FLAG DROP TYPE FAULT INDICATOR

ZK TYPE

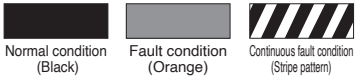
STRUCTURE

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.



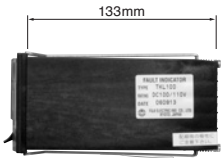
SPECIFICATIONS (RATINGS, PERFORMANCE)

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	

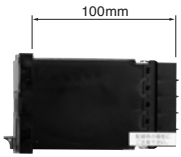
∗ Please rafer to the page B70 for the technical data.

FEATURES

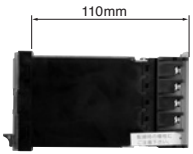
1 The panel back size is shorter than TK type by about 25%.



TK Type



ZK Type (Faston tab type)



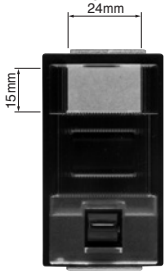
ZK Type (screw type)

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.

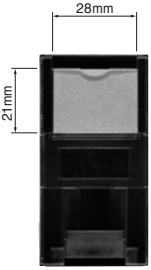
3 Short time input operation is available for current type.
(operating at 200% or more of rated current, at input pulse of 10 msec).
It sensitively responds to an pulse input signal to the annunciator relay.
For further details, refer to technical information (page B70).

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.

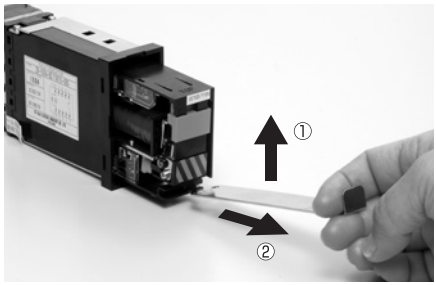


TK Type



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		—

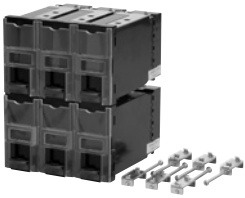
■How to order as assembled products

●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.

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.

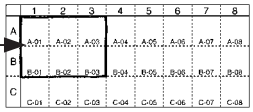
Order Sheet for ZK Type Fault Indicator

Date of order: (month) (days) (year)

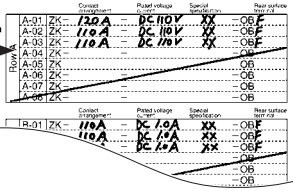
Company name		Person in charge	
Address		TEL	
		FAX	
Type of order			
Quantity	Units / Delivery time (month) (day) (year)	Number of Order	

●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



Layout configuration



＊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						

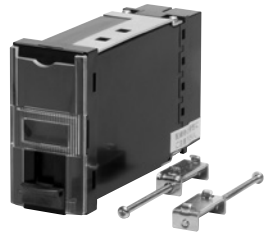
＊Single row is not available.

FLAG DROP TYPE FAULT INDICATOR

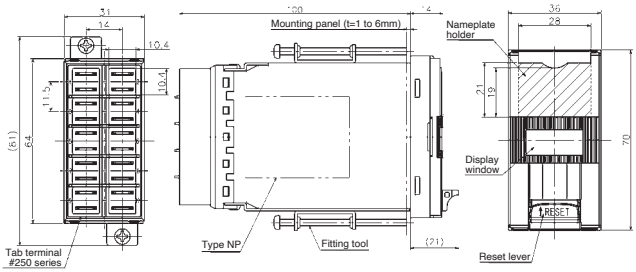
ZK TYPE

STANDARD PRODUCTS

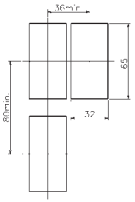
ZK (Faston type)



●Outline



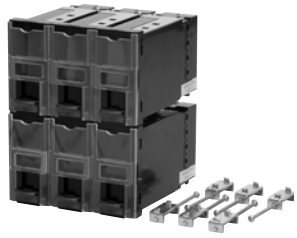
Mounting hole size
〈When mounting a single unit〉



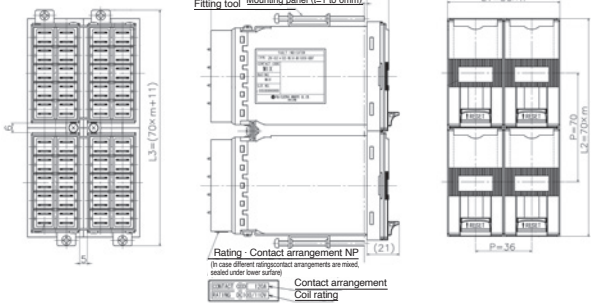
●Accessories

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

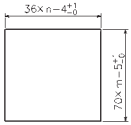
ZK (Faston type [collective])



●Outline



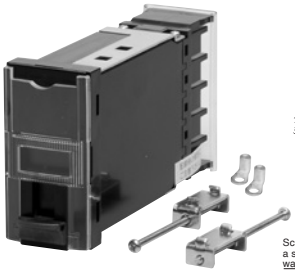
Mounting hole size



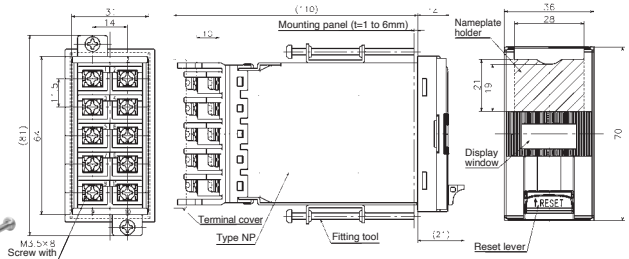
●Accessories

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

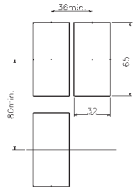
ZK (Screw type)



●Outline



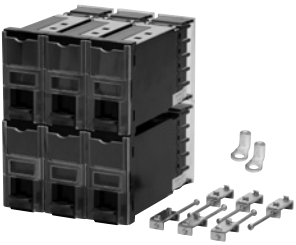
Mounting hole size
〈When mounting a single unit〉

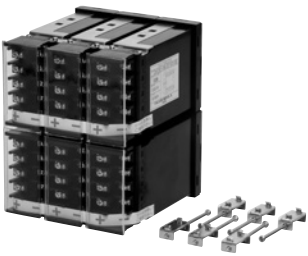


●Accessories

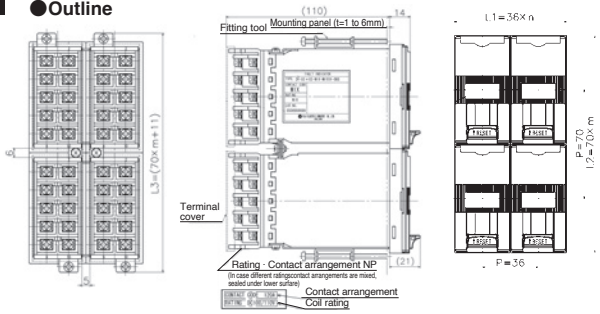
Internal element	**ZK-U** □ - □
Nameplate	**ZK-DP** (Sold separately)
Element unplugging tool	**TK-NQ** (Sold separately)
Terminal cover	**ZK-CV** (standard equipment)
Fitting tool	**ZK-TK** (standard equipment)
Crimp terminal	**ZK-STSET** (10 pcs attached)
Jumper	**ZK-SBV** (Vertical linking) (Sold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

ZK (Screw type [collective])

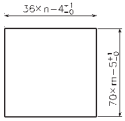




●Outline



Mounting hole size



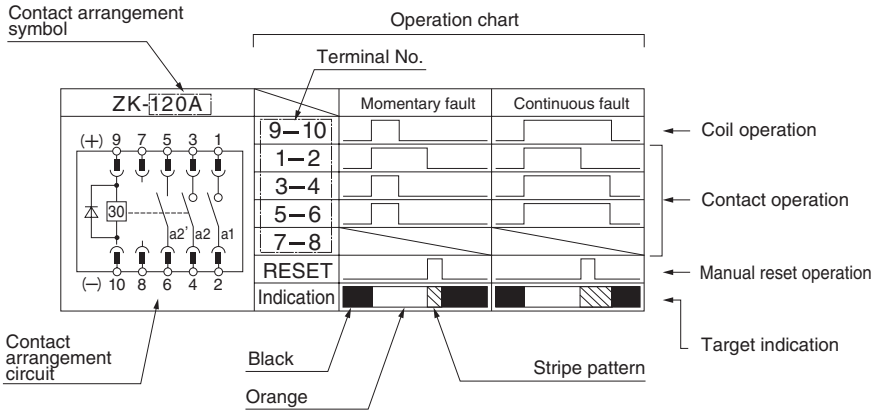
●Accessories

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)

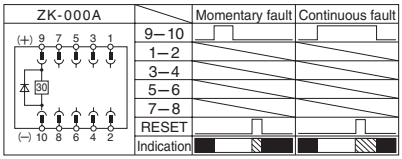
ZK TYPE

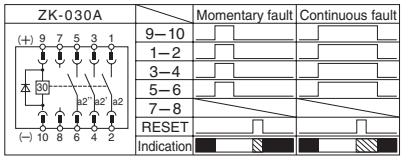
CONTACT ARRANGEMENTS AND SEQUENCES

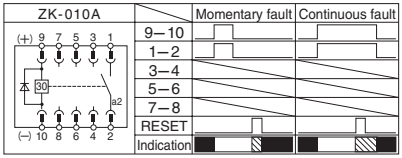
About contact arrangement

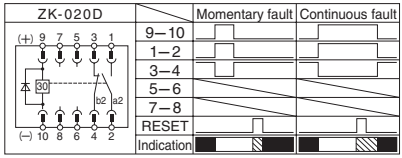


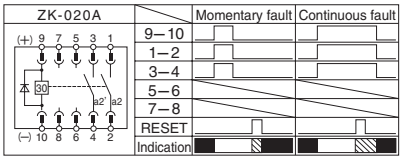
□ 1 : Contact which interlocked with flag
□ 2 : Contact which interlocked with coil
30 : Coil (Terminals # 9 and #10 fixed in all models)

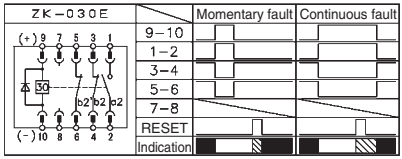






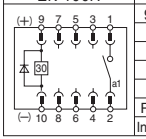






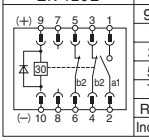
∗ Any contact arrangements other than those above are available. Please feel free to inquire.

ZK-100A



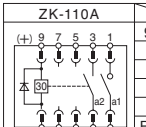
	Momentary fault	Continuous fault
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
Indication		

ZK-120E



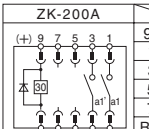
	Momentary fault	Continuous fault
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
Indication		

ZK-110A



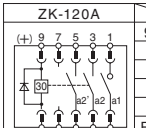
	Momentary fault	継続故障
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
表示		

ZK-200A



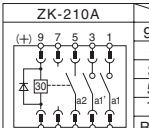
	Momentary fault	Continuous fault
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
Indication		

ZK-120A



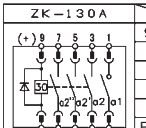
	Momentary fault	Continuous fault
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
Indication		

ZK-210A



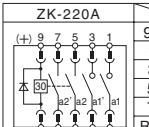
	Momentary fault	Continuous fault
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
Indication		

ZK-130A



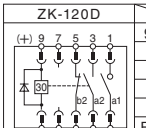
	Momentary fault	Continuous fault
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
Indication		

ZK-220A



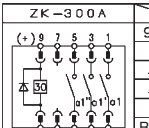
	Momentary fault	Continuous fault
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
Indication		

ZK-120D



	Momentary fault	Continuous fault
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
Indication		

ZK-300A



	Momentary fault	Continuous fault
9–10		
1–2		
3–4		
5–6		
7–8		
RESET		
Indication		

∗ 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)

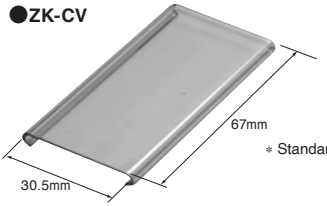
ZK-SBV	ZK-SB36	ZK-SB50
		
Vertical linking	Horizontal linking (36mm pitch)	Horizontal linking (50mm pitch)
For vertical adjacent terminals	For upper stage terminals of min. pitch instration (36mm) or assembled type	For upper stage terminals of 50mm pitch instration

Terminal cover

(Order unit: 100)

＊For rear terminal symbol S (screw specification)

●ZK-CV



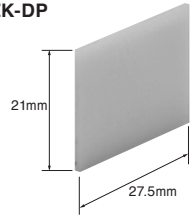
＊Standard equipment

Nameplate

(Order unit: 100)

(Acryl material t = 1mm)

●ZK-DP



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

Cramp terminal

(Order unit: 100)

●ZK-ST

＊Standard accessory for screw type (10 pcs).

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.

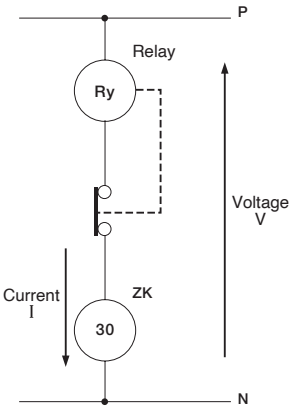


Figure 1. An example of circuit connection

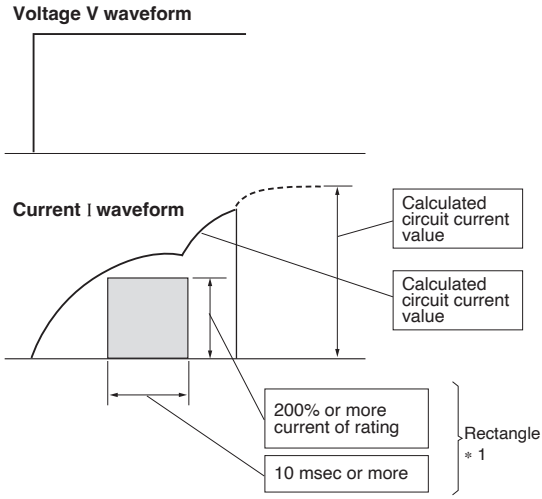


Figure 2. Voltage and current waveform

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 220V AC 2A
		Inductive load	110V DC 0.2A (L/R = 7ms) 24V DC 1.5A (L/R = 7ms) 220V AC 0.8A (cosϕ = 0.4) 24V AC 2.0A (cosϕ = 0.4)

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