A / DC 30V 5A Resistive Load
		1250VA, 150W
Operating temperature range		-10℃ ~ 55℃
Storage temperature range		-25℃ ~ 70℃
Relative humidity		30% ~ 80% of the daily average RH
Altitude		Less than 1000m
Others		Shall be no abnormal vibration & impact Shall be no severe air pollution
Applicable standard		KEMC 1120, IEC 60255

※ If device is used out of the operating temperature range, LCD may not be displayed clearly.

* 1P3W is not available for FN type.

3. The protection relay of GIPAM-2200

GIPAM-2200 has various protection relays to protect/synchronize Feeder, Motor, Transformer.

Protection relay	Operation type	Operating value setting / Increase & Decrease, Operating time	Remark
OCR(50/51)	INST High	Setting : Off, 1.0~32.0/0.1In	Being operated less than 40ms

	INST Low	Setting : Off, 1.0~32.0/0.1In Operating time : 0.05~300.0/0.01s	Definite time
	Time delay	Setting : Off, 0.1~10.0/0.01In Operating time : 0.05~1.20/0.01 (Inverse time) 0.05~300.0/0.01s (Definite time) Operation delay time : 0.0~10.0s/0.01s (Inverse time)	Time delay curve DT, SI, VI, EI, LI
	Permissible error	Operating value : less than ±5% or 0.01In Operating time : less than ±5% or ±20ms	
OCGR (50/51N)	INST High	Setting : Off, 0.1~8.0/0.02In	Being operated less than 40ms
	INST Low	Setting : Off, 0.1~8.0/0.02In Operating time : 0.05~300.0/0.01s	Definite time
	Time delay	Setting : Off, 0.02~2.0/0.01In Operating time : 0.05~1.20/0.01s (Inverse time) 0.05~300.0/0.01s (Definite time) Operating delay time : 0.0~10.0s/0.01s (Inverse time)	Time delay curve DT, SI, VI, EI, LI
	Permissible error	Operating value : less than ±5% or 0.01 In Operating time : less than ±5% or ±20ms	
NSOVR (47)	Time delay High	Setting : Off, 0.1~1.0 /0.1Vn Operating time: 0.05~10.0/0.01s	Definite time
	Time delay Low	Setting : Off, 0.1~1.0/0.1Vn Operating time: 0.05~10.0/0.01s	Definite time
UVR (27)	Time delay	Setting : 0.2~1.0/0.01Vn Operating time: 0.05~10.0/0.01s	Definite time
OVR (59)	Time delay High	Setting: Off, 0.8~1.6/0.01Vn Operating time: 0.05~10.0/0.01s	Definite time
	Time delay Low	Setting : Off, 0.8~1.6/0.01Vn Operating time: 0.05~10.0/0.01s	Definite time
OVGR (64)	INST	Setting : Off, 11~80/1V Operating time: INST or 50~250/5ms	Being operated less than 40ms in case of INST
	Time delay	Setting : Off, 11~80/1V Operating time: 0.05~300.0/0.01s (Definite time) 0.05~1.0/0.01 (Inverse time)	Time delay curve DT, SI

NSOCR (46)	INST	Setting : Off, 0.1~1.0/0.02In Operating time: INST or 50~250/5ms	Being operated less than 40ms in case of INST
	Time delay	Setting : Off, 0.1~1.0/0.01In Operating time: 0.05~10.0/0.01s (Definite time) 0.05~1.0/0.01 (Inverse time) Operating delay time : 0.0~10.0/0.01s (Inverse time)	Time delay curve DT,SI,VI,EI,LI
DGR (67N)	Time delay	Zero phase current setting: 0.02~2.0/0.01Ion Zero phase voltage setting: 11~80/1V Phase-sensitive standard angle: 0~90/5° Operating time: 0.05~10.00/0.01s	Earth type Definite time
SGR (67G)	Time delay	Zero phase current setting: 0.9~6.0/0.1mA Zero phase voltage setting: 11~80/1V Phase-sensitive standard angle: 0~90/5° Operating time: 0.05~10.00/0.01s	Non-earth type Definite time
THERMAL (49)	Time delay	Setting : 0.2~1.2/0.01In Hot thermal time constant : 2.0~60.0/0.5 min Cold thermal time constant : 2.0~60.0/0.5 min k Factor : 0.80~1.20/0.05	Hot = Heating Cold = Cooling
STALL/LOCK (48/51LR)	Stall Time delay	Setting : Off, 0.2~10.0/0.01In Operating time: 0.05~300.0/0.01s	Definite time
	Lock Time delay	Setting : Off, 0.2~10.0/0.01In Operating time: 0.05~300.0/0.01s (Definite time) 0.05~1.00/0.01 (Inverse time)	Time delay curve DT, VI,EI
	Motor operating time	1~300.0/0.1 s	
UCR (37)	Time delay	Setting : 0.1~0.9/0.02In Operating time: 0.10~10.00/0.01s	Definite time
NCH (66)	–	Starting No. : 1~5/1 time Setting time : 10~60/1min Time interval between starting : 1~60/1min Time interval between stop and starting: 1~60/1min Residual heating value : 10~80/1%	Start-limit

DFR-P (87T)	INST (High)	Differential current setting : 2~32/0.1In	Being operated less than 40ms

		Differential current setting : 0.2~1.0/0.1In Slope1 : 15~100/1% Slope2 : 15~100/1% Knee Point : 1.0~20.0/0.1In f_2 BLOCK: Off, 10~50/1% Io Elimination : ON/OFF Operating time: INST or 0.05~10.00/0.01s	In case Inrush is Off with INST, being operated within 40 ms In case Inrush is On, being operated within 50ms
	Time delay(Low) f_2 BLOCK		
DFR-G	-	Differential current setting : 0.05~1.0/0.01In Slope : 15~100/1% Operating time: INST or 0.05~10.0/0.01s	Being operated within 40ms in case of INST

7.1.16 Directional Active Power Relay-32P

ㄱ. Detection : Detect the active power in electric system

ㄴ. Operation characteristics: Time delay

Operation at 3 phase over active power

Operation characteristics & setting range of Directional Active Power Relay

Operating type		Operating value setting	Operating time characteristics		Remark
			Setting range	Characteristics	
Definite time	Directional Overpower	∞, 0.80~1.50Pn/ 0.01Pn	0.10~120.00/0.10s	Definite time	-
	Reverse Directional Overpower	∞, 0.02~0.50Pn/ 0.01Pn	0.10~120.00/0.10s	Definite time	-

ㄷ. Permissible error of operating value:

0.02<= Pn <= 0.1 : The ±20% of setting value or ±0.01Pn

0.1< Pn <= 1.50 : The ±10% of setting value or less than ±0.01Pn

The angle by ±60° measured when max. Torque occurred

ㄹ. Permissible error of operating time : The ±5% setting value or less than ±40ms

ㅁ. Pn = Vn * In * 3 (3P4W), Pn = √3 * Vn * In (3P3W)

ㅂ. Permissible error of returning value: Apply the permissible error applied to the operating value

but, the standard is the operating value

7.1.17 Under Power Relay-37P

ㄱ. Detection : Detect the active power in electric system

ㄴ. Operation characteristics: Time delay

Operation at 3 phase under power

Operation characteristics & setting range of Under Power Relay

Operating type	Operating value setting	Operating time characteristics		Remark
		Setting range	Characteristics	
Time delay	∞, 0.10~0.80Pn/ 0.01Pn	0.10~120.00/0.10s	Definite time	-

ㄷ. Permissible error of operating value : The ±10% of setting value or less than ±0.01 Pn

But, the angle by ±60° measured when max. Torque occurred

ㄹ. Permissible error of operating time: The ±5% of setting value or less than ±40ms

ㅁ. Pn = Vn * In * 3 (3P4W), Pn = √3 * Vn * In (3P3W)

ㅂ. Permissible error of returning value: Apply the permissible error applied to the operating value.

But, the standard is the operating value.

7.1.18 Directional Reactive Power Relay-32Q

ㄱ. Detection : Detect the reverse reactive power in electric system

ㄴ. Operation characteristics : Time delay

Detect reverse directional single phase and reactive power

Operating type	Operating value setting	Operating time characteristics		Remark
		Setting range	Characteristics	
Time delay	∞, 0.02~1.20Qn/ 0.01Qn	0.10~120.00/0.10s	Definite time	

ㄷ. Permissible error of operating value :

0.02<= Qn <= 0.1 : The ±20% of setting value or ±0.01Qn

0.1< Qn <= 1.50 : The ±10% of setting value or less than ±0.01Qn

But, the angle by ±60° measured when max. Torque occurred

ㄹ. Permissible error of operating time: The ±5% of setting value or less than ±40ms

ㅁ. Qn = Vn * In (3P4W), Qn = Vn * In / √3 (3P3W)

ㅂ. Permissible error of returning value: Apply the permissible error applied to the operating value.

But, the standard is the operating value.

7.1.19 Under-frequency Relay - 81U

ㄱ. Detection : Detect the frequency in electric system

ㄴ. Operation characteristics : Time delay

Operation when detecting low frequency : Voltage R-phase

Operating type	Operating value setting	Operating time characteristics		Remark
		Setting range	Characteristics	
Delay time	∞, fn−10~fn/ 0.01Hz	0.10~300.00/0.10s	Definite time	GIPAM2200−IG Fn=60Hz
Under voltage Block	0.50~0.90Vn/ 0.01Vn	–		

⊏. Permissible error of operating value : The ±0.005Hz of setting value or ±0.03%

⊒. Permissible error of operating time : The ±5% of setting value or less than ±20ms

⊐. Permissible error of under voltage block : The ±5% of setting value or ±0.01Vn

7.1.20 Over-frequency Relay − 81O

¬. Detection : Detect the frequency in electric system

∟. Operation Characteristics : Time delay

Operation when detecting over frequency with single phase

Operating type	Operating value setting	Operating time characteristics		Remark
		Setting range	Characteristics	
Time delay	∞, fn~fn+10/ 0.01Hz	0.1~300.0/0.1s	Definite time	GIPAM2200−IG Fn=60Hz
Block	0.50~0.90Vn/ 0.01Vn	–		

⊏. Permissible error of operating value : The ±0.01Hz of setting value or ±0.03%

⊒. Permissible error of operating time : The ±5% of setting value or less than ±20ms

⊐. Permissible error of under voltage block : The ±5% of setting value or ±0.01Vn

7.1.21 Synchronism Check Relay − 25

¬. Detection : Detect the frequency in electric system

∟. Operating time : Time delay

Operation when detecting over active power with single phase

Operating type	Operating value setting	Remark
Voltage Difference	2~50/ 1V	IG type
Phase Difference	5~45/ 1°	

Slip Frequency	0.01~0.5Hz 0.01Hz	
The Closing time of circuit breaker	0~1000/ 1ms	
Dead Voltage	Off, 0.2~0.40Vn 0.01Vn	

ㄷ. Permissible error of operating value

  -Voltage : The ±5% of setting value or less than ±0.01Vn

  -Phase : 3°

  -Slip frequency : The ±0.02Hz of setting value or less than ±0.06%

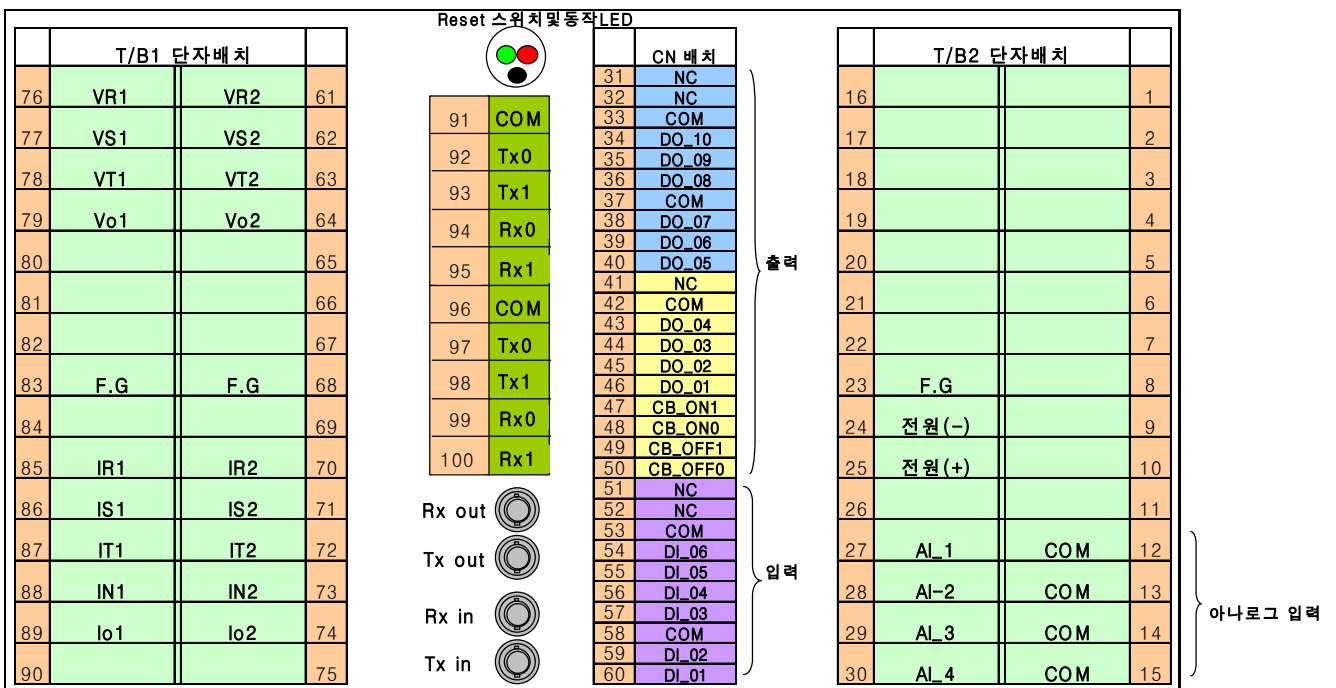ㄹ. Permissible error of closing time of circuit breaker : The ±5% of setting value or less than ±20ms

ㅁ. Permissible error of synchronizing : 0.5~1.20Vn

4. The spec of User Interface

4-1. The configuration of terminal block of GIPAM 2200 - F, IG Model

(1) The configuration of TERMINAL BLOCK

1) 단자대 번호는 GIPAM2000과 동일하게 전원부부터 Numbering
2) 통신B/D는 모든 제품에 공통된 사양이 아니므로 늦은 번호를 할당.
3) AI는 OPTION 사양임.

33번 COM04,37번 COM03, 42번 COM02,53번 COM01, 58번 COM00

COMM04:DO_08~DO_10,COM03:DO_07~DO_05,COM02:DO_01 ~DO_04,COM01:DI_06~DI_03

COM00:DI_01~DI_02

(2) Input & output contact of GIPAM2200 –F Model

단자번호	단자설명	기본설정 (Default)	변경시 용도
60	DI_01	CB 상태입력_52a	변경불가
59	DI_02	CB 상태입력_52b	
57	DI_03	General DI	General DI
56	DI_04	General DI	General DI
55	DI_05	General DI	General DI
54	DI_06	General DI	General DI
50	CB_OFF0	CB_OPEN 출력	변경불가
49	CB_OFF1		
48	CB_ON0	CB_CLOSE 출력	
47	CB_ON1		
46	DO_01	50/51 (OCR)	General DO (Normal/Pulse)
45	DO_02	50/51N, 67N/G (OCGR/DGR/SGR)	General DO (Normal/Pulse)
44	DO_03	27 (UVR)	General DO (Normal/Pulse)
43	DO_04	59 (OVR)	General DO (Normal/Pulse)
40	DO_05	64 (OVGR)	General DO (Normal/Pulse)
39	DO_06	47 (NSOVR)	General DO (Normal/Pulse)
38	DO_07	49 (THR)	General DO (Normal/Pulse)
36	DO_08	48/51LR (Stall/Lock)	General DO (Normal/Pulse)
35	DO_09	Pick-up (계전요소 Pick-up)	변경불가
34	DO_10	Power_Fail/Diag_Err (전원이상 및 자기진단)	

※ Default is Normal(Holding) in case of General DO.

4.2 The configuration of terminal block of GIPAM2200 – T Model

(1) The configuration of TERMINAL BLOCK

Reset 스위치및동작LED

T/B1 단자배치				CN 배치			T/B2 단자배치		
76			61	31 NC		16			1
77	Pri_IR1	Pri_IR2	62	32 NC		17			2
				33 COM					
78	Pri_IS1	Pri_IS2	63	34 DO_10		18			3
79	Pri_IT1	Pri_IT2	64	35 DO_09		19			4
				36 DO_08					
80 주1) Pri_IN1		Pri_IN2	65	37 COM		20			5
				38 DO_07	출력				
81	IG1	IG2	66	39 DO_06		21			6
82			67	40 DO_05		22			7
				41 NC					
83	F.G	F.G	68	42 COM		23	F.G		8
				43 DO_04					
84			69	44 DO_03		24	전원(-)		9
				45 DO_02					
85	Sec_IR1	Sec_IR2	70	46 DO_01		25	전원(+)		10
				47 CB_ON1					
86	Sec_IS1	Sec_IS2	71	48 CB_ON0		26			11
				49 CB_OFF1					
87	Sec_IT1	Sec_IT2	72	50 CB_OFF0		27	AI_1	COM	12
				51 NC					
88 주2) Sec_IN1		Sec_IN2	73	52 NC		28	AI-2	COM	13
				53 COM					
89	Vo1	Vo2	74	54 DI_06	입력	29	AI_3	COM	14
				55 DI_05					
90			75	56 DI_04		30	AI_4	COM	15
				57 DI_03					
				58 COM					
				59 DI_02					
				60 DI_01					

91	COM
92	Tx0
93	Tx1
94	Rx0
95	Rx1
96	COM
97	Tx0
98	Tx1
99	Rx0
100	Rx1

Rx out
Tx out
Rx in
Tx in

아나로그 입력

※ T2 MODEL은 주2)가 Io로 결선되고, T3 MODEL은 주1)이 Io로 결선된다.
   1) 단자대 번호는 GIPAM2000과 동일하게 전원부부터 Numbering
   2) 통신B/D는 모든 제품에 공통된 사양이 아니므로 늦은 번호를 할당.
   3) AI는 OPTION 사양임.

33번 COM04,37번 COM03, 42번 COM02,53번 COM01, 58번 COM00

COMM04:DO_08~DO_10,COM03:DO_07~DO_05,COM02:DO_01 ~DO_04,COM01:DI_06~DI_03

COM00:DI_01~DI_02

(2) The input & output contact of GIPAM2200 – T Model

단자번호	단자설명	기본설정 (Default)	변경시 용도
60	DI_01	CB 상태입력_52a	변경불가
59	DI_02	CB 상태입력_52b	
57	DI_03	General DI	General DI
56	DI_04	General DI	General DI
55	DI_05	General DI	General DI
54	DI_06	General DI	General DI
50	CB_OFF0	CB_OPEN 출력	변경불가
49	CB_OFF1		
48	CB_ON0	CB_CLOSE 출력	
47	CB_ON1		
46	DO_01	87T-P (DFR)	General DO (Normal/Pulse)
45	DO_02	87T-G (DFR)	General DO (Normal/Pulse)
44	DO_03	50/51 (OCR 1)	General DO (Normal/Pulse)
43	DO_04	50/51 (OCR 2)	General DO (Normal/Pulse)
40	DO_05	50/51N, 67N/G (OCGR/DGR/SGR 1)	General DO (Normal/Pulse)
39	DO_06	50/51N, 67N/G (OCGR/DGR/SGR 2)	General DO (Normal/Pulse)
38	DO_07	64 (OVGR)	General DO (Normal/Pulse)
36	DO_08	General DO (Normal)	General DO (Normal/Pulse)
35	DO_09	Pick-up (계전요소 Pick-up)	변경불가
34	DO_10	Power_Fail/Diag_Err (전원이상 및 자기진단)	

※ Default is Normal(Holding) in case of General DO.

4.3 The wiring connection of GIPAM 2200

(1) GIPAM2200-F,IG
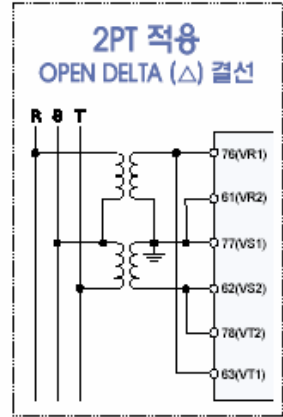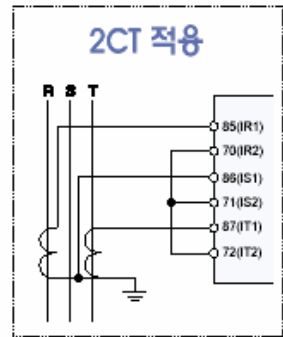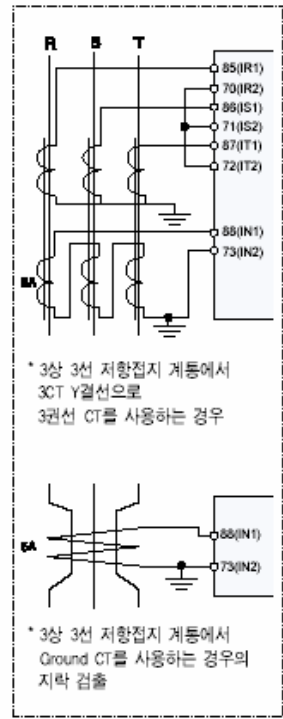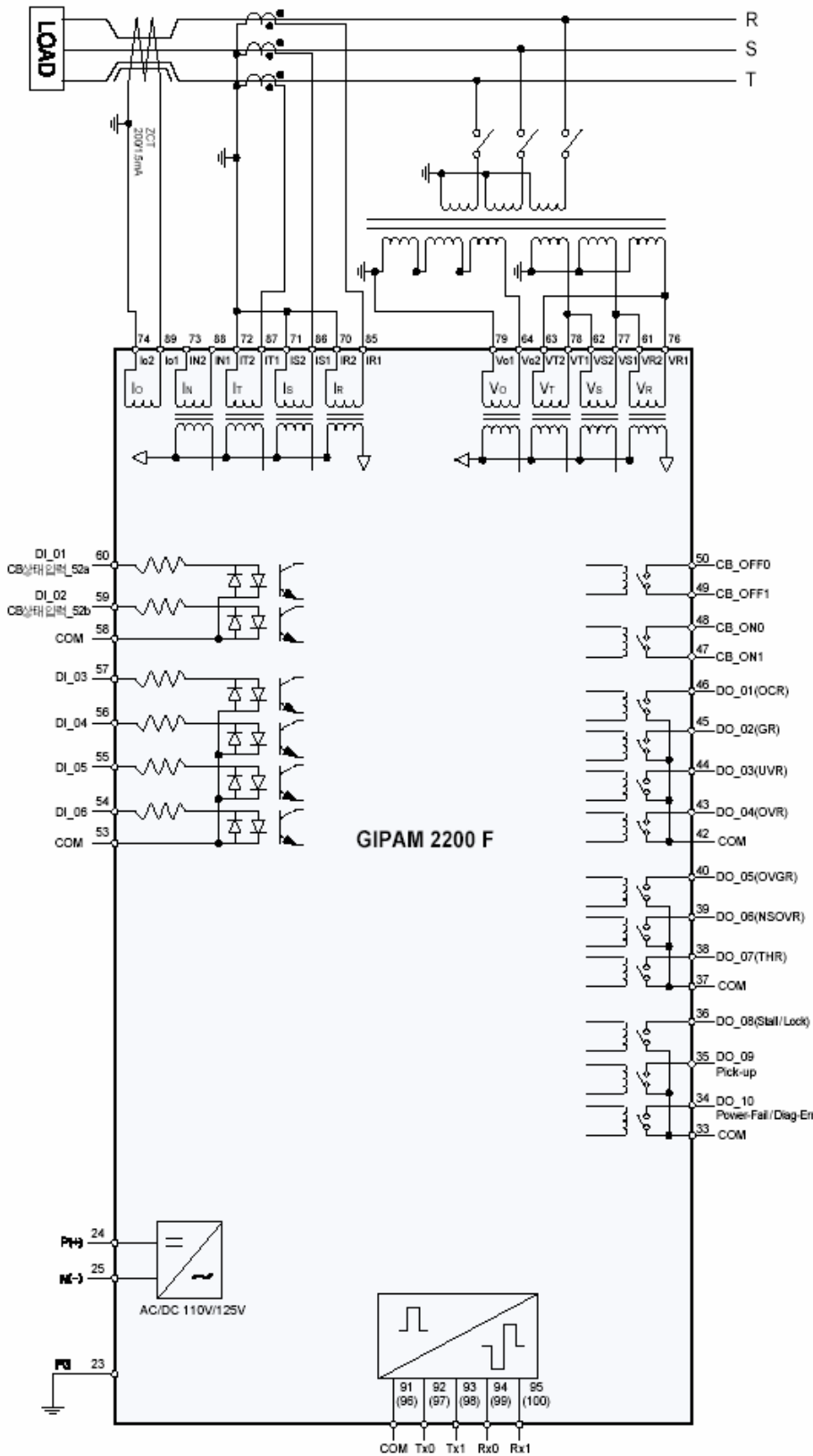
3P4W
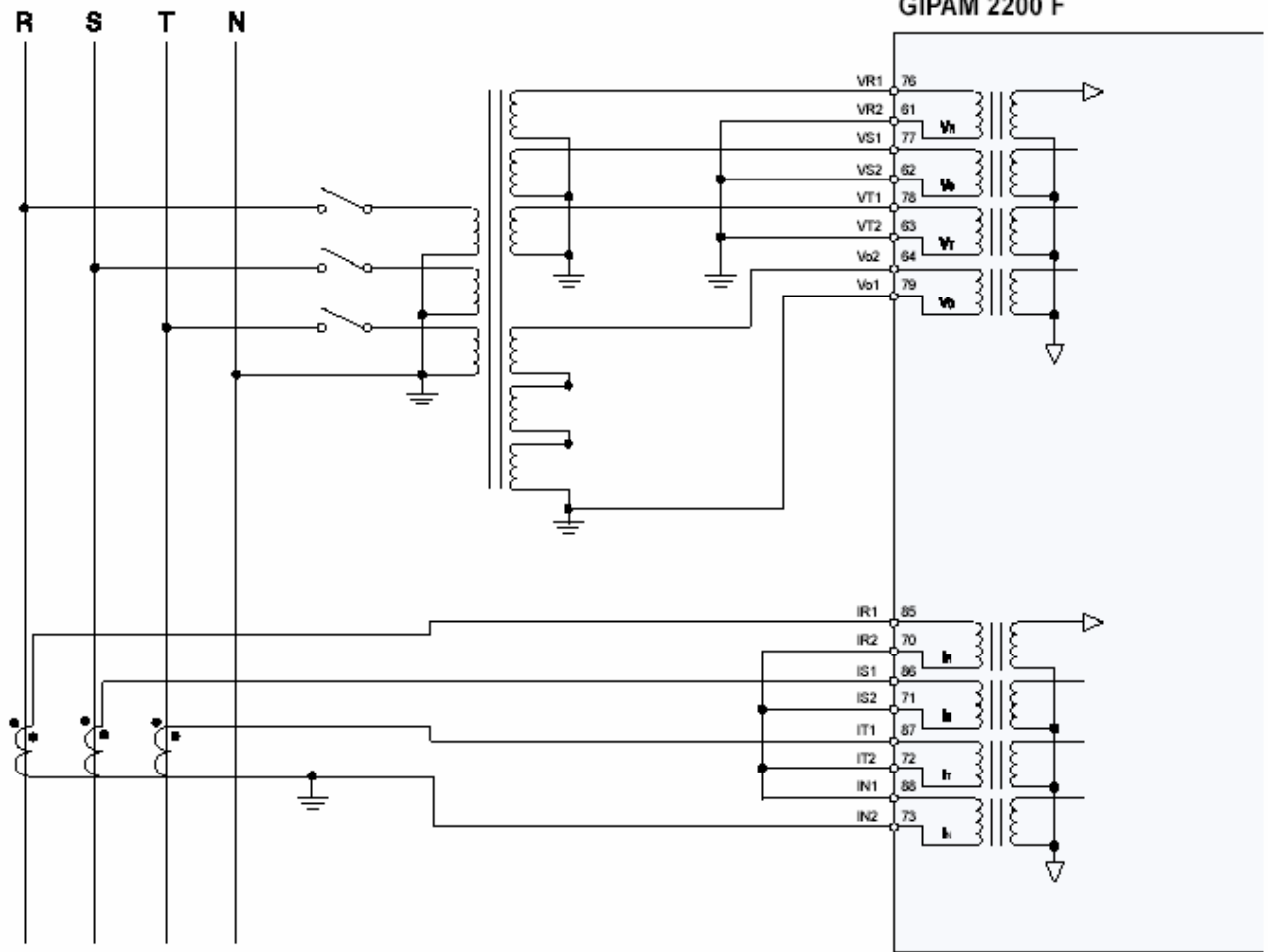
1P3W
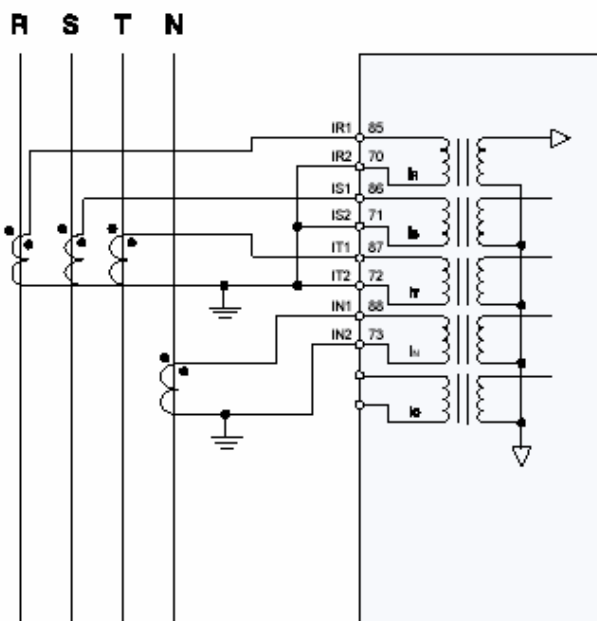
* 중성점에 별도의 CT를 사용하는 경우
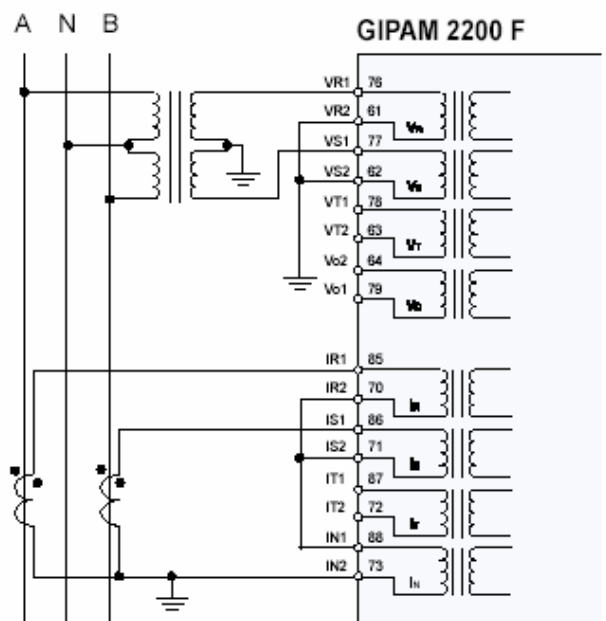
(2) GIPAM2200 – T1
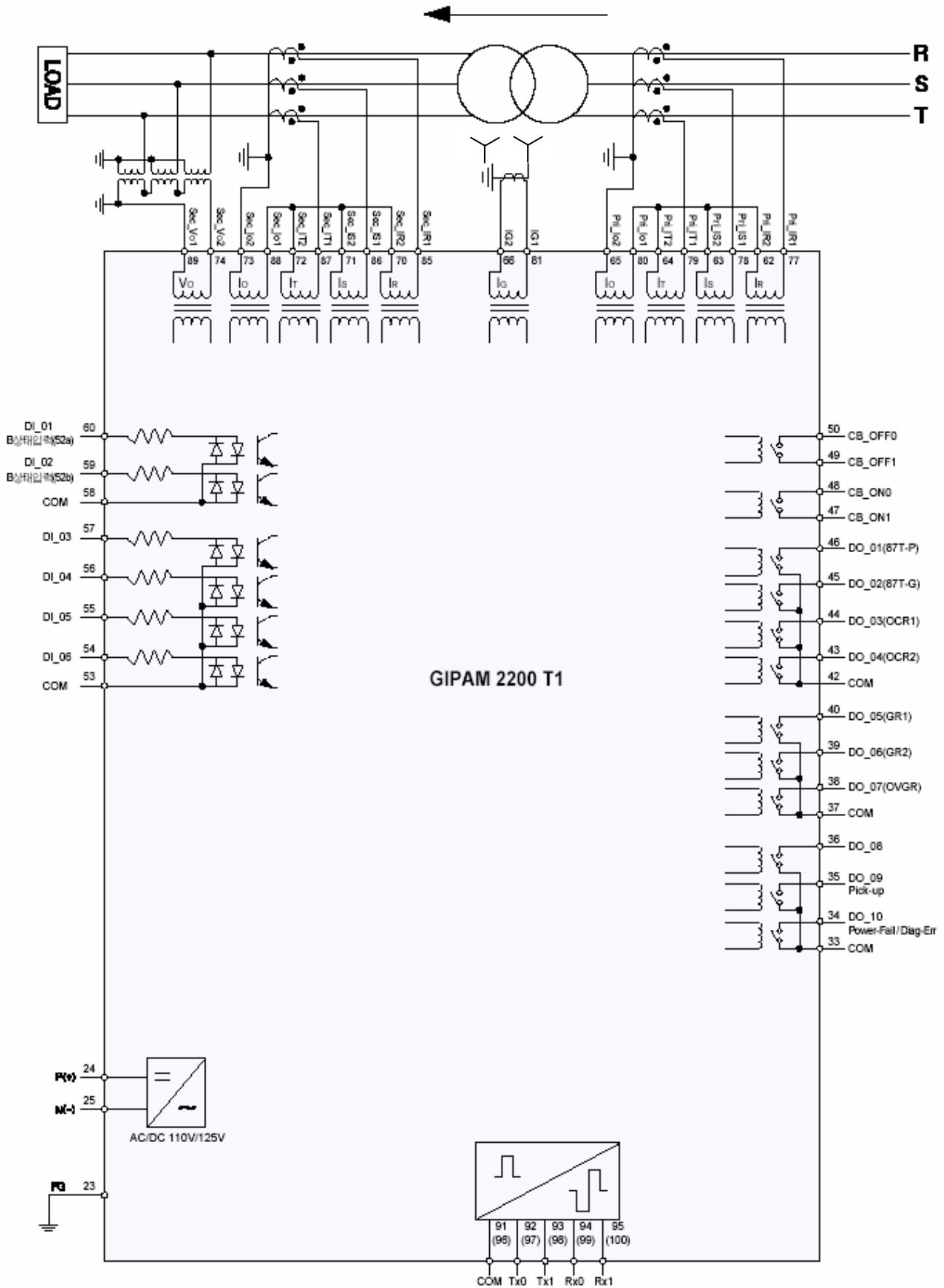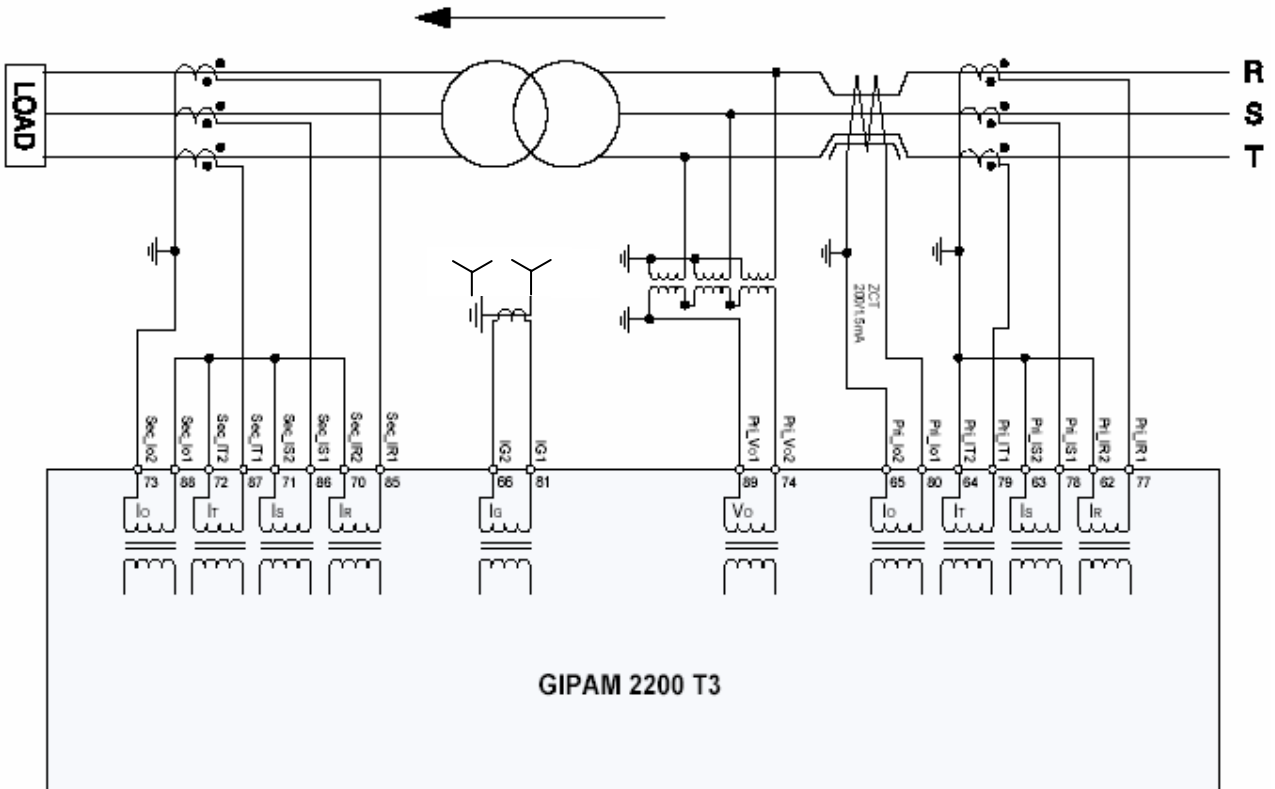
(3) GIPAM2200 – T2

GIPAM 2200 T2
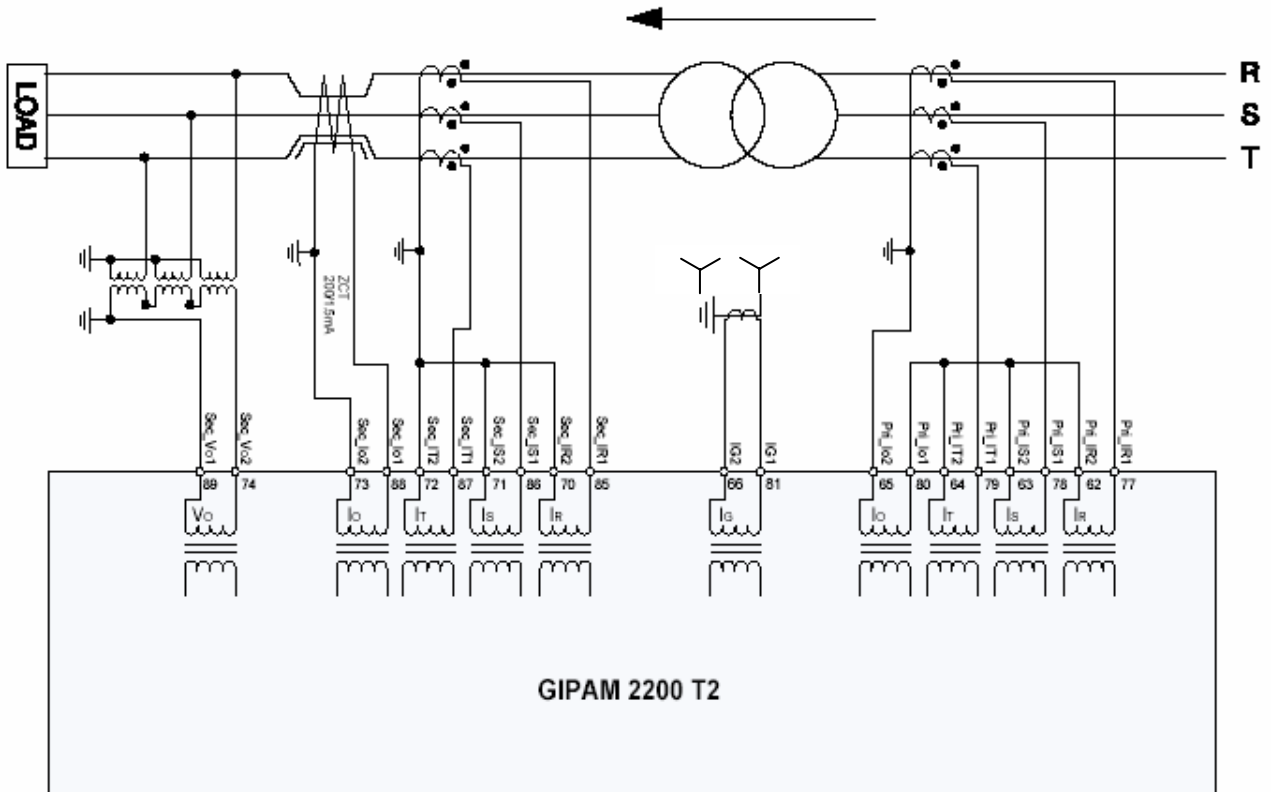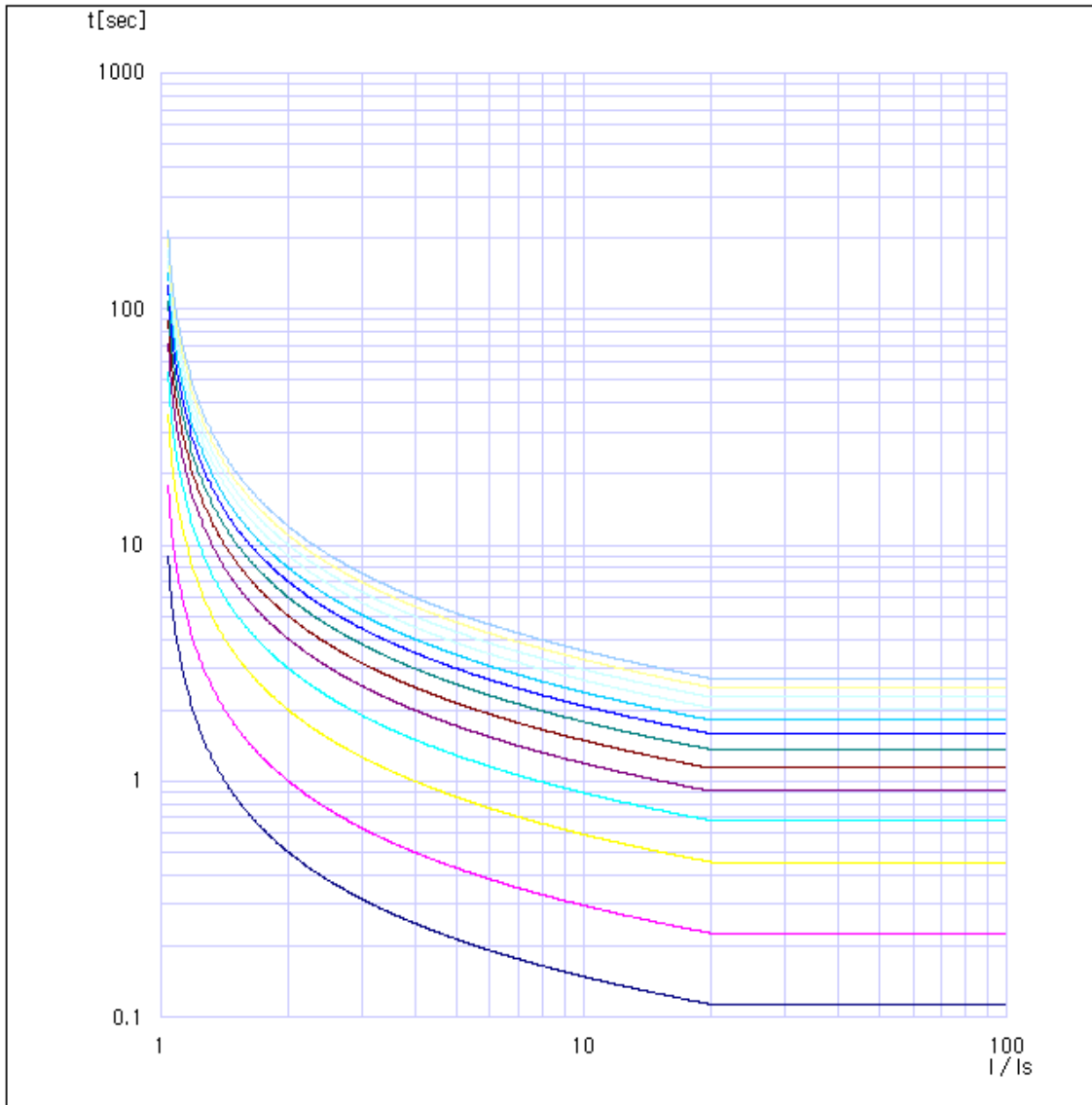
(4) GIPAM2200 – T3

GIPAM 2200 T3

5. The Characteristic Curves

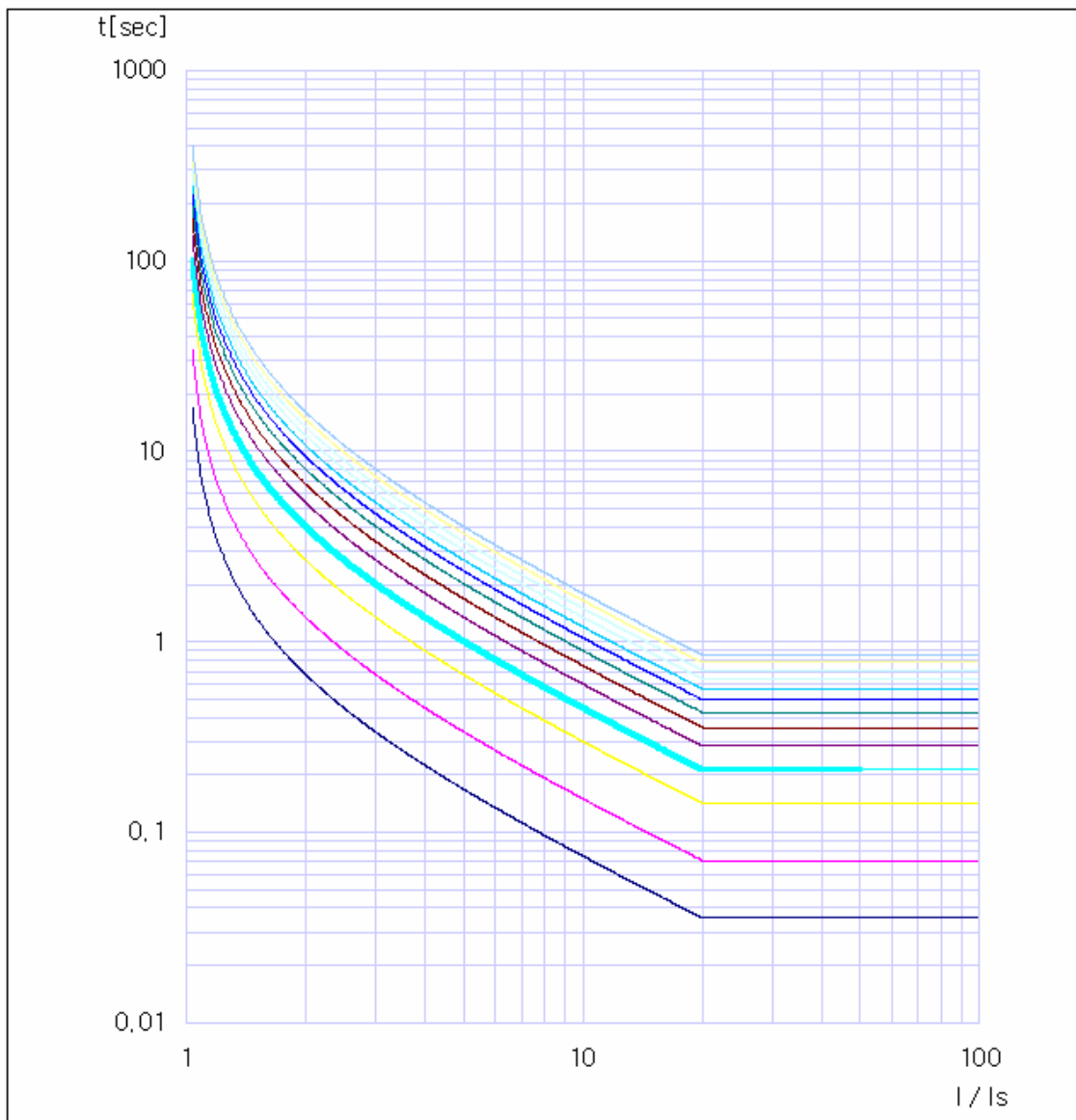(1) Standard Inverse Time – SI characteristic curve

<< SI characteristic curve >>

$$t = \frac{0.14}{(I/I_S)^{0.02} - 1}TL + Td$$

Incident voltage (current) / Setting value

※ Applicable protection relay: Over current (50/51), Ground fault over current (50/51N),

Ground fault over voltage (64), Negative sequence over current (46)
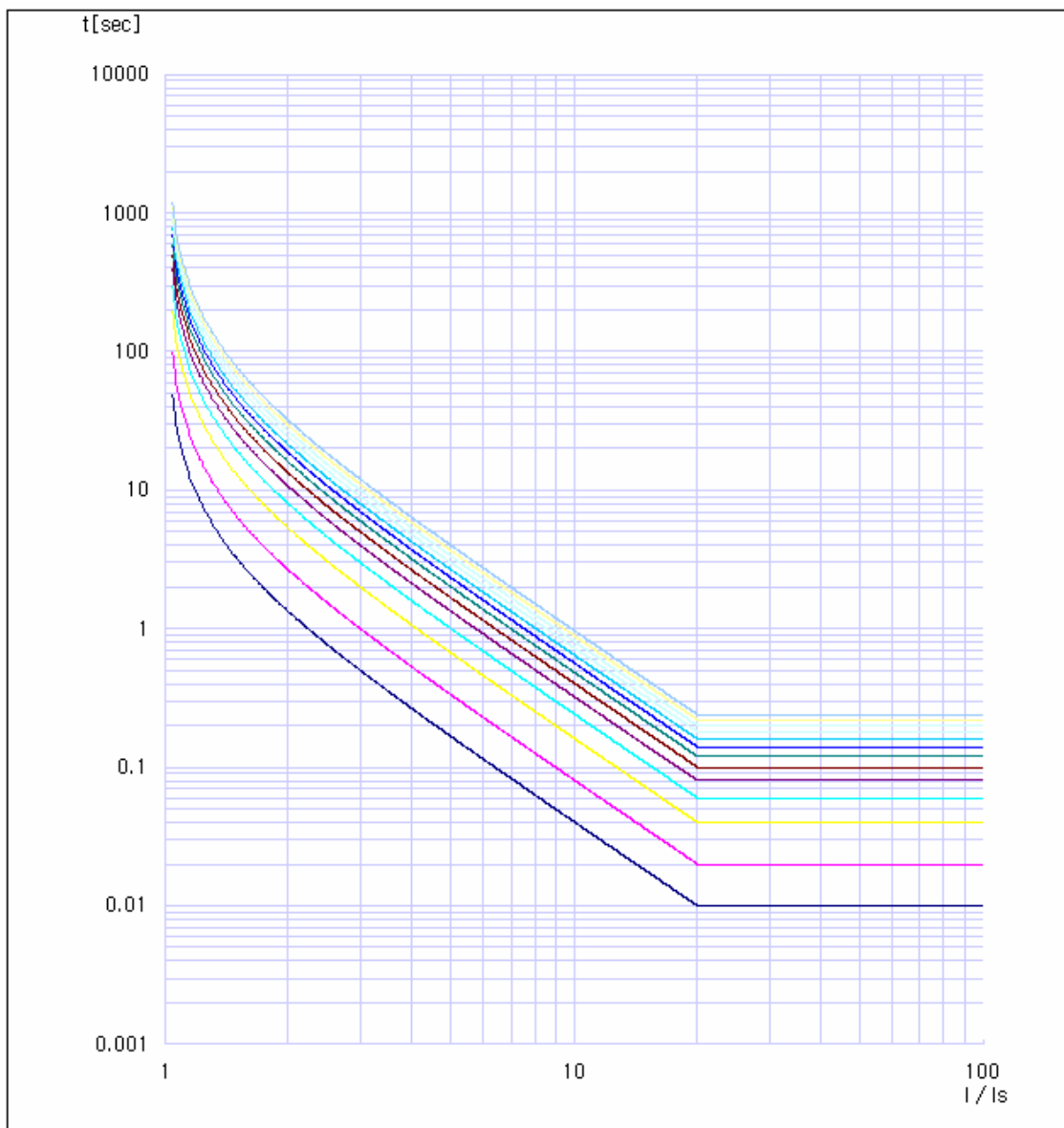
(2) Very Inverse Time – VI characteristic curve

<< VI characteristic curve >>

$$t = \frac{13.5}{(I/I_S)-1}TL + Td$$

※ Applicable protection relay: Over current (50/51), Ground fault over current (50/51N),

Ground fault over voltage (64), Negative sequence over current (46)

Locked Rotor (51LR)

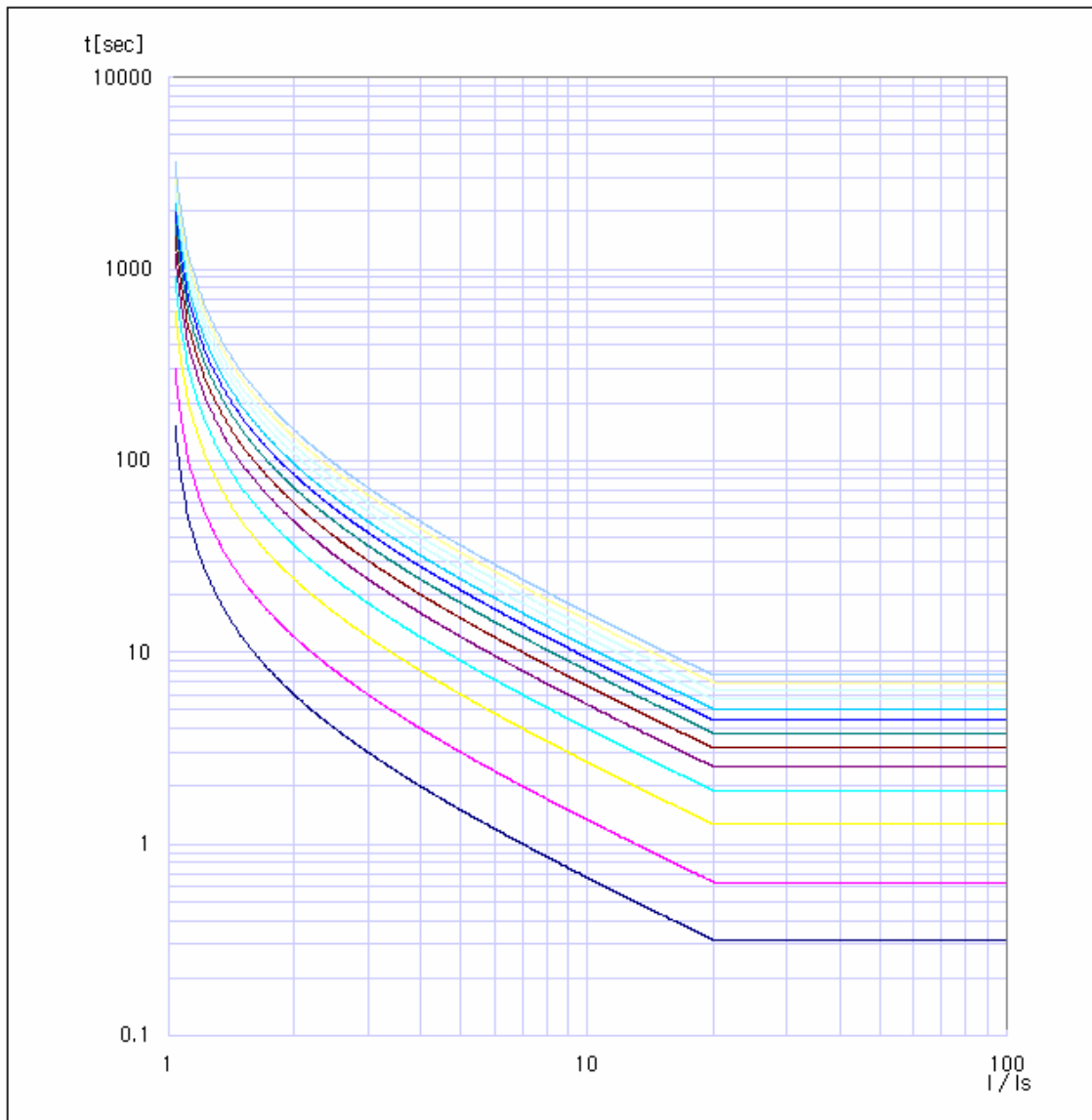(3) Extremely Inverse Time - EI characteristic curve

<< EI characteristic curve >>

$$t = \frac{80}{(I/I_s)^2 - 1}TL + Td$$

※ Applicable protection relay: Over current (50/51), Ground fault over current (50/51N),

　　　　　　　　　　　　Ground fault over voltage (64), Negative sequence over voltage(46)

　　　　　　　　　　　　Locked Rotor(51LR)
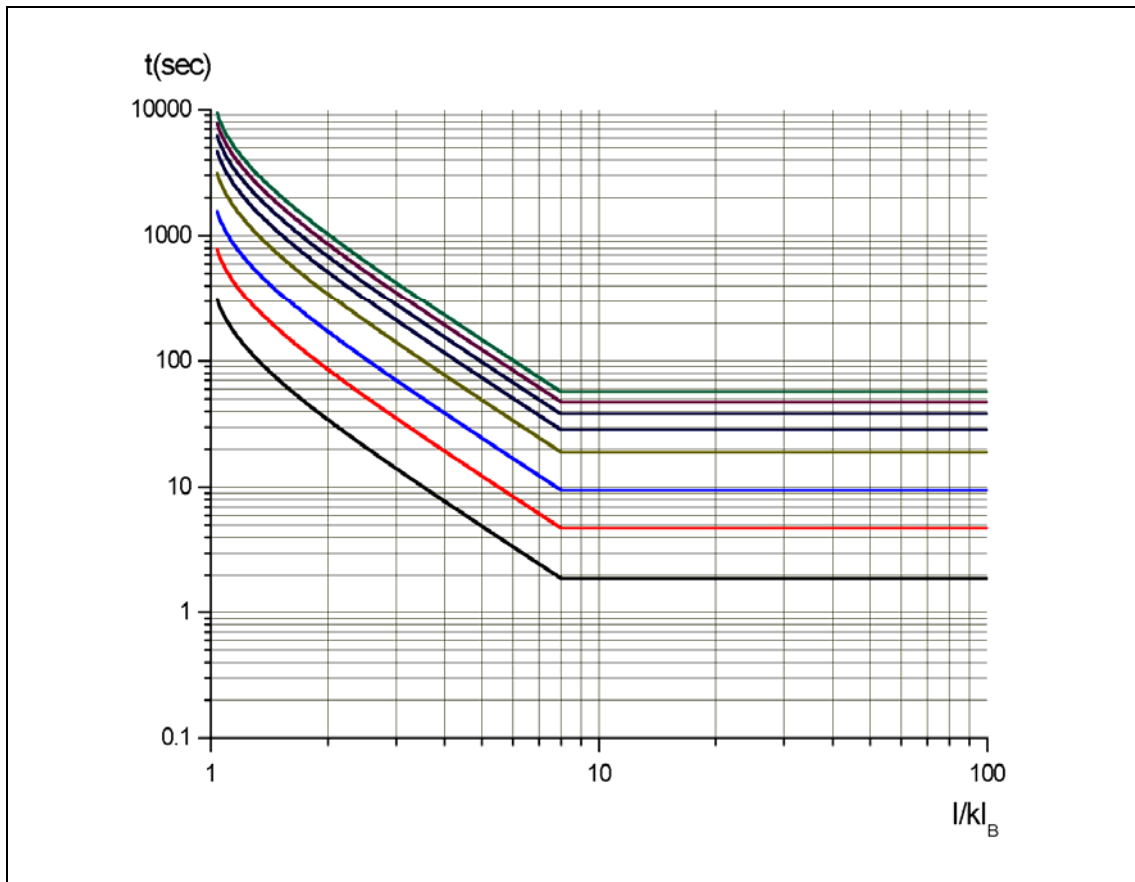
(4) Long Inverse Time – LI characteristic curve

<<LI characteristic curve >>

$$t = \frac{80}{(I/I_S)^2 - 1} TL + \top d$$

※ Applicable protection relay: Over current (50/51), Ground fault over current (50/51N),

Negative sequence over voltage(46)

(5) Thermal Curve(COLD status)
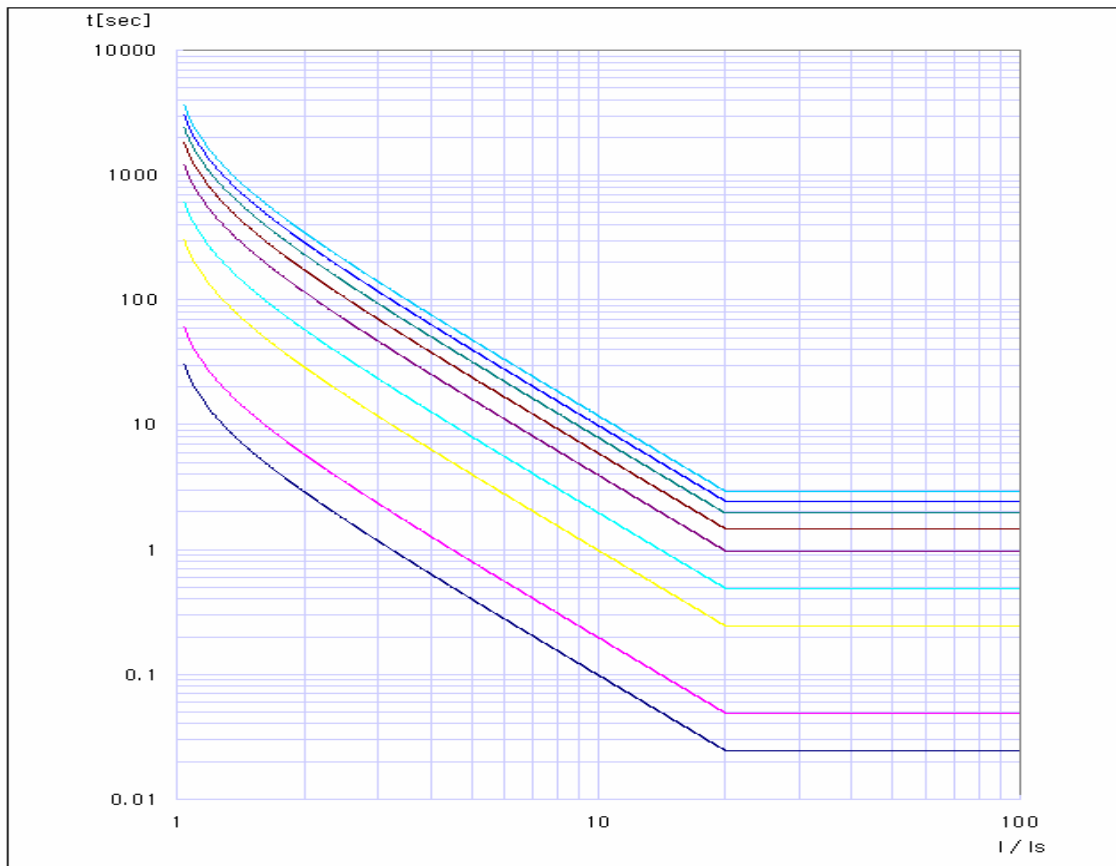

<<Thermal Cold Characteristic Curve >>

$$t = \tau \ln \frac{I^2}{I^2 - (kI_B)^2} \quad [\min]$$

τ=2, 5, 10, 20, 30, 40, 50, 60min

k=1, I_B=1

※ Applicable protection relay : Thermal overload (49)

⑹ Thermal Curve(HOT status)

$$t=\tau.\ln[(I^{2-}\ I_p{}^2)/\{I^2-(k.I_B)^2\}]$$
$\tau=$2, 10, 20, 30, 40, 50, 60min
I_p=0.5, K=1, I_B=1

※ Applicable protection relay : Thermal overload (49)

6. PLC Index

The indication of Input Index used at property is as followings:

<Table 1. Logic Index Table>

Input Index	Indication	Remark
66	Notching relay/NCH	
37	Under current/UCR	
46/50	Negative sequence over current INST /NSOCR50	
46/51	Negative sequence over current time Delay/NSOCR51	
27	Under voltage/UVR	
27PHa	Under voltage HIGH a phase	
27PHb	Under voltage HIGH b phase	
27PHc	Under voltage HIGH c phase	
27PLa	Under voltage LOW a phase	
27PLb	Under voltage LOW b phase	
27PLc	Under voltage LOW c phase	
51LR	LOCK	
48	STALL	
49	Thermal overload/THR	
64INST	Over voltage ground fault INST /OVGRINST	
64TD	Over voltage ground fault Time Delay /OVGRTD	
67G	Selective ground fault/SGR	
67N	Directional ground fault/DGR	
(1)50NH	Over current ground fault INST High /OCGR_H	Common use (T type: Primary winding)
(1)50NL	Over current ground fault INST Low /OCGR_L	Common use (T type: Primary winding)
(1)51N	Over current ground fault Time Delay /OCGR_TD	Common use (T type: Primary winding)
(1)50PH	Over current High/OCR_H	Common use (T type: Primary winding)
(1)50PL	Over current Low/OCR_L	Common use (T type: Primary winding)
(1)51P	Over current Time Delay /OCR_TD	Common use (T type: Primary winding)

25	Synchronizing	ONLY available for IG TYPE
32QRa	Reverse reactive power a phase	ONLY available for IG TYPE
32QRb	Reverse reactive power b phase	ONLY available for IG TYPE
32QRc	Reverse reactive power c phase	ONLY available for IG TYPE
37P	Under active power	ONLY available for IG TYPE
32P	Over active power	ONLY available for IG TYPE
32PR	Reverse active power	ONLY available for IG TYPE
81O	High frequency	ONLY available for IG TYPE
81U	Low frequency	ONLY available for IG TYPE
59PH	Over voltage High/OVRH	
59PL	Over voltage Low/OVRL	
47H	Negative sequence over voltage High /NSOVRH	
47L	Negative sequence over voltage Low /NSOVRL	
87G	Differential ratio ground fault/DFRG	
87/50	Differential ratio INST/DFRP50	
87/51	Differential ratio Time Delay/DFRP51	
(2)50PH	Over current High/OCR_H	T type: Secondary winding
(2)50PL	Over current Low/OCR_L	T type: Secondary winding
(2)51P	Over current time delay/OCR_TD	T type: Secondary winding
(2)50NH	Over current ground fault INST High /OCGR_H	T type: Secondary winding
(2)50NL	Over current ground fault INST Low /OCGR_L	T type: Secondary winding
(2)51N	Over current ground fault time Delay /OCGR_TD	T type: Secondary winding
DI01	Digital Input 01	
DI02	Digital Input 02	
DI03	Digital Input 03	
DI04	Digital Input 04	
DI05	Digital Input 05	
DI06	Digital Input 06	
CC01	Control Contact 01	
CC02	Control Contact 02	
CC03	Control Contact 03	

CC04	Control Contact 04	
60FL	PT Fuse Fail	
CBF	CB Fail	
CB_CLS_C	CB Close Command	
CB_OPN_C	CB Open Command	
Fault Reset	Fault Reset	
TRS	Trip Relay Supervision	

7. The external dimension

208

214
209
4-ø5
248
260

Mark the holes for withdrawing HEX cover (2EA)

Cut Size

237

285

35   187.5
25   165   22.5
185
247

214

260