# Subminiature Basic Switch SSG

#### Global Subminiature Basic Switch Conforming to EN61058-1 (EC601058-1), UL1054, and CSA C22.2 No. 54

- A wide operating temperature range of -25°C to 125°C is available for at high-temperature use.
- Flexible change lever using the external snap-fit lever.
- PCB terminal models are resistant to flux.
- Even-pitched PCB terminals conform to IEC1020-6-2.
- Mounting hold size conforms to IEC1020-6-2.
- RoHS Compliant.





## **Ordering Information**

## **■** Model Number Legend

1. Ratings

0.1: 0.1A 5: 5A

2. Actuator

Note: Pin plunger L1: Hinge lever

L3: Simulated hinge lever L2: Hinge roller lever

#### 3. Contact Form

None: SPDT -2: SPST-NC -3: SPST-NO

4. Terminals

H: Solder

T: Quick-connect terminals (#110)

P: PCB

5. Operating Force max.

None: 1.5 N {153gf} -5: 0.5 N {51 gf}

Note: These values are for the pin plunger model.

## **■** List of Models

Actuator	Rating	OF max.	Solder	Quick-connect terminal (#110)	PCB
Pin plunger	0.1 A	1.50 N {153 gf}	SSG-01H	SSG-01T	SSG-01P
		0.50 N {51 gf}	SSG-01H-5	SSG-01T-5	SSG-01P-5
	5 A	1.50 N {153 gf}	SSG-5H	SSG-5T	SSG-5P
		0.50 N {51 gf}	SSG-5H-5	SSG-5T-5	SSG-5P-5
Hinge lever	0.1 A	0.60 N {61 gf}	SSG-01L1H	SSG-01L1T	SSG-01L1P
		0.20 N {20 gf}	SSG-01L1H-5	SSG-01L1T-5	SSG-01L1P-5
	5 A	0.60 N {61 gf}	SSG-5L1H	SSG-5L1T	SSG-5L1P
		0.20 N {20 gf}	SSG-5L1H-5	SSG-5L1T-5	SSG-5L1P-5
Simulated hinge lever	0.1 A	0.60 N {61 gf}	SSG-01L3H	SSG-01L3T	SSG-01L3P
		0.20 N {20 gf}	SSG-01L3H-5	SSG-01L3T-5	SSG-01L3P-5
. <del></del>	5 A	0.60 N {61 gf}	SSG-5L3H	SSG-5L3T	SSG-5L3P
		0.20 N {20 gf}	SSG-5L3H-5	SSG-5L3T-5	SSG-5L3P-5
Hinge lever	0.1 A	0.60 N {61 gf}	SSG-01L2H	SSG-01L2T	SSG-01L2P
<u>₩</u>		0.20 N {20 gf}	SSG-01L2H-5	SSG-01L2T-5	SSG-01L2P-5
	5 A	0.60 N {61 gf}	SSG-5L2H	SSG-5L2T	SSG-5L2P
		0.20 N {20 gf}	SSG-5L2H-5	SSG-5L2T-5	SSG-5L2P-5

Note: SPST models are also available, but not listed in the above table.

## **Specifications**

## **■** Ratings

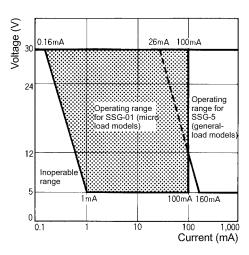
### **General Ratings**

Rated		Non-inductive load			Inductive load			
voltage	Resistiv	e load	La	ımp load	Induct	ive load	Mo	otor load
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	5 (0.1) A (see no	ote 1)	1.5 A	0.7 A	3 A		2.5 A	1.3 A
250 VAC	3 A		1	0.5 A	2 A		1.5 A	0.8 A
8 VDC	5 A		2 A		5 A		3 A	
14 VDC	5 A		2 A		4 A		3 A	
30 VDC	4 (0.1) A (see no	ote 1)	2 A		3 A		3 A	
125 VDC	0.4 A		0.05 A		0.4 A		0.05 A	
250 VDC	0.2 A		0.03 A		0.2 A		0.05 A	

Note: 1. The values in the parentheses are for the SSG-01.

- 2. The above current ratings are the values of the steady-state current.
- 3. Inductive load has a power factor of 0.7 min. (AC) and a time constant of 7 ms max. (DC).
- 4. Lamp load has an inrush current of 10 times the steady-state current.
- 5. Motor load has an inrush current of 6 times the steady-state current.
- 6. If the Switch is used in a DC circuit and is subjected to a surge current, connect a surge suppressor across the switch.

Use the Switch in the following operation range.



Model	SSG-01	SSG-5
Minimum applicable load	1 mA at 5 VDC	160 mA at 5 VDC

## **■** Characteristics

Operating speed	0.1 mm to 1 m	n/s (at pin plunger models)
Operating frequency	Mechanical:	400 operations per minute
	Electrical:	60 operations per minute
Insulation resistance	100 M $\Omega$ min.	
Contact resistance	OF 1.50 N:	SSG-5 models: 30 m $\Omega$ max.
		SSG-01 models: $50 \text{ m}\Omega$ max.
	OF 0.50 N:	SSG-5 models: $50 \text{ m}\Omega$ max.
		SSG-01 models: $100 \text{ m}\Omega$ max.
Dielectric strength	1,000 VAC, 50	1/60 Hz for 1 min. between contacts of the same polarity
	(600 VAC for 8	SSG-01H and SSG-01T models)
	1,500 VAC, 50	0/60 Hz for 1 min. between each terminal and ground
	1,500 VAC, 50	1/60 Hz for 1 min. between each terminal and non-current-carrying metal part
Vibration resistance	Malfunction:	10 to 2,000 Hz, 196 m/s² {20G} (contact open: 10 $\mu$ s max., lever position: at TTP)
Shock resistance	Malfunction:	490 m/s <sup>2</sup> {approx. 50G} (contact open: 10 μs max., lever position: at TTP)
Life expectancy	Mechanical:	10,000,000 operations min. (OT: rated value)
	Electrical:	200,000 operations min. (5 A at 125 VAC for SSG-5, 0.1 A at 125 VAC for SSG-01 resistive OT: full)
Degree of protection (IP code)	IP00	
Degree of protection against electrical shock	Class I	
Ambient temperature	Operating:	-25°C to 125°C (with no icing)
Ambient humidity	Operating:	85% max. (5°C to 30°C)
Proof tracking index	175	
Switch category (IEC335-1)	D	
Weight	Approx. 1.6 g	(pin plunger models)

## **■** Approved Standards

Standard	EN61058-1/EC60158-1		
Approval body	ÜV Rheinland (File No. T9451449)		
	AB (File No. C0746)		
	IQ (File No. EL662)		
	DE (File No. 100873, EN61058-1 1992+ AI: 1993)		
Rating	SSG-5 models: 5 A at 250 VAC (T125, 50,000 operations)		
	SSG-01 models: 0.1 A at 30 VDC (T125, 50,000 operations)		

#### UL1054 (File No. E41515), CSA C22.2 No. 55 (File No. LR21642) Approved Ratings

SSG-5 Models: 5 A at 125 VAC, 3 A at 250 VAC

3 A at 250 VAC, 3 A at 30 VDC (100,000 operations)

SSG-01 Models: 0.1 A at 125 VAC, 0.1 A at 30 VDC

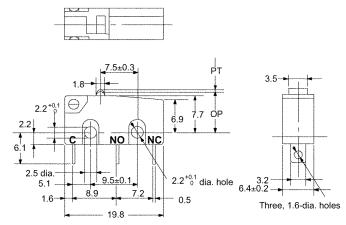
## **■** Contact

	Item	SSG-5	SSG-01H.T	SSG-01P
Contact	Specification	Rivet	Crossbar	Crossbar
	Material	Silver	Gold alloy	Gold alloy
	Gap (standard value)	0.5 mm	0.25 mm	0.5 mm
Inrush current	NC	20 A max.	1 A max.	1 A max
	NO	10 A max.	1 A max.	1 A max.

## **Dimensions**

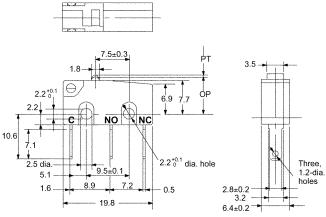
## **■** Terminals

#### **Solder Terminals**



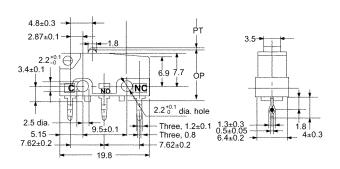
#### **Quick connect Terminals (#110)**

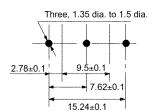
**PCB Mounting** 



**PCB Terminals** 

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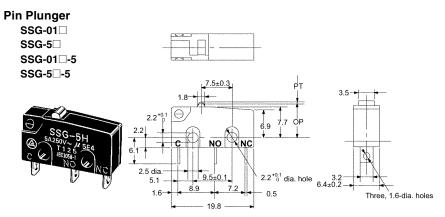




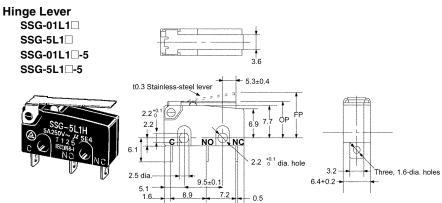
## **■** Dimensions and Operating Characteristics

- Note: 1. All units are in millimeters unless otherwise indicated
  - 2. Every actual model number includes the code instead of  $\square$  for the kind of terminals incorporated by the model.
  - 3. Unless otherwise specified, a tolerance of  $\pm 0.25$  mm applies to all dimensions.

#### **Solder/Quick-connect Terminal**



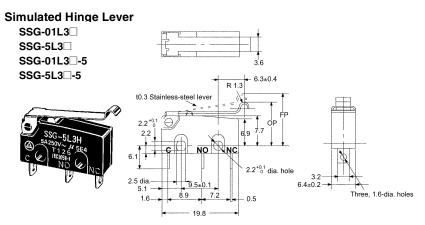
Model	SSG-01□ SSG-5□	SSG-01□-5 SSG-5□-5
OF max.	1.50 N {153 gf}	0.50 N {51 gf}
RF min.	0.25 N {25 gf}	0.04 N {4 gf}
PT max.	0.6 mm	
OT min.	0.4 mm	
MD max.	0.1 mm	
FP max.	_	
OP	8.4±0.3 mm	



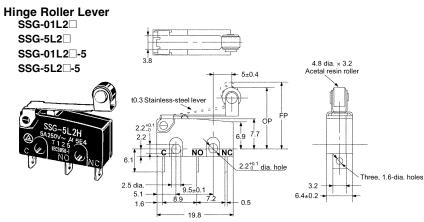
Model	SSG-01L1□ SSG-5L1□	SSG-01L1□-5 SSG-5L1□-5
OF max.	0.60 N {61 gf}	0.20 N {20 gf}
RF min.	0.06 N {6 gf}	0.02 N {2 gf}
PT max.	1.0 mm	
OT min.	0.8 mm	
MD max.	_	
FP max.	13.6 mm	
OP	8.8 <sup>+1.0</sup> / <sub>-0.6</sub> mm	

Note: Also available are models with a hinge lever length of 39 mm under the following model numbers: SSG-01L14□, SSG-5L14□, SSG01L14□-5, and SSG-5L14□-5. Contact your OMRON representative for these models.

#### OMRON

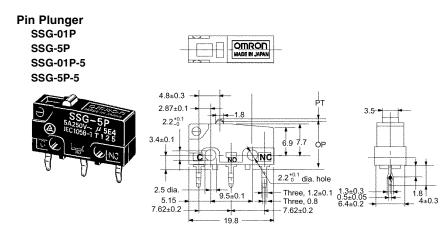


Model	SSG-01L3□ SSG-5L3□	SSG-01L3□-5 SSG-5L3□-5
OF max.	0.60 N {61 gf}	0.20 N {20 gf}
RF min.	0.06 N {6 gf}	0.02 N {2 gf}
PT max.	1.0 mm	
OT min.	0.8 mm	
MD max.	_	
FP max.	15.5 mm	
ОР	10.7 <sup>+1.0</sup> / <sub>-0.6</sub> mm	



Model	SSG-01L2□ SSG-5L2□	SSG-01L2□-5 SSG-5L2□-5
OF max.	0.60 N {61 gf}	0.20 N {20 gf}
RF min.	0.06 N {6 gf}	0.02 N {2 gf}
PT max.	1.0 mm	
OT min.	0.8 mm	
MD max.	_	
FP max.	19.0 mm	
OP	14.5 <sup>+1.0</sup> / <sub>-0.6</sub> mm	

#### **PCB Terminal**

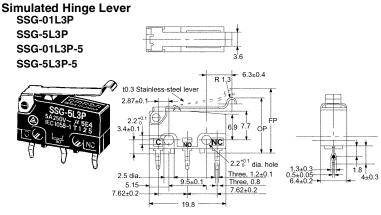


Model	SSG-01P SSG-5P	SSG-01P-5 SSG-5P-5
OF max.	1.50 N {153 gf}	0.50 N {51 gf}
RF min.	0.25 N {25 gf}	0.04 N {4 gf}
PT max.	0.6 mm	
OT min.	0.4 mm	
MD max.	0.1 mm	
FP max.	_	
OP	11.8±0.4 mm	

Hinge Lever SSG-01L1P SSG-5L1P SSG-01L1P-5	3.6
SSG-5L1P-5	5.3±0.4
SSG-5LIP \$A2500 # 5424 \$C0038-1 1128 \$W MC	10.3 Stainless-steel lever 2.87±0.1  2.2*0.1  3.4±0.1  3.4±0.1  2.5 dia.  9.5±0.1  Three, 1.2±0.1  7.62±0.2  19.8

Model	SSG-01L1P SSG-5L1P	SSG-01L1P-5 SSG-5L1P-5
OF max.	0.60 N {61 gf}	0.20 N {20 gf}
RF min.	0.06 N {6 gf}	0.02 N {2 gf}
PT max.	_	
OT min.	1.0 mm	
MD max.	0.8 mm	
FP max.	17 mm	
OP	12.2 <sup>+1.1</sup> / <sub>-0.7</sub> mm	

Note: Also available are models with a hinge lever length of 39 mm under the following model numbers: SSG-01L14P, SSG-5L14P, SSG-01L14P-5, and SSG-5L14P-5. Contact your OMRON representative for these models.



Model	SSG-01L3P SSG-5L3P	SSG-01L3P-5 SSG-5L3P-5
OF max.	0.60 N {61 gf}	0.20 N {20 gf}
RF min.	0.06 N {6 gf}	0.02 N {2 gf}
PT max.	_	
OT min.	1.0 mm	
MD max.	0.8 mm	
FP max.	18.9 mm	
OP	14.4 <sup>+1.1</sup> / <sub>-0.7</sub> mm	

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Hinge Roller Leve SSG-01L2P SSG-5L2P SSG-01L2P-5	er		4.8 dia. × 3.2
SSG-5L2P-5		5±0.4	Acetal resin roller
SSG-512P SX4550V-2P BIC:1058-1 77 5E4 1C:1058-1 71 25	2.5 dia. 5.15 7.62±0.2	NC	1.3±0.3 0.5±0.05 6.4±0.2

Model	SSG-01L2P SSG-5L2P	SSG-01L2P-5 SSG-5L2P-5
OF max.	0.60 N {61 gf}	0.20 N {20 gf}
RF min.	0.06 N {6 gf}	0.02 N {2 gf}
PT max.	_	
OT min.	1.0 mm	
MD max.	0.8 mm	
FP max.	22.4 mm	
ОР	17.9 <sup>+1.1</sup> / <sub>-0.7</sub> mm	

## **Precautions**

#### ■ Terminal Connections

When soldering a lead wire to a switch terminal, insert the wire conductor into the hole of the switch terminal and take the following steps promptly.

- Make sure that the capacity of the soldering iron is 60 W maximum. Do not take more than 5 s to solder the switch terminal. Improper soldering involving an excessively high temperature or excessive soldering time may deteriorate the characteristics of the Switch.
- Be sure to apply only the minimum required amount of flux. The SSG may have contact failures if flux intrudes into the interior of the
- Use the following lead wires to connect to the solder terminals.

Туре	Conductor size
SSG-01	AWG 22 to 20
SSG-5	AWG 20 to 18

• Soldering Categories (Refer to the conditions of EN61058-1).

Туре	Classified by EN61058-1
Solder terminal	Soldering iron used with soldering hole
	Solder terminal type 1.2
PCB terminal	Soldering bath used
	Solder terminal type 1.2

To automatically solder the Switch to a PCB in a soldering bath, complete soldering within 5 seconds at a flux temperature of 250°C and avoid the overflow of flux onto the surface of the PCB where the Switch or other parts are mounted.

Wire the quick-connect terminals (#110) with receptacles. Insert the terminals straight into the receptacles. Do not impose excessive force on the terminal in the horizontal direction, otherwise the terminal may be deformed or the housing may be damaged.

#### **Insulation Distance**

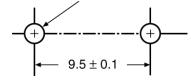
The Switch does not have a ground terminal. The minimum distance through insulation (IEC61058-1) is 0.9 mm. If proper insulation for the end product cannot be secured, additional insulation such as a Separator or insulation cover should be attached.

#### Mounting

When securing the SSG, be sure to use M2.2 mounting screws and tighten the screws with flat washers and spring washers securely within a torque range between 0.20 to 0.24 N • m (2 to 2.5 kgf • cm).

#### **Mounting Holes**

Two 2.4-dia. mounting holes or M2.3 screw holes



Make sure that the plate to which the SSG is mounted is flat. If the plate has protruding or warped part, the SSG may not operate prop-

#### **Operating Stroke**

Make sure that the operating stroke is 70% to 100% of the rated OT distance. Do not operate the actuator exceeding the OT distance otherwise the life expectancy of the SSG may be shortened.

#### **Omron Electronic Components, LLC**

#### Terms and Conditions of Sales

#### I. GENERAL

- Definitions: The words used herein are defined as follows:
  - Terms: These terms and conditions

Seller: Omron Electronic Components LLC and its subsidiaries

The buyer of Products, including any end user in section III through VI Products and/or services of Seller Buyer:

Products: (d)

Including without limitation Including:

- Offer: Acceptance: These Terms are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of Products by Seller. Seller hereby objects to any Terms proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these
- Distributor: Any distributor shall inform its customer of the contents after and including

#### II. SALES

- Prices: Payment: All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at time of shipment. Payments for Products received are due net 30 days unless otherwise stated in the invoice. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice.
- Discounts: Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (a) the invoice is paid according to Seller's payment terms and (b) Buyer has no past due amounts owing to Seller.
- Interest: Seller, at its option, may charge Buyer 1.5% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms. Orders: Seller will accept no order less than 200 U.S. dollars net billing.

- Currencies: If the prices quoted herein are in a currency other than U.S. dollars, Buyer shall make remittance to Seller at the then current exchange rate most favorable to Seller; provided that if remittance is not made when due, Buyer will convert the amount to U.S. dollars at the then current exchange rate most favorable to Seller available during the period between the due date and the date remittance is actually made.
- Governmental Approvals: Buyer shall be responsible for all costs involved in obtaining any government approvals regarding the importation or sale of the Products.
- Taxes: All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Seller or required to be collected directly or indirectly by Seller for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Seller.
- <u>Financial</u>: If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Seller may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts
- Cancellation: Etc: Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
- Force Majeure: Seller shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.

11. Shipping: Delivery: Unless otherwise expressly agreed in writing by Seller:

- (a) All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Products shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Products until the full purchase price is paid by Buyer;
- Delivery and shipping dates are estimates only; and
- Seller will package Products as it deems proper for protection against normal
- handling and extra charges apply to special conditions.

  12. Claims: Any claim by Buyer against Seller for shortage or damage to the Products occurring before delivery to the carrier must be presented in detail in writing to Seller within 30 days of receipt of shipment.

#### **III. PRECAUTIONS**

- Suitability: IT IS THE BUYER'S SOLE RESPOINSIBILITY TO ENSURE THAT ANY OMRON PRODUCT IS FIT AND SUFFICIENT FOR USE IN A MOTORIZED VEHICLE APPLICATION. BUYER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPLICATION. BUTER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPROPRIATENESS OF THE PARTICULAR PRODUCT WITH RESPECT TO THE BUYER'S APPLICATION INCLUDING (A) ELECTRICAL OR ELECTRONIC COMPONENTS, (B) CIRCUITS, (C) SYSTEM ASSEMBLIES, (D) END PRODUCT, (E) SYSTEM, (F) MATERIALS OR SUBSTANCES OR (G) OPERATING ENVIRONMENT. Buyer acknowledges that it alone has determined that the Products will meet their requirements of the intended use in all cases. Buyer must know and observe all prohibitions of use applicable to the Product/s.
- Use with Attention: The followings are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible use of any Product, nor to imply that any use listed may be suitable for any Product:
  - Outdoor use, use involving potential chemical contamination or electrical interference
  - Use in consumer Products or any use in significant quantities.

- (c) 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. Prohibited Use: NEVER USE THE PRODUCT 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 PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
- Motorized Vehicle Application: USE OF ANY PRODUCT/S FOR A MOTORIZED VEHICLE APPLICATION MUST BE EXPRESSLY STATED IN THE SPECIFICATION BY
- Programmable Products: Seller shall not be responsible for the Buyer's programming of a programmable Product

#### **WARRANTY AND LIMITATION**

- Warranty: Seller's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Seller (or such other period expressed in writing by Seller). SELLER MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT ALL OTHER WARRANTIES, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS.
- Buyer Remedy: Seller's sole obligation hereunder shall be to replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product or, at Seller's election, to repay or credit Buyer an amount equal to the purchase price of the Product; provided that there shall be no liability for Seller or its affiliates unless Seller's analysis confirms that the Products were handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be
- approved in writing by Seller before shipment. Limitation on Liability: SELLER AND ITS AFFILIATES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. FURTHER, IN NO EVENT SHALL LIABILITY OF SELLER OR ITS AFFILITATES EXCEED THE INDIVIDUAL PRICE OF THE PRODUCT ON WHICH LIABILITY IS ASSERTED.
- Indemnities: Buyer shall indemnify and hold harmless Seller, its affiliates and its employees from and against all liabilities, losses, claims, costs and expenses (including attomey's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Seller is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products.

#### V. INFORMATION; ETC.

- Intellectual Property: The intellectual property embodied in the Products is the exclusive property of Seller and its affiliates and Buyer shall not attempt to duplicate it in any way without the written permission of Seller. Buyer (at its own expense) shall indemnify and hold harmless Seller and defend or settle any action brought against Seller to the extent that it is based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
- Property: Confidentiality: Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Seller. All information and materials supplied by Seller to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
- Performance Data: Performance data is provided as a guide in determining suitability and does not constitute a warranty. It may represent the result of Seller's test conditions, and the users must correlate it to actual application requirements.
- Change In Specifications: Product specifications and description may be changed at any time based on improvements or other reasons. It is Seller's practice to change part numbers when published ratings or features are changed, or when significant engineering changes are made. However, some specifications of the Product may be changed without any notice.
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Cat. No. J01C-E-01 01/07 **OMRON ON-LINE** 

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