

Separate Construction with Smallest Class of Depth in the World





- Direct opening mechanism to open contacts in emergencies, such as when they are welded.
- Conforms to EN 60947-5-5.
- Includes a safety lock to prevent misuse.
- Features separate construction that allows the Switch to be separated for easier wiring and one-piece construction that allows easier handling.
- Models available with 3 contacts built into a single block (A165E-U).



Be sure to read the "Safety Precautions" on page 9.

Model Number Structure

List of Models

Diameter of Operation Unit	Function	Model	Shape
30-mm models 40-mm models	Push-Lock, turn-reset	A165E	 (30-mm model)
		A165E-□-03U	 (30-mm model)

Model Number Legend (Completely Assembled)

Shipped as a set that includes the Operation Unit and light source.

1
2
3
A165E-LS-24D-02

IP65 (Oil-resistant)

1. Operation Unit Shape and Functions

Code	Functions	Pushbutton
S	Non-lighted	30 dia.
LS	Lighted	
M	Non-lighted	40 dia.
LM	Lighted	

2. Light Source

Code	Type	Operation voltage	Rated voltage
None	Non-lighted	---	---
24D	LED	24 VAC/ VDC±5%	24 VAC/ VDC

3. Contacts

Code	Description
01	SPST-NC
02	DPST-NC
03U	TPST-NC *

* TPST-NC models have one-piece construction with the contact unit. Only non-lighted models are available.

Note: Models with separate construction (SPST-NC and DPST-NC) are for normal loads only. One-piece models (TPST-NC) are for either normal loads or microloads.

Ordering Information

List of Sets

Illumination	Rated voltage	Pushbutton color	Pushbutton size	Terminal	Contact form	Model
LED	24 VAC/VDC	Red	30 dia.	Solder terminal	SPST-NC	A165E-LS-24D-01
Non-lighted	---				DPST-NC	A165E-LS-24D-02
					SPST-NC	A165E-S-01
LED	24 VAC/VDC				DPST-NC	A165E-S-02
			SPST-NC		A165E-LM-24D-01	
Non-lighted	---		DPST-NC		A165E-LM-24D-02	
			SPST-NC		A165E-M-01	
Non-lighted	---		DPST-NC		A165E-M-02	
			TPST-NC		A165E-S-03U	
					A165E-M-03U	



List of Sets (in Different Colors)

Illumination	Pushbutton color *	Pushbutton size	Terminal	Contact form	Model
Non-lighted	Yellow	30 dia.	Solder terminal	SPST-NC	A165E-SY-01
	Gray				A165E-SGR-01
	Yellow			DPST-NC	A165E-SY-02
	Gray				A165E-SGR-02
	Yellow			TPST-NC	A165E-SY-03U
	Gray				A165E-SGR-03U


* Models with yellow or gray pushbutton colors cannot be used as emergency switches.

Individual Parts (for Switches with Separate Construction)


Operation Units

Appearance	Illumination	Model
30 dia. 	Non-lighted	A165E-S
	Lighted	A165E-LS
40 dia. 	Non-lighted	A165E-M
	Lighted	A165E-LM

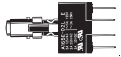
Lamps

Appearance	LED color		Rated voltage	Model
	Red	Bright	5 VDC	A16-5DSR
			12 VAC/VDC	A16-12DSR
			24 VAC/VDC	A16-24DSR





Switches

Appearance	Illumination	Contact form	Model
	Non-lighted	SPST-NC	A165E-01
		DPST-NC	A165E-02
	Lighted	SPST-NC	A165E-01L
		DPST-NC	A165E-02L

Switch Units

Appearance	Illumination	Contact form	Model
	Lighted	SPST-NC	A165E-R-24D-01
		DPST-NC	A165E-R-24D-02

Accessories (Order Separately)

Item	Appearance	Type	Model	Precautions
Yellow Plate		Yellow, 45 dia.	A16Z-5070	Use this as an emergency stop nameplate.
Panel Plug		Round	A16ZT-3003	Used for covering the panel cutouts for future panel expansion. Degree of protection: IP40 Color: Black
Tightening Tool		---	A16Z-3004	Useful for repetitive mounting. Be careful not to tighten excessively.
Extractor			A16Z-5080	Convenient for extracting the Switch and Lamp.

Specifications

Certified Standard Ratings

UL508, CSA C22.2 No.14, CCC(GB14048.5)

Models with Separate Construction

Rated voltage	Resistive load
125 VAC	5 A
250 VAC	3 A
30 VDC	3 A

Models with One-piece Construction

Rated voltage	Resistive load
125 VAC	1 A
250 VAC	0.5 A
30 VDC	1 A

TÜV(EN60947-5-1)

Models with Separate Construction

Rated voltage	Resistive load
250 VAC	3 A
30 VDC	3 A

Models with One-piece Construction

Rated voltage	Resistive load
250 VAC	0.5 A
30 VDC	1 A

Certified Standards

Certification body	Standards	File No.
UL *	UL508, CSA C22.2 No.14	E41515
TÜV SÜD	EN60947-5-1 (certified direct opening), EN60947-5-5	Consult your OMRON representative for details.
CQC (CCC)	GB14048.5	2003010303070678

* Certification for CSA C22.2 No. 14 has been obtained. Separate construction models have been certified for the Switch Unit.

Switch Ratings

Models with Separate Construction

Rated voltage	Resistive load
125 VAC	5 A
250 VAC	3 A
30 VDC	3 A

Note: Minimum applicable load: 5 VDC, 150 mA

Models with One-piece Construction

Rated voltage	Resistive load
125 VAC	1 A
250 VAC	0.5 A
30 VDC	1 A

Note: Minimum applicable load: 5 VDC, 1 mA

LED Ratings

(Only for Models with LEDs)

Rated voltage	Rated current	Operation voltage
24 VAC/VDC	8 mA	24 VAC/VDC±5%

Characteristics

Item	Type	Emergency Stop Switch		
		Non-lighted A165E-S/A165E-M	Lighted A165E-LS/A165-LM	Non-lighted, One-piece construction A165E-U
Allowable operating frequency	Mechanical	20 operations/minute max.		
	Electrical	10 operations/minute max.		
Insulation resistance		100 M Ω min. (at 500 VDC)		
Dielectric strength	Between terminals of same polarity	1,000 VAC, 50/60 Hz for 1 min		
	Between terminals of different polarity	2,000 VAC 50/60 Hz for 1 min		
	Between each terminal and ground	2,000 VAC 50/60 Hz for 1 min		
	Between lamp terminals	1,000 VAC, 50/60 Hz for 1 min *1	---	
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms)		
Shock resistance	Destruction	500 m/s ²		
	Malfunction	300 m/s ² max. (malfunction within 1 ms)	150 m/s ² max. (malfunction within 1 ms)	
Durability	Mechanical	100,000 operations min.		
	Electrical	100,000 operations min.		
Degree of protection		IP65 Oil-resistant *2	IP65 *2	IP65 Oil-resistant *2
Electric shock protection class		Class II		
PTI (tracking characteristic)		175		
Degree of contamination		3 (EN60947-5-1)		
Weight		Approx. 16 g (in case of DPST-NC Switches)		
Ambient operating temperature		-10 to 55°C (with no icing or condensation)		
Ambient operating humidity		35% to 85%		
Ambient storage temperature		-25 to 65°C (with no icing or condensation)		

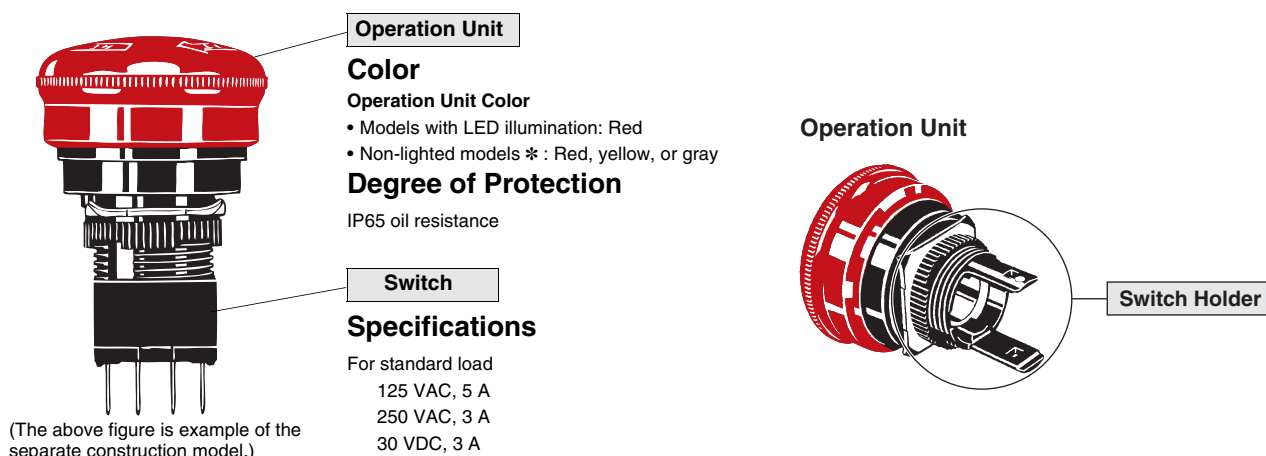
*1. LED not mounted. (Test them with the LED removed.)

*2. Degree of protection from the front of the panel.

Operating Characteristics

Item	Type	Characteristics of models with separate construction	Characteristics of models with one-piece construction
Operating force	OF max.	14.7 N	14.7 N
Releasing force	RF min.	0.1 N·m	0.1 N·m
Pretravel	PT	3.5±0.5 mm	3±0.5 mm

Structure and Nomenclature



* Models with yellow or gray pushbutton colors cannot be used as emergency switches.

Dimensions

A165E-S

Non-lighted models
30 mm diameter



- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

A165E-LS

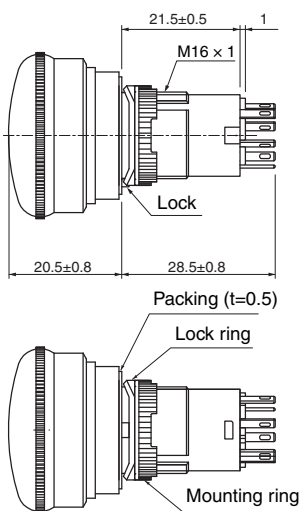
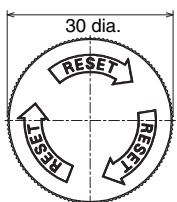
Lighted models
30 mm diameter



- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

A165E-S-03U

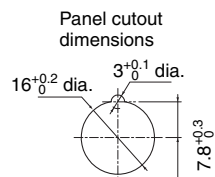
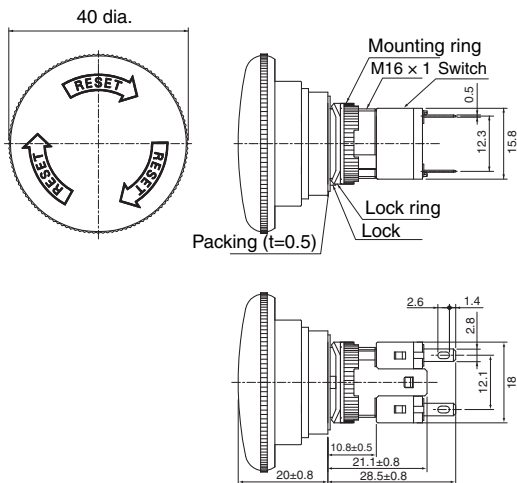
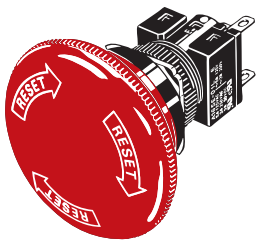
Non-lighted,
One-piece construction models
30 mm diameter



- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

A165E-M

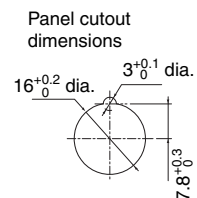
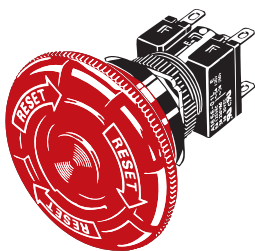
Non-lighted models
40 mm diameter



- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

A165E-LM

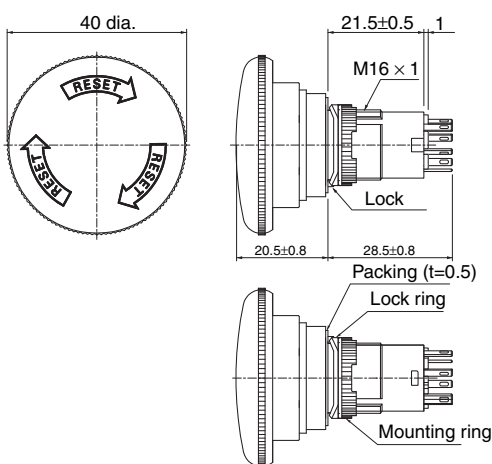
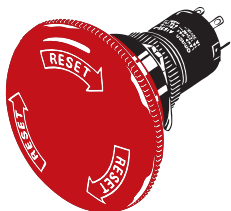
Lighted models
40 mm diameter



- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

A165E-M-03U

One-piece construction models
40 mm diameter

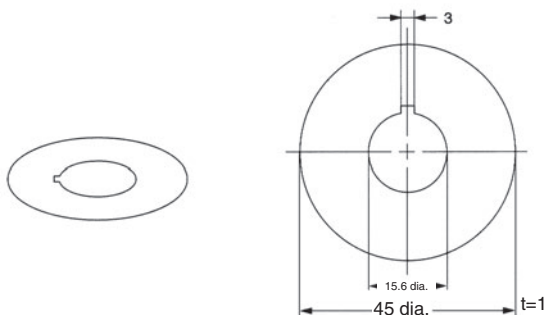


- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

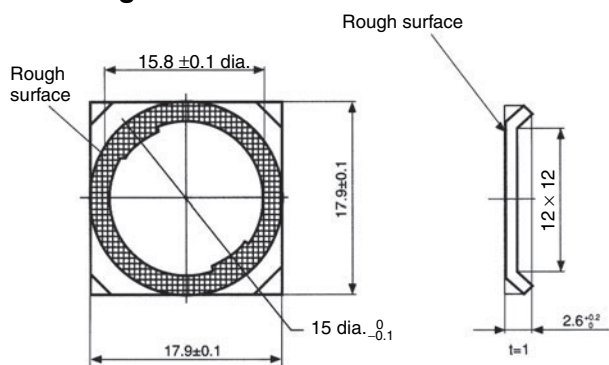
Accessories

Yellow Plate (Vinyl Chloride)

A16Z-5070

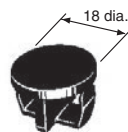


Lock Ring



Panel Plugs (Round Type)

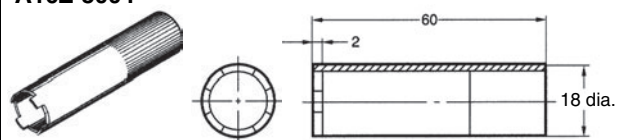
A16ZT-3003



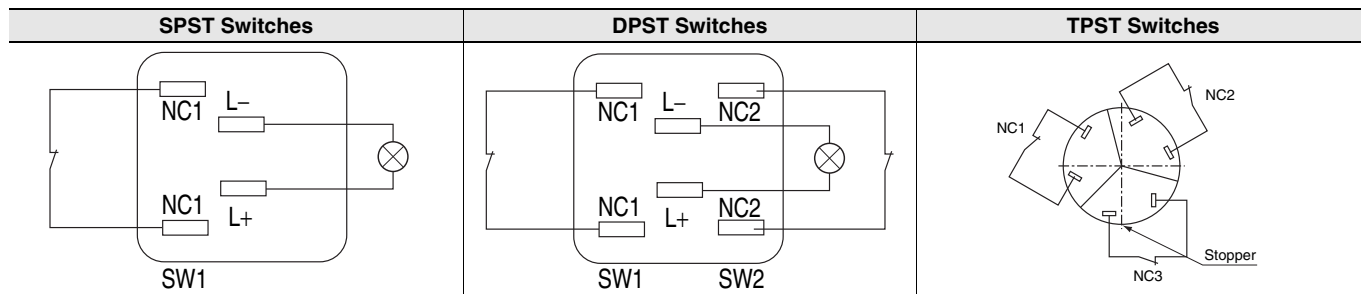
- Select an appropriate Panel Plug according to the panel design and mount from the front side of the panel. Panel cutout dimensions are the same as those for the Operation Unit.

Tightening Tool

A16Z-3004



Terminal Arrangement



Note: The L+ and L- terminals are not available with the non-lighted models.

Installation

Mounting to the Panel (Models with Separate Construction)

After installing the Operation Unit, snap in the Switch from the back of the panel.

(1) Installing the Operation Unit	
<ul style="list-style-type: none"> • Attach rubber packing or the Yellow Plate onto the Operation Unit from its terminal side. Insert the Operation Unit into the panel from the front. Install the lock ring and mounting nut from the terminal side and tighten. • Adjust the slits on the hole of rubber packing and Yellow Plate to the protruding part of the Unit. • Rubber packing is not necessary when the Yellow Plate is used. • Tighten the nut to the torque of 0.29 to 0.49 N·m. • The Operation Unit should be installed with its protruding part adjusted to the slit of the panel hole. • Align the lock ring to the groove of the Operation Unit so that the edge is drawn to the panel side. 	
(2) Mounting the Switch	(3) Removing the Switch
<ul style="list-style-type: none"> • Snap on the Switch to the Operation Unit. • Make sure that the Switch has the correct orientation when snapping it onto the Operation Unit. • Align the white dot on the Operation Unit with the guide groove on the side of the Switch marked with an "L" as shown below, and push the Switch into the Operation Unit until it clicks into place. Confirm that the Switch is securely in place before using. 	<ul style="list-style-type: none"> • Insert the prongs of the A16Z-5080 Extractor between the Switch and the Operation Unit, grip the Switch, and pull to remove.
(4) Installing the LED Lamp	
<ul style="list-style-type: none"> • When mounting the Lamp, make sure it is facing the direction shown in the following diagram. Insert the Lamp while matching the protruding part of the Lamp and the small guides on the outer surface of the switch. 	

Safety Precautions

Be sure to read the precautions for all A165E models in the website at: <http://www.ia.omron.com/>.

Indication and Meaning for Safe Use

⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
Precautions for Safe Use	Supplementary comments on what to do or avoid doing, to use the product safely.

⚠ CAUTION

If the Operation Unit is separated from the Switch Unit, the equipment will not stop, creating a hazardous condition. Always confirm that safety functions are operating before starting operation.



Precautions for Correct Use

Mounting

- Always make sure that the power is turned OFF before mounting, removing, or wiring the Switch, or performing maintenance. Electrical shock or fire may result if the power is not turned OFF.
- The tightening torque is 0.29 to 0.49 N·m.

Wiring

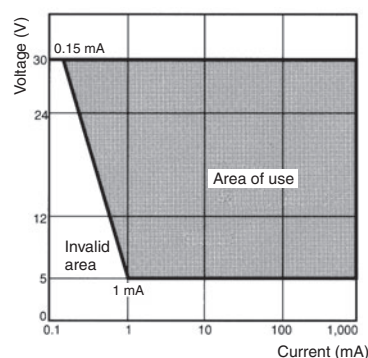
- Be sure to use electrical wires that are a size appropriate for the applied voltage and carry current. Perform soldering according to the conditions given below. If the soldering is not properly performed, abnormal heating may result, possibly resulting in fire.
 1. Hand soldering: 30 W, within 5 s
 2. Dip soldering: 240°C, within 3 s
 Wait for one minute after soldering before exerting any external force on the solder.
- Use non-corrosive resin fluid as the flux.
- Make sure that the electric cord is wired so that it does not touch the Unit. If the electric cord will touch the Unit, then electric wires with a heat resistance of 100°C min. must be used.
- After wiring the Switch, maintain an appropriate clearance and creepage distance.

Operating Environment

- The IP65 model is designed with a degree of protection so that it will not sustain damage if it is subjected to water from any direction to the front of the panel.
- The Switch is intended for indoor use only. Using the Switch outdoor may cause it to fail.

Using the Microload

- Insert a contact protection circuit, if necessary, to prevent the reduction of life expectancy due to extreme wear on the contacts caused by loads where inrush current occurs when the contact is opened and closed.
- The A165E-□U (one-piece construction) allows both a standard load (125 V at 1 A, 250 V at 0.5 A) and a microload. If a standard load is applied, however, the microload area cannot be used. If the microload area is used with a standard load, the contact surface will become rough, and the opening and closing of the contact for a microload may become unreliable.
- The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% (λ_{60}) (conforming to JIS C5003).
- The equation, $\lambda_{60} = 0.5 \times 10^{-6}/\text{time}$ indicates that the estimated malfunction rate is less than 1/2,000,000 with a reliability level of 60%.



LEDs

The LED current-limiting resistor is built-in, so external resistance is not required.

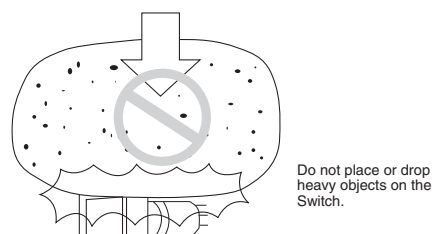
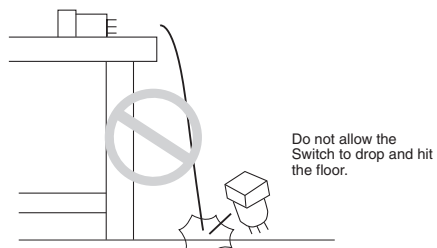
Rated voltage	Internal limiting resistor
24 VAC/VDC	2.4 kΩ

Operating Torque

- Do not exceed an operating torque of 0.49 N·m in the direction of rotation.
- Do not pull the operating button or apply excessive force to any side of the button. Otherwise it may be damaged.

Others

- The oil-resistant IP65 uses NBR rubber and is resistant to general cutting oil and cooling oil. Some special oils cannot be used with the oil-resistant IP65, however, so contact your OMRON representative for details.
- If the panel is to be coated, make sure that the panel meets the specified dimensions after coating.
- Due to the structure of the Switch, severe shock or vibration may cause malfunctions or damage to the Switch.
Also, most Switches are made from resin and will be damaged if they come into contact with sharp objects. Particularly scratches on the Operation Unit may create visual and operational obtrusions. Handle the Switches with care, and do not throw or drop them.



Terms and Conditions of Sale

1. **Offer; Acceptance.** These terms and conditions (these "**Terms**") are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "**Products**") by Omron Electronics LLC and its subsidiary companies ("**Omron**"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
2. **Prices; Payment Terms.** All prices stated are current, subject to change without notice by Omron. Omron reserves the right to increase or decrease prices on any unshipped portions of outstanding orders. Payments for Products are due net 30 days unless otherwise stated in the invoice.
3. **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 (i) the invoice is paid according to Omron's payment terms and (ii) Buyer has no past due amounts.
4. **Interest.** Omron, at its option, may charge Buyer 1-1/2% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
5. **Orders.** Omron will accept no order less than \$200 net billing.
6. **Governmental Approvals.** Buyer shall be responsible for, and shall bear all costs involved in, obtaining any government approvals required for the importation or sale of the Products.
7. **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 Omron or required to be collected directly or indirectly by Omron 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 Omron.
8. **Financial.** If the financial position of Buyer at any time becomes unsatisfactory to Omron, Omron 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, Omron 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.
9. **Cancellation; Etc.** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Omron against all related costs or expenses.
10. **Force Majeure.** Omron 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 Omron:
 - a. Shipments shall be by a carrier selected by Omron; Omron will not drop ship except in "break down" situations.
 - b. Such carrier shall act as the agent of Buyer and delivery to such carrier shall constitute delivery to Buyer;
 - c. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid;
 - d. Delivery and shipping dates are estimates only; and
 - e. Omron 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 Omron for shortage or damage to the Products occurring before delivery to the carrier must be presented in writing to Omron within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Products from Omron in the condition claimed.
13. **Warranties.** (a) **Exclusive Warranty.** Omron'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 Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied. (b) **Limitations.** OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) **Buyer Remedy.** Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses 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. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty. See <http://www.omron247.com> or contact your Omron representative for published information.
14. **Limitation on Liability; Etc.** OMRON COMPANIES 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 Omron Companies exceed the individual price of the Product on which liability is asserted.
15. **Indemnities.** Buyer shall indemnify and hold harmless Omron Companies and their employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Omron 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. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless Omron and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
16. **Property; Confidentiality.** Any intellectual property in the Products is the exclusive property of Omron Companies and Buyer shall not attempt to duplicate it in any way without the written permission of Omron. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Omron. All information and materials supplied by Omron 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.
17. **Export Controls.** Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (ii) sale of products to "forbidden" or other proscribed persons; and (iii) disclosure to non-citizens of regulated technology or information.
18. **Miscellaneous.** (a) **Waiver.** No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) **Assignment.** Buyer may not assign its rights hereunder without Omron's written consent. (c) **Law.** These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) **Amendment.** These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) **Severability.** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) **Setoff.** Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) **Definitions.** As used herein, "including" means "including without limitation"; and "Omron Companies" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

Certain Precautions on Specifications and Use

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