

Small Limit Switch D4V

Compact Vertical Models Sized for Asian Standards

- Compact new design approximately 1/3 the size of OMRON vertical Limit Switches.
- Structure enables the terminal section to be fully opened for easy wiring.
- RoHS compliant.
- Degree of protection: IP65



Model Number Structure

Model Number Legend









D4V-81□□Z
1

1. Actuator type

- | | |
|-----------------------------|-------------------------|
| 04: Roller lever | 12: Roller plunger |
| 07: Rod lever | 22: Crossroller plunger |
| 08: Adjustable roller lever | 66: Coil spring |
| 11: Push plunger | 69: Wire spring |

Ordering Information

List of Models

Actuator type	Model
Roller lever 	D4V-8104Z
Rod lever 	D4V-8107Z
Adjustable roller lever 	D4V-8108Z
Push plunger 	D4V-8111Z
Roller plunger 	D4V-8112Z
Crossroller plunger 	D4V-8122Z
Coil spring 	D4V-8166Z
Wire spring 	D4V-8169Z

Note: Metallic roller levers and metallic variable roller levers can also be manufactured.

Specifications

■ Certified Standards

Certification body	Standard	File No.
CCC	GB14048.5	Consult your OMRON representative for details.
UL (See note.)	UL508, CSA C22.2 No. 14	
TÜV	IEC60947-5-1	

Note: Certification equivalent to CSA C22.2 No. 14 has been obtained from UL.

■ 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	5		1.5	0.7	3		2	1
250 VAC	5		1	0.5	3		1.5	0.8
12 VDC	5		3		4		3	
24 VDC	5		3		4		3	
125 VDC	0.4	0.2	---		---		---	
250 VDC	0.4	0.2	---		---		---	

- Note:**
- The above current ratings are for steady-state current.
 - Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
 - Lamp load has an inrush current of 10 times the steady-state current.
 - Motor load has an inrush current of 6 times the steady-state current.

Inrush current	NC	24 A max.
	NO	12 A max.

■ Ratings for Safety Standard Certification

CCC (GB14048.5), TÜV (EN60947-5-1)

Category and rating
AC-12: 250 VAC at 5 A, resistive load DC-12: 125 VDC at 0.4 A, resistive load

UL (UL508, CSA C22.2 No. 14)

Ratings
5 A, 250 VAC 0.4 A, 125 VDC

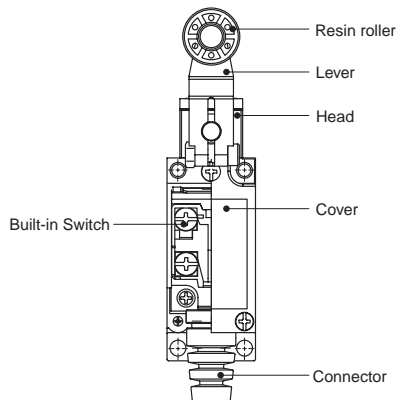
■ Characteristics

Degree of protection		IP65
Durability (See note 3.)	Mechanical	10,000,000 operations min.
	Electrical	300,000 operations min. (5 A at 250 VAC, resistive load)
Operating speed		5 mm to 0.5 m/s
Operating frequency	Mechanical	120 operations/min
	Electrical	30 operations/min
Insulation resistance		100 MΩ min. (at 500 VDC)
Contact resistance		25 mΩ max. (initial value)
Dielectric strength	Between terminals of the same polarity	1,000 VAC, 50/60 Hz for 1 min
	Between current-carrying metal parts and ground	1,500 VAC, 50/60 Hz for 1 min
Rated insulation voltage (Ui)		250 V
Pollution degree (application environment)		3 (EN 60947-5-1)
Short-circuit protection device		10-A fuse, gG or gI (IEC 269)
Conditional short-circuit current		100 A (EN 60947-5-1)
Rated open thermal current (Ith)		5 A (EN 60947-5-1)
Electric shock protection class		Class I
Rated frequency		50/60 Hz
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude (See note 4.)
	Destruction	1,000 m/s ² (free position) min.
Shock resistance	Malfunction	300 m/s ² (operation limit position) min. (See note 4.)
	Destruction	1,000 m/s ² (free position) min.
Ambient operating temperature range		-20°C to 60°C (with no icing)
Ambient operating humidity range		90% max.
Weight		Approx. 130 to 190 g

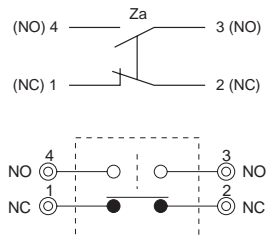
- Note:**
- The above values are initial values.
 - The above characteristics may vary depending on the model. Contact your OMRON representative for further details.
 - Durability values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%.
 - Except for the coil spring model and wire spring model

Nomenclature

■ Structure



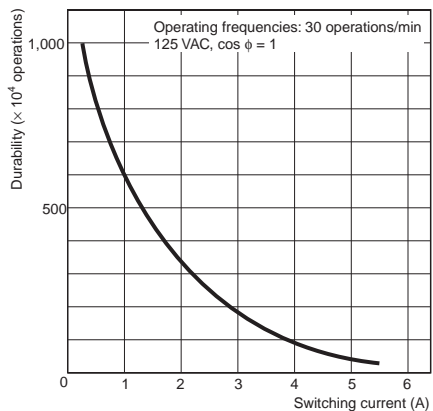
■ Contact Form



Engineering Data

Electrical Durability: $\cos \phi = 1$

(Ambient temperature: 5°C to 35°C; ambient humidity: 40% to 70%)

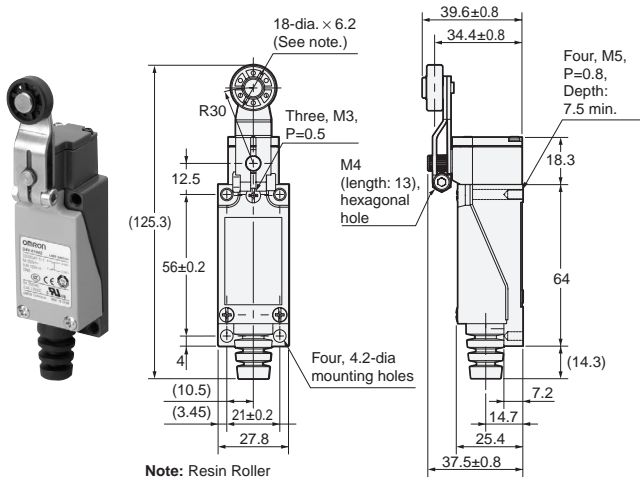


Dimensions

Note: All units are in millimeters unless otherwise indicated.

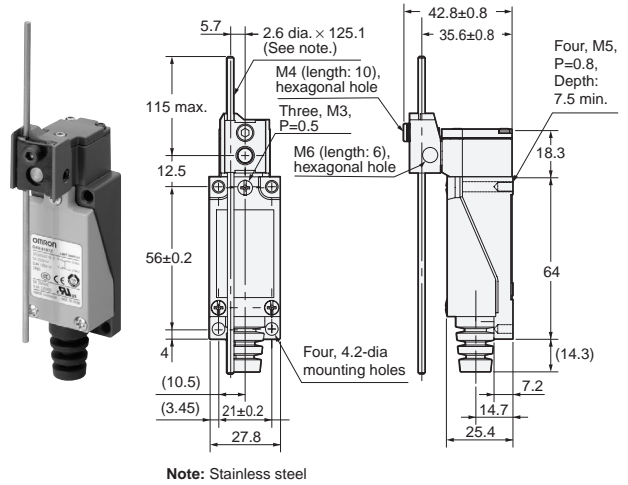
Roller Lever

D4V-8104Z



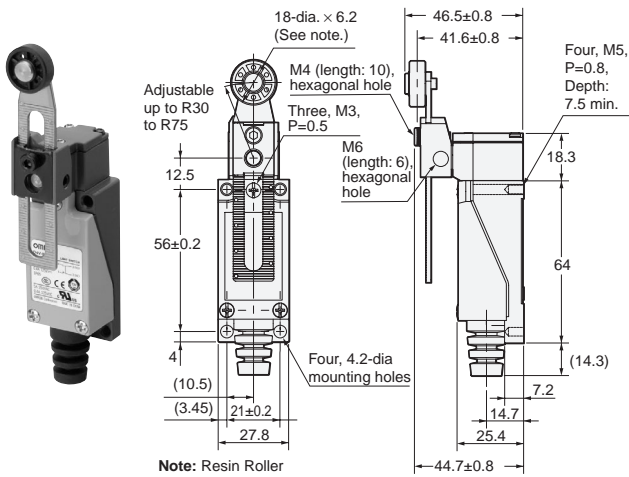
Rod Lever

D4V-8107Z



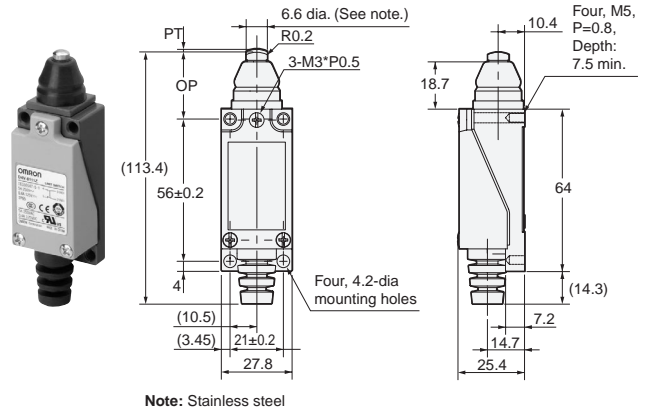
Adjustable Roller Lever

D4V-8108Z



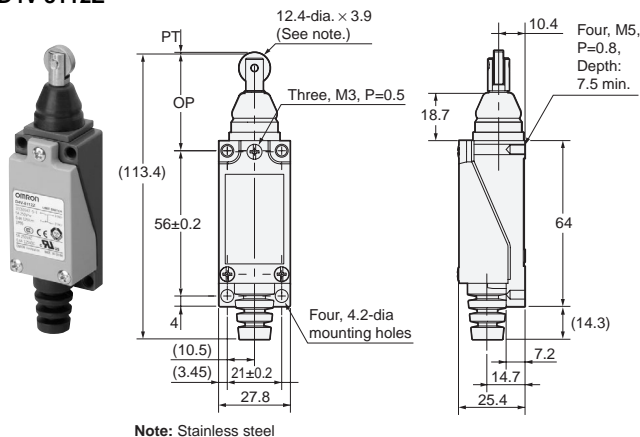
Push Plunger

D4V-8111Z



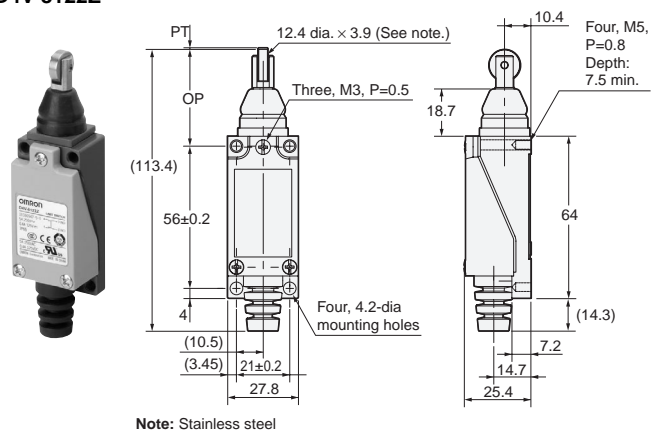
Roller Plunger

D4V-8112Z



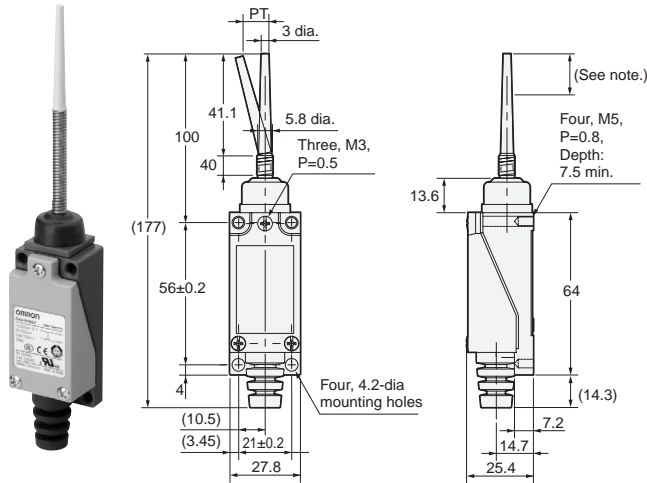
Crossroller Plunger

D4V-8122Z



Coil Spring

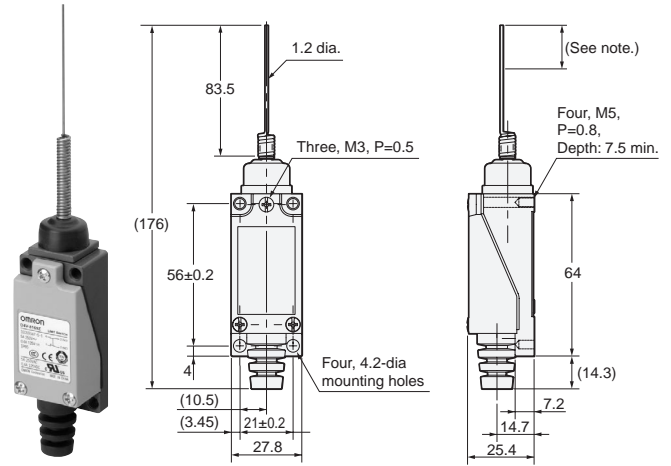
D4V-8166Z



Note: The range for operation is between the tip of the rod and 1/3 of the length of the actuator.

Wire Spring

D4V-8169Z



Note: The range for operation is between the tip of the rod and 1/3 of the length of the actuator.

Note: Unless otherwise specified, the tolerances are ± 0.4 mm for the above dimensions for each model.

Operating Characteristics

Operating characteristics	Model	D4V-8104Z	D4V-8107Z	D4V-8108Z	D4V-8111Z	D4V-8112Z	D4V-8122Z	D4V-8166Z	D4V-8169Z
Operating force	OF max.	5.88 N	5.88 N	7.84 N	9.8 N	9.8 N	9.8 N	0.88 N	0.88 N
Release force	RF min.	0.49 N	0.69 N	0.49 N	2.94 N	2.94 N	2.94 N	---	---
Pretravel	PT max.	20°	20°	20°	1.5 mm	1.5 mm	1.5 mm	30 mm	30 mm
Overtravel	OT min.	75°	75°	75°	4 mm	4 mm	4 mm	---	---
Movement differential	MD max.	10°	10°	10°	1.2 mm	1.2 mm	1.2 mm	---	---
Total travel	TT min.	95°	95°	95°	5.5 mm	5.5 mm	5.5 mm	---	---
Operating position	OP	---	---	---	26±0.8 mm	37±0.8 mm	37±0.8 mm	---	---

Note: The operating characteristics of the D4V-8107 are measured with a lever length of 30 mm. The operating characteristics of the D4V-8108 are measured with a lever length of R30.

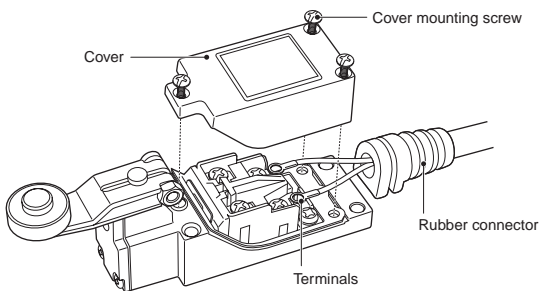
Precautions

■ Precautions for Correct Use

Wiring

Wiring Procedure

1. Loosen the cover mounting screws and remove the cover.
2. Run the wiring through the rubber connector on the cover and then press-fit the solderless terminals. (The following solderless terminals are available.)
3. After inserting the solderless terminal into the Switch, tighten the terminal screws securely.
4. Mount the cover. (Make sure that the rubber connector is securely pressed into the cover slot.)
5. Tighten the three screws evenly. (The optimum tightening torque for each screw is 0.49 to 0.59 N·m.)



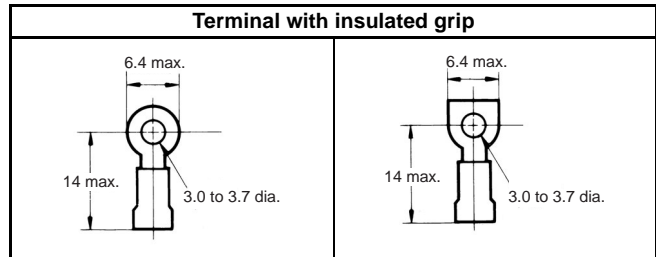
Applicable Lead Wires

Wire name	Applicable wire		
	Number of conductors	Conductor size	Finished outside diameter
Vinyl cabtire cord (VCTF)	2 conductors 3 conductors 4 conductors	0.75 mm ²	Round, 6 to 9 dia.
Vinyl cabtire cable (VCT)	2 conductors	0.75 mm ²	
600-V vinyl-insulated sheath cable (VVF)	2 conductors	1 dia., 1.2 dia., 1.6 dia.	

Note: Do not use wires containing silicone, otherwise a contact failure may result.

Applicable Terminals

The following solderless terminals can be used. (Do not use fork or any other type of terminals, otherwise an accidental disconnection resulting in a ground fault may result.)

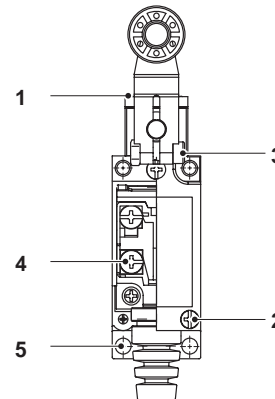


Appropriate Tightening Torque

If screws are too loose, they can lead to an early malfunction of the Switch, so ensure that all screws are tightened using the correct torque.

No.	Type	Appropriate tightening torque
1	Head mounting screw	0.49 to 0.59 N·m
2	Cover mounting screw	0.49 to 0.59 N·m
3	Lever mounting screw	2.45 to 2.94 N·m
4	Terminal screw (M3)	0.49 to 0.59 N·m
5	Switch mounting screw (M4 Allen-head bolt)	2.45 to 2.94 N·m

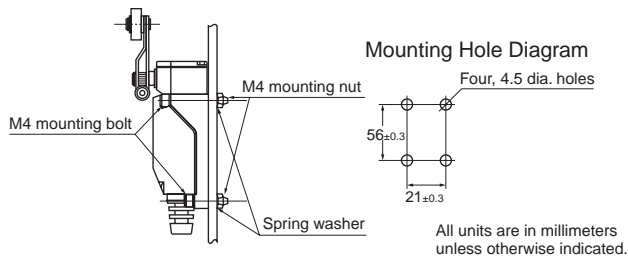
Note: In particular, when changing the direction of the Head, make sure that all screws are tightened again to the correct torque. Be careful not to allow any foreign substance to enter the Switch.



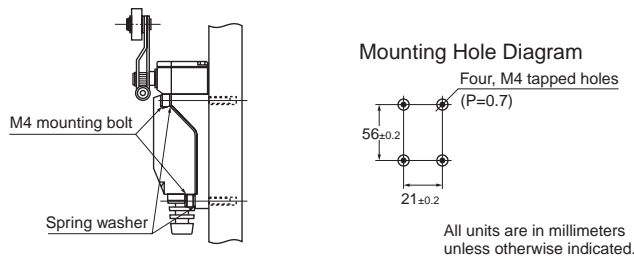
Mounting

1. Front Surface Mounting

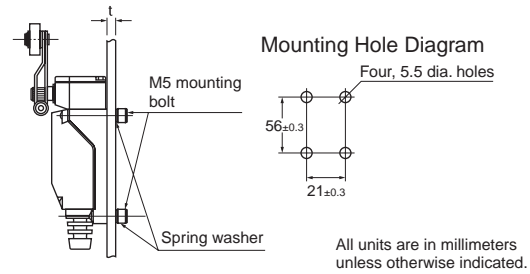
1. Through-hole Panel Mounting



2. Tap Panel Mounting



2. Rear Surface Mounting



Note: The tap screws for the body are M5, P=0.8, with a minimum depth of 7.5 mm. Use bolts with a length of the panel thickness $t + 7$ mm or less.

Others

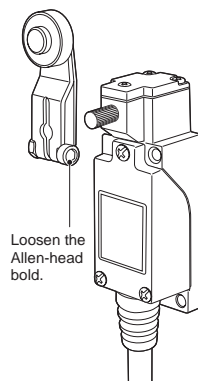
- Do not use the Limit Switch outdoors, otherwise the Limit Switch will be damaged by rust or ozone.
- The Limit Switch is not suitable in places exposed to the spray of rainwater, seawater, or oily water. Contact your OMRON representative if such specifications are required.
- If high-sealing performance is required along with shielded wiring or conduit wiring, use the D4C or WL.

Using the Switch

Changing the Actuator Mounting Position

(D4V-8104Z, D4V-8108Z, D4V-8107Z)

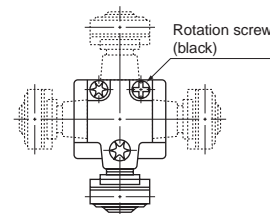
By loosening the Allen-head bolt on the actuator lever, the position of the actuator can be set anywhere within the 360°.



Changing the Head Direction

(D4V-8104Z, D4V-8107Z, D4V-8108Z)

By loosening one screw (black) at a time, the head can be changed at 90° increments in any of the four directions.



Operation

- Operate the coil spring and wire spring models between the tip of the actuator and 1/3 the length of the actuator and parallel to the direction of operation.
- Handling the bottom of the actuator or excessively pushing in the tip may lead to bending damage, deformation, malfunction, and deterioration of service life.
- Contact bouncing, chattering, or telegraphing may occur. Take steps so that incorrect signals are not detected on the circuit side if doing so will cause problems with the application.

Note: Telegraphing refers to the phenomenon of the actuator being used and bouncing back after the operating body has passed, and moving to the operation point on the opposite side, which causes the contact to operate.

READ AND UNDERSTAND THIS DOCUMENT

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

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 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.

SUITABILITY FOR USE

THE PRODUCTS CONTAINED IN THIS DOCUMENT ARE NOT SAFETY RATED. THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PERSONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMPONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES. Please refer to separate catalogs for OMRON's safety rated products.

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 product.

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 document.
- 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 PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PERFORMANCE DATA

Performance data given in this document 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.

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 product 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.

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.

PROGRAMMABLE PRODUCTS

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

COPYRIGHT AND COPY PERMISSION

This document shall not be copied for sales or promotions without permission.

This document is protected by copyright and is intended solely for use in conjunction with the product. Please notify us before copying or reproducing this document in any manner, for any other purpose. If copying or transmitting this document to another, please copy or transmit it in its entirety.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. C139-E1-01 **In the interest of product improvement, specifications are subject to change without notice.**

OMRON Corporation

Industrial Automation Company

Sensing Devices Division H.Q.

Industrial Sensors Division

Shiokoji Horikawa, Shimogyo-ku,

Kyoto, 600-8530 Japan

Tel: (81)75-344-7022/Fax: (81)75-344-7107

Printed in Japan

0306-2M (0306) (O)