

Numerical Protection Relay

MELPRO ™-D Series COMMUNICATION CARD (CC-Link)

MODEL

CC-COM

INSTRUCTION MANUAL (MODEL-SPECIFIC INFORMATION)

Request

Ensure that this Instruction Manual is delivered to the end users and the maintenance manager.

- Introduction -

Thank you for your purchasing MITSUBISHI ELECTRIC MELPRO-D Series Protection Relay Communication Board.

Please read this book carefully before putting the product into operation to be familiar with the functions and performances enough to use the product properly.

Please note that end user is required to be provided with this operation manual.

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Manual information

The manual indicated in the table below is prepared relating to this product.

Using the table, please order the manual if required:

Related manual

| Title of manual | Document No. |
|---|--------------|
| MELPRO–D Series Protection Relay CC-COM Communication Card (CC-Link) Operation Manual (general information) | JEP0-IL9417 |

1 Use of this manual

1.1 About this manual

This manual describes model-specific information necessary for setting and displaying data relating to the communication function specification stated in the MELPRO-D Series Protection Relay CC-COM Communication Card Operation Manual.

1.2 How to use this manual

1.2.1 Common items

The common items are needed to set or monitor setting values and shared by all the protection relay models.

1.2.2 Model-specific information

Information required by each model is described in this manual. The following explains how to use this information by setting item:

(1) Setting

Information necessary for selecting setting values. See the setting value set command described in the operation manual stated above.

| the operation manual states above. | | |
|------------------------------------|--|--|
| Channel No. | Item | |
| 00H | Phase fault time-delayed operation current (A) | |
| 01H | Phase fault time-delayed operation time multiplier | |
| | | |

(2) Measurement

Information necessary for obtaining measurements. See the real-time monitoring command described in the operation manual stated above.

| Channel No. | Item |
|-------------|---------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| | |

(3) Forced operation

Information necessary for setting forced operation. See the forced operation set command described in the operation manual stated above.

| Channel No. | Item |
|-------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X₁ |
| | |

(4) Waveform

Information necessary for monitoring waveform. See the waveform monitoring command described in the operation manual stated above.

| Channel No. | Item |
|-------------|---------------------|
| A1H | A-phase current (A) |
| A2H | B-phase current (A) |
| | |

(5) Operation element

Information necessary for monitoring the operation elements. See the operation element monitoring command described in the operation manual stated above.

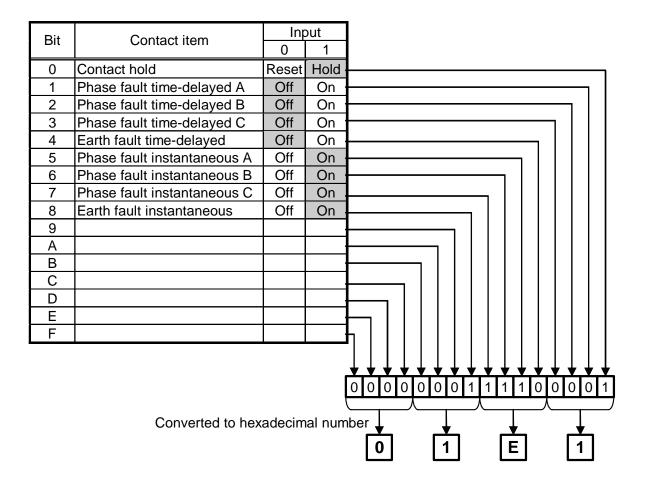
| bit | Item |
|-----|----------------------------|
| 0 | Phase fault time-delayed A |
| 1 | Phase fault time-delayed B |
| | |

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(6) Contact arrangement

To set or monitor setting values, you need to configure a contact arrangement. The data is expressed in the form of one word (16 bits) to make up data to be transmitted from or to the master station. The setting items should be specified and displayed according to the bit allocation pattern specific to each setting item. When a bit in a word is set to "1", "OR" of the corresponding item will be allocated to the contact. The following shows a sample configuration. Put "0" if the corresponding contact item box is blank.

<Example>



To input data for the bit allocation pattern shown above, enter "01E1H" in the high/low order word of the setting value set command.

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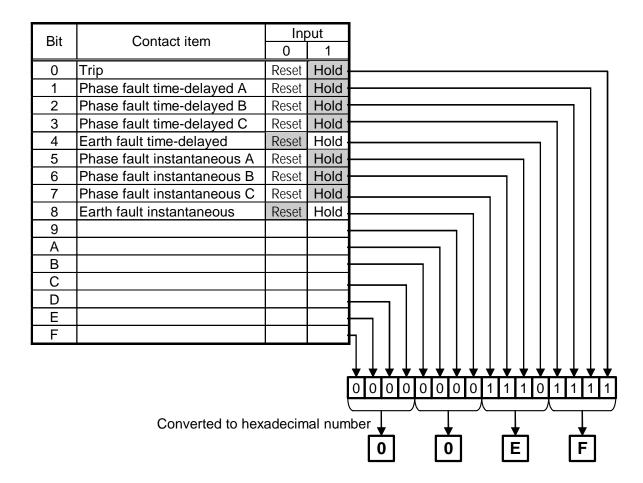
JEP0-1L9418

(7) Operation indicator LED hold

To set or monitor setting values, you need to specify contact hold pattern. The data is expressed in the form of one word (16 bits) to make up data to be transmitted from or to the master station. The setting items should be specified and displayed according to the bit allocation pattern specific to each setting item. When a bit in a word is set to "1", the corresponding contact will self-hold. When it is set to "0", the corresponding contact will automatically be reset. The following shows a sample configuration.

Put "0" if the corresponding contact item box is blank.

<Example>



To input data for the bit allocation pattern shown above, enter "00EFH" in the high/low order word of the setting value set command.

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(8) RX information (relay operating element)

This is RX information sent from each remote station. For further information, see MELPRO-D Series Protection Relay CC-COM Communication Card Operation Manual (General Information) (JEP0-IL9417).

<Example>

| Bit | Contact item | Reading | |
|-----|--------------------------------------|---------|-----------|
| DIL | Contact item | 0 | 1 |
| 0 | Self-diagnosis result (fixed) | Normal | Abnormal |
| 1 | Data readout permission flag (fixed) | - | Operating |
| 2 | Trip | 1 | Operating |
| 3 | | - | Operating |
| 4 | | - | Operating |
| 5 | Phase fault time-delayed A | - | Operating |
| 6 | Phase fault time-delayed B | 1 | Operating |
| 7 | Phase fault time-delayed C | - | Operating |
| 8 | Earth fault time-delayed | 1 | Operating |
| 9 | | 1 | Operating |
| Α | Phase fault instantaneous A | - | Operating |
| В | Phase fault instantaneous B | - | Operating |
| С | Phase fault instantaneous C | - | Operating |
| D | Earth fault instantaneous | - | Operating |
| Е | | - | Operating |

The allocation patterns only for the bits after bit "2" are indicated in the RX information tables prepared for individual models.

2 Common items

(1) Operation characteristics

Data to be written in or read from the high/low order bits of data.

| High/low order of data | Description | High/low order of data | Description |
|------------------------------|-----------------------------------|---------------------------|-----------------------------------|
| 0 | Normal inverse time-delayed 01 | 6 | Extremely inverse time-delayed 11 |
| 1 | Normal inverse time-delayed 11 | 7 | Extremely inverse time-delayed 12 |
| 2 | Normal inverse time-delayed 21 | 8 | Long inverse time-delayed 01 |
| 3 | Very inverse time-delayed 01 | 9 | Long inverse time-delayed 02 |
| 4 | Very inverse time-delayed 21 | 10 | Long inverse time-delayed 21 |
| 5 | Extremely inverse time-delayed 01 | 11 | Definite time-delayed 01 |

(2) Reset characteristics

Data to be written in or read from the high/low order bits of data.

| High/low order of | Description |
|----------------------|-------------------------|
| data | |
| 0 | 200 ms |
| 1 | Normal inverse time-lag |
| 2 | 50 ms |

(3) UV test

| Data | Description |
|------|-------------|
| 0 | OFF |
| 1 | AB phase |
| 2 | BC phase |
| 3 | CA phase |

(4) Other setting items than those above

a. To set data:

Write the value 100 times the setting value indicated in the MELPRO-D protection relay operation manual in the high/low order bits.

<Note> However, regarding set data of the df/dt element of the following types of relay, apply 100 times instead of 1000 times. Also, apply divided by 1000 instead of divided by 100 for the monitor data of the df/dt element of the following types of relay.

CPP1-A11D2, CPP1-A12D2, CPP3-A11D2, CPP3-A01D2

b. To monitor data:

Read the setting value to divide the data by 100.

(5) CT and VT ratios

a. To set data:

Write the value 10 times the setting value indicated in the MELPRO-D protection relay operation manual in the high/medium/low order bits.

b. To monitor data:

Read the setting value to divide the data by 100.

3 Model-specific information

3.1 COC1-A01D1 (Overcurrent relay)

(1) Setting

| (1) Settin | ig |
|----------------|--|
| Channel No. | Item |
| 00H | Overcurrent time-delayed operation current (A) |
| 01H | Overcurrent time-delayed operation time multiplier |
| 02H | Overcurrent time-delayed operation characteristics |
| 03H | Overcurrent time-delyaed reset characteristics |
| 04H | Overcurrent instantaneous operation current (A) |
| 05H | Overcurrent instantaneous operation time (sec.) |
| 06H | Contact arrangement (contact X ₀) (Note 1) |
| 07H | Contact arrangement (contact X ₁) (Note 1) |
| 08H | Contact arrangement (contact X ₂) (Note 1) |
| 09H | Contact arrangement (contact X ₃) (Note 1) |
| 0AH | Contact arrangement (contact X ₄) (Note 1) |
| 0BH | Contact arrangement (contact X₅) (Note 1) |
| 0CH | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |

(5) Operation element

| Bit | ltem |
|-----|---------------|
| | |
| 0 | Time-delayed |
| 1 | |
| 2 | |
| 3 | |
| 4 | Instantaneous |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(2) Measurement

| (=) | |
|----------------|-------------|
| Channel No. | Item |
| 10H | Current (A) |

(6) RX information

| Bit | Item |
|-----|---------------|
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Time-delayed |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | Instantaneous |
| В | |
| С | |
| D | |
| Е | |

(3) Forced operation

| Channel No. | ltem |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| Channel No. | ltem |
|----------------|-------------|
| A1H | Current (A) |

(Note 1) Contact arrangement

| | ontact arrangement |
|-----|--------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Time-delayed |
| 2 | |
| 3 | |
| 4 | |
| 5 | Instantaneous |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|---------------|
| 0 | Trip |
| 1 | Time-delayed |
| 2 | |
| 3 | |
| 4 | |
| 5 | Instantaneous |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.2 COC1-A02D1 (Overcurrent relay)

(1) Setting

| (1) Settin | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Overcurrent time-delayed operation current (A) |
| 01H | Overcurrent time-delayed operation time multiplier |
| 02H | Overcurrent time-delayed operation characteristics |
| 03H | Overcurrent time-delayed reset characteristics |
| 04H | Overcurrent instantaneous operation current (A) |
| 05H | Overcurrent instantaneous operation time (sec.) |
| 06H | Contact arrangement (contact X ₀) (Note 1) |
| 07H | Contact arrangement (contact X ₁) (Note 1) |
| 08H | Contact arrangement (contact X ₂) (Note 1) |
| 09H | Contact arrangement (contact X ₃) (Note 1) |
| 0AH | Contact arrangement (contact X ₄) (Note 1) |
| 0BH | Contact arrangement (contact X ₅) (Note 1) |
| 0CH | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |

(5) Operation element

| Bit | Item |
|-----|---------------|
| 0 | |
| 1 | |
| 2 | |
| 3 | Time-delayed |
| 4 | |
| 5 | |
| 6 | |
| 7 | Instantaneous |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(2) Measurement

| Channel No. | Item | |
|----------------|-------------|--|
| 10H | Current (A) | |

| (3) Force | ed operation |
|----------------|------------------------|
| Channel No. | Item |
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(6) RX information

| Bit | Item |
|-----|---------------|
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Time-delayed |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | Instantaneous |
| В | |
| С | |
| D | |
| Е | |

(4) Waveform

| Channel No. | Item |
|----------------|-------------|
| A4H | Current (A) |

(Note 1) Contact arrangement

| Bit | Item |
|-----|---------------|
| DIL | |
| 0 | Contact hold |
| 1 | |
| 2 | |
| 3 | |
| 4 | Time-delayed |
| 5 | |
| 6 | |
| 7 | |
| 8 | Instantaneous |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|---------------|
| 0 | Trip |
| 1 | |
| 2 | |
| 3 | |
| 4 | Time-delayed |
| 5 | |
| 6 | |
| 7 | |
| 8 | Instantaneous |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.3 COC2-A01D1 (Overcurrent relay)

(1) Setting

| (1) Settil | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Overcurrent time-delayed operation current (A) |
| 01H | Overcurrent time-delayed operation time multiplier |
| 02H | Overcurrent time-delayed operation characteristics |
| 03H | Overcurrent time-delayed reset characteristics |
| 04H | Overcurrent instantaneous operation current (A) |
| 05H | Overcurrent instantaneous operation time (sec.) |
| 06H | Contact arrangement (contact X ₀) (Note 1) |
| 07H | Contact arrangement (contact X ₁) (Note 1) |
| 08H | Contact arrangement (contact X ₂) (Note 1) |
| 09H | Contact arrangement (contact X ₃) (Note 1) |
| 0AH | Contact arrangement (contact X ₄) (Note 1) |
| 0BH | Contact arrangement (contact X ₅) (Note 1) |
| 0CH | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |

(5) Operation element

| Bit | Item |
|-----|-----------------------------|
| 0 | Time-delayed A |
| 1 | |
| 2 | Time-delayed C |
| 3 | |
| 4 | Phase fault instantaneous A |
| 5 | |
| 6 | Phase fault instantaneous C |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(2) Measurement

| Channel No. | Item |
|----------------|---------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |

(6) RX information

| Bit | Item |
|-----|-----------------------------|
| 2 | Trip |
| 3 | Time-delayed A |
| 4 | |
| 5 | |
| 6 | Time-delayed C |
| 7 | |
| 8 | |
| 9 | |
| Α | Phase fault instantaneous A |
| В | Phase fault instantaneous C |
| С | |
| D | |
| Е | |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| Channel No. | Item |
|----------------|---------------------|
| A1H | A-phase current (A) |
| A3H | C-phase current (A) |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-----------------------------|
| 0 | Contact hold |
| 1 | Time-delayed A |
| 2 | - |
| 3 | Time-delayed C |
| 4 | |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------------------|
| 0 | Trip |
| 1 | Time-delayed A |
| 2 | |
| 3 | Time-delayed C |
| 4 | |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.4 COC3-A01D1 (Overcurrent relay)

(1) Setting

| (1) Settil | iy |
|----------------|--|
| Channel No. | Item |
| 00H | Overcurrent time-delayed operation current (A) |
| 01H | Overcurrent time-delayed operation time multiplier |
| 02H | Overcurrent time-delayed operation characteristics |
| 03H | Overcurrent time-delayed reset characteristics |
| 04H | Overcurrent instantaneous operation current (A) |
| 05H | Overcurrent instantaneous operation time (sec.) |
| 06H | Contact arrangement (contact X ₀) (Note 1) |
| 07H | Contact arrangement (contact X ₁) (Note 1) |
| 08H | Contact arrangement (contact X ₂) (Note 1) |
| 09H | Contact arrangement (contact X ₃) (Note 1) |
| 0AH | Contact arrangement (contact X ₄) (Note 1) |
| 0BH | Contact arrangement (contact X ₅) (Note 1) |
| 0CH | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |

(5) Operation element

| Bit | Item |
|-----|-----------------|
| 0 | Time-delayed A |
| 1 | Time-delayed B |
| 2 | Time-delayed C |
| 3 | |
| 4 | Instantaneous A |
| 5 | Instantaneous B |
| 6 | Instantaneous C |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(2) Measurement

| Channel No. | Item |
|----------------|---------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |

(6) RX information

| Bit | Item |
|-----|-----------------|
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Time-delayed A |
| 6 | Time-delayed B |
| 7 | Time-delayed C |
| 8 | |
| 9 | |
| Α | Instantaneous A |
| В | Instantaneous B |
| С | Instantaneous C |
| D | |
| E | |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| Channel No. | ltem |
|----------------|---------------------|
| A1H | A-phase current (A) |
| A2H | B-phase current (A) |
| A3H | C-phase current (A) |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-----------------|
| 0 | Contact hold |
| 1 | Time-delayed A |
| 2 | Time-delayed B |
| 3 | Time-delayed C |
| 4 | |
| 5 | Instantaneous A |
| 6 | Instantaneous B |
| 7 | Instantaneous C |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------|
| 0 | Trip |
| 1 | Time-delayed A |
| 2 | Time-delayed B |
| 3 | Time-delayed C |
| 4 | |
| 5 | Instantaneous A |
| 6 | Instantaneous B |
| 7 | Instantaneous C |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.5 COC3-A02D1 (Overcurrent relay)

(1) Setting

| (1) Settir | ig |
|----------------|--|
| Channel No. | Item |
| 00H | Phase fault time-delayed operation current (A) |
| 01H | Phase fault time-delayed operation time multiplier |
| 02H | Phase fault time-delayed operation characteristics |
| 03H | Phase fault time-delayed reset characteristics |
| 04H | Phase fault instantaneous operation current (A) |
| 05H | Phase fault instantaneous operation time (sec.) |
| 06H | Earth fault time-delayed operation current (A) |
| 07H | Earth fault time-delayed operation time multiplier |
| 08H | Earth fault time-delayed operation characteristics |
| 09H | Earth fault time-delayed reset characteristics |
| 0AH | Earth fault instantaneous operation current (A) |
| 0BH | Earth fault instantaneous operation time (sec.) |
| 0CH | Contact arrangement (contact X ₀) (Note 1) |
| 0DH | Contact arrangement (contact X ₁) (Note 1) |
| 0EH | Contact arrangement (contact X ₂) (Note 1) |
| 0FH | Contact arrangement (contact X ₃) (Note 1) |
| 10H | Contact arrangement (contact X ₄) (Note 1) |
| 11H | Contact arrangement (contact X ₅) (Note 1) |
| 12H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | CT Zero-phase primary (A) |

(2) Measurement

| Channel No. | ltem |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | C-phase current (A) |
| 12H | Zero-phase current (A) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A3H | C-phase current (A) |
| A4H | Zero-phase current (A) |

(5) Operation element

| (0) 000 | |
|---------|-----------------------------|
| Bit | Item |
| 0 | Phase fault time-delayed A |
| 1 | |
| 2 | Phase fault time-delayed C |
| 3 | Earth fault time-delayed |
| 4 | Phase fault instantaneous A |
| 5 | |
| 6 | Phase fault instantaneous C |
| 7 | Earth fault instantaneous |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| | IOITIIalioii |
|-----|-----------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Phase fault time-delayed A |
| 6 | Phase fault time-delayed C |
| 7 | Earth fault time-delayed |
| 8 | |
| 9 | |
| Α | Phase fault instantaneous A |
| В | Phase fault instantaneous C |
| С | Earth fault instantaneous |
| D | |
| E | |

(Note 1) Contact arrangement

| () - | ontaot arrangement |
|-------|-----------------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Phase fault time-delayed A |
| 2 | |
| 3 | Phase fault time-delayed C |
| 4 | Earth fault time-delayed |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | Earth fault instantaneous |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------------------|
| 0 | Trip |
| 1 | Phase fault time-delayed A |
| 2 | |
| 3 | Phase fault time-delayed C |
| 4 | Earth fault time-delayed |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | Earth fault instantaneous |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

3.6 COC4-A01D1 (Overcurrent relay)

(1) Setting

| (1) Settil | 9 |
|----------------|--|
| Channel No. | Item |
| 00H | Phase fault time-delayed operation current (A) |
| 01H | Phase fault time-delayed operation time multiplier |
| 02H | Phase fault time-delayed operation characteristics |
| 03H | Phase fault time-delayed reset characteristics |
| 04H | Phase fault instantaneous operation current (A) |
| 05H | Phase fault instantaneous operation time (sec.) |
| 06H | Earth fault time-delayed operation current (A) |
| 07H | Earth fault time-delayed operation time multiplier |
| 08H | Earth fault time-delayed operation characteristics |
| 09H | Earth fault time-delayed reset characteristics |
| 0AH | Earth fault instantaneous operation current (A) |
| 0BH | Earth fault instantaneous operation time (sec.) |
| 0CH | Contact arrangement (contact X₀) (Note 1) |
| 0DH | Contact arrangement (contact X ₁) (Note 1) |
| 0EH | Contact arrangement (contact X ₂) (Note 1) |
| 0FH | Contact arrangement (contact X ₃) (Note 1) |
| 10H | Contact arrangement (contact X ₄) (Note 1) |
| 11H | Contact arrangement (contact X ₅) (Note 1) |
| 12H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | CT Zero-phase primary (A) |

(2) Measurement

| Channel No. | ltem |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | Zero-phase current (A) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | B-phase current (A) |
| A3H | C-phase current (A) |
| A4H | Zero-phase current (A) |

(5) Operation element

| (5) Opera | ation element |
|-----------|-----------------------------|
| Bit | ltem |
| 0 | Phase fault time-delayed A |
| 1 | Phase fault time-delayed B |
| 2 | Phase fault time-delayed C |
| 3 | Earth fault time-delayed |
| 4 | Phase fault instantaneous A |
| 5 | Phase fault instantaneous B |
| 6 | Phase fault instantaneous C |
| 7 | Earth fault instantaneous |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|-----------------------------|
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Phase fault time-delayed A |
| 6 | Phase fault time-delayed B |
| 7 | Phase fault time-delayed C |
| 8 | Earth fault time-delayed |
| 9 | |
| Α | Phase fault instantaneous A |
| В | Phase fault instantaneous B |
| С | Phase fault instantaneous C |
| D | Earth fault instantaneous |
| Е | |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-----------------------------|
| 0 | Contact hold |
| 1 | Phase fault time-delayed A |
| 2 | Phase fault time-delayed B |
| 3 | Phase fault time-delayed C |
| 4 | Earth fault time-delayed |
| 5 | Phase fault instantaneous A |
| 6 | Phase fault instantaneous B |
| 7 | Phase fault instantaneous C |
| 8 | Earth fault instantaneous |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------------------|
| 0 | Trip |
| 1 | Phase fault time-delayed A |
| 2 | Phase fault time-delayed B |
| 3 | Phase fault time-delayed C |
| 4 | Earth fault time-delayed |
| 5 | Phase fault instantaneous A |
| 6 | Phase fault instantaneous B |
| 7 | Phase fault instantaneous C |
| 8 | Earth fault instantaneous |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

3.7 COC4-A02D1 (Overcurrent relay)

(1) Setting

| (1) Settir | ng | |
|----------------|--|--|
| Channel No. | Item | |
| 00H | Phase fault time-delayed operation current (A) | |
| 01H | Phase fault time-delayed operation time multiplier | |
| 02H | Phase fault time-delayed operation characteristics | |
| 03H | Phase fault time-delayed reset characteristics | |
| 04H | Phase fault instantaneous operation current (A) | |
| 05H | Phase fault instantaneous operation time (sec.) | |
| 06H | Earth fault time-delayed operation current (A) | |
| 07H | Earth fault time-delayed operation time multiplier | |
| H80 | Earth fault time-delayed operation characteristics | |
| 09H | Earth fault time-delayed reset characteristics | |
| 0AH | Earth fault instantaneous operation current (A) | |
| 0BH | Earth fault instantaneous operation time (sec.) | |
| 0CH | Contact arrangement (contact X ₀) (Note 1) | |
| 0DH | Contact arrangement (contact X ₁) (Note 1) | |
| 0EH | Contact arrangement (contact X ₂) (Note 1) | |
| 0FH | Contact arrangement (contact X ₃) (Note 1) | |
| 10H | Contact arrangement (contact X ₄) (Note 1) | |
| 11H | Contact arrangement (contact X ₅) (Note 1) | |
| 12H | Operation indicator LED hold (Note 2) | |
| 00H | CT primary (A) | |
| 01H | CT Zero-phase primary (A) | |

(2) Measurement

| Channel No. | Item |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | Zero-phase current (A) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | B-phase current (A) |
| АЗН | C-phase current (A) |
| A4H | Zero-phase current (A) |

(5) Operation element

| (0) Opon | ation didiniont | |
|----------|-----------------------------|--|
| Bit | Item | |
| 0 | Phase fault time-delayed A | |
| 1 | Phase fault time-delayed B | |
| 2 | Phase fault time-delayed C | |
| 3 | Earth fault time-delayed | |
| 4 | Phase fault instantaneous A | |
| 5 | Phase fault instantaneous B | |
| 6 | Phase fault instantaneous C | |
| 7 | Earth fault instantaneous | |
| 8 | | |
| 9 | | |
| Α | | |
| В | | |
| С | | |
| D | | |
| Е | | |
| F | | |

(6) RX information

| Bit | Item | |
|-----|-----------------------------|--|
| 2 | Trip | |
| 3 | | |
| 4 | | |
| 5 | Phase fault time-delayed A | |
| 6 | Phase fault time-delayed B | |
| 7 | Phase fault time-delayed C | |
| 8 | Earth fault time-delayed | |
| 9 | | |
| А | Phase fault instantaneous A | |
| В | Phase fault instantaneous B | |
| С | Phase fault instantaneous C | |
| D | Earth fault instantaneous | |
| E | | |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-----------------------------|
| 0 | Contact hold |
| 1 | Phase fault time-delayed A |
| 2 | Phase fault time-delayed B |
| 3 | Phase fault time-delayed C |
| 4 | Earth fault time-delayed |
| 5 | Phase fault instantaneous A |
| 6 | Phase fault instantaneous B |
| 7 | Phase fault instantaneous C |
| 8 | Earth fault instantaneous |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item | |
|-----|-----------------------------|--|
| 0 | Trip | |
| 1 | Phase fault time-delayed A | |
| 2 | Phase fault time-delayed B | |
| 3 | Phase fault time-delayed C | |
| 4 | Earth fault time-delayed | |
| 5 | Phase fault instantaneous A | |
| 6 | Phase fault instantaneous B | |
| 7 | Phase fault instantaneous C | |
| 8 | Earth fault instantaneous | |
| 9 | | |
| Α | | |
| В | | |
| С | | |
| D | | |
| E | | |
| F | | |

3.8 COV1-A01D1 (Overvoltage relay)

(1) Setting

| (1) | .9 | |
|----------------|--|--|
| Channel No. | ltem | |
| 00H | Overvoltage operation voltage (V) | |
| 01H | Overvoltage operation time (sec.) | |
| 02H | Contact arrangement (contact X ₀) (Note 1) | |
| 03H | Contact arrangement (contact X ₁) (Note 1) | |
| 04H | Contact arrangement (contact X ₂) (Note 1) | |
| 05H | Contact arrangement (contact X ₃) (Note 1) | |
| 06H | Contact arrangement (contact X ₄) (Note 1) | |
| 07H | Contact arrangement (contact X ₅) (Note 1) | |
| 08H | Operation indicator LED hold (Note 2) | |
| 00H | VT primary (V) | |
| 01H | VT secondary (V) | |

(2) Measurement

| (-) | |
|----------------|-------------|
| Channel No. | Item |
| 10H | Voltage (V) |

(3) Forced operation

| (0) | | |
|----------------|------------------------|--|
| Channel No. | Item | |
| 00H | Contact X ₀ | |
| 01H | Contact X ₁ | |
| 02H | Contact X ₂ | |
| 03H | Contact X ₃ | |
| 04H | Contact X ₄ | |
| 05H | Contact X ₅ | |

(4) Waveform

| Channel No. | Item | |
|----------------|-------------|--|
| A1H | Voltage (V) | |

(5) Operation element

| Bit | ltem |
|-----|-------------|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | Overvoltage |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| (0) 1(7(11) | Iomation |
|-------------|-------------|
| Bit | ltem |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Overvoltage |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| | · |

(Note 1) Contact arrangement

| Bit | Item |
|-----|--------------|
| 0 | Contact hold |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | Overvoltage |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------|
| 0 | Trip |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | Overvoltage |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.9 COV3-A01D1 (Overvoltage relay)

(1) Setting

| (1) Cotti | .9 |
|----------------|--|
| Channel No. | Item |
| 00H | Overvoltage operation voltage (V) |
| 01H | Overvoltage operation time (sec.) |
| 02H | Contact arrangement (contact X ₀) (Note 1) |
| 03H | Contact arrangement (contact X ₁) (Note 1) |
| 04H | Contact arrangement (contact X ₂) (Note 1) |
| 05H | Contact arrangement (contact X ₃) (Note 1) |
| 06H | Contact arrangement (contact X ₄) (Note 1) |
| 07H | Contact arrangement (contact X ₅) (Note 1) |
| 08H | Operation indicator LED hold (Note 2) |
| 00H | VT primary (V) |
| 01H | VT secondary (V) |

(2) Measurement

| Channel No. | Item |
|----------------|----------------------|
| 10H | AB phase voltage (V) |
| 11H | BC phase voltage (V) |
| 12H | CA phase voltage (V) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| Channel No. | Item |
|----------------|----------------------|
| A1H | AB phase voltage (V) |
| A2H | BC phase voltage (V) |
| АЗН | CA phase voltage (V) |

(5) Operation element

| Bit | Item |
|-----|----------------|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | Overvoltage AB |
| 5 | Overvoltage BC |
| 6 | Overvoltage CA |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| (o) TX IIIOIIIation | |
|---------------------|----------------|
| Bit | Item |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Overvoltage AB |
| 6 | Overvoltage BC |
| 7 | Overvoltage CA |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |

(Note 1) Contact arrangement

| Bit | Item |
|-----|----------------|
| 0 | Contact hold |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | Overvoltage AB |
| 6 | Overvoltage BC |
| 7 | Overvoltage CA |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|----------------|
| 0 | Trip |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | Overvoltage AB |
| 6 | Overvoltage BC |
| 7 | Overvoltage CA |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

3.10 CUV1-A01D1 (Undervoltage relay)

(1) Setting

| (1) | ·9 |
|----------------|--|
| Channel No. | Item |
| 00H | Undervoltage operation voltage (V) |
| 01H | Undervoltage operation time (sec.) |
| 02H | Contact arrangement (contact X ₀) (Note 1) |
| 03H | Contact arrangement (contact X ₁) (Note 1) |
| 04H | Contact arrangement (contact X ₂) (Note 1) |
| 05H | Contact arrangement (contact X ₃) (Note 1) |
| 06H | Contact arrangement (contact X ₄) (Note 1) |
| 07H | Contact arrangement (contact X ₅) (Note 1) |
| 08H | Operation indicator LED hold (Note 2) |
| 00H | VT primary (V) |
| 01H | VT secondary (V) |

(2) Measurement

| Channel No. | | Item | |
|----------------|-------------|------|--|
| 10H | Voltage (V) | | |

(3) Forced operation

| (0) | |
|----------------|------------------------|
| Channel No. | Item |
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| Channel No. | Item | |
|----------------|-------------|--|
| A1H | Voltage (V) | |

(5) Operation element

| Bit | Item |
|-----|--------------|
| 0 | Undervoltage |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| | TOTTIALION |
|-----|--------------|
| Bit | Item |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Undervoltage |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |

(Note 1) Contact arrangement

| Bit | Item |
|-----|--------------|
| 0 | Contact hold |
| 1 | Undervoltage |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|--------------|
| 0 | Trip |
| 1 | Undervoltage |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.11 CUV3-A01D1 (Undervoltage relay)

(1) Setting

| (1) Octin | .9 |
|----------------|--|
| Channel No. | ltem |
| 00H | Undervoltage operation voltage (V) |
| 01H | Undervoltage operation time (sec.) |
| 02H | UV test |
| 03H | Contact arrangement (contact X₀) (Note 1) |
| 04H | Contact arrangement (contact X ₁) (Note 1) |
| 05H | Contact arrangement (contact X ₂) (Note 1) |
| 06H | Contact arrangement (contact X ₃) (Note 1) |
| 07H | Contact arrangement (contact X ₄) (Note 1) |
| 08H | Contact arrangement (contact X ₅) (Note 1) |
| 09H | Operation indicator LED hold (Note 2) |
| 00H | VT primary (V) |
| 01H | VT secondary (V) |

(2) Measurement

| Channel No. | Item |
|----------------|----------------------|
| 10H | AB phase voltage (V) |
| 11H | BC phase voltage (V) |
| 12H | CA phase voltage (V) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| Channel No. | ltem |
|----------------|----------------------|
| A1H | AB phase voltage (V) |
| A2H | BC phase voltage (V) |
| АЗН | CA phase voltage (V) |

(5) Operation element

| Bit | Item |
|-----|-----------------|
| 0 | Undervoltage AB |
| 1 | Undervoltage BC |
| 2 | Undervoltage CA |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | UV test |
| D | |
| Е | |
| F | |

(6) RX information

| (0) IXX III | Iomation |
|-------------|-----------------|
| Bit | Item |
| 2 | Trip |
| 3 | UV-TEST |
| 4 | |
| 5 | Undervoltage AB |
| 6 | Undervoltage BC |
| 7 | Undervoltage CA |
| 8 | |
| 9 | |
| А | • |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-----------------|
| 0 | Contact hold |
| 1 | Undervoltage AB |
| 2 | Undervoltage BC |
| 3 | Undervoltage CA |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------|
| 0 | Trip |
| 1 | Undervoltage AB |
| 2 | Undervoltage BC |
| 3 | Undervoltage CA |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.12 CBV1-A01D1 (Voltage relay)

(1) Setting

| (1) Settin | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Undervoltage operation voltage (V) |
| 01H | Undervoltage operation time (sec.) |
| 02H | Earth fault overvoltage operation voltage (V) |
| 03H | Earth fault overvoltage operation time (sec.) |
| 04H | Contact arrangement (contact X ₀) (Note 1) |
| 05H | Contact arrangement (contact X ₁) (Note 1) |
| 06H | Contact arrangement (contact X ₂) (Note 1) |
| 07H | Contact arrangement (contact X ₃) (Note 1) |
| 08H | Contact arrangement (contact X ₄) (Note 1) |
| 09H | Contact arrangement (contact X ₅) (Note 1) |
| 0AH | Operation indicator LED hold (Note 2) |
| 00H | VT primary (V) |
| 01H | VT secondary (V) |
| 02H | EVT primary (V) |
| 03H | EVT ternary (V) |

(5) Operation element

| Bit | Item |
|-----|-------------------------|
| 0 | Undervoltage |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(2) Measurement

| Channel No. | Item |
|----------------|------------------------|
| 10H | AB phase voltage (V) |
| 11H | Zero-phase voltage (V) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(6) RX information

| (-) | |
|-------|-------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Undervoltage |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | Earth fault overvoltage |
| В | |
| С | |
| D | |
| Е | |

(4) Waveform

| (T) Wave | 101111 |
|----------------|------------------------|
| Channel No. | ltem |
| A1H | AB phase voltage (V) |
| A4H | Zero-phase voltage (V) |

(Note 1) Contact arrangement

| (11010 1) 0 | ontaet arrangement |
|-------------|-------------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Undervoltage |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | Earth fault overvoltage |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | Undervoltage |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | Earth fault overvoltage |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

3.13 CBV2-A01D1 (Voltage relay)

(1) Setting

| (1) Settin | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Undervoltage operation voltage (V) |
| 01H | Undervoltage operation time (sec.) |
| 02H | UV test |
| 03H | Overvoltage operation voltage (V) |
| 04H | Overvoltage operation time (sec.) |
| 05H | Contact arrangement (contact X ₀) (Note 1) |
| 06H | Contact arrangement (contact X ₁) (Note 1) |
| 07H | Contact arrangement (contact X ₂) (Note 1) |
| H80 | Contact arrangement (contact X ₃) (Note 1) |
| 09H | Contact arrangement (contact X ₄) (Note 1) |
| 0AH | Contact arrangement (contact X ₅) (Note 1) |
| 0BH | Operation indicator LED hold (Note 2) |
| 00H | VT primary (V) |
| 01H | VT secondary (V) |

(5) Operation element

| Bit | Item |
|-----|-----------------|
| 0 | Undervoltage AB |
| 1 | Undervoltage BC |
| 2 | Undervoltage CA |
| 3 | |
| 4 | Overvoltage AB |
| 5 | Overvoltage BC |
| 6 | Overvoltage CA |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | UV test |
| D | |
| Е | |
| F | |

(2) Measurement

| ` ' | |
|----------------|----------------------|
| Channel No. | Item |
| 10H | AB phase voltage (V) |
| 11H | BC phase voltage (V) |
| 12H | CA phase voltage (V) |

(6) RX information

| Bit | Item |
|-----|-----------------|
| 2 | Trip |
| 3 | UV-TEST |
| 4 | |
| 5 | Undervoltage AB |
| 6 | Undervoltage BC |
| 7 | Undervoltage CA |
| 8 | |
| 9 | |
| Α | Overvoltage AB |
| В | Overvoltage BC |
| С | Overvoltage CA |
| D | |
| E | |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(4) Waveform

| Channel No. | Item |
|----------------|----------------------|
| A1H | AB phase voltage (V) |
| A2H | BC phase voltage (V) |
| A3H | CA phase voltage (V) |

(Note 1) Contact arrangement

| | ontaet arrangement |
|-----|--------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Undervoltage AB |
| 2 | Undervoltage BC |
| 3 | Undervoltage CA |
| 4 | |
| 5 | Overvoltage AB |
| 6 | Overvoltage BC |
| 7 | Overvoltage CA |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------|
| 0 | Trip |
| 1 | Undervoltage AB |
| 2 | Undervoltage BC |
| 3 | Undervoltage CA |
| 4 | |
| 5 | Overvoltage AB |
| 6 | Overvoltage BC |
| 7 | Overvoltage CA |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.14 CBV2-A02D1 (Voltage relay)

(1) Setting

| (1) 561111 | ig . |
|----------------|--|
| Channel No. | Item |
| 00H | Undervoltage operation voltage (V) |
| 01H | Undervoltage operation time (sec.) |
| 02H | UV test |
| 03H | Overvoltage operation voltage (V) |
| 04H | Overvoltage operation time (sec.) |
| 05H | Contact arrangement (contact X ₀) (Note 1) |
| 06H | Contact arrangement (contact X ₁) (Note 1) |
| 07H | Contact arrangement (contact X ₂) (Note 1) |
| 08H | Contact arrangement (contact X ₃) (Note 1) |
| 09H | Contact arrangement (contact X ₄) (Note 1) |
| 0AH | Contact arrangement (contact X ₅) (Note 1) |
| 0BH | Operation indicator LED hold (Note 2) |
| 00H | VT primary (V) |
| 01H | VT secondary (V) |

(5) Operation element

| (o) Open | ation cicincit |
|----------|-----------------|
| Bit | Item |
| 0 | Undervoltage AB |
| 1 | Undervoltage BC |
| 2 | |
| 3 | |
| 4 | Overvoltage AB |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | UV test |
| D | |
| Е | |
| F | |

(2) Measurement

| ` ' | |
|----------------|----------------------|
| Channel No. | Item |
| 10H | AB phase voltage (V) |
| 11H | BC phase voltage (V) |

(6) RX information

| Bit | Item |
|-----|-----------------|
| 2 | Trip |
| 3 | UV-TEST |
| 4 | |
| 5 | Undervoltage AB |
| 6 | Undervoltage BC |
| 7 | |
| 8 | |
| 9 | |
| Α | Overvoltage AB |
| В | |
| С | |
| D | |
| E | |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(4) Waveform

| (1) | |
|----------------|----------------------|
| Channel No. | ltem |
| A1H | AB phase voltage (V) |
| A2H | BC phase voltage (V) |

(Note 1) Contact arrangement

| () () | ontact arrangement |
|---------|--------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Undervoltage AB |
| 2 | Undervoltage BC |
| 3 | |
| 4 | |
| 5 | Overvoltage AB |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | _ |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------|
| 0 | Trip |
| 1 | Undervoltage AB |
| 2 | Undervoltage BC |
| 3 | |
| 4 | |
| 5 | Overvoltage AB |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.15 CBV3-A01D1 (Voltage relay)

(1) Setting

| (1) Settir | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Undervoltage operation voltage (V) |
| 01H | Undervoltage operation time (sec.) |
| 02H | Overvoltage operation voltage (V) |
| 03H | Overvoltage operation time (sec.) |
| 04H | Earth fault overvoltage operation voltage (V) |
| 05H | Earth fault overvoltage operation time (sec.) |
| 06H | Contact arrangement (contact X ₀) (Note 1) |
| 07H | Contact arrangement (contact X ₁) (Note 1) |
| 08H | Contact arrangement (contact X ₂) (Note 1) |
| 09H | Contact arrangement (contact X ₃) (Note 1) |
| 0AH | Contact arrangement (contact X ₄) (Note 1) |
| 0BH | Contact arrangement (contact X ₅) (Note 1) |
| 0CH | Operation indicator LED hold (Note 2) |
| 00H | VT primary (V) |
| 01H | VT secondary (V) |
| 02H | EVT primary (V) |
| 03H | EVT ternary (V) |

(2) Measurement

| Channel No. | Item |
|----------------|------------------------|
| 10H | AB phase voltage (V) |
| 11H | Zero-phase voltage (V) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | AB phase voltage (V) |
| A4H | Zero-phase voltage (V) |

(5) Operation element

| Bit | Item |
|-----|-------------------------|
| 0 | Undervoltage |
| 1 | |
| 2 | |
| 3 | |
| 4 | Overvoltage |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| (6) RX in | formation |
|-----------|-------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Undervoltage |
| 6 | Overvoltage |
| 7 | |
| 8 | |
| 9 | |
| Α | Earth fault overvoltage |
| В | |
| С | |
| D | |
| Е | |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | Undervoltage |
| 2 | - |
| 3 | |
| 4 | |
| 5 | Overvoltage |
| 6 | |
| 7 | |
| 8 | Earth fault overvoltage |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | Undervoltage |
| 2 | |
| 3 | |
| 4 | |
| 5 | Overvoltage |
| 6 | |
| 7 | |
| 8 | Earth fault overvoltage |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

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3.16 CBV4-A01D1 (Voltage relay)

(1) Setting

| (1) Setti | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Undervoltage operation voltage (V) |
| 01H | Undervoltage operation time (sec.) |
| 02H | UV test |
| 03H | Earth fault overvoltage (1) operation voltage (V) |
| 04H | Earth fault overvoltage (1) operation time (sec.) |
| 05H | Earth fault overvoltage (2) operation voltage (V) |
| 06H | Earth fault overvoltage (2) operation time (sec.) |
| 07H | Contact arrangement (contact X ₀) (Note 1) |
| 08H | Contact arrangement (contact X ₁) (Note 1) |
| 09H | Contact arrangement (contact X ₂) (Note 1) |
| 0AH | Contact arrangement (contact X ₃) (Note 1) |
| 0BH | Contact arrangement (contact X ₄) (Note 1) |
| 0CH | Contact arrangement (contact X ₅) (Note 1) |
| 0DH | Operation indicator LED hold (Note 2) |
| 00H | VT primary (V) |
| 01H | VT secondary (V) |
| 01H | EVT primary (V) |
| 10H | EVT ternary (V) |

(2) Measurement

| Channel No. | Item |
|----------------|------------------------|
| 10H | AB phase voltage (A) |
| 11H | BC phase voltage (A) |
| 12H | CA phase voltage (A) |
| 13H | Zero-phase voltage (V) |
| 14H | Phase |

Each of 10 - 13H reads the maximum record.

(3) Forced operation

| (0) 10100 | operation |
|----------------|------------------------|
| Channel No. | Item |
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| (+) vvavc | +) Wavelolli | |
|-----------------------|------------------------|--|
| Channel No. | Item | |
| A1H | AB phase voltage (V) | |
| A2H | BC phase voltage (V) | |
| АЗН | CA phase voltage (V) | |
| A4H | Zero-phase voltage (V) | |

(5) Operation element

| <u> </u> | ation diditiont |
|----------|-----------------------------|
| Bit | Item |
| 0 | Undervoltage AB |
| 1 | Undervoltage BC |
| 2 | Undervoltage CA |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage (1) |
| 8 | Earth fault overvoltage (2) |
| 9 | |
| Α | |
| В | |
| С | UV test |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|-----------------------------|
| 2 | Trip |
| 3 | UV-TEST |
| 4 | |
| 5 | Undervoltage AB |
| 6 | Undervoltage BC |
| 7 | Undervoltage CA |
| 8 | |
| 9 | |
| Α | Earth fault overvoltage (1) |
| В | Earth fault overvoltage (2) |
| С | |
| D | |
| Е | |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-----------------------------|
| 0 | Contact hold |
| 1 | Undervoltage AB |
| 2 | Undervoltage BC |
| 3 | Undervoltage CA |
| 4 | - |
| 5 | |
| 6 | |
| 7 | |
| 8 | Earth fault overvoltage (1) |
| 9 | Earth fault overvoltage (2) |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------------------|
| 0 | Trip |
| 1 | Undervoltage AB |
| 2 | Undervoltage BC |
| 3 | Undervoltage CA |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | Earth fault overvoltage (1) |
| 9 | Earth fault overvoltage (2) |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.17 CFP1-A01D1 (Line protection relay)

(1) Setting

| (1) Settir | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Phase fault time-delayed operation current (A) |
| 01H | Phase fault time-delayed operation time multiplier |
| 02H | Phase fault time-delayed operation characteristics |
| 03H | Phase fault time-delayed reset characteristics |
| 04H | Phase fault instantaneous operation current (A) |
| 05H | Phase fault instantaneous operation time (sec.) |
| 06H | Earth fault directional operation current (mA) |
| 07H | Earth fault directional operation voltage (V) |
| 08H | Earth fault directional operation time (sec.) |
| 09H | Characteristic angle (°) |
| 0AH | Contact arrangement (contact X ₀) (Note 1) |
| 0BH | Contact arrangement (contact X ₁) (Note 1) |
| 0CH | Contact arrangement (contact X ₂) (Note 1) |
| 0DH | Contact arrangement (contact X ₃) (Note 1) |
| 0EH | Contact arrangement (contact X ₄) (Note 1) |
| 0FH | Contact arrangement (contact X ₅) (Note 1) |
| 10H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | EVT primary (V) |
| 02H | EVT ternary (V) |
| 03H | ZCT error correction ON/OFF (Note 3) |

(2) Measurement

| Channel No. | Item |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | C-phase current (A) |
| 12H | Zero-phase current (A) |
| 13H | Zero-phase voltage (V) |
| 14H | Phase (Note 4) |

Each of 10 - 13H reads the maximum record.

(3) Forced operation

| Channel No. | ltem |
|----------------|------------------------|
| 00H | Contact X₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| (1) ************************************ | |
|--|------------------------|
| Channel No. | ltem |
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| АЗН | Zero-phase current (A) |
| A4H | Zero-phase voltage (V) |

(5) Operation element

| Bit | Item |
|-----|-----------------------------|
| 0 | Phase fault time-delayed A |
| 1 | |
| 2 | Phase fault time-delayed C |
| 3 | |
| 4 | Phase fault instantaneous A |
| 5 | |
| 6 | Phase fault instantaneous C |
| 7 | |
| 8 | Earth fault directional |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| (0) 1()(11) | Iomation |
|-------------|-----------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Phase fault time-delayed A |
| 6 | Phase fault time-delayed C |
| 7 | Earth fault directional |
| 8 | |
| 9 | |
| А | Phase fault instantaneous A |
| В | Phase fault instantaneous C |
| С | |
| D | |
| E | |

voltage.

(Note 1) Contact arrangement

| | errouse en en egeneers |
|-----|-----------------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Phase fault time-delayed A |
| 2 | |
| 3 | Phase fault time-delayed C |
| 4 | |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | |
| 9 | Earth fault directional |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| (14010 2) 0 | peration indicator LLD floid |
|-------------|------------------------------|
| Bit | Item |
| 0 | Trip |
| 1 | Phase fault time-delayed A |
| 2 | |
| 3 | Phase fault time-delayed C |
| 4 | |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | |
| 9 | Earth fault directional |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 3) ON/OFF ZCT-ERR.

[ON]: 1, [OFF]: 0

(Note 4) Receiving data of measurement value

For this relay, the processing model of command 83H specified in the "CC-COM communication card operation manual (general)" is not applicable, just only to read the original receiving data. 10000 is output when there is no current or

3.18 CFP1-A02D1 (Line protection relay)

(1) Setting

| (1) Settir | ng |
|----------------|--|
| Channel No. | Item |
| 00H | Phase fault time-delayed operation current (A) |
| 01H | Phase fault time-delayed operation time multiplier |
| 02H | Phase fault time-delayed operation characteristics |
| 03H | Phase fault time-delayed reset characteristics |
| 04H | Phase fault instantaneous operation current (A) |
| 05H | Phase fault instantaneous operation time (sec.) |
| 06H | Earth fault directional operation current (mA) |
| 07H | Earth fault directional operation voltage (V) |
| H80 | Earth fault directional operation time (sec.) |
| 09H | Chrematistics angle (°) |
| 0AH | Contact arrangement (contact X ₀) (Note 1) |
| 0BH | Contact arrangement (contact X ₁) (Note 1) |
| 0CH | Contact arrangement (contact X ₂) (Note 1) |
| 0DH | Contact arrangement (contact X ₃) (Note 1) |
| 0EH | Contact arrangement (contact X ₄) (Note 1) |
| 0FH | Contact arrangement (contact X ₅) (Note 1) |
| 10H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | EVT primary (V) |
| 02H | EVT ternary (V) |
| 03H | ZCT error correction ON/OFF (Note 3) |

(2) Measurement

| Channel No. | Item |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | C-phase current (A) |
| 12H | Zero-phase current (A) |
| 13H | Zero-phase voltage (V) |
| 14H | Phase (Note 4) |

Each of 10 - 13H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X5 |

(4) Waveform

| | Channel No. | Item |
|---|----------------|------------------------|
| I | A1H | A-phase current (A) |
| I | A2H | C-phase current (A) |
| I | АЗН | Zero-phase current (A) |
| | A4H | Zero-phase voltage (V) |

(5) Operation element

| | ation dicinicint |
|-------------|-----------------------------|
| Bit | Item |
| 0 | Phase fault time-delayed A |
| 1 | |
| 2 | Phase fault time-delayed C |
| 3 | |
| 4 | Phase fault instantaneous A |
| 5 | |
| 6 | Phase fault instantaneous C |
| 7 | |
| 8 | Earth fault directional |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | ltem |
|-----|-----------------------------|
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Phase fault time-delayed A |
| 6 | Phase fault time-delayed C |
| 7 | Earth fault directional |
| 8 | |
| 9 | |
| Α | Phase fault instantaneous A |
| В | Phase fault instantaneous C |
| С | |
| D | |
| Ē | |

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voltage.

(Note 1) Contact arrangement

| | errouse en en egeneers |
|-----|-----------------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Phase fault time-delayed A |
| 2 | |
| 3 | Phase fault time-delayed C |
| 4 | |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | |
| 9 | Earth fault directional |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------------------|
| 0 | Trip |
| 1 | Phase fault time-delayed A |
| 2 | |
| 3 | Phase fault time-delayed C |
| 4 | |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | |
| 9 | Earth fault directional |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 3) Line voltage

For 6.6 kV line: "0"

For 3.3 kV line: "1"

(Note 4) Receiving data of measurement value

For this relay, the processing model of command 83H specified in the "CC-COM communication card operation manual (general)" is not applicable, just only to read the original receiving data. 10000 is output when there is no current or

3.19 CFP1-A03D1 (Line protection relay)

(1) Setting

| (1) Settin | ng |
|----------------|--|
| Channel No. | Item |
| 00H | Phase fault time-delayed operation current (A) |
| 01H | Phase fault time-delayed operation time multiplier |
| 02H | Phase fault time-delayed operation characteristics |
| 03H | Phase fault time-delayed reset characteristics |
| 04H | Phase fault instantaneous operation current (A) |
| 05H | Phase fault instantaneous operation time (sec.) |
| 06H | Earth fault directional operation current (A) |
| 07H | Earth fault directional operation voltage (%) |
| 08H | Earth fault directional operation time (sec.) |
| 09H | Characteristics angle (°) |
| 0AH | Line voltage (kV) (Note 3) |
| 0BH | Contact arrangement (contact X₀) (Note 1) |
| 0CH | Contact arrangement (contact X ₁) (Note 1) |
| 0DH | Contact arrangement (contact X ₂) (Note 1) |
| 0EH | Contact arrangement (contact X ₃) (Note 1) |
| 0FH | Contact arrangement (contact X ₄) (Note 1) |
| 10H | Contact arrangement (contact X ₅) (Note 1) |
| 11H | Operation indicator LED hold (Note 2) |
| 00H | VT primary (V) |

(2) Measurement

| Channel No. | Item |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | C-phase current (A) |
| 12H | Zero-phase current (A) |
| 13H | Zero-phase voltage (V) |
| 14H | Phase (Note 4) |

Each of 10 - 13H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | Zero-phase current (A) |
| A4H | Zero-phase voltage (V) |

(5) Operation element

| (b) Open | ation dicinicint |
|----------|-----------------------------|
| Bit | Item |
| 0 | Phase fault time-delayed A |
| 1 | |
| 2 | Phase fault time-delayed C |
| 3 | |
| 4 | Phase fault instantaneous A |
| 5 | |
| 6 | Phase fault instantaneous C |
| 7 | |
| 8 | Earth fault directional |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| (6) | |
|-----|-----------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Phase fault time-delayed A |
| 6 | Phase fault time-delayed C |
| 7 | Earth fault directional |
| 8 | |
| 9 | |
| Α | Phase fault instantaneous A |
| В | Phase fault instantaneous C |
| С | |
| D | |
| Е | |

voltage.

(Note 1) Contact arrangement

| Bit | Item |
|-----|-----------------------------|
| 0 | Contact hold |
| 1 | Phase fault time-delayed A |
| 2 | |
| 3 | Phase fault time-delayed C |
| 4 | |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | |
| 9 | Earth fault directional |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------------------|
| 0 | Trip |
| 1 | Phase fault time-delayed A |
| 2 | |
| 3 | Phase fault time-delayed C |
| 4 | |
| 5 | Phase fault instantaneous A |
| 6 | |
| 7 | Phase fault instantaneous C |
| 8 | |
| 9 | Earth fault directional |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 3) Line voltage

For 6.6 kV line: "0" For 3.3 kV line: "1"

(Note 4) Receiving data of measurement value

For this relay, the processing model of command 83H specified in the "CC-COM communication card operation manual (general)" is not applicable, just only to read the original receiving data. 10000 is output when there is no current or

3.20 CAC1-A01D2 (Biased differential relay)

(1) Setting

| (1) 361111 | ig . |
|----------------|--|
| Channel No. | Item |
| 00H | Matching tap primary current (A) |
| 01H | Matching tap secondary current (A) |
| 02H | Biased differential operation current (%) |
| 03H | Bias (%) |
| 04H | DIF test |
| 05H | 2 nd harmonic restraint ratio (%) |
| 06H | Differential overcurrent operation current (x) |
| 07H | Contact arrangement (contact X ₀) (Note 1) |
| 08H | Contact arrangement (contact X ₁) (Note 1) |
| 09H | Contact arrangement (contact X ₂) (Note 1) |
| 0AH | Contact arrangement (contact X ₃) (Note 1) |
| 0BH | Contact arrangement (contact X ₄) (Note 1) |
| 0CH | Contact arrangement (contact X ₅) (Note 1) |
| 0DH | Operation indicator LED hold (Note 2) |

(2) Measurement (Note 3)

| Channel No. | Item |
|----------------|------------------------------|
| 10H | A-phase restraining current |
| 11H | A-phase differential current |
| 12H | A-phase If2/If1 |
| 20H | B-phase restraining current |
| 21H | B-phase differential current |
| 22H | B-phase If2/If1 |
| 30H | C-phase restraining current |
| 31H | C-phase differential current |
| 32H | C-phase If2/If1 |

There is not the maximum record of 2f/1f.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(4) Waveform

| Channel No. | ltem |
|----------------|-------------------------------|
| A1H | A-phase primary current (A) |
| A2H | A-phase secondary current (A) |
| B1H | B-phase primary current (A) |
| B2H | B-phase secondary current (A) |
| C1H | C-phase primary current (A) |
| C2H | C-phase secondary current (A) |

(5) Operation element

| (e) Opera | ation didinont |
|------------------|--------------------------------------|
| Bit | Item |
| 0 | Biased differential A |
| 1 | Biased differential B |
| 2 | Biased differential C |
| 3 | Differential overcurrent A |
| 4 | Differential overcurrent B |
| 5 | Differential overcurrent C |
| 6 | 2 nd harmonic restraint A |
| 7 | 2 nd harmonic restraint B |
| 8 | 2 nd harmonic restraint C |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|--------------------------------------|
| 2 | Trip |
| 3 | DIF test |
| 4 | Biased differential A |
| 5 | Biased differential B |
| 6 | Biased differential C |
| 7 | Differential overcurrent A |
| 8 | Differential overcurrent B |
| 9 | Differential overcurrent C |
| Α | 2 nd harmonic restraint A |
| В | 2 nd harmonic restraint B |
| С | 2 nd harmonic restraint C |
| D | |
| Ē | |

(Note 1) Contact arrangement

| Bit | Item |
|-----|--------------------------------------|
| 0 | Contact hold |
| 1 | Biased differential A |
| 2 | Biased differential B |
| 3 | Biased differential C |
| 4 | Differential overcurrent A |
| 5 | Differential overcurrent B |
| 6 | Differential overcurrent C |
| 7 | 2 nd harmonic restraint A |
| 8 | 2 nd harmonic restraint B |
| 9 | 2 nd harmonic restraint C |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|----------------------------|
| 0 | Trip |
| 1 | Biased differential A |
| 2 | Biased differential B |
| 3 | Biased differential C |
| 4 | Differential overcurrent A |
| 5 | Differential overcurrent B |
| 6 | Differential overcurrent C |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 3) Receiving data of measurement value

For this relay, the processing model of command 83H specified in the "CC-COM communication card operation manual (general)" is not applicable. It just only read the original receiving data.

3.21 CPP1-A01D2 (Interconnection protection relay)

(1) Setting

| Channel No. OOH Earth fault overvoltage operation voltage (V) O1H Earth fault overvoltage operation time (sec.) O2H Overvoltage operation voltage (V) O3H Overvoltage operation time (sec.) O4H Undervoltage operation time (sec.) O4H Undervoltage operation time (sec.) O5H Undervoltage operation time (sec.) O6H Undervoltage UV test O7H Phase fault directional L operation current (%) O8H Phase fault directional L operation current (%) O8H Phase fault directional H operation current (%) OAH Phase fault directional H operation time (sec.) OBH Directional phase fault UV (V) OCH Directional phase fault DS test ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation time (sec.) OFH Reverse power operation time (sec.) 11H Over frequency operation time (sec.) 12H Over frequency operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 17H Contact arrangement (contact X ₂) (Note 1) 18H Contact arrangement (contact X ₃) (Note 1) | 1) Settin | g |
|---|-----------|--|
| 01H Earth fault overvoltage operation time (sec.) 02H Overvoltage operation voltage (V) 03H Overvoltage operation time (sec.) 04H Undervoltage operation time (sec.) 05H Undervoltage operation time (sec.) 06H Undervoltage UV test 07H Phase fault directional L operation current (%) 08H Phase fault directional L operation current (%) 09H Phase fault directional H operation current (%) 0AH Phase fault directional H operation time (sec.) 0BH Directional phase fault UV (V) 0CH Directional phase fault DS test 0DH Under frequency operation frequency (Hz) 0EH Under frequency operation time (sec.) 0FH Reverse power operation time (sec.) 10H Reverse power operation frequency (Hz) 12H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X₀) (Note 1) | | ltem |
| O2H Overvoltage operation voltage (V) O3H Overvoltage operation time (sec.) O4H Undervoltage operation voltage (V) O5H Undervoltage operation time (sec.) O6H Undervoltage UV test O7H Phase fault directional L operation current (%) O8H Phase fault directional L operation time (sec.) O9H Phase fault directional H operation current (%) OAH Phase fault directional H operation current (%) OAH Phase fault directional H operation time (sec.) OBH Directional phase fault UV (V) OCH Directional phase fault DS test ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact Xo) (Note 1) | 00H | Earth fault overvoltage operation voltage (V) |
| O3H Overvoltage operation time (sec.) O4H Undervoltage operation voltage (V) O5H Undervoltage operation time (sec.) O6H Undervoltage UV test O7H Phase fault directional L operation current (%) O8H Phase fault directional H operation current (%) OAH Phase fault directional H operation current (%) OAH Phase fault directional H operation time (sec.) OBH Directional phase fault UV (V) OCH Directional phase fault DS test ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X₀) (Note 1) | 01H | Earth fault overvoltage operation time (sec.) |
| 04H Undervoltage operation voltage (V) 05H Undervoltage operation time (sec.) 06H Undervoltage UV test 07H Phase fault directional L operation current (%) 08H Phase fault directional L operation time (sec.) 09H Phase fault directional H operation current (%) 0AH Phase fault directional H operation time (sec.) 0BH Directional phase fault UV (V) 0CH Directional phase fault DS test 0DH Under frequency operation frequency (Hz) 0EH Under frequency operation time (sec.) 0FH Reverse power operation current (A) 10H Reverse power operation frequency (Hz) 12H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X₀) (Note 1) | 02H | Overvoltage operation voltage (V) |
| 05H Undervoltage operation time (sec.) 06H Undervoltage UV test 07H Phase fault directional L operation current (%) 08H Phase fault directional L operation time (sec.) 09H Phase fault directional H operation current (%) 0AH Phase fault directional H operation time (sec.) 0BH Directional phase fault UV (V) 0CH Directional phase fault DS test 0DH Under frequency operation frequency (Hz) 0EH Under frequency operation time (sec.) 0FH Reverse power operation current (A) 10H Reverse power operation frequency (Hz) 12H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X₀) (Note 1) | 03H | Overvoltage operation time (sec.) |
| 06H Undervoltage UV test 07H Phase fault directional L operation current (%) 08H Phase fault directional L operation time (sec.) 09H Phase fault directional H operation current (%) 0AH Phase fault directional H operation time (sec.) 0BH Directional phase fault UV (V) 0CH Directional phase fault DS test 0DH Under frequency operation frequency (Hz) 0EH Under frequency operation time (sec.) 0FH Reverse power operation current (A) 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X₀) (Note 1) | 04H | Undervoltage operation voltage (V) |
| O7H Phase fault directional L operation current (%) O8H Phase fault directional L operation time (sec.) O9H Phase fault directional H operation current (%) OAH Phase fault directional H operation time (sec.) OBH Directional phase fault UV (V) OCH Directional phase fault DS test ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation frequency (Hz) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X₀) (Note 1) | 05H | Undervoltage operation time (sec.) |
| O8H Phase fault directional L operation time (sec.) O9H Phase fault directional H operation current (%) OAH Phase fault directional H operation time (sec.) OBH Directional phase fault UV (V) OCH Directional phase fault DS test ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation frequency (Hz) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X₀) (Note 1) | 06H | Undervoltage UV test |
| O9H Phase fault directional H operation current (%) OAH Phase fault directional H operation time (sec.) OBH Directional phase fault UV (V) OCH Directional phase fault DS test ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X₀) (Note 1) | 07H | Phase fault directional L operation current (%) |
| OAH Phase fault directional H operation time (sec.) OBH Directional phase fault UV (V) OCH Directional phase fault DS test ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power operation time (sec.) 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | H80 | Phase fault directional L operation time (sec.) |
| OBH Directional phase fault UV (V) OCH Directional phase fault DS test ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 09H | Phase fault directional H operation current (%) |
| OCH Directional phase fault DS test ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X₀) (Note 1) | 0AH | Phase fault directional H operation time (sec.) |
| ODH Under frequency operation frequency (Hz) OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 0BH | Directional phase fault UV (V) |
| OEH Under frequency operation time (sec.) OFH Reverse power operation current (A) 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 0CH | Directional phase fault DS test |
| OFH Reverse power operation current (A) 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 0DH | Under frequency operation frequency (Hz) |
| 10H Reverse power operation time (sec.) 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 0EH | Under frequency operation time (sec.) |
| 11H Over frequency operation frequency (Hz) 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 0FH | Reverse power operation current (A) |
| 12H Over frequency operation time (sec.) 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 10H | Reverse power operation time (sec.) |
| 13H Under power operation current (%) 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 11H | Over frequency operation frequency (Hz) |
| 14H Under power operation time (sec.) 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 12H | Over frequency operation time (sec.) |
| 15H Under power open circuit detection lock 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 13H | Under power operation current (%) |
| 16H Lock at un-interconnected condition (sec.) 17H Contact arrangement (contact X ₀) (Note 1) | 14H | Under power operation time (sec.) |
| 17H Contact arrangement (contact X ₀) (Note 1) | 15H | Under power open circuit detection lock |
| | 16H | Lock at un-interconnected condition (sec.) |
| 18H Contact arrangement (contact X ₁) (Note 1) | 17H | Contact arrangement (contact X ₀) (Note 1) |
| Total Contact arrangement (contact A) (Note 1) | 18H | Contact arrangement (contact X ₁) (Note 1) |
| 19H Contact arrangement (contact X ₂) (Note 1) | 19H | Contact arrangement (contact X ₂) (Note 1) |
| 1AH Contact arrangement (contact X ₃) (Note 1) | 1AH | Contact arrangement (contact X ₃) (Note 1) |
| 1BH Contact arrangement (contact X ₄) (Note 1) | 1BH | Contact arrangement (contact X ₄) (Note 1) |
| 1CH Contact arrangement (contact X₅) (Note 1) | 1CH | Contact arrangement (contact X ₅) (Note 1) |
| 1DH Contact arrangement (contact X ₆) (Note 1) | 1DH | |
| 1EH Contact arrangement (contact X ₇) (Note 1) | | Contact arrangement (contact X ₇) (Note 1) |
| 1FH Contact arrangement (contact X ₈) (Note 1) | 1FH | Contact arrangement (contact X ₈) (Note 1) |
| 20H Contact arrangement (contact X ₉) (Note 1) | | |
| 21H Contact arrangement (contact X _a) (Note 1) | | |
| 22H Contact arrangement (contact X _b) (Note 1) | | |
| 23H Operation indicator LED hold (Note 2) | 23H | Operation indicator LED hold (Note 2) |
| 00H CT primary (A) | 00H | CT primary (A) |
| 01H VT primary (V) | 01H | |
| 02H VT secondary (V) | 02H | VT secondary (V) |
| 03H EVT primary (V) | 03H | EVT primary (V) |
| 04H EVT tertiary (V) | 04H | EVT tertiary (V) |

(2) Measurement(Note3)

| Channel No. | Item |
|----------------|---------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (V) |
| 17H | Active power (kW) |
| 18H | Reverse active power (kW) |
| 19H | Power factor |
| 1AH | Frequency (Hz) |

Each of 10H - 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |
| 06H | Contact X ₆ |
| 07H | Contact X ₇ |
| 08H | Contact X ₈ |
| 09H | Contact X ₉ |
| 0AH | Contact X _a |
| 0BH | Contact X _b |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| (5) 5 5 5 5 | |
|-------------|-------------------------|
| Bit | Item |
| 0 | Phase fault directional |
| 1 | Undervoltage |
| 2 | Reverse power |
| 3 | Under power |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | Earth fault overvoltage |
| 7 | Overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|--|
| 0 | |
| 1 | |
| 2 | Trip |
| 3 | Test |
| 4 | Undervoltage for phase fault directional |
| 5 | Lock at un-interconnected condition |
| 6 | Earth fault overvoltage |
| 7 | Overvoltage |
| 8 | Undervoltage |
| 9 | Directional phase fault |
| Α | |
| В | Under frequency |
| С | Reverse power |
| D | Over frequency |
| E | Under power |

(7) DI

| (1) 01 | |
|--------|----------------------------------|
| Bit | Item |
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | ltem |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | Phase fault directional |
| 2 | Undervoltage |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | Overvoltage |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | Phase fault directional |
| 2 | Undervoltage |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | Overvoltage |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency.

- #1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.
- #2 Frequency: When the voltage is 35V or less, 0 Hz is output.

(1) Setting

| (1) Settir | ng |
|----------------|--|
| Channel No. | Item |
| 00H | Earth fault overvoltage operation voltage (%) |
| 01H | Earth fault overvoltage operation time (sec.) |
| 02H | Overvoltage operation voltage (V) |
| 03H | Overvoltage operation time (sec.) |
| 04H | Undervoltage operation voltage (V) |
| 05H | Undervoltage operation time (sec.) |
| 06H | Undervoltage UV test |
| 07H | Phase fault directional L operation current (%) |
| H80 | Phase fault directional L operation time (sec.) |
| 09H | Phase fault directional H operation current (%) |
| 0AH | Phase fault directional H operation time (sec.) |
| 0BH | Phase fault directional UV (V) |
| 0CH | Phase fault directional DS test |
| 0DH | Under frequency operation frequency (Hz) |
| 0EH | Under frequency operation time (sec.) |
| 0FH | Reverse power operation current (%) |
| 10H | Reverse power operation time (sec.) |
| 11H | Over frequency operation frequency (Hz) |
| 12H | Over frequency operation time (sec.) |
| 13H | Under power operation current (%) |
| 14H | Under power operation time (sec.) |
| 15H | Under power open circuit detection lock |
| 16H | Lock at un-interconnected condition (sec.) |
| 17H | Contact arrangement (contact X ₀) (Note 1) |
| 18H | Contact arrangement (contact X ₁) (Note 1) |
| 19H | Contact arrangement (contact X ₂) (Note 1) |
| 1AH | Contact arrangement (contact X ₃) (Note 1) |
| 1BH | Contact arrangement (contact X ₄) (Note 1) |
| 1CH | Contact arrangement (contact X ₅) (Note 1) |
| 1DH | Contact arrangement (contact X ₆) (Note 1) |
| 1EH | Contact arrangement (contact X ₇) (Note 1) |
| 1FH | Contact arrangement (contact X ₈) (Note 1) |
| 20H | Contact arrangement (contact X ₉) (Note 1) |
| 21H | Contact arrangement (contact X _a) (Note 1) |
| 22H | Contact arrangement (contact X _b) (Note 1) |
| 23H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | VT primary (V) |
| 02H | VT secondary (V) |
| 03H | System voltage (KV) |

(2) Measurement (Note3)

| Channel No. | Item |
|----------------|-----------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (%) |
| 17H | Active power (kW) |
| 18H | Reverse active power (kW) |
| 19H | Power factor |
| 1AH | Frequency (H _z) |

Each of 10H - 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |
| 06H | Contact X ₆ |
| 07H | Contact X ₇ |
| 08H | Contact X ₈ |
| 09H | Contact X ₉ |
| 0AH | Contact X _a |
| 0BH | Contact X _b |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| (e) Speration demonit | |
|-----------------------|-------------------------|
| Bit | Item |
| 0 | Phase fault directional |
| 1 | Undervoltage |
| 2 | Reverse power |
| 3 | Under power |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | Earth fault overvoltage |
| 7 | Overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| D'I | n . |
|-----|--|
| Bit | <u> </u> Item |
| 2 | Trip |
| 3 | Test |
| 4 | Undervoltage for phase fault directional |
| 5 | Lock at un-interconnected condition |
| 6 | Earth fault overvoltage |
| 7 | Overvoltage |
| 8 | Undervoltage |
| 9 | Directional phase fault |
| Α | |
| В | Under frequency |
| С | Reverse power |
| D | Over frequency |
| E | Under power |

(7) DI

| Bit | Item |
|-----|----------------------------------|
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | ltem |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | Phase fault directional |
| 2 | Undervoltage |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | Overvoltage |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | Phase fault directional |
| 2 | Undervoltage |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | Overvoltage |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency.#1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less,0 Hz is output.

(1) Setting

| (1) Settin | ng |
|----------------|--|
| Channel No. | Item |
| 00H | Earth fault overvoltage operation voltage (V) |
| 01H | Earth fault overvoltage operation time (sec.) |
| 02H | Overvoltage operation voltage (V) |
| 03H | Overvoltage operation time (sec.) |
| 04H | Undervoltage operation voltage (V) |
| 05H | Undervoltage operation time (sec.) |
| 06H | Undervoltage UV test |
| 07H | Phase fault directional L operation current (%) |
| H80 | Phase fault directional L operation time (sec.) |
| 09H | Phase fault directional H operation current (%) |
| 0AH | Phase fault directional H operation time (sec.) |
| 0BH | Phase fault directional UV (V) |
| 0CH | Phase fault directional DS test |
| 0DH | Under frequency operation frequency (Hz) |
| 0EH | Under frequency operation time (sec.) |
| 0FH | Reverse power operation current (%) |
| 10H | Reverse power operation time (sec.) |
| 11H | Over frequency operation frequency (Hz) |
| 12H | Over frequency operation time (sec.) |
| 13H | Under power operation current (%) |
| 14H | Under power operation time (sec.) |
| 15H 16H | Under power open circuit detection lock |
| 10П | Lock at un-interconnected condition (sec.) |
| 17H | Islanding detection Rate of change of operation frequency (Hz/s) |
| 18H | Islanding detection operation time (sec.) |
| 19H | Contact arrangement (contact X₀) (Note 1) |
| 1AH | Contact arrangement (contact X ₁) (Note 1) |
| 1BH | Contact arrangement (contact X ₂) (Note 1) |
| 1CH | Contact arrangement (contact X ₃) (Note 1) |
| 1DH | Contact arrangement (contact X ₄) (Note 1) |
| 1EH | Contact arrangement (contact X ₅) (Note 1) |
| 1FH | Contact arrangement (contact X ₆) (Note 1) |
| 20H | Contact arrangement (contact X ₇) (Note 1) |
| 21H | Contact arrangement (contact X ₈) (Note 1) |
| 22H | Contact arrangement (contact X ₉) (Note 1) |
| 23H | Contact arrangement (contact X _a) (Note 1) |
| 24H | Contact arrangement (contact X _b) (Note 1) |
| 25H | Contact arrangement (contact X _c) (Note 1) |
| 26H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | VT primary (V) |
| 02H | VT secondary (V) |
| 03H | EVT primary (V) |
| 04H | EVT tertiary (V) |

(2) Measurement (Note3)

| Channel No. | Item |
|----------------|-----------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (V) |
| 17H | Active power (kW) |
| 18H | Reverse active power (kW) |
| 19H | Power factor |
| 1AH | Frequency (H _z) |

Each of 10H - 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |
| 06H | Contact X ₆ |
| 07H | Contact X ₇ |
| 08H | Contact X ₈ |
| 09H | Contact X ₉ |
| 0AH | Contact X _a |
| 0BH | Contact X _b |
| 0CH | Contact X _c |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| (e) Speration defined | |
|-----------------------|-------------------------|
| Bit | Item |
| 0 | Phase fault directional |
| 1 | Undervoltage |
| 2 | Reverse power |
| 3 | Under power |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | Earth fault overvoltage |
| 7 | Overvoltage |
| 8 | Islanding detection |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|--|
| 2 | Trip |
| 3 | Test |
| 4 | Undervoltage for phase fault directional |
| 5 | Lock at an-interconnected condition |
| 6 | Earth fault overvoltage |
| 7 | Overvoltage |
| 8 | Undervoltage |
| 9 | Directional phase fault |
| Α | Islanding detection |
| В | Under frequency |
| С | Reverse power |
| D | Over frequency |
| E | Under power |

(7) DI

| Bit | ltem |
|-----|----------------------------------|
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | ltem |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | Phase fault directional |
| 2 | Undervoltage |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | Overvoltage |
| 9 | Islanding detection |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | Phase fault directional |
| 2 | Undervoltage |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | Overvoltage |
| 9 | Islanding detection |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency.#1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less,0 Hz is output.

3.24 CPP1-A12D2 (Interconnection protection relay)

(1) Setting

| (1) Settin | ıy |
|----------------|--|
| Channel No. | Item |
| 00H | Earth fault overvoltage operation voltage (%) |
| 01H | Earth fault overvoltage operation time (sec.) |
| 02H | Overvoltage operation voltage (V) |
| 03H | Overvoltage operation time (sec.) |
| 04H | Undervoltage operation voltage (V) |
| 05H | Undervoltage operation time (sec.) |
| 06H | Undervoltage UV test |
| 07H | Phase fault directional L operation current (%) |
| 08H | Phase fault directional L operation time (sec.) |
| 09H | Phase fault directional H operation current (%) |
| 0AH | Phase fault directional H operation time (sec.) |
| 0BH | Phase fault directional UV (V) |
| 0CH | Phase fault directional DS test (V) |
| 0DH | Under frequency operation frequency (Hz) |
| 0EH | Under frequency operation time (sec.) |
| 0FH | Reverse power operation current (%) |
| 10H | Reverse power operation time (sec.) |
| 11H | Over frequency operation frequency (Hz) |
| 12H | Over frequency operation time (sec.) |
| 13H | Under power operation current (%) |
| 14H | Under power operation time (sec.) |
| 15H | Under power open circuit detection lock |
| 16H | Lock at an-interconnected condition (sec.) |
| 17H | Islanding detection Rate of change of operation frequency (Hz/s) |
| 18H | Islanding detection operation time (sec.) |
| 19H | Contact arrangement (contact X₀) (Note 1) |
| 1AH | Contact arrangement (contact X ₁) (Note 1) |
| 1BH | Contact arrangement (contact X ₂) (Note 1) |
| 1CH | Contact arrangement (contact X ₃) (Note 1) |
| 1DH | Contact arrangement (contact X ₄) (Note 1) |
| 1EH | Contact arrangement (contact X ₅) (Note 1) |
| 1FH | Contact arrangement (contact X ₆) (Note 1) |
| 20H | Contact arrangement (contact X ₇) (Note 1) |
| 21H | Contact arrangement (contact X ₈) (Note 1) |
| 22H | Contact arrangement (contact X ₉) (Note 1) |
| 23H | Contact arrangement (contact X _a) (Note 1) |
| 24H | Contact arrangement (contact X _b) (Note 1) |
| 25H | Contact arrangement (contact X _c) (Note 1) |
| 26H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | VT primary (V) |
| 02H | VT secondary (V) |
| 03H | System voltage (KV) |

(2) Measurement (Note3)

| Channel No. | Item |
|----------------|-----------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (%) |
| 17H | Active power (kW) |
| 18H | Reverse active power (kW) |
| 19H | Power factor |
| 1AH | Frequency (H _z) |

Each of 10H - 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |
| 06H | Contact X ₆ |
| 07H | Contact X ₇ |
| 08H | Contact X ₈ |
| 09H | Contact X ₉ |
| 0AH | Contact X _a |
| 0BH | Contact X _b |
| 0CH | Contact X _c |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| (5) | |
|-----|-------------------------|
| Bit | Item |
| 0 | Phase fault directional |
| 1 | Undervoltage |
| 2 | Reverse power |
| 3 | Under power |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | Earth fault overvoltage |
| 7 | Overvoltage |
| 8 | Islanding detection |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|--|
| 2 | Trip |
| 3 | Test |
| 4 | Undervoltage for phase fault directional |
| 5 | Lock at un-interconnected condition |
| 6 | Earth fault overvoltage |
| 7 | Overvoltage |
| 8 | Undervoltage |
| 9 | Directional phase fault |
| А | Islanding detection |
| В | Under frequency |
| С | Reverse power |
| D | Over frequency |
| E | Under power |

(7) DI

| Bit | Item |
|-----|----------------------------------|
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | ltem |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | Phase fault directional |
| 2 | Undervoltage |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | Overvoltage |
| 9 | Islanding detection |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | Phase fault directional |
| 2 | Undervoltage |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | Overvoltage |
| 9 | Islanding detection |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency.#1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less,0 Hz is output.

3.25 CPP2-A01D2 (Interconnection protection relay)

(1) Setting

| lg |
|--|
| Item |
| Earth fault overvoltage operation voltage (V) |
| Earth fault overvoltage operation time (sec.) |
| Under frequency operation frequency (Hz) |
| Under frequency operation time (sec.) |
| Reverse power operation current (%) |
| Reverse power operation time (sec.) |
| Over frequency operation frequency (Hz) |
| Over frequency operation time (sec.) |
| Under power operation current (%) |
| Under power operation time (sec.) |
| Under power open circuit detection lock |
| Lock at un-interconnected condition (sec.) |
| Contact arrangement (contact X ₀) (Note 1) |
| Contact arrangement (contact X ₁) (Note 1) |
| Contact arrangement (contact X ₂) (Note 1) |
| Contact arrangement (contact X ₃) (Note 1) |
| Contact arrangement (contact X ₄) (Note 1) |
| Contact arrangement (contact X ₅) (Note 1) |
| Contact arrangement (contact X ₆) (Note 1) |
| Contact arrangement (contact X ₇) (Note 1) |
| Operation indicator LED hold (Note 2) |
| CT primary (A) |
| VT primary (V) |
| VT secondary (V) |
| EVT primary (V) |
| EVT tertiary (V) |
| |

(2) Measurement (Note3)

| Channel No. | Item |
|----------------|---------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (V) |
| 17H | Active power (KW) |
| 18H | Reverse active power (KW) |
| 19H | Power factor |
| 1AH | Frequency (Hz) |

Each of 10H - 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |
| 06H | Contact X ₆ |
| 07H | Contact X ₇ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| (0) 0 0 10 | ation diamont |
|------------|-------------------------|
| Bit | ltem |
| 0 | |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| А | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|------|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |

(7) DI

| (1) | |
|-----|----------------------------------|
| Bit | Item |
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency.

- #1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.
- #2 Frequency: When the voltage is 35V or less, 0 Hz is output.

3.26 CPP2-A02D2 (Interconnection protection relay)

(1) Setting

| 19 |
|--|
| Item |
| Earth fault overvoltage operation voltage (%) |
| Earth fault overvoltage operation time (sec.) |
| Under frequency operation frequency (Hz) |
| Under frequency operation time (sec.) |
| Reverse power operation current (%) |
| Reverse power operation time (sec.) |
| Over frequency operation frequency (Hz) |
| Over frequency operation time (sec.) |
| Under power operation current (%) |
| Under power operation time (sec.) |
| Under power open circuit detection lock |
| Lock at un-interconnected condition (sec.) |
| Contact arrangement (contact X ₀) (Note 1) |
| Contact arrangement (contact X ₁) (Note 1) |
| Contact arrangement (contact X ₂) (Note 1) |
| Contact arrangement (contact X ₃) (Note 1) |
| Contact arrangement (contact X ₄) (Note 1) |
| Contact arrangement (contact X ₅) (Note 1) |
| Contact arrangement (contact X ₆) (Note 1) |
| Contact arrangement (contact X ₇) (Note 1) |
| Operation indicator LED hold (Note 2) |
| CT primary (A) |
| VT primary (V) |
| VT secondary (V) |
| System voltage (KV) |
| |

(2) Measurement (Note3)

| Channel No. | Item |
|----------------|---------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (%) |
| 17H | Active power (KW) |
| 18H | Reverse active power (KW) |
| 19H | Power factor |
| 1AH | Frequency (Hz) |

Each of 10H- 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |
| 06H | Contact X ₆ |
| 07H | Contact X ₇ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| Bit | Item |
|-----|-------------------------|
| | Item |
| 0 | |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | ltem |
|-----|------|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |

(7) DI

| () = : | |
|---------|----------------------------------|
| Bit | Item |
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| А | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency.#1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less,0 Hz is output.

3.27 CPP3-A01D2 (Interconnection protection relay)

(1) Setting

| (1) Settir | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Earth fault overvoltage operation voltage (V) |
| 01H | Earth fault overvoltage operation time (sec.) |
| 02H | Reverse power operation current (%) |
| 03H | Reverse power operation time (sec.) |
| 04H | Under power operation current (%) |
| 05H | Under power operation time (sec.) |
| 06H | Under power open circuit detection lock |
| 07H | Lock at un-interconnected condition (sec.) |
| H80 | Contact arrangement (contact X ₀) (Note 1) |
| 09H | Contact arrangement (contact X ₁) (Note 1) |
| 0AH | Contact arrangement (contact X ₂) (Note 1) |
| 0BH | Contact arrangement (contact X ₃) (Note 1) |
| 0CH | Contact arrangement (contact X ₄) (Note 1) |
| 0DH | Contact arrangement (contact X ₅) (Note 1) |
| 0EH | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | VT primary (V) |
| 02H | VT secondary (V) |
| 03H | EVT primary (V) |
| 04H | EVT tertiary (V) |

(2) Measurement (Note3)

| Channel No. | Item |
|----------------|---------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (%) |
| 17H | Active power (kW) |
| 18H | Reverse active power (kW) |
| 19H | Power factor |
| 1AH | Frequency (Hz) |

Each of 10H - 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| АЗН | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| Bit | Item |
|-----|-------------------------|
| 0 | |
| 1 | |
| 2 | Reverse power |
| 3 | Under power |
| 4 | |
| 5 | |
| 6 | Earth fault overvoltage |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| (-) | |
|-----|-------------------------------------|
| Bit | ltem |
| 0 | |
| 1 | |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Lock at un-interconnected condition |
| 6 | Earth fault overvoltage |
| 7 | Reverse power |
| 8 | Under power |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |

64

(7) DI

| (1) | |
|-----|----------------------------------|
| Bit | Item |
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency.

#1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less,0 Hz is output.

3.28 CPP3-A02D2 (Interconnection protection relay)

(1) Setting

| (1) Settir | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Earth fault overvoltage operation voltage (V) |
| 01H | Earth fault overvoltage operation time (sec.) |
| 02H | Reverse power operation current (%) |
| 03H | Reverse power operation time (sec.) |
| 04H | Under power operation current (%) |
| 05H | Under power operation time (sec.) |
| 06H | Under power open circuit detection lock |
| 07H | Lock at un-interconnected condition (sec.) |
| 08H | Contact arrangement (contact X ₀) (Note 1) |
| 09H | Contact arrangement (contact X ₁) (Note 1) |
| 0AH | Contact arrangement (contact X ₂) (Note 1) |
| 0BH | Contact arrangement (contact X ₃) (Note 1) |
| 0CH | Contact arrangement (contact X ₄) (Note 1) |
| 0DH | Contact arrangement (contact X ₅) (Note 1) |
| 0EH | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | VT primary (V) |
| 02H | VT secondary (V) |
| 03H | System voltage (KV) |

(2) Measurement (Note3)

| Channel No. | Item |
|----------------|---------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (%) |
| 17H | Active power (kW) |
| 18H | Reverse active power (kW) |
| 19H | Power factor |
| 1AH | Frequency (Hz) |

Each of 10H - 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| Bit | Item |
|-----|-------------------------|
| 0 | |
| 1 | |
| 2 | Reverse power |
| 3 | Under power |
| 4 | |
| 5 | |
| 6 | Earth fault overvoltage |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|-------------------------------------|
| 0 | |
| 1 | |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Lock at un-interconnected condition |
| 6 | Earth fault overvoltage |
| 7 | Reverse power |
| 8 | Under power |
| 9 | |
| А | |
| В | |
| С | |
| D | |
| Е | |

| (7) | DI |
|-----|----|
| | |

| (1) | |
|-----|----------------------------------|
| Bit | Item |
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency.

#1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less,0 Hz is output.

3.29 CPP3-A11D2 (Interconnection protection relay)

(1) Setting

| (1) Settir | ng |
|----------------|---|
| Channel No. | Item |
| 00H | Earth fault overvoltage operation voltage (V) |
| 01H | Earth fault overvoltage operation time (sec.) |
| 02H | Reverse power operation current (%) |
| 03H | Reverse power operation time (sec.) |
| 04H | Under power operation current (%) |
| 05H | Under power operation time (sec.) |
| 06H | Under power open circuit detection lock |
| 07H | Lock at un-interconnected condition (sec.) |
| H80 | Islanding detection Rate of change of operation frequency (H _z /s) |
| 09H | Islanding detection operation time (sec.) |
| 0AH | Contact arrangement (contact X ₀) (Note 1) |
| 0BH | Contact arrangement (contact X ₁) (Note 1) |
| 0CH | Contact arrangement (contact X ₂) (Note 1) |
| 0DH | Contact arrangement (contact X ₃) (Note 1) |
| 0EH | Contact arrangement (contact X ₄) (Note 1) |
| 0FH | Contact arrangement (contact X ₅) (Note 1) |
| 10H | Contact arrangement (contact X ₆) (Note 1) |
| 11H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | VT primary (V) |
| 02H | VT secondary (V) |
| 03H | EVT primary (V) |
| 04H | EVT tertiary (V) |

(2) Measurement (Note3)

| Channel No. | Item |
|----------------|---------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (%) |
| 17H | Active power (kW) |
| 18H | Reverse active power (kW) |
| 19H | Factor |
| 1AH | Frequency (Hz) |

Each of 10H - 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |
| 06H | Contact X ₆ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| Bit | Item |
|-----|-------------------------|
| 0 | |
| 1 | |
| 2 | Reverse power |
| 3 | Under power |
| 4 | |
| 5 | |
| 6 | Earth fault overvoltage |
| 7 | |
| 8 | Islanding detection |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|-------------------------------------|
| 0 | |
| 1 | |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Lock at un-interconnected condition |
| 6 | Earth fault overvoltage |
| 7 | Reverse power |
| 8 | Under power |
| 9 | |
| А | Islanding detection |
| В | |
| С | |
| D | |
| Е | |

(7) DI

| Bit | Item |
|-----|----------------------------------|
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | Islanding detection |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-------------------------|
| 0 | Trip |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | Islanding detection |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency. #1 Power factor: When the voltage is 5.5V or

less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less,

0 Hz is output.

3.30 CPP3-A12D2 (Interconnection protection relay)

(1) Setting

| (1) Settin | ng |
|----------------|---|
| Channel No. | Item |
| 00H | Earth fault overvoltage operation voltage (%) |
| 01H | Earth fault overvoltage operation time (sec.) |
| 02H | Reverse power operation current (%) |
| 03H | Reverse power operation time (sec.) |
| 04H | Under power operation current (%) |
| 05H | Under power operation time (sec.) |
| 06H | Under power open circuit detection lock |
| 07H | Lock at un-interconnected condition (sec.) |
| 08H | Islanding detection Rate of change of operation frequency (H _z /s) |
| 09H | Islanding detection operation time (sec.) |
| 0AH | Contact arrangement (contact X ₀) (Note 1) |
| 0BH | Contact arrangement (contact X ₁) (Note 1) |
| 0CH | Contact arrangement (contact X ₂) (Note 1) |
| 0DH | Contact arrangement (contact X ₃) (Note 1) |
| 0EH | Contact arrangement (contact X ₄) (Note 1) |
| 0FH | Contact arrangement (contact X ₅) (Note 1) |
| 10H | Contact arrangement (contact X ₆) (Note 1) |
| 11H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | VT primary (V) |
| 02H | VT secondary (V) |
| 03H | System voltage (KV) |

(2) Measurement (Note3)

| Channel No. | Item |
|----------------|---------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase voltage (%) |
| 17H | Active power (kW) |
| 18H | Reverse active power (kW) |
| 19H | Power factor |
| 1AH | Frequency (Hz) |

Each of 10H - 18H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |
| 06H | Contact X ₆ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | AB phase voltage (V) |
| A4H | BC phase voltage (V) |
| B1H | B-phase current (A) |
| B2H | Zero-phase voltage (V) |

(5) Operation element

| (5) Operation element | |
|-----------------------|-------------------------|
| Bit | Item |
| 0 | |
| 1 | |
| 2 | Reverse power |
| 3 | Under power |
| 4 | |
| 5 | |
| 6 | Earth fault overvoltage |
| 7 | |
| 8 | Islanding detection |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|-------------------------------------|
| 0 | |
| 1 | |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Lock at un-interconnected condition |
| 6 | Earth fault overvoltage |
| 7 | Reverse power |
| 8 | Under power |
| 9 | |
| А | Islanding detection |
| В | |
| С | |
| D | |
| Е | |

(7) DI

| Bit | Item |
|-----|----------------------------------|
| 1 | System interconnection condition |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-------------------------|
| 0 | Contact hold |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | Islanding detection |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | ltem |
|-----|-------------------------|
| 0 | Trip |
| 1 | |
| 2 | |
| 3 | Reverse power |
| 4 | Under power |
| 5 | |
| 6 | |
| 7 | Earth fault overvoltage |
| 8 | |
| 9 | Islanding detection |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note3) For the measurement item, note the followings about power factor and frequency. #1 Power factor: When the voltage is 5.5V or

less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less, 0 Hz is output.

3.31 CMP1-A01D1 (Motor protection relay)

(1) Setting

| Channel Item | |
|---|--------------|
| NI HEIH | |
| No. | |
| 00H Motor rated current (A) | |
| 01H Overload operation current (%) | |
| 02H Overload operation time setting | |
| 03H Overload negative-sequence heat multiplying | factor |
| 04H Overload characteristic changeover | |
| 05H Overcurrent instantaneous operation | current (A) |
| 06H Overcurrent instantaneous operation | time (sec.) |
| 07H Overcurrent time-delayed operation | current (%) |
| 08H Overcurrent time-delayed operation | time setting |
| 09H Negative-sequence overcurrent operation current (×) | - |
| OAH Negative-sequence overcurrent operation time (sec.) | |
| 0BH Earth fault directional operation curre | ent (mA) |
| OCH Earth fault directional operation volta | |
| 0DH Earth fault directional operation time | (sec.) |
| 0EH Earth fault directional characteristic a | angle (°) |
| 0FH Undercurrent operation current (A) | |
| 10H Undercurrent operation time (sec.) | |
| 11H Number of start-up times | |
| 12H Start-up time (sec.) | |
| 13H Countdown rate of start-up time coul | nter |
| 14H Contact arrangement (contact X₀) (N | |
| 15H Contact arrangement (contact X ₁) (N | lote 1) |
| 16H Contact arrangement (contact X ₂) (N | lote 1) |
| 17H Contact arrangement (contact X ₃) (N | lote 1) |
| 18H Contact arrangement (contact X ₄) (N | lote 1) |
| 19H Contact arrangement (contact X₅) (N | lote 1) |
| 1AH Contact arrangement (contact X ₆) (N | lote 1) |
| 1BH Operation indicator LED hold (Note 2 | 2) |
| 00H CT primary (A) | |
| 01H EVT primary (V) | |
| 02H EVT tertiary (V) | |
| 03H ZCT error correction ON / OFF | |

(2) Measurement (Note 3)

| Channel No. | Item |
|----------------|-------------------------------|
| 10H | A-phase current (A) |
| 11H | C-phase current (A) |
| 12H | Zero-phase current (A) |
| 13H | Zero-phase voltage (V) |
| 14H | Phase (Note 3) |
| 15H | Negative-sequence current (A) |

Each of 10H - 13H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |
| 06H | Contact X ₆ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | Zero-phase current (A) |
| A4H | Zero-phase voltage (V) |

(5) Operation element

| (o) Open | ation didinant |
|----------|--------------------------------------|
| Bit | Item |
| 0 | Overload |
| 1 | Overcurrent instantaneous A |
| 2 | |
| 3 | Overcurrent instantaneous C |
| 4 | Overcurrent time-delayed A |
| 5 | |
| 6 | Overcurrent time-lag C |
| 7 | Negative-sequence overcurrent |
| 8 | Earth fault directional |
| 9 | Undercurrent A |
| Α | |
| В | Undercurrent C |
| С | Limit of he number of start-up times |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|---------------------------------------|
| 2 | Trip |
| 3 | Overload |
| 4 | Overcurrent instantaneous A, C |
| 5 | Overcurrent time-delayed A, C |
| 6 | Negative-sequence overcurrent |
| 7 | Earth fault directional |
| 8 | Undercurrent A, C |
| 9 | Limit of the number of start-up times |
| Α | |
| В | |
| С | |
| D | |
| E | |

(Note 1) Contact arrangement

| Bit | Item |
|-----|---------------------------------------|
| 0 | Contact hold |
| 1 | Overload |
| 2 | Overcurrent instantaneous A |
| 3 | |
| 4 | Overcurrent instantaneous C |
| 5 | Overcurrent time-delayed A |
| 6 | |
| 7 | Overcurrent time-lag C |
| 8 | Negative-sequence overcurrent |
| 9 | Earth fault directional |
| Α | Undercurrent A |
| В | |
| С | Undercurrent C |
| D | Limit of the number of start-up times |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|---------------------------------------|
| 0 | Trip |
| 1 | Overload |
| 2 | Overcurrent instantaneous A |
| 3 | |
| 4 | Overcurrent instantaneous C |
| 5 | Overcurrent time-delayed A |
| 6 | |
| 7 | Overcurrent time-lag C |
| 8 | Negative-sequence overcurrent |
| 9 | Earth fault directional |
| Α | Undercurrent A |
| В | |
| С | Undercurrent C |
| D | Limit of the number of start-up times |
| Е | |
| F | |

(Note 3) Receiving data of measurement value

For this relay, the processing model of command 83H specified in the "CC-COM communication card operation manual (general)" is not applicable, just only to read the original receiving data. 10000 is output when there is no current or voltage.

3.32 CMP1-A01D2 (Motor protection relay)

(1) Setting

| (1) Settin | 9 |
|------------|--|
| Channel | ltem |
| No. | iteiii |
| 00H | Motor rated current (A) |
| 01H | Overload operation current (%) |
| 02H | Overload operation time setting |
| 03H | Overload negative-sequence heat multiplying factor |
| 04H | Overload characteristic changeover |
| 05H | Overcurrent instantaneous operation current (A) |
| 06H | Overcurrent instantaneous operation time (sec.) |
| 07H | Overcurrent time-delayed operation current (%) |
| 08H | Overcurrent time-delayed operation time setting |
| 09H | Negative-sequence overcurrent operation current (x) |
| 0AH | Negative-sequence overcurrent operation time (sec.) |
| 0BH | Earth fault directional operation current (mA) |
| 0CH | Earth fault directional operation voltage (V) |
| 0DH | Earth fault directional operation time (sec.) |
| 0EH | Earth fault directional characteristic angle (°) |
| 0FH | Undercurrent operation current (A) |
| 10H | Undercurrent operation time (sec.) |
| 11H | Limit of the number of start-up times |
| 12H | Start-up time (sec.) |
| 13H | Countdown rate of start-up time counter |
| 14H | Contact arrangement (contact X₀) (Note 1) |
| 15H | Contact arrangement (contact X ₁) (Note 1) |
| 16H | Contact arrangement (contact X ₂) (Note 1) |
| 17H | Contact arrangement (contact X ₃) (Note 1) |
| 18H | Contact arrangement (contact X ₄) (Note 1) |
| 19H | Contact arrangement (contact X₅) (Note 1) |
| 1AH | Contact arrangement (contact X ₆) (Note 1) |
| 1BH | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | EVT primary (V) |
| 02H | EVT tertiary (V) |
| 03H | ZCT error correction ON / OFF |

(2) Measurement (Note 3)

| Channel No. | Item |
|----------------|-------------------------------|
| 10H | A-phase current (A) |
| 11H | C-phase current (A) |
| 12H | Zero-phase current (A) |
| 13H | Zero-phase voltage (V) |
| 14H | Phase (Note 3) |
| 15H | Negative-sequence current (A) |

Each of 10H - 13H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |
| 06H | Contact X ₆ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | C-phase current (A) |
| A3H | Zero-phase current (A) |
| A4H | Zero-phase voltage (V) |

(5) Operation element

| (o) Open | ation didinant |
|----------|---------------------------------------|
| Bit | ltem |
| 0 | Overload |
| 1 | Overcurrent instantaneous A |
| 2 | |
| 3 | Overcurrent instantaneous C |
| 4 | Overcurrent time-delayed A |
| 5 | |
| 6 | Overcurrent time-lag C |
| 7 | Negative-sequence overcurrent |
| 8 | Earth fault directional |
| 9 | Undercurrent A |
| Α | |
| В | Undercurrent C |
| С | Limit of the number of start-up times |
| D | DI (1) |
| Е | DI (2) |
| F | |

(6) RX information

| Bit | Item |
|-----|---------------------------------------|
| 2 | Trip |
| 3 | Overload |
| 4 | Overcurrent instantaneous A, C |
| 5 | Overcurrent time-IdelayedA, C |
| 6 | Negative-sequence overcurrent |
| 7 | Earth fault directional |
| 8 | Undercurrent A, C |
| 9 | Limit of the number of start-up times |
| Α | DI (1) |
| В | DI (2) |
| С | |
| D | |
| Е | |

(7) DI

| (1) | |
|-----|--------|
| Bit | Item |
| 1 | DI (1) |
| 2 | DI (2) |

(Note 1) Contact arrangement

| Bit | Item |
|-----|---------------------------------------|
| 0 | Contact hold |
| 1 | Overload |
| 2 | Overcurrent instantaneous A |
| 3 | |
| 4 | Overcurrent instantaneous C |
| 5 | Overcurrent time-delayed |
| 6 | |
| 7 | Overcurrent time-lag C |
| 8 | Negative-sequence overcurrent |
| 9 | Earth fault directional |
| Α | Undercurrent A |
| В | |
| С | Undercurrent C |
| D | Limit of the number of start-up times |
| Е | DI (1) |
| F | DI (2) |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|---------------------------------------|
| 0 | Trip |
| 1 | Overload |
| 2 | Overcurrent instantaneous A |
| 3 | |
| 4 | Overcurrent instantaneous C |
| 5 | Overcurrent time-delayed A |
| 6 | |
| 7 | Overcurrent time-lag C |
| 8 | Negative-sequence overcurrent |
| 9 | Earth fault directional |
| А | Undercurrent A |
| В | |
| С | Undercurrent C |
| D | Limit of the number of start-up times |
| Е | DI (1) |
| F | DI (2) |

(Note 3) Receiving data of measurement value

For this relay, the processing model of command 83H specified in the "CC-COM communication card operation manual (general)" is not applicable, just only to read the original receiving data. 10000 is output when there is no current or voltage.

3.33 CMP1-A02D1 (Motor protection relay)

(1) Setting

| (1) Settir | ng |
|----------------|--|
| Channel No. | Item |
| 00H | Motor rated current (A) |
| 01H | Overload operation current (%) |
| 02H | Overload operation time setting |
| 03H | Overload negative-sequence heat multiplying factor |
| 04H | Overload characteristic changeover |
| 05H | Overcurrent instantaneous operation current (A) |
| 06H | Overcurrent instantaneous operation time (sec.) |
| 07H | Overcurrent time-delayed operation current (%) |
| H80 | Overcurrent time-delayed operation time setting |
| 09H | Negative-sequence overcurrent operation current (x) |
| 0AH | Negative-sequence overcurrent operation time (sec.) |
| 0BH | Earth fault overcurrent operation current (A) |
| 0CH | Earth fault overcurrent operation time (sec.) |
| 0DH | Undercurrent operation current (A) |
| 0EH | Undercurrent operation time (sec.) |
| 0FH | Number of start-up times |
| 10H | Start-up time (sec.) |
| 11H | Countdown rate of start-up time counter |
| 12H | Contact arrangement (contact X ₀) (Note 1) |
| 13H | Contact arrangement (contact X ₁) (Note 1) |
| 14H | Contact arrangement (contact X ₂) (Note 1) |
| 15H | Contact arrangement (contact X ₃) (Note 1) |
| 16H | Contact arrangement (contact X ₄) (Note 1) |
| 17H | Contact arrangement (contact X ₅) (Note 1) |
| 18H | Contact arrangement (contact X ₆) (Note 1) |
| 19H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | CT zero-phase primary (A) |

(2) Measurement (Note 3)

| Channel No. | Item |
|----------------|-------------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | Zero-phase current (A) |
| 14H | Negative-sequence current (A) |

Each of 10H - 13H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |
| 06H | Contact X ₆ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | B-phase current (A) |
| A3H | C-phase current (A) |
| A4H | Zero-phase current (A) |

(5) Operation element

| (5) Opera | ation element |
|-----------|--------------------------------------|
| Bit | Item |
| 0 | Overload |
| 1 | Overcurrent instantaneous A |
| 2 | Overcurrent instantaneous B |
| 3 | Overcurrent instantaneous C |
| 4 | Overcurrent time- delayed A |
| 5 | Overcurrent time- delayed B |
| 6 | Overcurrent time- delayed C |
| 7 | Negative-sequence overcurrent |
| 8 | Earth fault overcurrent |
| 9 | Undercurrent A |
| Α | Undercurrent B |
| В | Undercurrent C |
| С | Limit of he number of start-up times |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|---------------------------------------|
| 2 | Trip |
| 3 | Overload |
| 4 | Overcurrent instantaneous A, B, C |
| 5 | Overcurrent time-delayed A, B, C |
| 6 | Negative-sequence overcurrent |
| 7 | Earth fault overcurrent |
| 8 | Undercurrent A, B, C |
| 9 | Limit of the number of start-up times |
| Α | |
| В | |
| С | |
| D | |
| E | |

(Note 1) Contact arrangement

| Bit | Item |
|-----|---------------------------------------|
| 0 | Contact hold |
| 1 | Overload |
| 2 | Overcurrent instantaneous A |
| 3 | Overcurrent instantaneous B |
| 4 | Overcurrent instantaneous C |
| 5 | Overcurrent time-delayed A |
| 6 | Overcurrent time-delayed B |
| 7 | Overcurrent time-delayed C |
| 8 | Negative-sequence overcurrent |
| 9 | Earth fault overcurrent |
| Α | Undercurrent A |
| В | Undercurrent B |
| С | Undercurrent C |
| D | Limit of the number of start-up times |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|---------------------------------------|
| 0 | Trip |
| 1 | Overload |
| 2 | Overcurrent instantaneous A |
| 3 | Overcurrent instantaneous B |
| 4 | Overcurrent instantaneous C |
| 5 | Overcurrent time-delayed A |
| 6 | Overcurrent time-delayed B |
| 7 | Overcurrent time-delayed C |
| 8 | Negative-sequence overcurrent |
| 9 | Earth fault overcurrent |
| Α | Undercurrent A |
| В | Undercurrent B |
| С | Undercurrent C |
| D | Limit of the number of start-up times |
| E | |
| F | |

3.34 CMP1-A02D2 (Motor protection relay)

(1) Setting

| (1) Settir | ng |
|----------------|--|
| Channel No. | Item |
| 00H | Motor rated current (A) |
| 01H | Overload operation current (%) |
| 02H | Overload operation time setting |
| 03H | Overload negative-sequence heat multiplying factor |
| 04H | Overload characteristic changeover |
| 05H | Overcurrent instantaneous operation current (A) |
| 06H | Overcurrent instantaneous operation time (sec.) |
| 07H | Overcurrent time-delayed operation current (%) |
| 08H | Overcurrent time-delayed operation time setting |
| 09H | Negative-sequence overcurrent operation current (x) |
| 0AH | Negative-sequence overcurrent operation time (sec.) |
| 0BH | Earth fault overcurrent operation current (A) |
| 0CH | Earth fault overcurrent operation time (sec.) |
| 0DH | Undercurrent operation current (A) |
| 0EH | Undercurrent operation time (sec.) |
| 0FH | Number of start-up times |
| 10H | Start-up time (sec.) |
| 11H | Countdown rate of start-up time counter |
| 12H | Contact arrangement (contact X ₀) (Note 1) |
| 13H | Contact arrangement (contact X ₁) (Note 1) |
| 14H | Contact arrangement (contact X ₂) (Note 1) |
| 15H | Contact arrangement (contact X ₃) (Note 1) |
| 16H | Contact arrangement (contact X ₄) (Note 1) |
| 17H | Contact arrangement (contact X ₅) (Note 1) |
| 18H | Contact arrangement (contact X ₆) (Note 1) |
| 19H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | CT zero-phase primary (A) |

(2) Measurement (Note 3)

| Channel No. | Item |
|----------------|-------------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | Zero-phase current (A) |
| 14H | Negative-sequence current (A) |

Each of 10H - 13H reads the maximum record.

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |
| 06H | Contact X ₆ |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | B-phase current (A) |
| A3H | C-phase current (A) |
| A4H | Zero-phase current (A) |

(5) Operation element

| · · | |
|-----|---------------------------------------|
| Bit | Item |
| 0 | Overload |
| 1 | Overcurrent instantaneous A |
| 2 | Overcurrent instantaneous B |
| 3 | Overcurrent instantaneous C |
| 4 | Overcurrent time-delayed A |
| 5 | Overcurrent time-delayed B |
| 6 | Overcurrent time-delayed C |
| 7 | Negative-sequence overcurrent |
| 8 | Earth fault overcurrent |
| 9 | Undercurrent A |
| Α | Undercurrent B |
| В | Undercurrent C |
| С | Limit of the number of start-up times |
| D | DI (1) |
| Е | DI (2) |
| F | |

(6) RX information

| D.II | li . |
|------|---------------------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | Overload |
| 4 | Overcurrent instantaneous A, B, C |
| 5 | Overcurrent time-delayed A, B, C |
| 6 | Negative-sequence overcurrent |
| 7 | Earth fault overcurrent |
| 8 | Undercurrent A, B, C |
| 9 | Limit of the number of start-up times |
| Α | DI (1) |
| В | DI (2) |
| С | |
| D | |
| Е | |

(7) DI

| (1) | |
|-----|--------|
| Bit | Item |
| 1 | DI (1) |
| 2 | DI (2) |

(Note 1) Contact arrangement

| Bit | Item |
|-----|---------------------------------------|
| 0 | Contact hold |
| 1 | Overload |
| 2 | Overcurrent instantaneous A |
| 3 | Overcurrent instantaneous B |
| 4 | Overcurrent instantaneous C |
| 5 | Overcurrent time-delayed A |
| 6 | Overcurrent time-delayed B |
| 7 | Overcurrent time-delayed C |
| 8 | Negative-sequence overcurrent |
| 9 | Earth fault overcurrent |
| Α | Undercurrent A |
| В | Undercurrent B |
| С | Undercurrent C |
| D | Limit of the number of start-up times |
| Е | DI (1) |
| F | DI (2) |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|---------------------------------------|
| 0 | Trip |
| 1 | Overload |
| 2 | Overcurrent instantaneous A |
| 3 | Overcurrent instantaneous B |
| 4 | Overcurrent instantaneous C |
| 5 | Overcurrent time-delayed A |
| 6 | Overcurrent time-delayed B |
| 7 | Overcurrent time-delayed C |
| 8 | Negative-sequence overcurrent |
| 9 | Earth fault overcurrent |
| Α | Undercurrent A |
| В | Undercurrent B |
| С | Undercurrent C |
| D | Limit of the number of start-up times |
| Е | DI (1) |
| F | DI (2) |

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3.35 COC3-A03D1 (Overcurrent relay)

(1) Setting

| (1) Settil | ig . |
|----------------|--|
| Channel No. | Item |
| 00H | Overcurrent time-delayed operation current (A) |
| 01H | Overcurrent time-delayed operation time multiplier |
| 02H | Overcurrent time-delayed operation characteristics |
| 03H | Phase fault time-delayed reset characteristics |
| 04H | Overcurrent instantaneous operation current (A) |
| 05H | Overcurrent instantaneous operation time (sec.) |
| 06H | Contact arrangement (contact X₀) (Note 1) |
| 07H | Contact arrangement (contact X ₁) (Note 1) |
| 08H | Contact arrangement (contact X ₂) (Note 1) |
| 09H | Contact arrangement (contact X ₃) (Note 1) |
| 0AH | Contact arrangement (contact X ₄) (Note 1) |
| 0BH | Contact arrangement (contact X ₅) (Note 1) |
| 0CH | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |

| (5) Opera | ation element |
|-----------|-----------------|
| Bit | Item |
| 0 | Time-delayed A |
| 1 | Time-delayed B |
| 2 | Time-delayed C |
| 3 | |
| 4 | Instantaneous A |
| 5 | Instantaneous B |
| 6 | Instantaneous C |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(2) Measurement

| Channel No. | ltem |
|----------------|---------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |

(6) RX information

| Bit | Item |
|-----|-----------------|
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Time-delayed A |
| 6 | Time-delayed B |
| 7 | Time-delayed C |
| 8 | |
| 9 | |
| А | Instantaneous A |
| В | Instantaneous B |
| С | Instantaneous C |
| D | |
| E | |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |

(4) Waveform

| Channel No. | ltem |
|----------------|---------------------|
| A1H | A-phase current (A) |
| A2H | B-phase current (A) |
| A3H | C-phase current (A) |

(Note 1) Contact arrangement

| Bit | Item |
|-----|-----------------|
| 0 | Contact hold |
| 1 | Time-delayed A |
| 2 | Time-delayed B |
| 3 | Time-delayed C |
| 4 | |
| 5 | Instantaneous A |
| 6 | Instantaneous B |
| 7 | Instantaneous C |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------|
| 0 | Trip |
| 1 | Time-delayed A |
| 2 | Time-delayed B |
| 3 | Time-delayed C |
| 4 | |
| 5 | Instantaneous A |
| 6 | Instantaneous B |
| 7 | Instantaneous C |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.36 COC4-A03D1 (Overcurrent with 2f lock relay)

(1) Setting

| (1) Settin | ıg |
|----------------|--|
| Channel No. | Item |
| 00H | Phase fault time-delayed operation current (A) |
| 01H | Phase fault time-delayed operation time multiplier |
| 02H | Phase fault time-delayed operation characteristics |
| 03H | Phase fault time-lag reset characteristics |
| 04H | Phase fault instantaneous operation current (A) |
| 05H | Phase fault instantaneous operation time (sec.) |
| 06H | Earth fault time-delayed operation current (A) |
| 07H | Earth fault time-delayed operation time multiplier |
| 08H | Earth fault time-delayed operation characteristics |
| 09H | Earth fault time-delayed reset characteristics |
| 0AH | Earth fault instantaneous operation current (A) |
| 0BH | Earth fault instantaneous operation time (sec.) |
| 0CH | 2 nd harmonic restraint ratio (%) |
| 0DH | Contact arrangement (contact X ₀) (Note 1) |
| 0EH | Contact arrangement (contact X ₁) (Note 1) |
| 0FH | Contact arrangement (contact X ₂) (Note 1) |
| 10H | Contact arrangement (contact X ₃) (Note 1) |
| 11H | Contact arrangement (contact X ₄) (Note 1) |
| 12H | Contact arrangement (contact X ₅) (Note 1) |
| 13H | Operation indicator LED hold (Note 2) |
| 00H | CT primary (A) |
| 01H | CT zero-phase primary (A) |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | A-phase current (A) |
| A2H | B-phase current (A) |
| A3H | C-phase current (A) |
| A4H | Zero-phase current (A) |

(5) Operation element

| (5) Operation element | |
|-----------------------|-----------------------------|
| Bit | ltem |
| 0 | Phase fault time-delayed A |
| 1 | Phase fault time-delayed B |
| 2 | Phase fault time-delayed C |
| 3 | Earth fault time-delayed |
| 4 | Phase fault instantaneous A |
| 5 | Phase fault instantaneous B |
| 6 | Phase fault instantaneous C |
| 7 | Earth fault instantaneous |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(2) Measurement

| Channel No. | Item |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | Zero-phase current (A) |
| 14H | A-phase If2/If1 (%) |
| 15H | B-phase If2/If1 (%) |
| 16H | C-phase If2/If1 (%) |

(6) RX information

| Bit | Item |
|-----|-----------------------------|
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Phase fault time-delayed A |
| 6 | Phase fault time-delayed B |
| 7 | Phase fault time-delayed C |
| 8 | Earth fault time-delayed |
| 9 | |
| Α | Phase fault instantaneous A |
| В | Phase fault instantaneous B |
| С | Phase fault instantaneous C |
| D | Earth fault instantaneous |
| E | |

(3) Forced operation

| Channel No. | ltem |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |

(Note 1) Contact arrangement

| (1.1010 1) 01 | ontact arrangement |
|---------------|-----------------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Phase fault time-delayed A |
| 2 | Phase fault time-delayed B |
| 3 | Phase fault time-delayed C |
| 4 | Earth fault time-delayed |
| 5 | Phase fault instantaneous A |
| 6 | Phase fault instantaneous B |
| 7 | Phase fault instantaneous C |
| 8 | Earth fault instantaneous |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| <u> </u> | |
|----------|-----------------------------|
| Bit | Item |
| 0 | Trip |
| 1 | Phase fault time-delayed A |
| 2 | Phase fault time-delayed B |
| 3 | Phase fault time-delayed C |
| 4 | Earth fault time-delayed |
| 5 | Phase fault instantaneous A |
| 6 | Phase fault instantaneous B |
| 7 | Phase fault instantaneous C |
| 8 | Earth fault instantaneous |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

3.37 CGP1-A01D2 (Generator protection relay)

(1) Setting

| (1) Settin | 9 |
|----------------|--|
| Channel No. | ltem |
| 00H | Generator rated current (A) |
| 01H | Over current time-lag operation current (A) |
| 02H | Over current time-lag operation time multiplier |
| 03H | Over current time-lag operation characteristics |
| 04H | Over current instantaneous operation current (A) |
| 05H | Over current instantaneous operation time (sec.) |
| 06H | Unbalance current1 operation current (A) |
| 07H | Unbalance current1 operation time multiplier |
| 08H | Unbalance current2 operation current(%) |
| 09H | Unbalance current2 operation time(s) |
| 0AH | Voltage detecting operation voltage(V) |
| 0BH | Voltage detecting operation time(s) |
| 0CH | Over voltage operation voltage(V) |
| 0DH | Over voltage operation time(s) |
| 0EH | Under voltage operation volage(V) |
| 0FH | Under voltage operation time(s) |
| 10H | Under voltage UV test |
| 11H | Under frequency operation frequency(Hz) |
| 12H | Under frequency operation time(s) |
| 13H | Over frequency operation frequency(Hz) |
| 14H | Over frequency operation time(s) |
| 15H | Reverse power operation current(%) |
| 16H | Reverse power operation time(s) |
| 17H | Earth fault direction Io operation current(mA) |
| 18H | Earth fault direction Vo operation voltage(V) |
| 19H | Earth fault direction operation time(s) |
| 1AH | Earth fault direction MAX. sensitivity angle(°) |
| 1BH | Earth fault over voltage operation voltage(V) |
| 1CH | Earth fault over voltage operation time(s) |
| 1DH | Contact arrangement (contact X ₀) (Note 1) |
| 1EH | Contact arrangement (contact X ₁) (Note 1) |
| 1FH | Contact arrangement (contact X ₂) (Note 1) |
| 20H | Contact arrangement (contact X ₃) (Note 1) |
| 21H | Contact arrangement (contact X ₄) (Note 1) |
| 22H | Contact arrangement (contact X ₅) (Note 1) |
| 23H 24H | Contact arrangement (contact X ₆) (Note 1) Contact arrangement (contact X ₇) (Note 1) |
| 25H | Contact arrangement (contact X ₃) (Note 1) |
| 26H | Contact arrangement (contact x ₈) (Note 1) Contact arrangement (contact X ₉) (Note 1) |
| 27H | Contact arrangement (contact x ₃) (Note 1) Contact arrangement (contact X ₃) (Note 1) |
| 28H | Contact arrangement (contact X _b) (Note 1) |
| 29H | Contact arrangement (contact X_0) (Note 1) |
| 2AH | Operation indicator LED hold (Note 2) |
| 2BH | DI 1 operation lock function(Note 3) |
| 2CH | DI 2 operation lock function(Note 3) |
| 00H | CT primary (A) |
| 01H | VT primary (V) |
| 02H | VT secondary (V) |
| 03H | EVT praimary (V) |
| 04H | EVT tertiary (V) |
| 05H | ZCT error correction ON/OFF (Note 4) |
| 0011 | 201 Shor confection on for (Note 7) |

(2) Measurement (Note 6)

| Channel No. | Item |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | B-phase current (A) |
| 16H | Zero-phase current (A) |
| 17H | Zero-phase voltage (V) |
| 18H | Power (kW) |
| 19H | Reverse power (kW) |
| 1AH | Power factor |
| 1BH | Frequency (Hz) |
| 1CH | Phase (°) (Note 5) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |
| 06H | Contact X ₆ |
| 07H | Contact X ₇ |
| 08H | Contact X ₈ |
| 09H | Contact X ₉ |
| 0AH | Contact X _a |
| 0BH | Contact X _b |
| 0CH | Contact X _c |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | AB phase voltage (V) |
| A2H | BC phase voltage (V) |
| B1H | A-phase current (A) |
| B2H | C-phase current (A) |
| ВЗН | Zero-phase current (A) |
| B4H | Zero-phase voltage (V) |

(5) Operation element

| (3) Opera | ation element |
|-----------|----------------------------|
| Bit | Item |
| 0 | Voltage detecting |
| 1 | Under voltage |
| 2 | Reverse power |
| 3 | Earth fault directional |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | Earth fault over voltage |
| 7 | Over voltage |
| 8 | Unbalance current 1 |
| 9 | Over current instantaneous |
| Α | Over current time-lag |
| В | |
| С | |
| D | Unbalance current 2 |
| Е | |
| F | |

(6) RX information

| (6) RX in | formation |
|-----------|--------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | TEST |
| 4 | Voltage detecting |
| 5 | Over current |
| 6 | Unbalance current 1 |
| 7 | Unbalance current 2 |
| 8 | Over voltage |
| 9 | Under voltage |
| Α | Under frequency |
| В | Over frequency |
| С | Reverse power |
| D | Earth fault directional |
| Е | Earth fault over voltage |
| F | |

(7) DI

| (1) | |
|-----|------|
| Bit | Item |
| 1 | DI1 |
| 2 | DI2 |

(Note 1) Contact arrangement

| Bit | Item |
|-----|----------------------------|
| 0 | Contact hold |
| 1 | Voltage detecting |
| 2 | Under voltage |
| 3 | Reverse power |
| 4 | Earth fault directional |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault over voltage |
| 8 | Over voltage |
| 9 | Unbalance current 1 |
| Α | Over current instantaneous |
| В | Over current time-lag |
| С | |
| D | |
| Е | Unbalance current 2 |
| F | |

(Note 2) Operation indicator LED hold

| (14010 2) 0 | peration indicator LED hold |
|-------------|-----------------------------|
| Bit | ltem |
| 0 | Trip |
| 1 | Voltage detecting |
| 2 | Under voltage |
| 3 | Reverse power |
| 4 | Earth fault directional |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault over voltage |
| 8 | Over voltage |
| 9 | Unbalance current 1 |
| Α | Over current instantaneous |
| В | Over current time-lag |
| С | |
| D | |
| Е | Unbalance current 2 |
| F | |

(Note 3) DI operation lock function

| | . ' |
|-----|----------------------------|
| Bit | Item |
| 0 | Voltage detecting |
| 1 | Under voltage |
| 2 | Reverse power |
| 3 | Earth fault directional |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | Earth fault over voltage |
| 7 | Over voltage |
| 8 | Unbalance current 1 |
| 9 | Over current instantaneous |
| Α | Over current time-lag |
| В | |
| С | |
| D | Unbalance current 2 |
| Е | |
| F | |

(Note 4) ON/OFF ZCT-ERR.

[ON]: 1, [OFF]: 0

(Note 5) Receiving data of measurement value

For this relay, the processing model of command 83H specified in the 「CC-COM communication card operation manual (general)」 is not applicable, just only to read the original receiving data. 10000 is output when there is no current or voltage.

(Note6) For the measurement item, note the followings about power factor and frequency.

#1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less, 0 Hz is output.

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3.38 CGP1-A02D2 (Generator protection relay)

(1) Setting

| Channel No. ODH Generator rated current (A) O1H Over current time-lag operation current (A) O2H Over current time-lag operation current (A) O2H Over current ime-lag operation characteristics O4H Over current instantaneous operation current (A) O5H Over current instantaneous operation current (A) O5H Over current instantaneous operation current (A) O7H Unbalance current1 operation current (M) O7H Unbalance current2 operation current (M) O9H Unbalance current2 operation time multiplier O8H Voltage detecting operation voltage(V) O9H Unbalance current2 operation time(s) OAH Voltage detecting operation voltage(V) OBH Voltage operation voltage(V) ODH Over voltage operation voltage(V) ODH Over voltage operation time(s) OEH Under voltage operation time(s) OEH Under voltage operation time(s) 10H Under voltage operation frequency(Hz) 12H Under frequency operation frequency(Hz) 12H Under frequency operation frequency(Hz) 13H Over frequency operation time(s) 13H Over frequency operation time(s) 14H Over frequency operation time(s) 15H Reverse power operation current(%) 16H Reverse power operation current(%) 18H Earth fault direction Vo operation voltage(V) 19H Earth fault direction poperation voltage(V) 19H Earth fault direction MAX. sensitivity angle(°) 18H Earth fault direction MAX. sensitivity angle(°) 18H Earth fault direction MAX. sensitivity angle(°) 19H Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₃) (Note 1) 22H Contact arrangement (contact X ₃) (Note 1) 23H Contact arrangement (contact X ₃) (Note 1) 24H Contact arrangement (contact X ₃) (Note 1) 25H Contact arrangement (contact X ₃) (Note 1) 26H Contact arrangement (contact X ₃) (Note 1) 27H Contact arrangement (contact X ₃) (Note 1) 28H Contact arrangement (contact X ₃) (Note 1) 29H Contact arrangement (contact X ₃) (Note 1) 29H Contact arrangement (contact X ₃) (Note 1) 29H Contact arrangement (contact X ₃) (Note 1) 29H Contac | (1) Settin | <u>ng</u> |
|---|----------------|--|
| O1H Over current time-lag operation current (A) O2H Over current time-lag operation time multiplier O3H Over current time-lag operation characteristics O4H Over current instantaneous operation current (A) O5H Over current instantaneous operation current (A) O5H Over current instantaneous operation current (A) O7H Unbalance current1 operation time multiplier O8H Unbalance current2 operation time multiplier O8H Unbalance current2 operation time (S) O9H Unbalance current2 operation time(S) O9H Unbalance current2 operation time(S) O0H Voltage detecting operation voltage(V) OBH Voltage operation over voltage(V) ODH Over voltage operation voltage(V) ODH Over voltage operation time(S) OCH Under voltage operation time(S) OEH Under voltage operation time(S) OH Under voltage operation frequency(Hz) Under frequency operation frequency(Hz) Under frequency operation frequency(Hz) 11H Under frequency operation frequency(Hz) 12H Under frequency operation frequency(Hz) 13H Over frequency operation time(S) 15H Reverse power operation time(S) 16H Reverse power operation time(S) 17H Earth fault direction lo operation current(MA) 18H Earth fault direction voltage(V) 19H Earth fault direction operation time(S) 1AH Earth fault direction operation time(S) 1CH Earth fault direction MAX, sensitivity angle(°) 1BH Earth fault over voltage operation voltage(W) 1CH Earth fault over voltage operation time(S) 1CH Earth fault over voltage operation time(S) 1CH Earth fault over voltage operation time(S) 1CH Contact arrangement (contact X ₂) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) 2CH Contact arrangement (contact X ₃) (Note 1) | Channel No. | Item |
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| 12H Under frequency operation time(s) 13H Over frequency operation frequency(Hz) 14H Over frequency operation time(s) 15H Reverse power operation current(%) 16H Reverse power operation time(s) 17H Earth fault direction lo operation current(mA) 18H Earth fault direction Vo operation voltage(V) 19H Earth fault direction MAX. sensitivity angle(°) 18H Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X₀) (Note 1) 1EH Contact arrangement (contact X₂) (Note 1) 20H Contact arrangement (contact X₃) (Note 1) 21H Contact arrangement (contact X₄) (Note 1) 22H Contact arrangement (contact X₃) (Note 1) 23H Contact arrangement (contact X₃) (Note 1) 24H Contact arrangement (contact X₃) (Note 1) 25H Contact arrangement (contact X₃) (Note 1) 26H Contact arrangement (contact X₃) (Note 1) 27H Contact arrangement (contact X₃) (Note 1) 27H Contact arrangement (contact X₃) (Note 1) 27H Contact arrangement (contact X₃) (Note 1) 28H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₃) (Note 1) 20H Coperation indicator LED hold (Note 2) 20H DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | | |
| 13H Over frequency operation frequency(Hz) 14H Over frequency operation time(s) 15H Reverse power operation current(%) 16H Reverse power operation time(s) 17H Earth fault direction lo operation current(mA) 18H Earth fault direction Vo operation voltage(V) 19H Earth fault direction MAX. sensitivity angle(°) 18H Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X₀) (Note 1) 1EH Contact arrangement (contact X₁) (Note 1) 1FH Contact arrangement (contact X₂) (Note 1) 20H Contact arrangement (contact X₂) (Note 1) 21H Contact arrangement (contact X₄) (Note 1) 22H Contact arrangement (contact X₃) (Note 1) 23H Contact arrangement (contact X₃) (Note 1) 24H Contact arrangement (contact X₃) (Note 1) 25H Contact arrangement (contact X₃) (Note 1) 25H Contact arrangement (contact X₃) (Note 1) 26H Contact arrangement (contact X₃) (Note 1) 27H Contact arrangement (contact X₃) (Note 1) 28H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₃) (Note 1) 20H Coperation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | | |
| 14H Over frequency operation time(s) 15H Reverse power operation current(%) 16H Reverse power operation current(%) 17H Earth fault direction lo operation current(mA) 18H Earth fault direction Vo operation voltage(V) 19H Earth fault direction MAX. sensitivity angle(°) 18H Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X ₀) (Note 1) 1EH Contact arrangement (contact X ₁) (Note 1) 1FH Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₄) (Note 1) 22H Contact arrangement (contact X ₅) (Note 1) 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 25H Contact arrangement (contact X ₉) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₁) (Note 1) 28H Contact arrangement (contact X ₁) (Note 1) 29H Contact arrangement (contact X ₂) (Note 1) 29H Contact arrangement (contact X ₂) (Note 1) 20H Doperation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | | |
| 15H Reverse power operation current(%) 16H Reverse power operation time(s) 17H Earth fault direction lo operation current(mA) 18H Earth fault direction Vo operation voltage(V) 19H Earth fault direction MAX. sensitivity angle(°) 18H Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X ₀) (Note 1) 1EH Contact arrangement (contact X ₁) (Note 1) 1FH Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₄) (Note 1) 22H Contact arrangement (contact X ₆) (Note 1) 23H Contact arrangement (contact X ₇) (Note 1) 24H Contact arrangement (contact X ₈) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₉) (Note 1) 28H Contact arrangement (contact X ₁) (Note 1) 29H Contact arrangement (contact X ₁) (Note 1) 29H Contact arrangement (contact X ₁) (Note 1) 29H Contact arrangement (contact X ₂) (Note 1) 20H Doperation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) OOH CT primary (A) OTH VT primary (V) OZH VT secondary (V) | | |
| 16H Reverse power operation time(s) 17H Earth fault direction lo operation current(mA) 18H Earth fault direction Vo operation voltage(V) 19H Earth fault direction operation time(s) 1AH Earth fault direction MAX. sensitivity angle(°) 1BH Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X ₀) (Note 1) 1EH Contact arrangement (contact X ₁) (Note 1) 20H Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₄) (Note 1) 22H Contact arrangement (contact X ₆) (Note 1) 23H Contact arrangement (contact X ₇) (Note 1) 24H Contact arrangement (contact X ₈) (Note 1) 25H Contact arrangement (contact X ₉) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₉) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 20H Doperation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) OOH CT primary (A) OTH VT primary (V) OZH VT secondary (V) | | |
| 17H Earth fault direction lo operation current(mA) 18H Earth fault direction Vo operation voltage(V) 19H Earth fault direction operation time(s) 1AH Earth fault direction MAX. sensitivity angle(°) 1BH Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X₀) (Note 1) 1EH Contact arrangement (contact X₂) (Note 1) 20H Contact arrangement (contact X₂) (Note 1) 21H Contact arrangement (contact X₃) (Note 1) 22H Contact arrangement (contact X₃) (Note 1) 22H Contact arrangement (contact X₅) (Note 1) 23H Contact arrangement (contact X₅) (Note 1) 24H Contact arrangement (contact X₃) (Note 1) 25H Contact arrangement (contact X₃) (Note 1) 26H Contact arrangement (contact X₃) (Note 1) 27H Contact arrangement (contact X₃) (Note 1) 28H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₃) (Note 1) 20H D1 1 operation lock function(Note 3) 20H D1 2 operation lock function(Note 3) OOH CT primary (V) O2H VT secondary (V) | | |
| 18H Earth fault direction Vo operation voltage(V) 19H Earth fault direction operation time(s) 1AH Earth fault direction MAX. sensitivity angle(°) 1BH Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X ₀) (Note 1) 1EH Contact arrangement (contact X ₁) (Note 1) 1FH Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₄) (Note 1) 22H Contact arrangement (contact X ₅) (Note 1) 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₂) (Note 1) 28H Contact arrangement (contact X ₂) (Note 1) 29H Contact arrangement (contact X ₂) (Note 1) 29H Contact arrangement (contact X ₂) (Note 1) 29H Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₂) (Note 1) 21H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 3) 22H Contact arrangement (contact X ₂) (Note 3) 22H Contact arrangement (contact X ₂) (Note 3) 22H Contact arrangement (contact X ₂) (Note 3) 22H Contact arrangement (contact X ₂) (Note 3) | | |
| 19H Earth fault direction operation time(s) 1AH Earth fault direction MAX. sensitivity angle(°) 1BH Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X₀) (Note 1) 1EH Contact arrangement (contact X₂) (Note 1) 20H Contact arrangement (contact X₂) (Note 1) 21H Contact arrangement (contact X₃) (Note 1) 22H Contact arrangement (contact X₃) (Note 1) 23H Contact arrangement (contact X₃) (Note 1) 23H Contact arrangement (contact X₃) (Note 1) 24H Contact arrangement (contact X₃) (Note 1) 25H Contact arrangement (contact X₃) (Note 1) 26H Contact arrangement (contact X₃) (Note 1) 27H Contact arrangement (contact X₃) (Note 1) 28H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₂) (Note 1) 29H Contact arrangement (contact X₂) (Note 1) 20H Contact arrangement (contact X₂) (Note 1) | | |
| 1AH Earth fault direction MAX. sensitivity angle(°) 1BH Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X ₀) (Note 1) 1EH Contact arrangement (contact X ₁) (Note 1) 1FH Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₄) (Note 1) 22H Contact arrangement (contact X ₅) (Note 1) 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₉) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 20H Operation indicator LED hold (Note 2) 20H DI 1 operation lock function(Note 3) 20H DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | | |
| 1BH Earth fault over voltage operation voltage(%) 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X₀) (Note 1) 1EH Contact arrangement (contact X₂) (Note 1) 2DH Contact arrangement (contact X₂) (Note 1) 2DH Contact arrangement (contact X₃) (Note 1) 21H Contact arrangement (contact X₃) (Note 1) 22H Contact arrangement (contact X₃) (Note 1) 23H Contact arrangement (contact X₃) (Note 1) 24H Contact arrangement (contact X₃) (Note 1) 25H Contact arrangement (contact X₃) (Note 1) 25H Contact arrangement (contact X₃) (Note 1) 26H Contact arrangement (contact X₃) (Note 1) 27H Contact arrangement (contact X₃) (Note 1) 28H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₂) (Note 1) 29H Contact arrangement (contact X₂) (Note 1) 20H DI 1 operation lock function(Note 3) 20H DI 2 operation lock function(Note 3) 00H CT primary (V) 02H VT secondary (V) | | |
| 1CH Earth fault over voltage operation time(s) 1DH Contact arrangement (contact X ₀) (Note 1) 1EH Contact arrangement (contact X ₁) (Note 1) 1FH Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₄) (Note 1) 22H Contact arrangement (contact X ₅) (Note 1) 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₂) (Note 1) 28H Contact arrangement (contact X ₂) (Note 1) 29H Contact arrangement (contact X ₂) (Note 1) 29H Contact arrangement (contact X ₂) (Note 1) 29H Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₂) (Note 1) 21H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₂) (Note 1) 22H Contact arrangement (contact X ₃) (Note 3) 22H Contact arrangement (contact X ₃) (Note 3) 22H Contact arrangement (contact X ₃) (Note 3) 22H Contact arrangement (contact X ₃) (Note 3) 22H Contact arrangement (contact X ₃) (Note 3) 22H Contact arrangement (contact X ₃) (Note 3) 22H Contact arrangement (contact X ₃) (Note 3) 22H Contact arrangement (contact X ₃) (Note 3) 22H Contact arrangement (contact X ₃) (Note 3) | 1BH | |
| 1DH Contact arrangement (contact X₀) (Note 1) 1EH Contact arrangement (contact X₁) (Note 1) 1FH Contact arrangement (contact X₂) (Note 1) 20H Contact arrangement (contact X₃) (Note 1) 21H Contact arrangement (contact X₄) (Note 1) 22H Contact arrangement (contact X₄) (Note 1) 23H Contact arrangement (contact X₆) (Note 1) 24H Contact arrangement (contact X₃) (Note 1) 25H Contact arrangement (contact X₃) (Note 1) 26H Contact arrangement (contact X₃) (Note 1) 27H Contact arrangement (contact X₃) (Note 1) 28H Contact arrangement (contact X₃) (Note 1) 29H Contact arrangement (contact X₂) (Note 1) 29H Contact arrangement (contact X₂) (Note 1) 20H Contact arrangement (contact X₃) (Note 1) | 1CH | |
| 1EH Contact arrangement (contact X ₁) (Note 1) 1FH Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₄) (Note 1) 22H Contact arrangement (contact X ₅) (Note 1) 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₉) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 20H Operation indicator LED hold (Note 2) 20H DI 1 operation lock function(Note 3) 20H DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 1DH | |
| 1FH Contact arrangement (contact X ₂) (Note 1) 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₄) (Note 1) 22H Contact arrangement (contact X ₅) (Note 1) 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₉) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 20H DI 1 operation lock function(Note 3) 20H DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 1EH | |
| 20H Contact arrangement (contact X ₃) (Note 1) 21H Contact arrangement (contact X ₄) (Note 1) 22H Contact arrangement (contact X ₅) (Note 1) 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₉) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 20H Operation indicator LED hold (Note 2) 20H DI 1 operation lock function(Note 3) 20H DI 2 operation lock function(Note 3) 00H CT primary (V) 01H VT primary (V) | | |
| 22H Contact arrangement (contact X ₅) (Note 1) 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₉) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Operation indicator LED hold (Note 2) 28H DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | | |
| 22H Contact arrangement (contact X ₅) (Note 1) 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₉) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Operation indicator LED hold (Note 2) 28H DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 21H | |
| 23H Contact arrangement (contact X ₆) (Note 1) 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₉) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 2AH Operation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | | 9 |
| 24H Contact arrangement (contact X ₇) (Note 1) 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₄) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 2AH Operation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | | 9 |
| 25H Contact arrangement (contact X ₈) (Note 1) 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X ₄) (Note 1) 28H Contact arrangement (contact X ₆) (Note 1) 29H Contact arrangement (contact X ₆) (Note 1) 2AH Operation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 24H | 9 |
| 26H Contact arrangement (contact X ₉) (Note 1) 27H Contact arrangement (contact X _a) (Note 1) 28H Contact arrangement (contact X _b) (Note 1) 29H Contact arrangement (contact X _c) (Note 1) 2AH Operation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 25H | |
| 27H Contact arrangement (contact X _a) (Note 1) 28H Contact arrangement (contact X _b) (Note 1) 29H Contact arrangement (contact X _c) (Note 1) 2AH Operation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 26H | |
| 28H Contact arrangement (contact X _b) (Note 1) 29H Contact arrangement (contact X _c) (Note 1) 2AH Operation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | | |
| 2AH Operation indicator LED hold (Note 2) 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 28H | |
| 2BH DI 1 operation lock function(Note 3) 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 29H | Contact arrangement (contact X _c) (Note 1) |
| 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 2AH | Operation indicator LED hold (Note 2) |
| 2CH DI 2 operation lock function(Note 3) 00H CT primary (A) 01H VT primary (V) 02H VT secondary (V) | 2BH | DI 1 operation lock function(Note 3) |
| 01H VT primary (V) 02H VT secondary (V) | 2CH | |
| 01H VT primary (V) 02H VT secondary (V) | 00H | CT primary (A) |
| 02H VT secondary (V) | | |
| | 02H | |
| | 03H | |

(2) Measurement (Note 6)

| Channel No. | Item |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | B-phase current (A) |
| 16H | Zero-phase current (A) |
| 17H | Zero-phase voltage (V) |
| 18H | Power (kW) |
| 19H | Reverse power (kW) |
| 1AH | Power factor |
| 1BH | Frequency (Hz) |
| 1CH | Phase (°) (Note 5) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |
| 06H | Contact X ₆ |
| 07H | Contact X ₇ |
| 08H | Contact X ₈ |
| 09H | Contact X ₉ |
| 0AH | Contact X _a |
| 0BH | Contact X _b |
| 0CH | Contact X _c |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | AB phase voltage (V) |
| A2H | BC phase voltage (V) |
| B1H | A-phase current (A) |
| B2H | C-phase current (A) |
| ВЗН | Zero-phase current (A) |
| B4H | Zero-phase voltage (V) |

(5) Operation element

| (5) Opcie | ation dicinicit |
|-----------|----------------------------|
| Bit | Item |
| 0 | Voltage detecting |
| 1 | Under voltage |
| 2 | Reverse power |
| 3 | Earth fault directional |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | Earth fault over voltage |
| 7 | Over voltage |
| 8 | Unbalance current 1 |
| 9 | Over current instantaneous |
| Α | Over current time-lag |
| В | |
| С | |
| D | Unbalance current 2 |
| Е | |
| F | |

(6) RX information

| (6) RX in | formation |
|-----------|--------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | TEST |
| 4 | Voltage detecting |
| 5 | Over current |
| 6 | Unbalance current 1 |
| 7 | Unbalance current 2 |
| 8 | Over voltage |
| 9 | Under voltage |
| Α | Under frequency |
| В | Over frequency |
| С | Reverse power |
| D | Earth fault directional |
| E | Earth fault over voltage |
| F | |

(7) DI

| (1) | |
|-----|------|
| Bit | Item |
| 1 | DI1 |
| 2 | DI2 |

(Note 1) Contact arrangement

| Bit | Item |
|-----|----------------------------|
| 0 | Contact hold |
| 1 | Voltage detecting |
| 2 | Under voltage |
| 3 | Reverse power |
| 4 | Earth fault directional |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault over voltage |
| 8 | Over voltage |
| 9 | Unbalance current 1 |
| Α | Over current instantaneous |
| В | Over current time-lag |
| С | |
| D | |
| E | Unbalance current 2 |
| F | |

(Note 2) Operation indicator LED hold

| (14010 2) 0 | peration indicator LED hold |
|-------------|-----------------------------|
| Bit | ltem |
| 0 | Trip |
| 1 | Voltage detecting |
| 2 | Under voltage |
| 3 | Reverse power |
| 4 | Earth fault directional |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | Earth fault over voltage |
| 8 | Over voltage |
| 9 | Unbalance current 1 |
| Α | Over current instantaneous |
| В | Over current time-lag |
| С | |
| D | |
| Е | Unbalance current 2 |
| F | |

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(Note 3) DI operation lock function

| Bit | Item |
|-----|----------------------------|
| 0 | Voltage detecting |
| 1 | Under voltage |
| 2 | Reverse power |
| 3 | Earth fault directional |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | Earth fault over voltage |
| 7 | Over voltage |
| 8 | Unbalance current 1 |
| 9 | Over current instantaneous |
| Α | Over current time-lag |
| В | |
| С | |
| D | Unbalance current 2 |
| E | |
| F | |

(Note 4) Line voltage

For 6.6 kV line: "0"

For 3.3 kV line: "1"

(Note 5) Receiving data of measurement value

For this relay, the processing model of command 83H specified in the 「CC-COM communication card operation manual (general)」 is not applicable, just only to read the original receiving data. 10000 is output when there is no current or voltage.

(Note6) For the measurement item, note the followings about power factor and frequency.

#1 Power factor: When the voltage is 5.5V or less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less, 0 Hz is output.

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3.39 CGP1-A03D2 (Generator protection relay)

(1) Setting

| (1) Settin | ig . |
|----------------|--|
| Channel No. | Item |
| 00H | Generator rated current (A) |
| 01H | Over current time-lag operation current (A) |
| 02H | Over current time-lag operation time multiplier |
| 03H | Over current time-lag operation characteristics |
| 04H | Over current instantaneous operation current (A) |
| 05H | Over current instantaneous operation time (sec.) |
| 06H | Unbalance current1 operation current (A) |
| 07H | Unbalance current1 operation time multiplier |
| 08H | Unbalance current2 operation current(%) |
| 09H | Unbalance current2 operation time(s) |
| 0AH | Voltage detecting operation voltage(V) |
| 0BH | Voltage detecting operation time(s) |
| 0CH | Over voltage operation voltage(V) |
| 0DH | Over voltage operation time(s) |
| 0EH | Under voltage operation volage(V) |
| 0FH | Under voltage operation time(s) |
| 10H | Under voltage UV test |
| 11H | Under frequency operation frequency(Hz) |
| 12H | Under frequency operation time(s) |
| 13H | Over frequency operation frequency(Hz) |
| 14H 15H | Over frequency operation time(s) |
| 16H | Reverse power operation current(%) |
| 17H | Reverse power operation time(s) Earth fault overcurrent operation current (A) |
| 17H | Earth fault overcurrent operation time (s) |
| 19H | Contact arrangement (contact X_0) (Note 1) |
| 1AH | Contact arrangement (contact X ₀) (Note 1) |
| 1BH | Contact arrangement (contact X ₁) (Note 1) |
| 1CH | Contact arrangement (contact X ₂) (Note 1) |
| 1DH | Contact arrangement (contact X ₄) (Note 1) |
| 1EH | Contact arrangement (contact X ₅) (Note 1) |
| 1FH | Contact arrangement (contact X ₆) (Note 1) |
| 20H | Contact arrangement (contact X ₇) (Note 1) |
| 21H | Contact arrangement (contact X ₈) (Note 1) |
| 22H | Contact arrangement (contact X ₉) (Note 1) |
| 23H | Contact arrangement (contact X _a) (Note 1) |
| 24H | Contact arrangement (contact X _b) (Note 1) |
| 25H | Contact arrangement (contact X _c) (Note 1) |
| 26H | Operation indicator LED hold (Note 2) |
| 27H | DI 1 operation lock function(Note 3) |
| 28H | DI 2 operation lock function(Note 3) |
| 00H | CT primary (A) |
| 01H | Zero phase CT primary(A) |
| 02H | VT primary (V) |
| 03H | VT secondary (V) |

(2) Measurement (Note 4)

| Channel No. | Item |
|----------------|------------------------|
| 10H | A-phase current (A) |
| 11H | B-phase current (A) |
| 12H | C-phase current (A) |
| 13H | AB phase voltage (V) |
| 14H | BC phase voltage (V) |
| 15H | CA phase voltage (V) |
| 16H | Zero-phase current (A) |
| 17H | Power (kW) |
| 18H | Reverse power (kW) |
| 19H | Power factor |
| 1AH | Frequency (Hz) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |
| 06H | Contact X ₆ |
| 07H | Contact X ₇ |
| 08H | Contact X ₈ |
| 09H | Contact X ₉ |
| 0AH | Contact X _a |
| 0BH | Contact X _b |
| 0CH | Contact X _c |

(4) Waveform

| Channel No. | Item |
|----------------|------------------------|
| A1H | AB phase voltage (V) |
| A2H | BC phase voltage (V) |
| B1H | A-phase current (A) |
| B2H | C-phase current (A) |
| ВЗН | Zero-phase current (A) |
| B4H | B-phase current (A) |

(5) Operation element

| <u> </u> | |
|----------|----------------------------|
| Bit | Item |
| 0 | Voltage detecting |
| 1 | Under voltage |
| 2 | Reverse power |
| 3 | |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | |
| 7 | Over voltage |
| 8 | Unbalance current 1 |
| 9 | Over current instantaneous |
| Α | Over current time-lag |
| В | Earth fault over current |
| С | |
| D | Unbalance current 2 |
| Е | |
| F | |

(6) RX information

| (6) RX in | formation |
|-----------|----------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | TEST |
| 4 | Voltage detecting |
| 5 | Over current time-lag |
| 6 | Over current instantaneous |
| 7 | Unbalance current 1 |
| 8 | Unbalance current 2 |
| 9 | Over voltage |
| А | Under voltage |
| В | Under frequency |
| С | Over frequency |
| D | Reverse power |
| E | Earth fault over current |
| F | |

(7) DI

| (1) | |
|-----|------|
| Bit | Item |
| 1 | DI1 |
| 2 | DI2 |

(Note 1) Contact arrangement

| Bit | Item |
|-----|----------------------------|
| 0 | Contact hold |
| 1 | Voltage detecting |
| 2 | Under voltage |
| 3 | Reverse power |
| 4 | |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | |
| 8 | Over voltage |
| 9 | Unbalance current 1 |
| Α | Over current instantaneous |
| В | Over current time-lag |
| С | Earth fault over current |
| D | |
| Е | Unbalance current 2 |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|----------------------------|
| 0 | Trip |
| 1 | Voltage detecting |
| 2 | Under voltage |
| 3 | Reverse power |
| 4 | |
| 5 | Over frequency |
| 6 | Under frequency |
| 7 | |
| 8 | Over voltage |
| 9 | Unbalance current 1 |
| А | Over current instantaneous |
| В | Over current time-lag |
| С | Earth fault over current |
| D | |
| Е | Unbalance current 2 |
| F | |

(Note 3) DI operation lock function

| Bit | Item |
|-----|----------------------------|
| 0 | Voltage detecting |
| 1 | Under voltage |
| 2 | Reverse power |
| 3 | |
| 4 | Over frequency |
| 5 | Under frequency |
| 6 | |
| 7 | Over voltage |
| 8 | Unbalance current 1 |
| 9 | Over current instantaneous |
| Α | Over current time-lag |
| В | Earth fault over current |
| С | |
| D | Unbalance current 2 |
| E | |
| F | |

(Note4) For the measurement item, note the followings about power factor and frequency.

#1 Power factor : When the voltage is 5.5V or less, power factor 1 is output.

#2 Frequency: When the voltage is 35V or less,0 Hz is output.

3.40 CGP2-A01D2 (Generator protection relay)

(1) Setting

| (1) Settii | 19 |
|----------------|--|
| Channel No. | Item |
| 00H | Biased differential · Operation current(A) |
| 01H | Biased differential · Bias(%) |
| 02H | Biased differential · Operation time(s) |
| 03H | Loss of excitation · Impedance ZF(ohm) |
| 04H | Loss of excitation · Impedance ZB(ohm) |
| 05H | Loss of excitation: Operation time(s) |
| 06H | DI1 operation lock · Lock time(s) |
| 07H | DI2 operation lock · Lock time(s) |
| 08H | Contact arrangement (contact X₀) (Note 1) |
| 09H | Contact arrangement (contact X ₁) (Note 1) |
| 0AH | Contact arrangement (contact X ₂) (Note 1) |
| 0BH | Contact arrangement (contact X ₃) (Note 1) |
| 0CH | Contact arrangement (contact X ₄) (Note 1) |
| 0DH | Contact arrangement (contact X ₅) (Note 1) |
| 0EH | Contact arrangement (contact X ₆) (Note 1) |
| 0FH | Operation indicator LED hold (Note 2) |
| 10H | DI 1 operation lock function (Note 3) |
| 11H | DI 2 operation lock function (Note 3) |
| 00H | CT primary (A) |
| 01H | VT primary (V) |
| 02H | VT secondary (V) |

(2) Measurement (Note 4)

| Channel No. | Item |
|----------------|-------------------------------|
| 10H | IA (A) (Output side CT) |
| 11H | IB (A) (Output side CT) |
| 12H | IC (A) (Output side CT) |
| 13H | IA (A) (Differential current) |
| 14H | IB (A) (Differential current) |
| 15H | IC (A) (Differential current) |
| 16H | VAB (V) |
| 17H | Phase IA-VAB(°) |
| 18H | Phase IB-VAB(°) |
| 19H | Frequency (Hz) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X ₅ |
| 06H | Contact X ₆ |

(4) Waveform

| Channel No. | Item |
|----------------|--------------------------|
| A1H | IA (A) (Output side CT) |
| A2H | IA (A) (Neutral side CT) |
| A3H | IC (A) (Output side CT) |
| A4H | IC (A) (Neutral side CT) |
| B2H | VAB (V) |
| ВЗН | IB (A) (Output side CT) |
| B4H | IB (A) (Neutral side CT) |

(5) Operation element

| Bit | Item |
|-----|-----------------------|
| 0 | Biased differential A |
| 1 | Biased differential B |
| 2 | Biased differential C |
| 3 | Loss of excitation |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| (O) 1(X III | Iomation |
|-------------|----------------------------|
| Bit | Item |
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Biased differential A |
| 6 | Biased differential B |
| 7 | Biased differential C |
| 8 | |
| 9 | Loss of excitation |
| Α | Differential current check |
| В | |
| С | |
| D | |
| Е | |
| F | |

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(7) DI

| Bit | Item |
|-----|------|
| 1 | DI1 |
| 2 | DI2 |

(Note 1) Contact arrangement

| (11010 1) 01 | ontact arrangement |
|--------------|-----------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Biased differential A |
| 2 | Biased differential B |
| 3 | Biased differential C |
| 4 | Loss of excitation |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------------|
| 0 | Trip |
| 1 | Biased differential A |
| 2 | Biased differential B |
| 3 | Biased differential C |
| 4 | Loss of excitation |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 3) DI operation lock function

| (. toto 6) 2 . | |
|----------------|-----------------------|
| Bit | Item |
| 0 | Biased differential A |
| 1 | Biased differential B |
| 2 | Biased differential C |
| 3 | Loss of excitation |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note4) For the measurement item, note the followings about phase and frequency.

- #1 Phase: When the voltage is 2.0V or less, or when the current is 0.4A or less, 10000 is output.
- #2 Frequency: When the voltage is 30V or less, 0 Hz is output.

3.41 CGP2-A02D2 (Generator protection relay)

(1) Setting

| (1) Octin | ·9 |
|----------------|--|
| Channel No. | Item |
| 00H | Biased differential · Operation current(A) |
| 01H | Biased differential · Bias(%) |
| 02H | Biased differential · Operation time(s) |
| 03H | DI1 operation lock · Lock time(s) |
| 04H | DI2 operation lock · Lock time(s) |
| 05H | Contact arrangement (contact X ₀) (Note 1) |
| 06H | Contact arrangement (contact X ₁) (Note 1) |
| 07H | Contact arrangement (contact X ₂) (Note 1) |
| 08H | Contact arrangement (contact X ₃) (Note 1) |
| 09H | Contact arrangement (contact X ₄) (Note 1) |
| 0AH | Contact arrangement (contact X ₅) (Note 1) |
| 0BH | Contact arrangement (contact X ₆) (Note 1) |
| 0CH | Operation indicator LED hold (Note 2) |
| 0DH | DI 1 operation lock function (Note 3) |
| 0EH | DI 2 operation lock function (Note 3) |
| 00H | CT primary (A) |

(2) Measurement (Note 4)

| Channel No. | Item |
|----------------|-------------------------------|
| 10H | IA (A) (Output side CT) |
| 11H | IB (A) (Output side CT) |
| 12H | IC (A) (Output side CT) |
| 13H | IA (A) (Differential current) |
| 14H | IB (A) (Differential current) |
| 15H | IC (A) (Differential current) |

(3) Forced operation

| Channel No. | Item |
|----------------|------------------------|
| 00H | Contact X ₀ |
| 01H | Contact X ₁ |
| 02H | Contact X ₂ |
| 03H | Contact X ₃ |
| 04H | Contact X ₄ |
| 05H | Contact X₅ |
| 06H | Contact X ₆ |

(4) Waveform

| Channel No. | Item |
|----------------|--------------------------|
| A1H | IA (A) (Output side CT) |
| A2H | IA (A) (Neutral side CT) |
| A3H | IC (A) (Output side CT) |
| A4H | IC (A) (Neutral side CT) |
| ВЗН | IB (A) (Output side CT) |
| B4H | IB (A) (Neutral side CT) |

(5) Operation element

| Bit | Item |
|-----|-----------------------|
| 0 | Biased differential A |
| 1 | Biased differential B |
| 2 | Biased differential C |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(6) RX information

| Bit | Item |
|-----|----------------------------|
| 2 | Trip |
| 3 | |
| 4 | |
| 5 | Biased differential A |
| 6 | Biased differential B |
| 7 | Biased differential C |
| 8 | |
| 9 | |
| Α | Differential current check |
| В | |
| С | |
| D | |
| Е | _ |
| F | |

(7) DI

| () – 1 | |
|---------|------|
| Bit | Item |
| 1 | DI1 |
| 2 | DI2 |

(Note 1) Contact arrangement

| (Note 1) Contact arrangement | |
|------------------------------|-----------------------|
| Bit | Item |
| 0 | Contact hold |
| 1 | Biased differential A |
| 2 | Biased differential B |
| 3 | Biased differential C |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 3) DI operation lock function

| Bit | Item |
|-----|-----------------------|
| 0 | Biased differential A |
| 1 | Biased differential B |
| 2 | Biased differential C |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| Е | |
| F | |

(Note 2) Operation indicator LED hold

| Bit | Item |
|-----|-----------------------|
| 0 | Trip |
| 1 | Biased differential A |
| 2 | Biased differential B |
| 3 | Biased differential C |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Α | |
| В | |
| С | |
| D | |
| E | |
| F | |



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