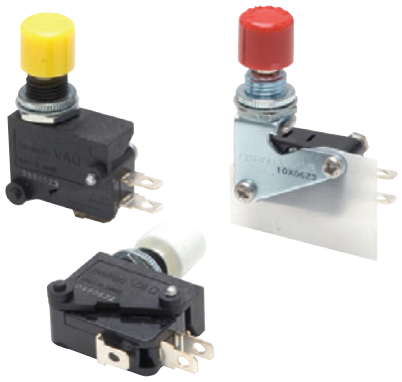
VAQ

CSM_VAQ_DS_E_4_1

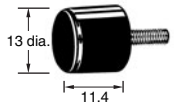
Built-in V-series Miniature Basic Switch for Compatibility with Business and Consumer Equipment

- Momentary operation and lock.
- Operation Unit available in six colors.
- Improved sense of touch with built-in miniature basic switch.



Refer to *Safety Precautions for All Pushbutton Switches* and *Safety Precautions* on page 4.

Ordering Information

Classification	Shape of Operation Unit	Output	Operation Unit color					
			Blue (-A)	Black (-B)	Green (-G)	Red (-R)	White (-W)	Yellow (-Y)
Momentary operation		1 *1	VAQ-4A-K	VAQ-4B-K	VAQ-4G-K	VAQ-4R-K	VAQ-4W-K	VAQ-4Y-K
		1 *2	VAQ-4A-L	VAQ-4B-L	VAQ-4G-L	VAQ-4R-L	VAQ-4W-L	VAQ-4Y-L
		2 *2	2VAQ-4A	2VAQ-4B	2VAQ-4G	2VAQ-4R	2VAQ-4W	2VAQ-4Y
Lock	*2	1 *2	VAQR-4A	VAQR-4B	VAQR-4G	VAQR-4R	VAQR-4W	—

*1. The Operation Unit can be inserted and removed.
*2. The Operation Unit is screwed in.

Specifications

Ratings

Item / Built-in Switch	Rated voltage (V)	Non-inductive load (A)		Inductive load (A)	
		Resistive load	Lamp load	Inductive load	Motor load
V-15-1A5	125 VAC	15	2	10	3
	250 VAC	15	2	10	3
	8 VDC	15	4	10	6
	30 VDC	10	4	10	4
	125 VDC	0.6	0.1	0.6	0.1
	250 VDC	0.3	0.05	0.3	0.05

Note: 1. The above values are for steady-state currents.
2. Inductive load: Power factor = 0.4 (AC); time constant = 7 ms (DC).
3. The lamp load has an inrush current of 10 times the steady-state current.
4. The motor load has an inrush current of 6 times the steady-state current.
5. The rated values above are for testing conducted under the following conditions.
(1) Ambient temperature: 20 ± 2°C.
(2) Ambient humidity: 65% ± 5%RH
(3) Operating frequency: 20 times/min.

Specifications

Characteristics

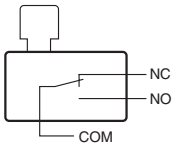
Operating frequency	**Mechanical**	120 operations/min
	Electrical	20 operations/min
Insulation resistance		100 MΩ min. (at 500 VDC)
Contact resistance		30 mΩ max. (initial value)
Dielectric strength	**Between terminals of same polarity**	1,000 VAC, 50/60 Hz for 1 minute
	Between current-carrying metal part and ground, and between each terminal and non-current-carrying metal part	1,500 VAC, 50/60 Hz for 1 minute
Vibration resistance	**Malfunction**	10 to 55 Hz, 1.5 mm double amplitude *
Shock resistance	**Destruction**	500 m/s²
	Malfunction	200 m/s² max. *
Durability	**Mechanical**	3,000,000 operations min.
	Electrical	100,000 operations min.
Weight		Approx. 12 to 40 g
Inrush current	**NC**	36 A max.
	NO	36 A max.
Ambient operating temperature		–25 to 80°C (with no icing or condensation)
Ambient operating humidity		35% to 85%RH
Ambient storage temperature		–25 to 80°C (with no icing or condensation)
Degree of protection		IP00
Electric shock protection class		Class II
PTI (proof tracking index)		175
Pollution degree		3 (IEC947-5-1)

* Malfunction within 1 ms

Operating Characteristics

Operating characteristics / Output		1	2
Operating force	**OF max.**	1.96 N	4.90 N
Releasing force	**RF min.**	0.39 N	0.78 N
Pretravel	**PT max.**	1.3 mm	1.6 mm

Contact Form

Name	Contact form
Double-throw contacts	

Approved Standard Ratings

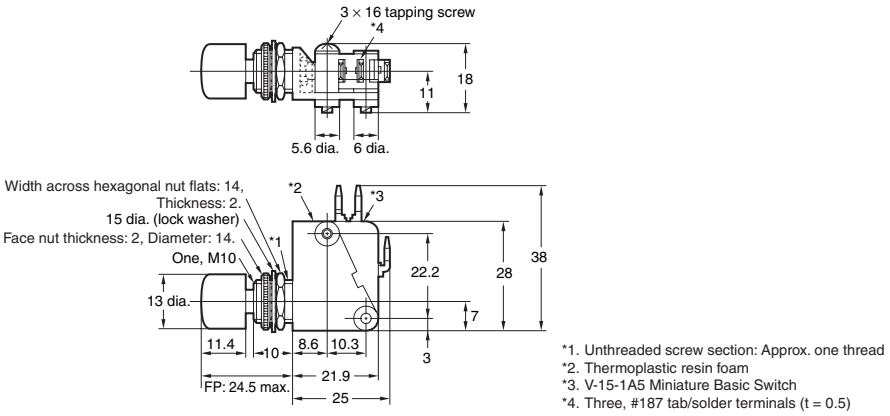
- The built-in V-15-1A5 Switch is approved for UL and CSA.

Dimensions

Insert one of the following letters into the box (□) in the model number. Refer to Ordering Information for color symbols.
(Unit: mm)

VAQ-4□-K

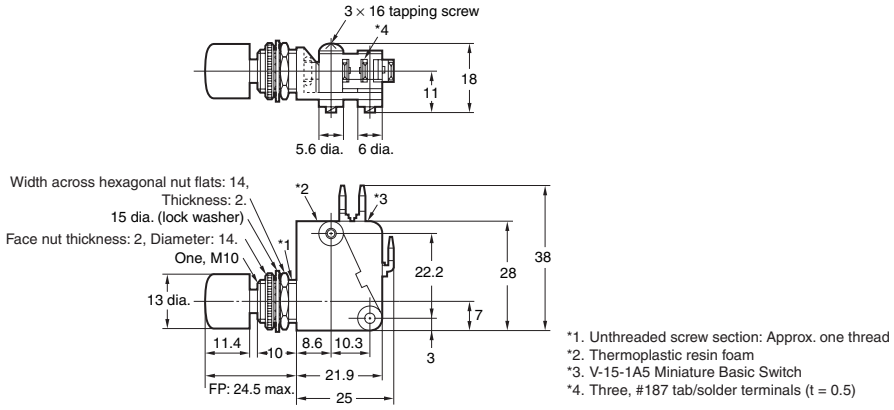
Note: The Operation Unit can be inserted and removed.



*1. Unthreaded screw section: Approx. one thread
*2. Thermoplastic resin foam
*3. V-15-1A5 Miniature Basic Switch
*4. Three, #187 tab/solder terminals (t = 0.5)

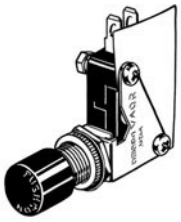
VAQ-4□-L

Note: The Operation Unit is mounted with M3 screws.

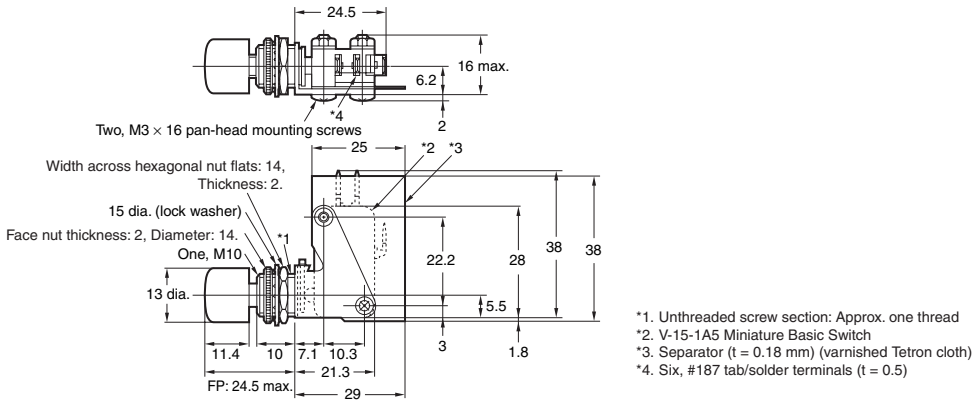


*1. Unthreaded screw section: Approx. one thread
*2. Thermoplastic resin foam
*3. V-15-1A5 Miniature Basic Switch
*4. Three, #187 tab/solder terminals (t = 0.5)

VAQR-4□

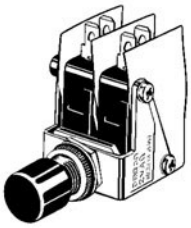


Note: The Operation Unit is mounted with M3 screws.

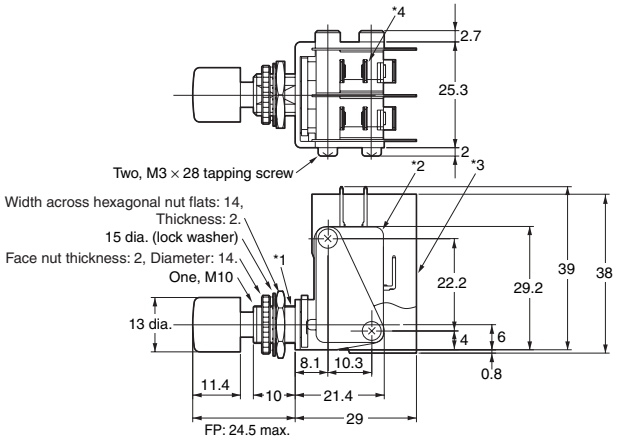


*1. Unthreaded screw section: Approx. one thread
*2. V-15-1A5 Miniature Basic Switch
*3. Separator (t = 0.18 mm) (varnished Tetron cloth)
*4. Six, #187 tab/solder terminals (t = 0.5)

2VAQ-4□



Note: The Operation Unit is mounted with M3 screws.



*1. Unthreaded screw section: Approx. one thread
*2. Two V-15-1A5 Miniature Basic Switches
*3. Separator (t = 0.18 mm) (varnished Tetron cloth)
*4. Six, #187 tab/solder terminals (t = 0.5)

Panel Cutout

(Unit: mm)

Note: Recommended panel thickness: 1 to 4 mm.

Safety Precautions

Refer to *Safety Precautions for All Pushbutton Switches*.

Precautions for Correct Use

Operation Unit Mounting

VAQ-4□-K

- The Operation Unit can be inserted and removed.
- Mounting can be performed by inserting the slit of the Operation Unit into the mounting screw of the Switch.
- Mounting force: 39.2 N max.
- Removing strength: 22.5 N min.

VAQ-4□-L

- The Operation Unit is screwed in.
- Mounting can be performed by inserting the M3 screw of the Operation Unit into the flange of the Switch.
- Tighten the Operation Unit to a torque of 0.20 to 0.39 N·m.

2VAQ-4□

VAQR-4□

- The Operation Unit is screwed in.
- Mounting can be performed by inserting the M3 screw of the Operation Unit into the metal flange of the Switch.
- Tighten the Operation Unit to a torque of 0.20 to 0.39 N·m.

Mounting

- Tighten the nut to a torque of 0.49 to 0.78 N·m.
- Do not perform wiring with power supplied to the Switch. Do not touch the terminals or other charged parts of the Switch while power is being supplied. Doing so may result in electric shock.
- After wiring the Switch, ensure an appropriate insulating distance.

Wiring

- Twist the conductors through the terminal holes before soldering. To perform soldering on solder terminals, use a soldering iron with a capacity of 60 W maximum and complete soldering within 5 seconds. Wait for one minute after soldering before exerting any external force on the solder.
- For connection with tab terminals, gently insert receptacles for #187 tabs in the terminal push-out direction.
  The Switch does not have a ground terminal.

Operation Unit Models

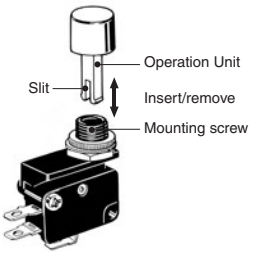
Method / Operation Unit color	Insert/remove	Screw-mounted
Blue (A)	VAQ-BA HEAD	VAQ-4A YO HEAD
Black (B)	VAQ-BB HEAD	VAQ-4B YO HEAD
Green (G)	VAQ-BG HEAD	VAQ-4G YO HEAD
Red (R)	VAQ-BR HEAD	VAQ-4R YO HEAD
White (W)	VAQ-BW HEAD	VAQ-4W YO HEAD
Yellow (Y)	VAQ-BY HEAD	VAQ-4Y YO HEAD

Panel Mounting and Operation Unit Mounting

Operation Unit Mounting

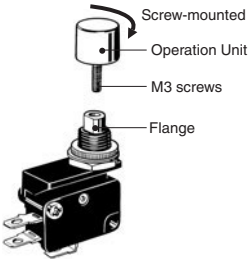
VAQ-4□-K

- The Operation Unit can be inserted and removed.
- Mounting can be performed by inserting the slit of the Operation Unit into the mounting screw of the Switch.
- Mounting force: 39.2 N max.
- Removing strength: 22.5 N min.



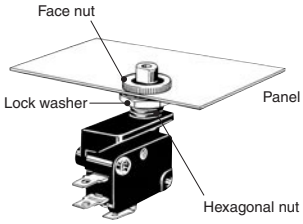
VAQ-4□-L, 2VAQ-4□, VAQR-4□

- The Operation Unit is screwed in.
- Mounting can be performed by inserting the M3 screw of the Operation Unit into the flange of the Switch.
- Tighten the Operation Unit to a torque of 0.20 to 0.39 N·m.



Panel Mounting

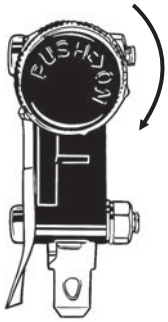
Tighten the hexagonal nut using a wrench while securing the Switch by holding it with your fingers.
(Hexagonal nut tightening torque: 0.98 N·m)



Locking Method

VAQR-□□

- To turn ON the lock, press the Operation Unit and turn it clockwise as indicated at the top of the Operation Unit.
- To release the lock, turn the Operation Unit counterclockwise.



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.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

ERRORS AND OMISSIONS

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

2010.10

In the interest of product improvement, specifications are subject to change without notice.

OMRON Corporation
Industrial Automation Company

http://www.ia.omron.com/