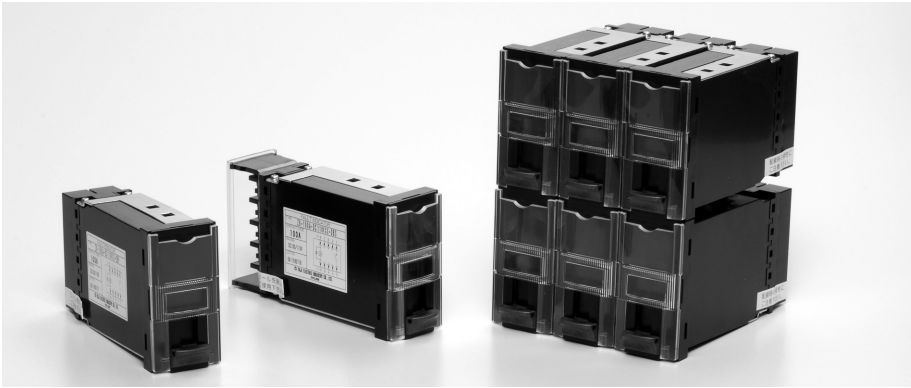
FLAG DROP TYPE FAULT INDICATOR

# ZK TYPE



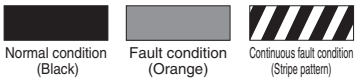
## STRUCTURE

**System:** **Flag Drop Type Fault Indicator**

**Indication & Reset operation:**

- The fault signal generated by the outer protective relay contacts excites the operating coil and drop the indication flag in the annunciator. The display window of the flag changes from the normal condition of black to the fault condition of orange.
- Pushing up the reset lever returns the indicator flag to the original position, and window returns to normal condition black, if the fault signal was monentary and operating coil is not excited any more.

**Indication pattern:** However, if the fault signal is continuous and still excites the operating coil, indicator flag in the display window change to stripe pattern in orange and black by operating the reset lever. After the fault signal is disappear the flag automatically return to the normal condition black.




●Operation

→ : Manual resetting

→ : Automatic resetting

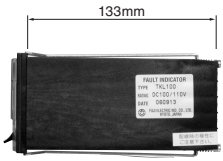
## SPECIFICATIONS (RATINGS, PERFORMANCE)

| Specification \ Type | | Voltage operation type | Current operation type |
|---|---|---|---|
| Rated insulation voltage (Ui) | | 250V | |
| Coil rating | Voltage | 24V, 48V, 100 / 110V, 125V, 200 / 220V AC / DC, 240V AC | — |
| | Current | — | 0.5A, 0.7A, 1.0A, 2.0A DC |
| Continuous input range | | 24V, 48V AC / DC: 80 to 130% Others: 70 to 130% | 90 to 100% (in case of continuous input) |
| Operating value | | Rating × 70% max. | Rating × 90% max. |
| Returning value | | Rating × 10% or more | Rating × 10% or more |
| Minimum input pulse width (rated voltage or current) | | 30 msec max. | 30 msec max. (200% input of rated current, 10 msec max.) |
| Operating time | | Flag interlock: 60ms or less | Coil interlock: 30ms or less |
| External Terminal | | Faston #250 or screw terminal (M3.5) | |
| Max. wire size | | 2mm² max. (AWG14) | |
| Insulation resistance | | 10MΩ or more (Between electric circuit block and ground) / 5MΩ or more (electric circuit between each other / Between contact terminals [Between poles]) | |
| Power frequency withstand voltage | | 2,000V AC (Between electric circuit block and ground / electric circuit between each other) / 1,000V AC (Between contact terminals [Between poles]) / 1 min. | |
| Lightning impulse withstand voltage | | ±4.5kV (Between electric circuit block and ground / electric circuit between each other) / ±3kV (Between contact terminals [Between poles]) / 3 times for each poles (1.2 / 50μs) | |
| Overload capability | | Rating × 1.3 times / 3 hours / 1 time | Rating × 6.0 times / 30 sec. / 1 time |
| Contact current-carrying capacity | | 2A | |
| Contact breaking capacity | | 110V DC, 0.2A (L/R = 7msec) | |
| Vibration resistance | | Frequency: 16.7Hz, Width of frequency: 4mm, 10 min for each axis | |
| Shock resistance | | 294m/s², 3 times each axial direction | |
| Durability | | 10,000 times or more (electrical, mechanical) | |
| Protection degree | | Panel surface: IP40 | |
| Ambient operating temperature | | 0 to 40°C (–10 to 55°C: a few hours are allowed per day) | |
| Storing temperature | | –20 to 60°C | |
| Relative humidity | | 30 to 80% (average per day, no dew condensation) | |
| Altitude | | 2,000 m max. | |
| Weight | | Approx. 300g | |

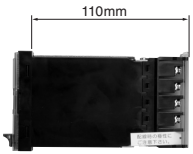
* Please rafer to the page B70 for the technical data.

## FEATURES

**1** The panel back size is shorter than TK type by about 25%.




**TK Type** **ZK Type (Faston tab type)**



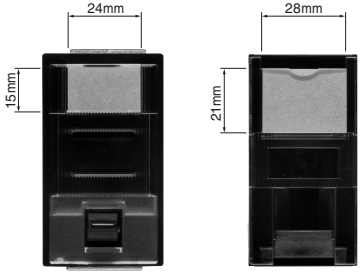

**ZK Type (screw type)**

**2** Faston / Tab type and Screw type are available as standard line up.
Screw type is equiped with a terminal cover.
Vertical and horizontal jumper for link reduce wires.

**3** Short time input operation is available for current type.
(operating at 200% or more of rated current, at input pulse of 10 msec).
It sensitively responds to an pulse input signal to the annunciator relay.
For further details, refer to technical information (page B70).

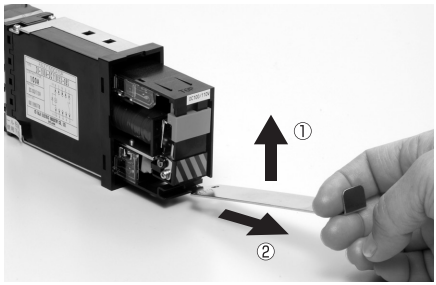
**4** 4 contacts can be chosen from 2 contacts linked with the display flag and 3 contacts linked with the coil voltage.
Wide contact variations enable to omit some auxiliary relays now in use.

**5** The approximately 40% expansion of the name character area enhances visibility of a nameplate.




**TK Type** **ZK Type**

**6** A plug-in method for internal elements is adopted, which enables easy changing of specifications and maintenance from the front of the panel.




* When removing the internal element, hang an element unplugging tool on the lower hook to unplug by lifting and removing the lock.

**7** Measures for whisker trouble are fully prepared by eliminating the use of tin and zinc plating.

**8** Collective mounting is available, which saves hole cutting work one by one.
It contributes to reduce man-hour.
(A vertical one-line assembly is not available).

FLAG DROP TYPE FAULT INDICATOR

# ZK TYPE

## HOW TO ORDER

### ■How to order as single unit

**ZK** - **120A** - **DC110V** **XX** - **O** **B** **F**
① ② ③ ④ ⑤ ⑥ ⑦

### ■How to order internal elements

**ZK-U** - **120A** - **DC110V** **XX** - **O**
① ② ③ ④ ⑤

| No. | Item | Code | | Detail | | Note |
|---|---|---|---|---|---|---|
| ① | Basic type | ZK | | — | | — |
| | | ZK-U | | Internal element | | — |
| ② | Contact arrangements | | | Flag interlock | Coil interlock | |
| | | 000A | | — | — | |
| | | 010A | | — | 1a | |
| | | 020A | | — | 2a | |
| | | 030A | | — | 3a | |
| | | 020D | | — | 1a1b | |
| | | 030E | | — | 1a2b | (For further details, see Page B67 to B68.) |
| | | 100A | | 1a | — | |
| | | 110A | | 1a | 1a | Any contact arrangements other than those above are available. |
| | | 120A | | 1a | 2a | |
| | | 130A | | 1a | 3a | |
| | | 120D | | 1a | 1a1b | |
| | | 120E | | 1a | 2b | |
| | | 200A | | 2a | — | |
| | | 210A | | 2a | 1a | |
| | | 220A | | 2a | 2a | |
| | | 300A | | 3a | — | |
| ③ | Rated voltage / current | | | Coil rating | Resistance value | — |
| | | Voltage operation type | DC024V | 24V DC | 270Ω | |
| | | | DC048V | 48V DC | 1080Ω | |
| | | | DC110V | 100 / 110V DC | 4800Ω | — |
| | | | DC125V | 125V DC | 6900Ω | |
| | | | DC220V | 200 / 220V DC | 19500Ω | |
| | | | AC024V | 24V AC | 270Ω | |
| | | | AC048V | 48V AC | 1080Ω | |
| | | | AC110V | 100 / 110V AC | 4800Ω | Note: Voltage type AC rated product has a built-in 800V rated rectifier. |
| | | | AC125V | 125V AC | 6900Ω | |
| | | | AC220V | 200 / 220V AC | 19500Ω | |
| | | | AC240V | 240V AC | 24100Ω | |
| | | Current operation type | DC0.5A | 0.5A DC | 4.4Ω | |
| | | | DC0.7A | 0.7A DC | 2.1Ω | — |
| | | | DC1.0A | 1.0A DC | 1.0Ω | |
| | | | DC2.0A | 2.0A DC | 0.28Ω | |
| ④ | Special specification | XX | | Standard specification | | — |
| | | XZ | | Varistor mounted type | | Voltage type only |
| ⑤ | Flag color | O | | Yellow-red (orange) | | When coil excitation continues after reset operation, the flag color turns pattern black and orange. |
| ⑥ | Surface frame | B | | Black (N1.5) | | — |
| ⑦ | Rear surface terminal | S | | Screw terminal (M3.5) | | — |
| | | F | | Faston tab #250 | | — |

## ■How to order as assembled products

●Collective mounting is available for ZK type. It is not necessary to make holes for each units, and the assembled units can be installed in only one hole.

*We do not provide assembly services after the unit has been purchased.
*Items in a single vertical row cannot be produced.

### ❶ In case of assembling the same specification

**ZK - 02 x 03 - 120A - DC110VXX - OBF**

| Basic type | Vertical number | Horizontal number | Contact arrangement | Rated voltage, Current |
|---|---|---|---|---|

### ❷ In case of assembling different specifications

**Please enter the order sheet for ZK Drop Type Annunciator Relay attached to the page B63.**

**ZK - 02 x 03 - MIX - MIX - OBF**

| Basic type | Vertical number 1 to 3 stages | Horizontal number 2 to 8 stages | Contact arrangement | Rated voltage, Current |
|---|---|---|---|---|

① Please refer to the above type coding for orders.
- Please write “MIX” in “Contact arrangement” in case of assembling different specifications of contact arrangement.
- Please write “MIX” in “Rated voltage, current” in case of assembling different specifications of rated voltage, current

② About the layout drawing
- Enclose the shape of the assembled window in the layout drawing with a continuous line.

③ About the layout configuration
- Fill the contact arrangement, rated voltage and current, and rear terminal in the layout configuration.

**Order Sheet for ZK Type Fault Indicator**

Date of order: (month) (day), (year)

| | | | |
|---|---|---|---|
| Company name | | Person in charge | |
| Address | | TEL | |
| | | FAX | |
| Type of order | | | |
| Quantity | Units / Delivery time (month) (day), (year) | Number of Order | |

●Please enclose the following layout drawing with a continuous line as the shape of an assembled window.
●Please fill the contact arrangement, rated voltage, current, special use and also rear terminal in the following layout configuration.
●The sizes of the mounting hole are the horizontal outside dimension: +4 mm and the vertical outside dimension: +5 mm.

Layout drawing

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| A | A-01 | A-02 | A-03 | A-04 | A-05 | A-06 | A-07 | A-08 |
| B | B-01 | B-02 | B-03 | B-04 | B-05 | B-06 | B-07 | B-08 |
| C | C-01 | C-02 | C-03 | C-04 | C-05 | C-06 | C-07 | C-08 |

Layout configuration

| Row | | Contact arrangement | Rated voltage, current | Special specification | Rear surface terminal |
|---|---|---|---|---|---|
| A | A-01 | ZK– | 120A – | DC 110V XX | –OBF |
| | A-02 | ZK– | 110A – | DC 110V XX | –OBF |
| | A-03 | ZK– | 110A – | DC 110V XX | –OBF |
| | A-04 | ZK– | – | | –OB |
| | A-05 | ZK– | – | | –OB |
| | A-06 | ZK– | – | | –OB |
| | A-07 | ZK– | – | | –OB |
| | A-08 | ZK– | – | | –OB |
| B | B-01 | ZK– | 110A – | DC 1.0A XX | –OBF |
| | | | 110A – | DC 1.0A XX | –OBF |
| | | | – | DC 1.0A XX | –OBF |
| | | | – | | –OB |
| | | | – | | –OB |
| | | | – | | –OB |

**＊Precaution for assemblies**

When ordering a collective type of rear terminal symbols S (screw specification), please order after taking the wire size and number of wires into account (there is a possibility that wiring may be difficult depending on the wire size and number of wires).

### Sizes of collective mounting

Refer to the right table as to sizes of collective mounting when mounting collectively.

A vertical one-line assembly is not available.

**Table of sizes** (mm)

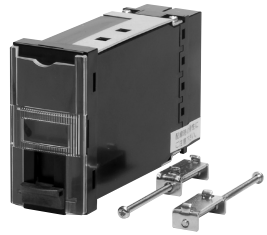
| Vertical stage number | | | Horizontal stage number 2 row | 3 row | 4 row | 5 row | 6 row | 7 row | 8 row |
|---|---|---|---|---|---|---|---|---|---|
| First stage | | L1 | 72 | 108 | 144 | 180 | 216 | 252 | 288 |
| | | L2 | 70 | | | | | | |
| | | L3 | 81 | | | | | | |
| Second stage | | L1 | 72 | 108 | 144 | 180 | 216 | 252 | 288 |
| | | L2 | 140 | | | | | | |
| | | L3 | 151 | | | | | | |
| Third stage | | L1 | 72 | 108 | 144 | 180 | 216 | 252 | 288 |
| | | L2 | 210 | | | | | | |
| | | L3 | 221 | | | | | | |

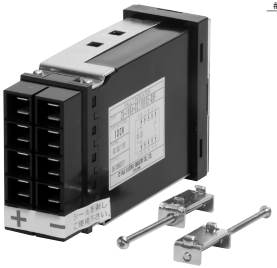
FLAG DROP TYPE FAULT INDICATOR

# ZK TYPE

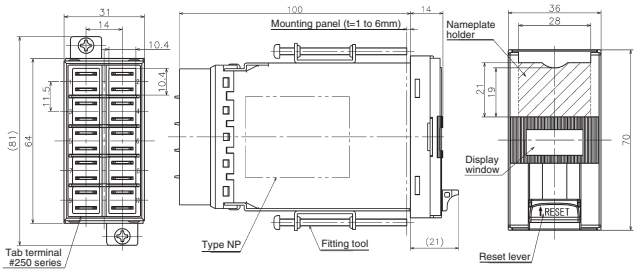
## STANDARD PRODUCTS

### ZK (Faston type)

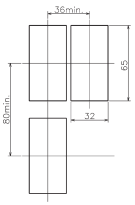




●Outline



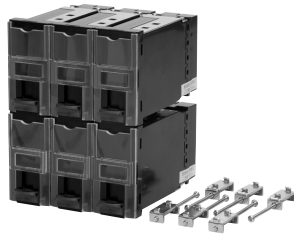

Mounting hole size
(When mounting a single unit)



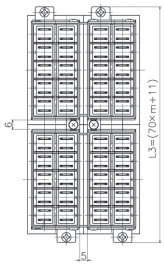

●Accessories

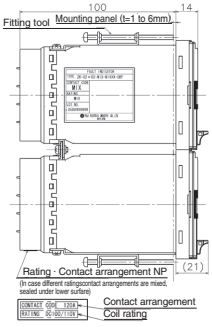
| | |
|---|---|
| Internal element | ZK-U-□-□ |
| Nameplate | ZK-DP (Sold separately) |
| Element unplugging tool | TK-NQ (Sold separately) |
| Fitting tool | ZK-TK (standard equipment) |

### ZK (Faston type [collective])



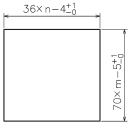
●Outline





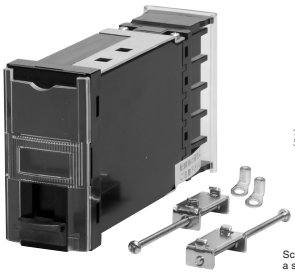
Mounting hole size



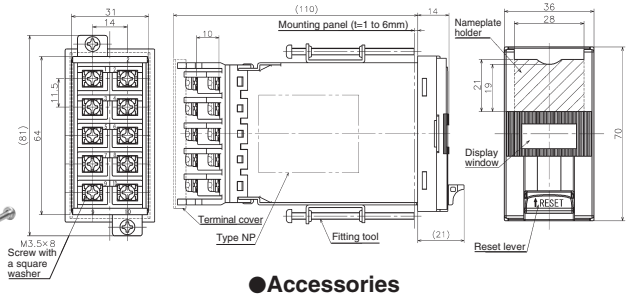

●Accessories

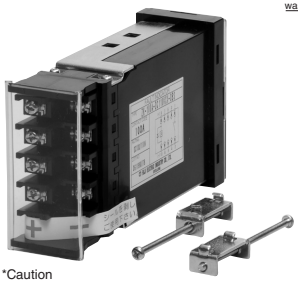
| | |
|---|---|
| Internal element | ZK-U-□-□ |
| Nameplate | ZK-DP (Sold separately) |
| Element unplugging tool | TK-NQ (Sold separately) |
| Fitting tool | ZK-TK (standard equipment) |

## ZK (Screw type)

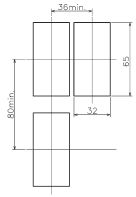


### ●Outline



Mounting hole size
〈When mounting a single unit〉

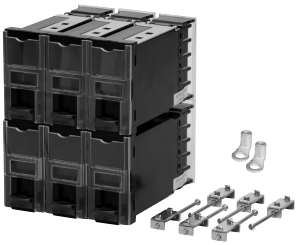



*Caution
When wiring assembled products, always verify the wire size, number of wires, and other specifications.(As wiring may be difficult in some cases.)

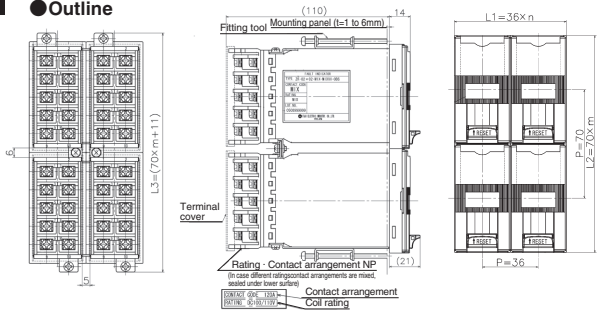
### ●Accessories

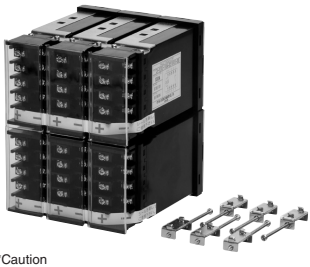
| | |
|---|---|
| **Internal element** | **ZK-U** □ - □ |
| **Nameplate** | **ZK-DP** (Sold separately) |
| **Element unplugging tool** | **TK-NQ** (Sold separately) |
| **Terminal cover** | **ZK-CV** (standard equipment) |
| **Fitting tool** | **ZK-TK** (standard equipment) |
| **Crimp terminal** | **ZK-STSET** (10 pcs attached) |
| **Jumper** | **ZK-SBV** (Vertical linking) (Sold separately) |
| **Jumper** | **ZK-SB36,50** (Horizontal linking) (Sold separately) |

## ZK (Screw type [collective])

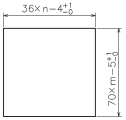


### ●Outline



Mounting hole size




*Caution
When wiring assembled products, always verify the wire size, number of wires, and other specifications.(As wiring may be difficult in some cases.)

### ●Accessories

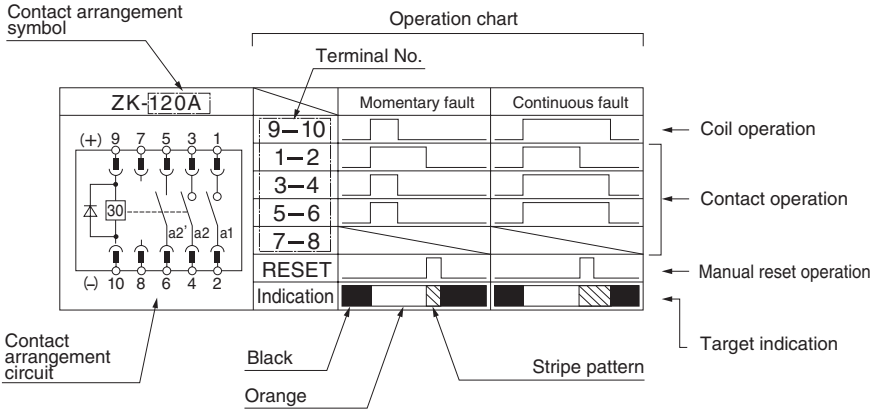
| | |
|---|---|
| **Internal element** | **ZK-U** □ - □ |
| **Nameplate** | **ZK-DP** (Sold separately) |
| **Element unplugging tool** | **TK-NQ** (Sold separately) |
| **Terminal cover** | **ZK-CV** (standard equipment) |
| **Fitting tool** | **ZK-TK** (standard equipment) |
| **Crimp terminal** | **ZK-STSET** (necessary pcs attached) |
| **Jumper** | **ZK-SBV** (Vertical linking) (Sold separately) |
| **Jumper** | **ZK-SB36** (Horizontal linking) (Sold separately) |

FLAG DROP TYPE FAULT INDICATOR

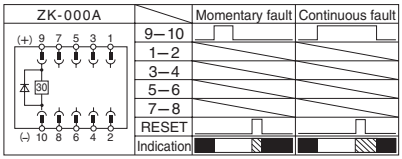
# ZK TYPE

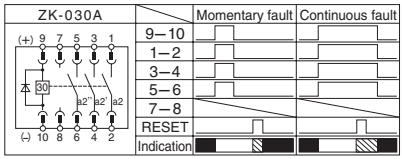
## CONTACT ARRANGEMENTS AND SEQUENCES

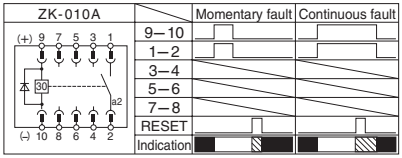
### About contact arrangement

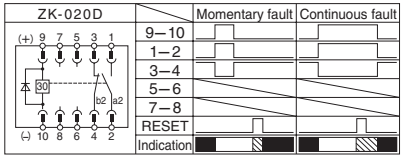


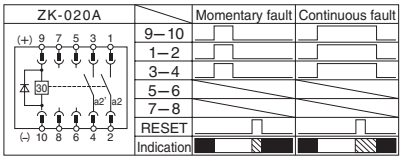

□ 1 : Contact which interlocked with flag
□ 2 : Contact which interlocked with coil
30 : Coil (Terminals # 9 and #10 fixed in all models)

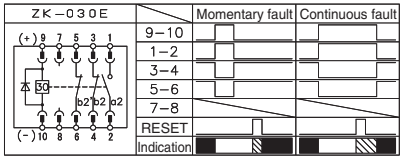


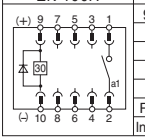



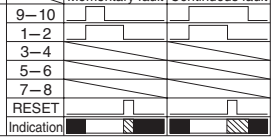



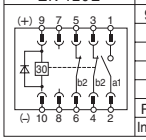

∗ Any contact arrangements other than those above are available. Please feel free to inquire.

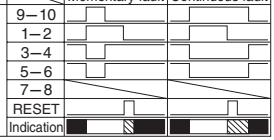
ZK-100A



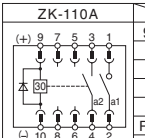



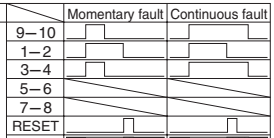

ZK-120E



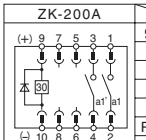



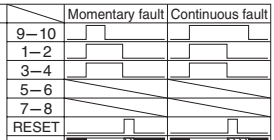

ZK-110A



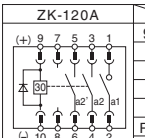



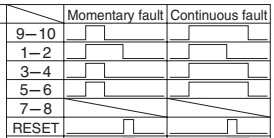

ZK-200A



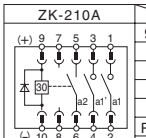



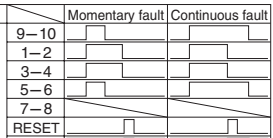

ZK-120A



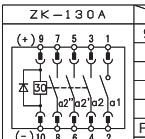



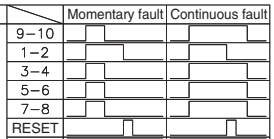

ZK-210A



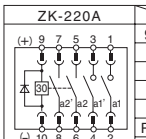



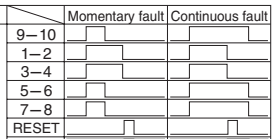

ZK-130A



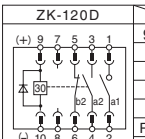



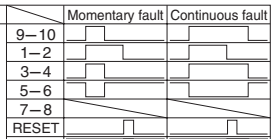

ZK-220A



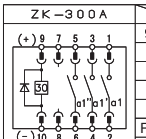



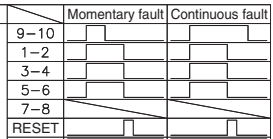

ZK-120D




ZK-300A




∗ Any contact arrangements other than those above are available. Please feel free to inquire.

FLAG DROP TYPE FAULT INDICATOR

# ZK TYPE

## ACCESSORIES

### Element extraction tool

●TK-NQ

(Order unit: 10)

### Fitting tool

(Order unit: 10)

●ZK-TK

∗ Standard equipment

### Jumper

(Order unit: 100)

∗ For rear terminal symbol S (screw specification)

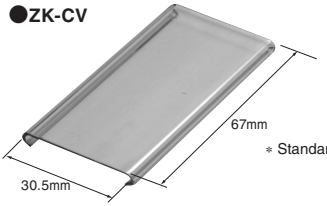
| ZK-SBV | ZK-SB36 | ZK-SB50 |
|---|---|---|
|  |  |  |
| Vertical linking | Horizontal linking (36mm pitch) | Horizontal linking (50mm pitch) |
| For vertical adjacent terminals | For upper stage terminals of min. pitch instration (36mm) or assembled type | For upper stage terminals of 50mm pitch instration |

### Terminal cover

(Order unit: 100)

∗ For rear terminal symbol S (screw specification)

●ZK-CV



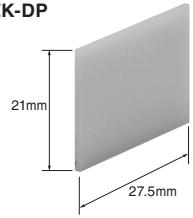

∗ Standard equipment

### Nameplate

(Order unit: 100)

(Acryl material t = 1mm)

●ZK-DP




∗ Commercial cardboards are also available instead of ZK-DP.

### Cramp terminal

(Order unit: 10)

●ZK-ST SET

(10 pcs)

∗ Standard accessory for screw type.

## TECHNICAL DATA

### ■Operating condition of current type

For the current operation type, it is sometimes used by connecting in series with a relay equipped with a self-cutoff contact in the manner shown in Figure 1; in that case, current I shows the waveform shown in Figure 2 depending on the coil inductance of those serial relays.

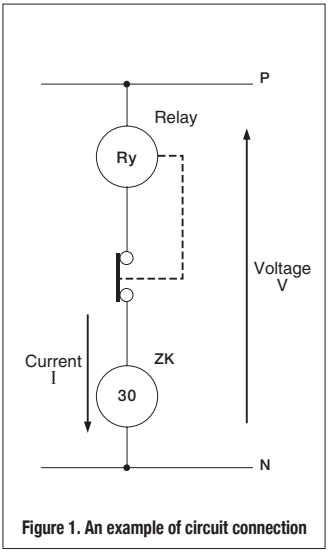



**Figure 1. An example of circuit connection**

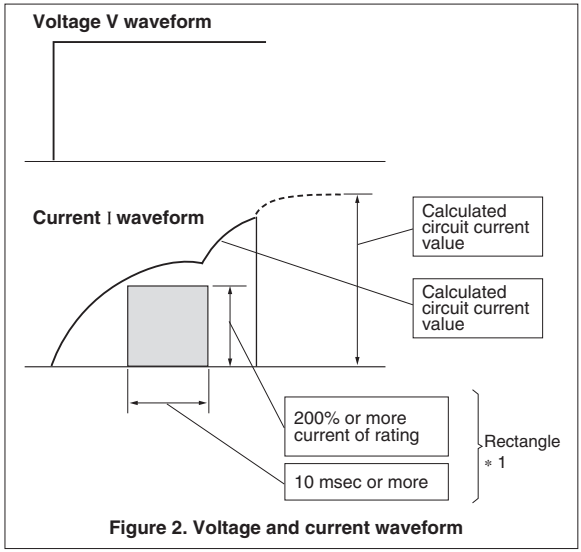



**Figure 2. Voltage and current waveform**

When high-speed operation is required (operation at 200% or more of rated current and minimum input pulse of 10 msec or less), please select a coil rating that can secure a rectangle∗1 within the actual circuit current waveform.

High-speed operation is confirmed in the condition with the resistance value of the serial relay (Fig. 1 Ry) in the following table.

| Coil rating of Fault Indicator | Relay resistance value |
|---|---|
| 0.5A DC | 36.7Ω |
| 0.7A DC | 26.2Ω |
| 1A DC | 18.3Ω |
| 2A DC | 9.2Ω |

### ■Ratings, performance

| No. | Specification | Ratings, performance | |
|---|---|---|---|
| 1 | Contact circuit resistance* | 150mΩ or less (voltage drop method 1A current flow measurement) | |
| 2 | Contact circuit current | 2A | |
| 3 | Contact rated load | Resistive load | 110V DC 2A<br>220V AC 2A |
| | | Inductive load | 110V DC 0.2A (L/R = 7ms)<br>24V DC 1.5A (L/R = 7ms)<br>220V AC 0.8A (cos$\phi$ = 0.4)<br>24V AC 2.0A (cos$\phi$ = 0.4) |

∗ Contact circuit resistance is the resistance between the outside box terminals of a contact circuit.