

# Explanation of switches

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[Ratings]  
Ratings of catalog switches are maximum with inductive loads.

[Load Types]

1. Resistive Load  
A resistive load is a load with a resistive component which has a power factor of 1 ( $\cos\phi=1$ ) The rating indication is of rated voltage and current at resistive load.
2. DC Load  
DC is unidirectional. Therefore, arc continuation is longer than with AC. Use at 30VDC or less is recommended. Also, common terminal shall be connected to  $\ominus$  side.
3. Inductive Load  
In the case of inductive loads, a peak current flows when the circuit is switched on, while an arc is generated by a reverse voltage when the circuit is turned off. Thus contact wear is more stringent than with a resistive load and expected life is shorter. It is recommended, therefore, that the switch be used at less than 60% of the rated current with a standard power factor of 0.6 ( $\cos\phi=0.6$ ).

### Electrical rating and performance of built-in switch

◆ The notation OFL-□ indicates the microswitch type (model) and the number of polarities. (excerpt from the manufacturer's catalog)

※ As of September 2012

Type	Item	Rating			Contact resistance (or less)	Insulation resistance (or more) by 500 VDC insulation tester	Withstand voltage (1 min)	Durable life (or more)	
		Resistance load	Induction load	Low-level load (minimum load)				Mechanical	Electrical (resistance load)
Z	1·2·3·2Y·TW	① AC 10A-125·250V 1A-480V DC 10A-8V-14V 3A-30V 0.5A-125V 0.25A-250V	AC 6A-125·250V 0.5A-480V DC 10A-8V 5A-14V 2.5A-30V 0.05A-125V	—	50mΩ	100MΩ	2000VAC	20,000,000 activations	500,000 activations
	ZG·2ZG (gold alloy contact)	② AC 0.1A-125V DC 0.1A-8-14-30V	—	DC 1mA-5V	50mΩ	100MΩ	1250VAC	20,000,000 activations	2,000,000 activations
V	V·1V·2V·TV·2YV 4V·HV	③ AC 15A-125·250V DC 0.6A-125V	AC 10A-125·250V DC 0.6A-125V	—	50mΩ	100MΩ	1500VAC	10,000,000 activations	100,000 activations
	G·2G·VG·2VG·TVG HVG (gold clad contact)	④ AC 3A-125·250V DC 0.1A-30V	—	DC 5mA-6V·2mA-12V 1mA-24V	50mΩ	100MΩ	1500VAC	10,000,000 activations	100,000 activations
S	S	⑤ AC 5A-125·250V DC 5A-30V 0.4A-125V	AC 3A-125·250V DC 3A-30V 0.05A-125V	DC 20mA-12V 10mA-24V	50mΩ	100MΩ	1500VAC	10,000,000 activations	70,000 activations
	SG (gold alloy contact)	⑥ AC 0.1A-125V DC 0.1A-30V	—	DC 1mA-5V	100mΩ	100MΩ	1500VAC	10,000,000 activations	200,000 activations
X	X (DC-specific type)	⑦ DC 10A-8-14-30-125V 3A-250V	DC 10A-8-14-30V 6A-125V 1.5A-250V	—	15mΩ	100MΩ	1500VAC	1,000,000 activations	100,000 activations
T	M 2M	⑧ AC 10A-125·250V 6A-480V DC 10A-8-14V 6A-30V 0.8A-115V 0.4A-230V	AC 6A-125·250V 4A-480V DC 6A-8-14V 4A-30V 0.2A-115V 0.1V-230V	DC 20mA-12V 10mA-24V	50mΩ	100MΩ	2000VAC	10,000,000 activations	500,000 activations
HE	2NY (enable switch type)	⑨ AC 1A-125V DC 1A-30V 0.2A-125V	AC 0.7A-125V DC 0.7A-30V 0.1A-125V	—	50mΩ	100MΩ	1500VAC	100,000 activations	100,000 activations
Z	BS (alternate type)	⑩ AC 5A-125·250V 1A-480V DC 5A-8-14-30V 0.5A-115V 0.25A-230V	AC 3A-125·250V 0.5A-480V DC 3A-8-14-30V 0.1A-115V 0.05V-230V	—	15mΩ	100MΩ	2000VAC	2,000,000 activations	500,000 activations
Push button	F (alternate type)	⑪ AC 10A-125V 6A-250V	—	—	20mΩ	100MΩ	1000VAC 1500VAC	30,000 activations	10,000 activations
	2F (alternate type)	—	—	—	—	—	—	—	—

### Seal structure switch inclusion type (reinforced drip resistance type)

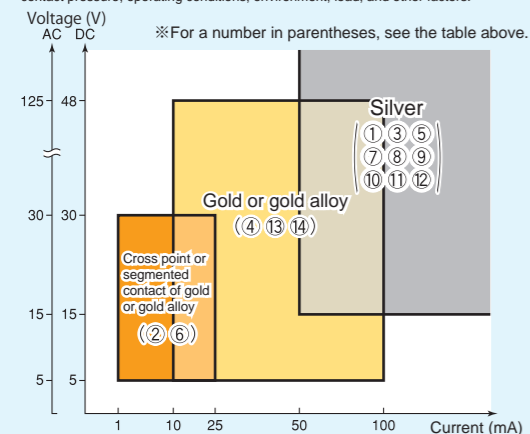
IPclass

Reed switch	R (Bestact contact)	—	DC 2A-110V	AC 0.5A-110-220V DC 0.3A-110V	DC 1mA-24V	500mΩ	1000MΩ	1500VAC	10,000,000 activations	200,000 activations	IP57
Z	55 (water-tight type switch)	⑫	AC 10A-125·250V 1A-480V DC 10A-8V-14V 3A-30V 0.5A-125V 0.25A-250V	AC 6A-125·250V 0.5A-480V DC 10A-8V 5A-14V 2.5A-30V 0.05A-125V	—	50mΩ	100MΩ	2000VAC	20,000,000 activations	500,000 activations	IP54
V	VG5·2VG5·TVG5 (gold clad contact)	⑬	AC 3A-250V DC 0.1A-30V	—	DC 5mA-6V·2mA-12V 1mA-24V	50-100mΩ	100MΩ	2000VAC	5,000,000 activations	1,000,000 activations	IP67
S	SG5 (gold clad contact)	⑭	AC 0.1A-125·250V DC 0.1A-30V	—	DC 5mA-6V·2mA-12V 1mA-24V	100mΩ	100MΩ	1500VAC	500,000 activations	200,000 activations	IP50

### Application Current Range (reference only)

The figure serves as a guide to the load voltage and current range of the microswitch.

※The effective range may vary depending on the type of microswitch, contact contact pressure, operating conditions, environment, load, and other factors.



IMPORTANT: Do not use silicone-family adhesive or rubber near the microswitch. Their presence could lead to poor contact or other problems.

### Supplementary Information

#### Accessory Cord Used with OJIDEN Foot Switches

(standard specification part)

The sheath outside diameter and the number of strands are as indicated in the table below. Use the information when selecting connectors for the cord.

◆ Finished Outside Diameter of the Cabtyre Cord  
Use the information when selecting the connector.

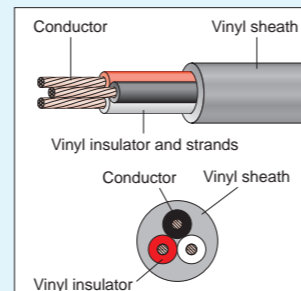
Type	Cross-sectional area (mm <sup>2</sup> )	Number of strands	Finished outside diameter φ (mm)
VCTF	0.5	3	約 φ6.4
	0.75	2	約 φ6.6
	0.75	3	約 φ7.0
	0.75	4	約 φ7.6
	0.75	6	約 φ8.9
	1.25	3	約 φ7.8
1.25	6	約 φ10.1	

◆ The actual color of the product may differ somewhat from the way it appears in printed matter.

◆ OJIDEN products are manufactured in keeping with thorough environmental considerations (e.g., lead-free, use of triad chromate plating).

◆ Consult us for modifications (e.g., cord length, number of strands).

◆ Parts of the VCTF Round Cord



# How to use foot switch properly

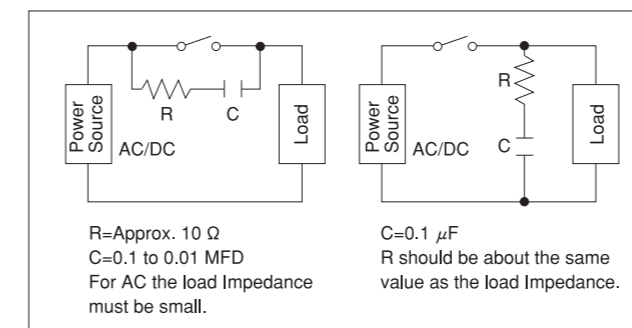
## How to Use Foot Switch Properly

When selecting a foot switch, choose an appropriate one suited for your application and use it properly, considering the power rating, mechanism, environment, etc.

### ⚠ Cautions in Using the Foot Switch

1. The power rating should be within the specified value.  
Turning ON/OFF an inductive load (relay, solenoid, motor, lamp, etc.) will pass a current larger than the steady-state current. We therefore recommend you to install a contact protection circuit (safety circuit), etc.

#### (1) EXSAMPLES OF PROTECTION CIRCUIT



#### (2) Select the proper switch so that contacts will with-stand rated currents.

LOAD TYPE	FOOT SWITCH VOLTAGE AND CURRENT
Resistive	Rated Voltage and Current
DC Load	1/4 Rated Voltage
Lamp Load	1/15 to 1/10 of Rated Current
Inductive	1/10 to 1/3 of Rated Current
Motor Load	1/8 to 1/4 of Rated Current
Capacitor	1/100 to 1/2 of Rated Current

The above values vary with conditions and should be used only for reference.

2. Connect the terminals properly after checking the contact configuration and the color-coding of lead wires.  
If the terminals are connected improperly, malfunctioning or short-circuiting may be caused.
3. Connect a ground wire to the grounding terminal screw.  
To prevent the accident of an electric shock, etc., be sure to connect a grounding wire.
4. Be sure to turn OFF the power before performing repairing.  
Touching the built-in switch with the foot switch energized may result in an electric shock accident.
5. Take care not to pull the cord or catch it on your foot.  
It may cause wire-breaking, short circuit and so on.
6. Do not give an excessive shock to the foot switch.  
Dropping the foot switch or a violent treading will result in malfunction or shorten the life of the foot switch.
7. Take sufficient care of the environment.  
Avoid using or keeping, the foot switch in environments where corrosive gas, or silicon exists or in dusty environments. Do not immerse the foot switch in water.
8. Synthetic resins and chemical reaction  
Not only contact with organic solvents (benzene, toluene, phenol, cresol, carbon tetrachloride, acetone, etc.) including lubricating oil but also with other chemicals may cause cracks or deformation to the foot switch.