PRODUCT SPECIFICATIONS	Description : Miniature Basic Switch
	Part number : V-15−9A5

1. Safety Standard

1.1 Approved standard —

1.2 File No. —

2. Structure

2.1 Outline drawing No. 9463894-6

2.2 Mechanism Snap action

2.3 Contact form Single pole single throw (SPST) COM-NO

2.4 Protective structure IP40 Conforming to *IEC standard

2.5 Terminal Solder / #187 quick-connect terminals

*IEC : International Electrotechnical Commission

3. Mechanical Characteristics

3.1 Operating characteristics (Initial value)

	Item	Abbr.	Unit	Specification value	
1	Operating force	OF	N	Max.	1. 96
2	Releasing force	RF	N	Min.	0. 49
3	Pretravel	PT	mm	Max.	1. 2
4	Overtravel	OT	mm	Min.	1. 0
5	Movement differential	MD	mm	Max.	0. 4
6	Operating position	OP	mm		14. 7±0. 4

3.2 Malfunction vibration

Open contact duration shall be 1msec. max. when the following vibration is applied;

Amplitude : 1.5mm

Frequency : 10 to 55Hz

Cycle : 3 to 5 minutes

Direction : X, Y and Z axis

Time : 10 minute per axis

3.3 Vibration durability

No electrical or mechanical defect after the following vibration is applied;

Amplitude : 1.5mm

Frequency : 10 to 55Hz

Cycle : 3 to 5 minutes

Direction : X, Y and Z axis

Time : 2 hours per axis

3.4 Malfunction shock

Open contact duration shall be 1msec. max. when the following shock is applied;

Shock : Max. 300m/s^2

Direction : X, Y and Z axis

Time : 3 times per axis

3.5 Shock durability

No electrical or mechanical defect after the following shock is applied;

Shock : Max. 1000m/s^2

Direction : X, Y and Z axis

Time : 3 times per axis

Condition common to Section 3.2 and 3.4

Applied voltage : 5VDC

Applied current : 100mA

Actuator position : Total travel position

(detected by oscilloscope)

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Condition common to Section 3.2 and 3.4

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Applied current : 100mA

Actuator position : Total travel position

(detected by oscilloscope)

3.6 Actuator strength

No electrical or mechanical defect when the following force is applied to the actuator;
Direction : Actuator operation direction
Force : 10 times of the specified operating force (OF) 19.6N
Time : 1 minute

3.7 Terminal strength

Solder terminal : No electrical or mechanical defect when the force of 23N is applied in the pulling direction for 1 minute.
Quick-connect terminal : No electrical or mechanical defect when the force of 80N is applied in the inserting or pulling-out direction for 1 minute.

＊The strength against the force of twisting or bending shall not be specified.

3.8 Permissible operating frequency

Electrical : 60 operations/minute max. Mechanical : 600 operations/minute max.

3.9 Permissible operating speed

0.1 to 1000mm/second

4. Electrical Characteristics

4.1 Ratings

125VAC 15A , 250VAC 15A , Resistive load
125VDC 0.6A , 250VDC 0.3A , Resistive load

4.2 Switching capacity per load (Reference value)

Items / Rated Voltages(V)		Non-Inductive load(A)				Inductive load(A)			
		Resistive load		Lamp load		Inductive load		Motor load	
		N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.
AC	125	---	15	---	3	---	10	---	3
	250	---	15	---	2	---	10	---	3
DC	8	---	15	---	4	---	10	---	6
	30	---	10	---	4	---	10	---	4
	125	---	0.6	---	0.1	---	0.6	---	0.1
	250	---	0.3	---	0.05	---	0.3	---	0.05

＊Lamp load : A load having an inrush current 10 times the steady-state current
＊Inductive load : A load having a minimum power factor of 0.4(AC) or a maximum time constant of 7ms (DC)
＊Motor load : A load having an inrush current 6 times the steady-state current

4.3 Minimum permissible load

5VDC 160mA The failure rate shall be N standard (reference value) at resistive load.
(N standard : Failure rate at 60% reliability level $\lambda^{60} = 0.5 \times 10^{-6}$/operation, Criterion for contact resistance : 5Ω)

4.4 Over-load current

Capable of switching the current 1.25 times the rated current (250VAC 18.75A, Inductive load) by 50 operations at the operating frequency of 10 operations/minute.

4.5 Temperature rise

The temperature rise at terminal shall be 30°C max. when 15A is applied after switching 250VAC 15A Inductive load by 6000 operations. (The switch shall be at total travel position.)

4.6 Permissible Inrush current

Normally opened (N.O.) : 36A MAX.
Normally closed (N.C.) : --A MAX.
(100VAC 50/60Hz by an electric bulb with tungsten filament.)

4.7 Contact resistance (at total travel position TTP)

Initial value 15mΩ max. at 6VDC 1A by voltage drop method

4.8 Insulation resistance, Dielectric strength

Item / Measuring part	Insulation resistance (500VDC megger)	Dielectric strength (50/60Hz for 1 minute)	Remark
Between terminals of the same polarity	100MΩ Min.	1000V	
Between each terminal and ground	100MΩ Min.	1500V	Using a separator
Between terminals and non charged metal part	100MΩ Min.	1500V	

4.9 Degree of protection against electric shock
Class I (protecting by ground in addition to basic insulation for shock prevention)
4.10 Proof tracking index (PTI)
175 level (Classification according to UL Yellow Book : PLC level 3 175≦CTI＜250)

5. Environmental Characteristics

5.1 Heat resistance
No electrical or mechanical defect at the standard test condition after leaving at room temperature and humidity for about 1 hour, after soaking under the ambience of 80±2℃ for 96 hours.
5.2 Cold resistance
No electrical or mechanical defect at the standard test condition after leaving at room temperature and humidity for about 1 hour, after soaking under the ambience of −25±2℃ for 96 hours.
There shall be no icing at a lower temperature range.
5.3 Humidity resistance
No electrical or mechanical defect at the standard test condition after leaving at room temperature and humidity for about 1 hour, after soaking under the ambience of 40±2℃ and 90 to 95%RH for 96 hours.
5.4 Temperature cycle resistance
No electrical or mechanical defect at the standard test condition after 1 cycles of −40±2℃ to 85±2℃ soaking (48 hours at each temperature)

6. Usage Environment

6.1 Ambient operating temperature
−25 to +80℃ (at ambient humidity of 60%RH Max.) with no dewing or icing
6.2 Ambient operating humidity
85%RH Max. (at +5 to +35℃)

7. Durability

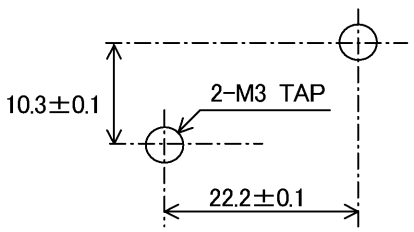
7.1 Electrical durability
No electrical or mechanical defect at the standard test condition when switching the rated load by 100,000 operations at the operating frequency of 30 operations/minute at the full stroke.
The contact resistance shall be 2Ω max. and the dielectric strength between terminals of the same polarity shall be excluded.
7.2 Mechanical durability
No electrical or mechanical defect at the standard test condition when switching by 50,000,000 operations at the operating frequency of 60 operations/minute at the stroke of the specified OT value.
The contact resistance shall not be defined.

8. Standard Test Condition and Criteria

8.1 Standard test condition
Temperature : 20±15℃ Humidity : 65±20%RH
8.2 Definition of "No electrical or mechanical defect"
Operating characteristics : Not exceeding ±20% of the specification value
Contact resistance : 4 times the initial specification value Max.
Insulation resistance : 10MΩ Min.
Dielectric strength : Meeting the specification value

9. Precautions

9.1 Switch mounting
・Using M3 mounting screws with plane washers or spring washers to secure a tight mounting.
Tightening the screws with the torque of 0.39 to 0.59N・m.
・Referring to the figure on the right for mounting-hole processing drawing.



9.2 Stroke setting for switch

・Setting an operating dog in the direction where the actuator moves and detaching the dog from the actuator completely when the switch is at the free position (FP).

・60 to 90% of the overtarvel (OT) is appropriate for the switch stroke setting.

・Avoiding an impact operation as much as possible as it can cause life deterioration.

9.3 Insulation and wiring in switch mounting

・Paying attention to creepage distance/clearance distance for insulation after wiring onto terminal when a mounting frame is made of metal.

・Using an appropriate separator when a sufficient insulation distance is not secured in wiring onto terminal.

9.4 Wiring for switch

・The rough standard for soldering work is as follows;

Capacity of soldering iron : 60W (250 to 350°C at the iron tip)

Soldering time : 5 seconds Max.

Not applying any external force for 1 minute after soldering.

・Applying only the minimum required amount of flux. It can cause a contact failure if flux enters the switch.

・Using a receptacle for #187 in connecting the quick-connect terminal and inserting it straight into the terminal. It can cause terminal deformation and housing damage if an excessive external force is applied to the terminal in the horizontal or vertical direction.

9.5 Usage/storage environment for switch

・Avoiding the location where a corrosive gas is generated or temperature changes suddenly, the ambience of high temperature or humidity, dusts and others.

・It is recommended that the switch should be inspected before use if it is stored for 3 to 6 months after the production, depending on the location.

10. Warranty

10.1 Content

(1) Warranty period

The warranty period for an OMRON product is one year from either the date of purchase or the date on which the OMRON product is delivered to the specified location.

(2) Extent of warranty

If an OMRON product is subject to a failure for which OMRON is responsible during the warranty period, either a replacement product will be provided or the defective product will be repaired free of charge at the place of purchase. This warranty, however, will not cover the problems that occur as a result of any of the following;

1) Using the OMRON product under conditions or in an environment not described in catalogs or in the specifications, or not operating the OMRON product according to the instructions contained in catalogs or in the specifications

2) Problem caused by something other than the OMRON product.

3) Modifications or repairs performed by a party other than OMRON.

4) Using the OMRON product for other than its designed purpose.

5) Problems that could not have been foreseen with the level of science and technology that existed at the time the OMRON product was shipped.

6) Problems caused by an Act of God or other circumstances for which OMRON is not responsible.

This warranty covers only the OMRON product itself. It does not cover any other damages that may occur directly or indirectly as a result of a problem with the OMRON product.

10.2 Limitations of liability

OMRON shall not be responsible for special, indirect, or consequential damages originating in an OMRON product.

10.3 Applicable conditions

(1) When using OMRON products in combination with other products, it is the user's responsibility to confirm compliance with all applicable standards and regulations. It is also the user's responsibility to confirm the suitability of the OMRON products for the system, devices, and equipment that are being used. OMRON accepts no responsibility for the suitability of OMRON products used in combination with other products.

(2) When using OMRON products in any of the following applications, consult an OMRON representative and check specifications to allow sufficient leeway in ratings and performance, and to implement suitable safety measures, such as safety circuits, to minimize danger in the event of an accident.

1) Outdoor applications, applications with potential for chemical contamination or electrical interference, or application under conditions or environments not described in catalogs.

2) Nuclear control systems, railroad systems, aviation systems, combustion systems, medical equipment, amusement machines, or equipment regulated by government or industrial standards.

3) Other systems, machines, and equipment that may have a serious influence on human life and property.
4) Equipment requiring a high level of reliability, such as gas, water, or electrical supply systems, and systems that operate 24 hours a day.
5) Other applications requiring a high level of safety, corresponding to items 1) to 4), above.

(3) When OMRON products are used in an application that could pose significant risk to human life or property, the overall system must be designed so that the required safety can be ensured by providing notice of the danger and incorporating redundancy into the design. Make sure that OMRON products are appropriately wired and mounted to serve their intended purpose in the overall system.

(4) Application examples provided in catalogs are for reference only. Confirm functionality and safety before actually using the devices and equipment.

(5) To prevent unexpected problems from arising due to the OMRON product being used incorrectly by the customer or any other party, make sure that you understand and carefully observe all of the relevant prohibitions and precautions.

(6) Each rating and performance value given in catalogs etc. is the value in an independent examination, and does not guarantee simultaneously the compound conditions of each rating and performance value.

(7) Do not use the OMRON Product for automotive applications (including two-wheeled motor vehicle.) .
Please consult with your OMRON representative if the OMRON Product is used in the automotive applications.

10.4 Changes of specifications

Specifications and accessories to the products in catalogs may be changed as needed to improve the products or for any other reason. Check with your OMRON representative for the actual specifications for OMRON products at the time purchase.

10.5 Treatment of the specifications for reference

When these specifications are issued for reference, please consult with your OMRON representative before actually using the specifications and confirm the latest specifications for the OMRON product.

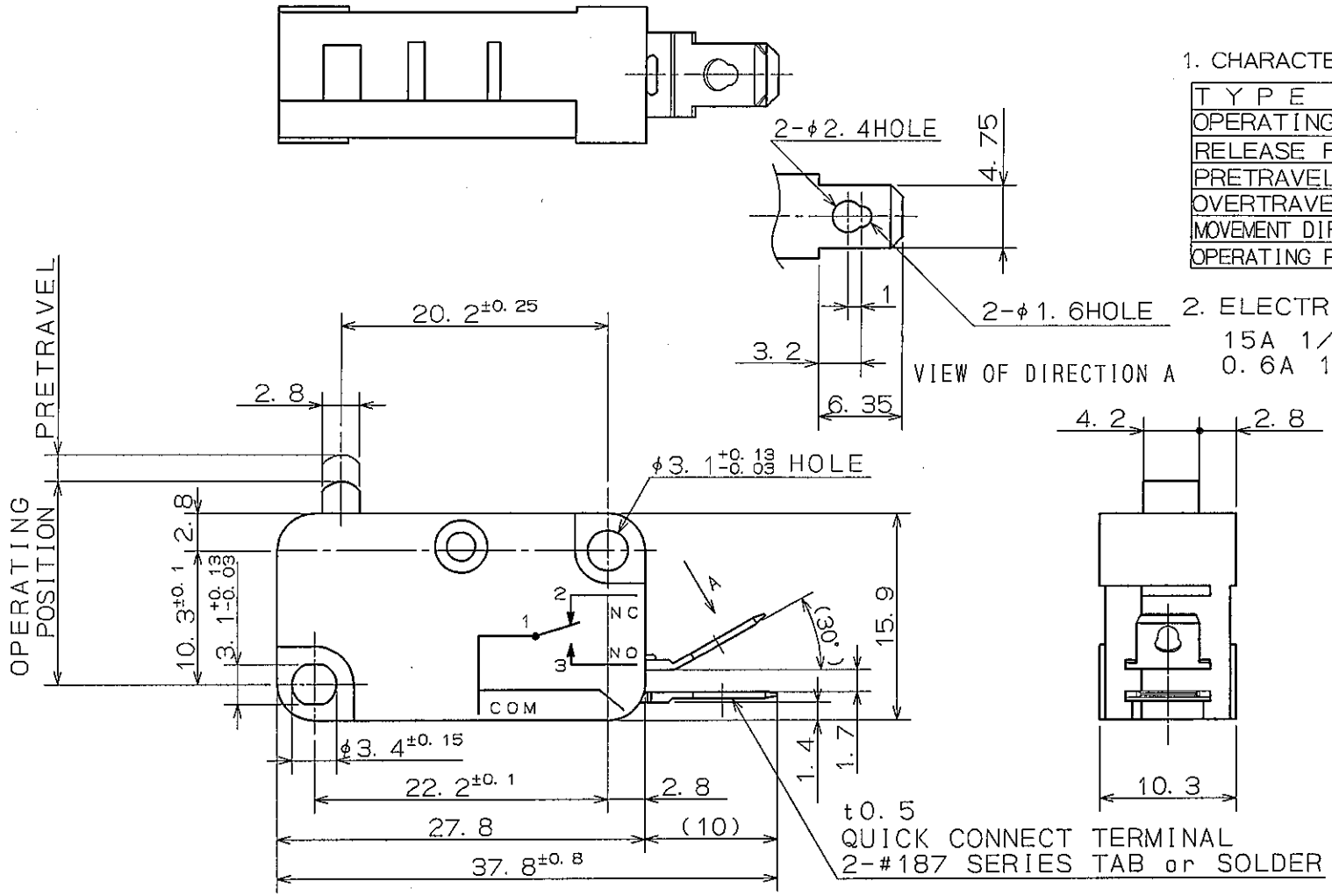
10.6 Extent of service

The price of an OMRON product does not include service costs, such as dispatching technical staff. If you wish for service, please consult with your OMRON representative.

10.7 Effective term

These specifications will be invalid when there is not return or an order for one year from the date of issue.

A	07.03.26	Newly prepared	M.Takahama		H.Yamada
Code	Date	Revision content	Issue	Check	Approval



1. CHARACTERISTICS

TYPE	
OPERATING FORCE	1.96N MAX
RELEASE FORCE	0.49N MIN
PRETRAVEL	1.2 mmMAX
OVERTRAVEL	1.0 mmMIN
MOVEMENT DIFFERENTIAL	0.4 mmMAX
OPERATING POSITION	14.7±0.4 mm

2. ELECTRICAL RATINGS

15A 1/2HP 125,250V AC
0.6A 125V DC 0.3A 250V DC

SYM	DATE	E/C CONTENTS	E/C NO.	SIGN

MATERIAL
FINISH
TOLERANCES UNLESS SPECIFIED ±0.4 mm
DESIGNED MAR. 26' 07 M. TAKAHAMA
CHECKED
APPROVED Mar. 26'07 H. Yamada
SCALE 2:1
3RD ANGLE
SHEET /

TYPE V-15-9A5
MINIATURE BASIC SWITCH
OUTLINE DRAWING

DRWG NO. 9463894-6 A
DESIGNED FOR

OMRON