

General-purpose Basic Switch

A


CSM_A_DS_E_3_2

High-capacity Switch Capable of Handling 20 A Loads with Large Inrush Currents

- Same shape as OMRON Z Basic Switches except in pin plunger position, yet endures inrush currents as large as 75 A.



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

 Be sure to read *Safety Precautions* on page 5 and *Safety Precautions for All Basic Switches*.

Model Number Structure

Model Number Legend

A - 20 G □ - □
(1) (2) (3) (4)

(1) Ratings

20 : 20 A (250 VAC)

(2) Contact Gap

G : 0.5 m












(3) Actuator

- None : Pin plunger
- D : Short spring plunger
- Q : Panel mount plunger
- Q21 : Panel mount cross roller plunger
- Q22 : Panel mount roller plunger
- V : Hinge lever
- V2 : Hinge roller lever
- V21 : Short hinge lever
- V22 : Short hinge roller lever

(4) Terminals

- None : Solder terminal
- B : Screw terminal (with toothed washer)

Ordering Information

Actuator	Terminal	Solder terminal 	Screw terminal (-B) 
		Model	Model
Pin plunger		A-20G	A-20G-B
Short spring plunger		A-20GD	A-20GD-B
Panel mount plunger		A-20GQ	A-20GQ-B
Panel mount roller plunger		A-20GQ22	A-20GQ22-B
Panel mount cross roller plunger		---	A-20GQ21-B
Short hinge lever		A-20GV21	A-20GV21-B
Hinge lever		A-20GV	A-20GV-B
Short hinge roller lever		A-20GV22	A-20GV22-B
Hinge roller lever		A-20GV2	A-20GV2-B

Specifications

Ratings

Rated voltage (V)	Non-inductive load (A)				Inductive load (A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	20		7.5		20		12.5	
250 VAC	20		7.5		20		8.3	
500 VAC	15		4		10		2	
8 VDC	20	3	1.5		20		12.5	
14 VDC	20	3	1.5		15		12.5	
30 VDC	6	3	1.5		5		5	
125 VDC	0.5	0.5	0.5		0.05		0.05	
250 VDC	0.25	0.25	0.25		0.03		0.03	

- Note: 1. The above values are for steady-state current.
 2. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
 3. Lamp load has an inrush current of 10 times the steady-state current.
 4. Motor load has an inrush current of 6 times the steady-state current.
 5. The ratings values apply under the following test conditions:
 (1) Ambient temperature: 20±2°C
 (2) Ambient humidity: 65±5%RH
 (3) Operating frequency: 20 operations/min

Certified Standard Ratings

Ask your OMRON representative for information on certified models. **UL/CSA (General ratings only)**

Rated voltage	Model	A-20G
125 VAC		1 HP 10 A "L"
250 VAC		2 HP
480 VAC		20 A
125 VDC		0.5 A
250 VDC		0.25 A

Accessories - Terminal Covers, and Separators (Order Separately): Refer to Z/A/X/DZ Common Accessories.

Characteristics

Operating speed		0.01 mm to 1m/s *1
Operating frequency	Mechanical	240 operations/min
	Electrical	20 operations/min
Insulation resistance		100 M Ω min. (at 500 VDC)
Contact resistance		15 m Ω max. (initial value)
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity 2,000 VAC, 50/60 Hz for 1 min between the current-carrying metal parts and the ground, and between each terminal and non-current-carrying metal parts
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude *2
Shock resistance	Destruction	1,000 m/s ² max.
	Malfunction	300 m/s ² max. *1 *2
Durability	Mechanical	1,000,000 operations min.
	Electrical	500,000 operations min.
Degree of protection		IP00
Degree of protection against electric shock		Class I
Proof tracking index (PTI)		175
Ambient operating temperature		-25°C to 80°C (with no icing)
Ambient operating humidity		35% to 85%RH
Weight		Approx. 22 to 58 g

*1. The value is for the pin plunger. (Contact your OMRON representative for other models.)

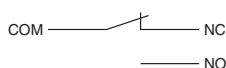
*2. Malfunction: 1 ms max.

Contact Specification

Contacts	Shape	Rivet
	Material	Silver alloy
	Gap (standard value)	0.5 mm
Inrush current	NC	75 A max.
	NO	75 A max.

Structure

Contact Form (SPDT)

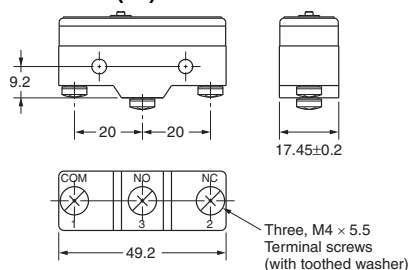


Dimensions

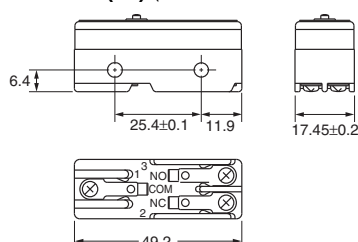
(Unit: mm)

Terminals

Screw Terminals (-B)



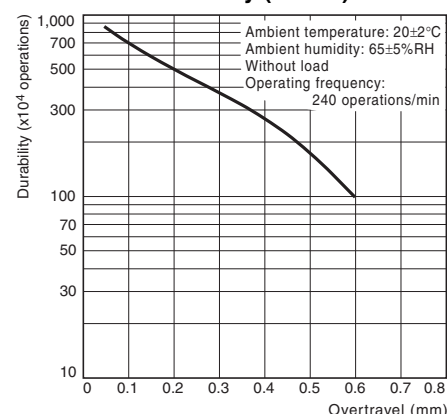
Solder Terminal (-A) ("A" is not included in the model numbers.)



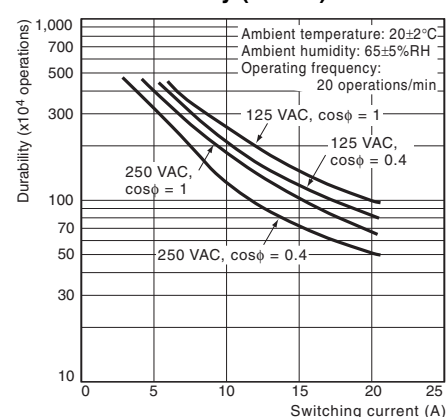
Note: 1. Appropriate terminal screw tightening torque: 0.78 to 1.18 N·m.
2. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

Engineering Data

Mechanical Durability (A-20G)

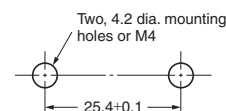


Electrical Durability (A-20G)



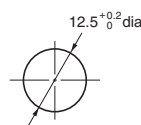
Mounting Holes

Use M4 mounting screws with plane washers or spring washers to securely mount the Switch. Tighten the screws to a torque of 1.18 to 1.47 N·m.

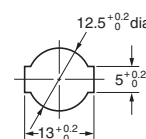


The Switch can be panel mounted, provided that the hexagonal nut of the actuator is tightened to a torque of 2.94 to 4.9 N·m.

Panel Mount Plunger



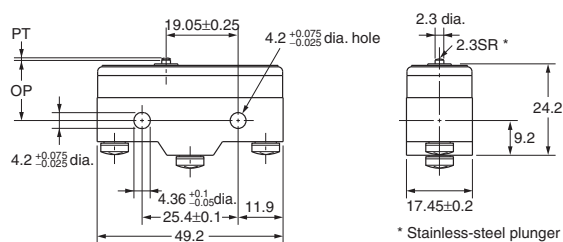
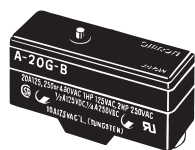
Panel Mount Roller Plunger



Dimensions and Operating Characteristics

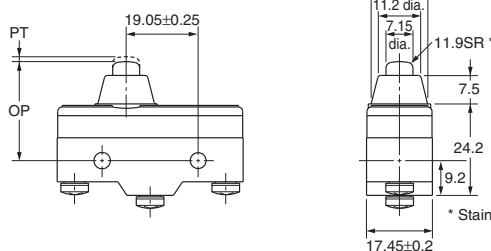
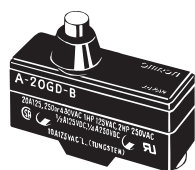
The models, illustrations, and graphics are for screw-terminal models. (The dimensions for models that are omitted here are the same as for pin-plunger models.)

Pin Plunger A-20G-B



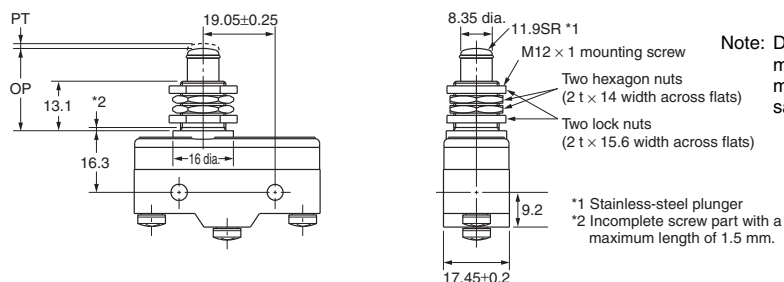
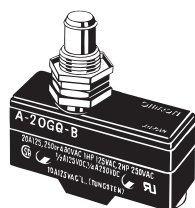
* Stainless-steel plunger

Short Spring Plunger A-20GD-B



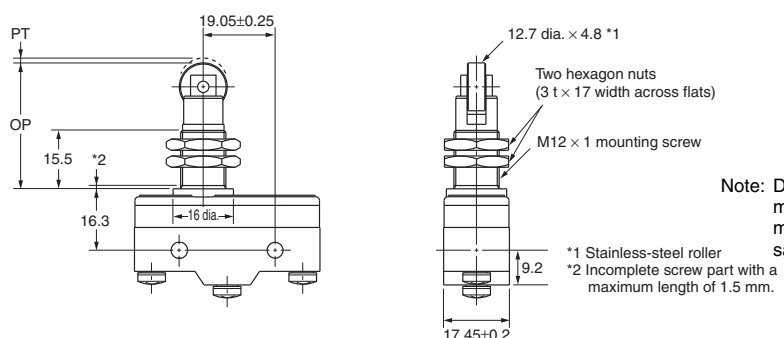
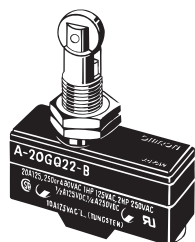
* Stainless-steel plunger

Panel Mount Plunger A-20GQ-B



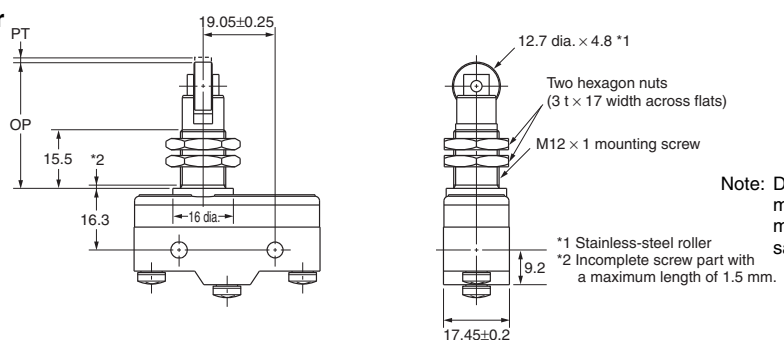
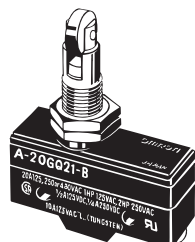
*1 Stainless-steel plunger
*2 Incomplete screw part with a maximum length of 1.5 mm.

Panel Mount Roller Plunger A-20GQ22-B



*1 Stainless-steel roller
*2 Incomplete screw part with a maximum length of 1.5 mm.

Panel Mount Cross Roller Plunger A-20GQ21-B

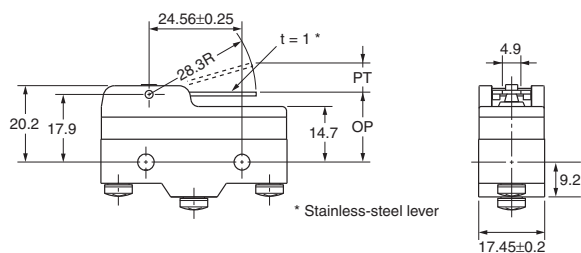
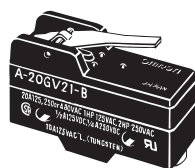


*1 Stainless-steel roller
*2 Incomplete screw part with a maximum length of 1.5 mm.

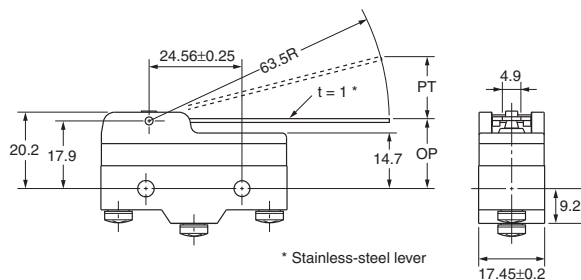
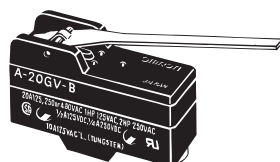
Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

Operating Characteristics	Model	A-20G-B	A-20GD-B	A-20GQ-B	A-20GQ22-B	A-20GQ21-B
Operating force	OF	3.92 to 6.13 N	3.92 to 6.13 N	3.92 to 6.13 N	6.18 N max.	6.18 N max.
Release force	RF min.	2.79 N	2.79 N	2.79 N	2.75 N	2.75 N
Pretravel	PT max.	1.3 mm	1.3 mm	1.3 mm	1.3 mm	1.3 mm
Over Travel	OT min.	0.25 mm	3 mm	5.6 mm	3.58 mm	3.58 mm
Movement differential	MD max.	0.2 mm	0.2 mm	0.2 mm	0.35 mm	0.35 mm
Operating Position	OP	16.3 ± 0.4 mm	26.2 ± 0.5 mm	21.8 ± 0.8 mm	33.4 ± 1.2 mm	33.4 ± 1.2 mm

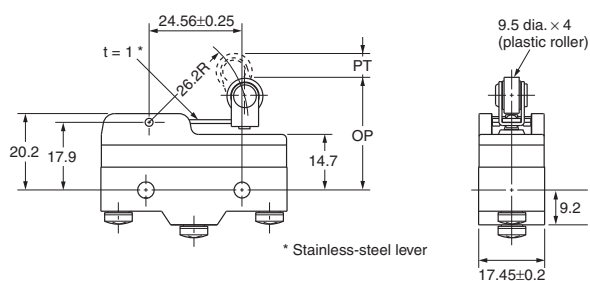
Short Hinge Lever A-20GV21-B



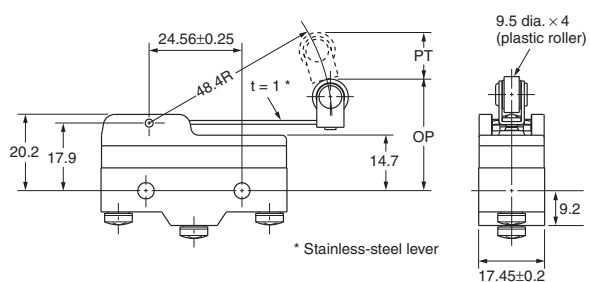
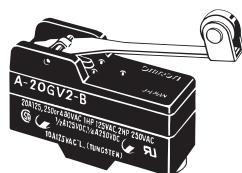
Hinge Lever A-20GV-B



Short Hinge Roller Lever A-20GV22-B



Hinge Roller Lever A-20GV2-B



Note: Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Operating Characteristics	Model	A-20GV21-B	A-20GV-B	A-20GV22-B	A-20GV2-B
OF max.		1.57 N	0.69 N	1.57 N	0.88 N
RF min.		0.41 N	0.14 N	0.41 N	0.14 N
PT max.		6.5 mm	15.9 mm	6.3 mm	12 mm
OT min.		1.2 mm	4 mm	1.2 mm	2.4 mm
MD max.		1.2 mm	2.4 mm	1.2 mm	2.2 mm
OP		19±0.8 mm	19±0.8 mm	29.8±0.8 mm	30.2±0.8 mm

Safety Precautions

Refer to *Safety Precautions for All Basic Switches*.

Precautions for Safe Use

Terminal Connection

When you wire a Switch, use a wire size that is suitable for the applied voltage and current flow. When soldering wires to the Switch, make sure that the capacity of the soldering iron is 60 W maximum and complete soldering within 5 s. If soldering is not performed correctly, heat may be abnormally generated when the Switch is used, which may cause burning. The characteristics of the Switch will deteriorate if a soldering iron with a capacity of more than 60 W is used or if heat is applied to the Switch for more than 5 s.

Operation

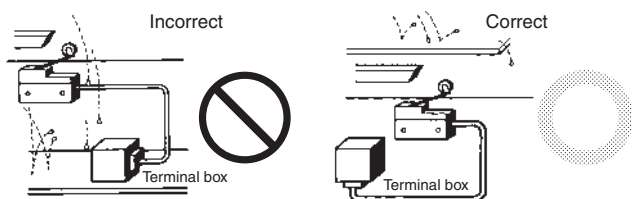
- Make sure that the switching frequency or speed is within the specified range.
 1. If the switching speed is extremely slow, the contact may not be switched smoothly, which may result in a contact failure or contact welding.
 2. If the switching speed is extremely fast, switching shock may damage the Switch soon. If the switching frequency is too high, the contact may not catch up with the speed.

The rated permissible switching speed and frequency indicate the switching reliability of the Switch.
The life of a Switch is determined at the specified switching speed. The life varies with the switching speed and frequency even when they are within the permissible ranges. In order to determine the life of a Switch model to be applied to a particular use, it is best to conduct an appropriate durability test on some samples of the model under actual conditions.
- Make sure that the actuator travel does not exceed the permissible OT position. The operating stroke must be set to 70% to 100% of the rated OT.

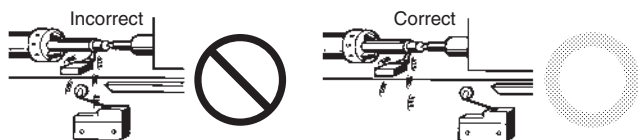
Precautions for Correct Use

Mounting Location

- Do not use the switch alone in atmospheres such as flammable or explosive gases. Arcing and heat generation associated with switching may cause fires or explosions.
- Switches are generally not constructed with resistance against water. Use a protective cover to prevent direct spraying if the switch is used in locations subject to splashing or spurting oil or water, dust adhering.

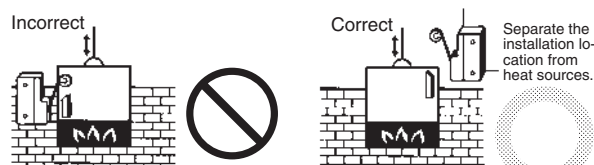


- Install the switch in a location that is not directly subject to debris and dust from cutting. The actuator and the switch body must be protected from accumulated cutting debris and dirt.



- Do not use the switch in locations subject to hot water (greater than 60°C) or in water vapor.
- Do not use the switch outside the specified temperature and atmospheric conditions.

The permissible ambient temperature depends on the model. (Refer to the specifications in this catalog.) Sudden thermal changes may cause thermal shock to distort the switch and result in faults.



- Mount a cover if the switch is to be installed in a location where worker inattention could result in incorrect operation or accidents.



- Subjecting the switch to continuous vibration or shock may result in contact failure or faulty operation due to abrasion powder and in reduced durability. Excessive vibration or shock will cause the contacts to operate malfunction or become damaged. Mount the switch in a location that is not subject to vibration or shock and in a direction that does not subject the switch to resonance.
- If silver contacts are used with relatively low frequency for a long time or are used with microloads, the sulfide coating produced on the contact surface will not be broken down and contact faults will result. Use a microload switch that uses gold contacts.
- Do not use the switch in atmospheres with high humidity or heat or in harmful gases, such as sulfide gas (H₂S, SO₂), ammonia gas (NH₃), nitric acid gas (HNO₃), or chlorine gas (Cl₂). Doing so may impair functionality, such as with damage due to contacting faults or corrosion.
- The switch includes contacts. If the switch is used in an atmosphere with silicon gas, arc energy may cause silicon oxide (SiO₂) to accumulate on the contacts and result in contact failure. If there is silicon oil, silicon filling, silicon wiring, or other silicon products in the vicinity of the switch, use a contact protection circuit to limit arcing and remove the source of the silicon gas.

Panel-mounting model (A-20G□)

- If a Switch is side-mounted with screws, remove the hexagonal nut of the actuator.
- If a Switch is side-mounted and secured with screws, make sure that the angle or speed of the actuating object is not excessively large or too high, otherwise the Switch may be damaged.
- If a Switch is panel-mounted, pay utmost attention to make sure that the actuating speed or OT distance is not excessively high or large. Not doing so may damage the Switch.

Accessories (Order Separately)

Refer to Z/A/X/DZ Common Accessories for details about Terminal Covers, Separators, and Actuators.

Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

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NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

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Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

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2015.9

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Industrial Automation Company

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