

Temperature Controller E5C2

CSM_E5C2_DS_E_7A_1

DIN-sized (48 x 48 mm) Temperature Controller with Analog Setting



- Compact, low-cost Temperature Controller.
- Incorporates proportional control and reset adjustment function.
- Consecutive mounting possible using mounting adapter.
- Incorporates a plug-in socket, thus allows to DIN-track and flush mounting.

⚠ Refer to *Safety Precautions for All Temperature Controllers*.



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Ordering Information

Temperature Controllers

Standard Models

Indication method		No indication		
Control mode		ON/OFF		
Input	Output	Relay		
Thermo-couple	K (CA)	0 to 200	E5C2-R20K	E5C2-R20K-W
		0 to 300	E5C2-R20K	E5C2-R20K-W
		0 to 400	E5C2-R20K	--
		0 to 600	E5C2-R20K	--
		0 to 800	E5C2-R20K	E5C2-R20K-W
		0 to 1000	E5C2-R20K	E5C2-R20K-W
		0 to 1200	E5C2-R20K	E5C2-R20K-W
	J (IC)	0 to 200	E5C2-R20J	E5C2-R20K-W
		0 to 300	E5C2-R20J	E5C2-R20K-W
		0 to 400	E5C2-R20J	E5C2-R20K-W
Control mode		Proportional		
Input	Output	Relay		
Thermo-couple	K (CA)	0 to 200	E5C2-R40K	E5C2-R40K-W
		0 to 300	E5C2-R40K	E5C2-R40K-W
		0 to 400	E5C2-R40K	--
		0 to 600	E5C2-R40K	--
		0 to 800	E5C2-R40K	--
		0 to 1000	--	--
		0 to 1200	--	E5C2-R40K-W
	J (IC)	0 to 200	--	E5C2-R40J-W
		0 to 300	--	E5C2-R40J-W
		0 to 400	--	E5C2-R40J-W

Indication method		No indication		
Control mode		ON/OFF		
Input	Output	Relay		
Input/standard scale (°C)	Resistance Thermometer	Platinum resistance thermometer Pt100	-50 to 50	E5C2-R20P-D
			-20 to 80	E5C2-R20P-D
			0 to 50	E5C2-R20P-D
			0 to 100	E5C2-R20P-D
			0 to 200	E5C2-R20P-D
			0 to 300	E5C2-R20P-D
			0 to 400	E5C2-R20P-D
	Thermistor	THE (replaceable element)	-50 to 50	E5C2-R20G
			0 to 100	E5C2-R20G
			50 to 150	E5C2-R20G
		100 to 200	E5C2-R20G	
		150 to 300	E5C2-R20G	

Accessories (Order Separately)

Protective Cover

Type	Model
Hard Protective Cover	Y92A-48B

Sockets

Name	Model
Front Connecting Socket	P2CF-08
Back Connecting Socket	P3G-08
Front Connecting Socket with Finger Protection	P2CF-08-E
Protective Cover (for finger protection)	Y92A-48G

Model Number Legend

E5C2- □ □ □ - □
 1 2 3 4

1. Control Outputs

R: Relay

2. Control Method

20: ON-OFF control

40: Proportional control

3. Input

K: K-type thermocouple

J: J-type thermocouple

P-D: Platinum resistance thermometer (Pt100)

G: Thermistor with replaceable element

4. Temperature Scale

Blank: Degrees C

W: Both Degrees C and Degrees F

Note: A functional explanation is provided here for illustration, but models are not necessarily available for all possible combinations. Refer to *Ordering Information* when ordering.

Examples

- Relay control output, ON/OFF control, type-K thermocouple input: E5C2-R20K
- Relay control output, proportional control, thermocouple input: E5C2-R40P-D

Temperature Ranges

Input					Thermocouple						Resistance Thermometer						Thermistor										
					K (CA) Chromel vs. alumel			J (IC) Iron vs. constantan			Platinum resistance thermometer Pt100						Thermistor (replaceable element)										
Setting method	Indication method	Control mode	Output	Minimum scale division (°C)	Standard scale (°C)												Thermistor nominal resistance										
					5	10	10	20	20	25	25	5	10	10	2	2	1	2	5	10	10	2	2	2	2	2	
Analog setting	No indication	ON/OFF	Relay	Model	E5C2-R20K						E5C2-R20J						E5C2-R20P-D						E5C2-R20G				
		Proportional (P)	Relay	Model	E5C2-R40K						---						---						---				

Specifications

Ratings

Supply voltage	100 to 240 VAC 50/60 Hz
Operating voltage range	90% to 110% of rated supply voltage
Power consumption	Approx. 3.6 VA
Input	Thermocouple (with sensor burnout detection circuit), platinum resistance thermometer, or thermistor with replaceable element
Control method	ON/OFF or proportional control
Setting method	Analog setting
Indication method	No indication
Control output	Relay output: SPDT, 3 A at 250 VAC, resistive load (switching capacity: 330 VA)
Ambient operating temperature	-10°C to 55°C (with no icing or condensation)
Ambient operating humidity	45% to 85%

Note: Do not use an inverter output as the power supply. (Refer to *Safety Precautions for All Temperature Controllers.*)

Characteristics

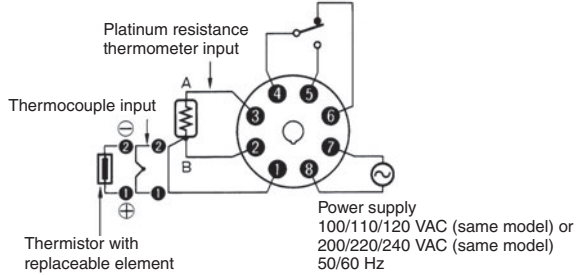
Setting accuracy	±2% FS max.
Hysteresis	Approx. 0.5% FS (fixed)
Proportional band	3% FS (fixed)
Control period	Approx. 20 s
Reset range	5 ±1% FS min. (See note 1.)
Insulation resistance	20 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min between charged terminals and uncharged metallic parts
Vibration resistance	Malfunction: 10 to 55 Hz, 0.15-mm single amplitude for 10 min each in X, Y, and Z directions Destruction: 16.7 Hz, 2-mm double amplitude for 2 hrs each in X, Y, and Z directions
Shock resistance	Malfunction: 147 m/s ² , 3 times each in 6 directions Destruction: 294 m/s ² , 3 times each in 6 directions
Life expectancy	Electrical: 100,000 operations min. (3 A at 110 VAC, resistive load)
Weight	Approx. 100 g (with flush-mounting adapter)
Degree of protection	Front panel: IEC standard IP40 (See note 2.) Terminals: IEC standard IP00
Applicable Socket	P2CF-08 (order separately), P3G-08 (order separately)
Applicable Protective Cover	Y92A-48B (order separately)

- Note:**
1. No reset function is incorporated by any E5C2 model with ON/OFF control. The reset function is used to correct offset for proportional control. If there is an offset below the set value, turn the reset adjustment clockwise.
 2. A special Watertight Cover is used to achieve this degree of protection (IP66, NEMA4). Refer to Y92A-□□N.

■ Connections

Connecting the Input

- Connect a thermocouple, the E52-THE□ Thermistor (replaceable element) or a platinum resistance thermometer to terminals 1 (positive) and 2 (negative) on the E5C2 as shown in the following illustration.



- On the E52-□□1D, the lead wires are thermocouple element wires, making them difficult to solder because solder will not stick to them easily. Remove the crimp terminal and polish the ends before attempting to solder them.

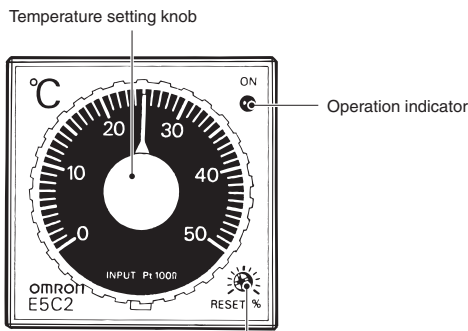
Output

- If the load circuit is a heating control system, be sure to connect the load to terminals 4 and 5. If the load circuit is a cooling control system, be sure to connect the load to terminals 4 and 6.
- We recommend using an external relay to extend the electrical life of internal relays when driving a large capacity load. This is particularly important when the output relay is switched frequently (e.g., with proportional control).

Power Supply

- If a single power supply is used for the E5C2 and the load, the supply voltage of the power supply may vary greatly when the load is open or closed if the capacity of the power supply is not large enough. Make sure that the capacity of the power supply is large enough so that the supply voltage range will be always from 90% to 110% of the rated supply voltage.
- The E5C2 operates at either 50 or 60 Hz.

Nomenclature



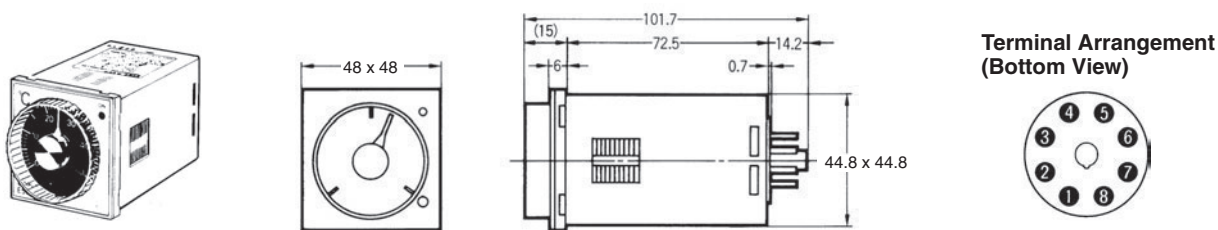
RESET adjustment shaft
No reset function is incorporated by any E5C2 model with ON/OFF control.

Operation Indicator

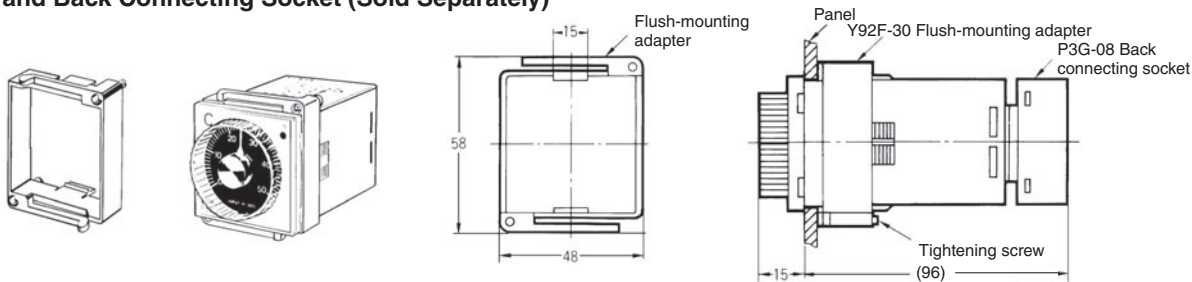
Indicator	Output	
	NO contacts (4 and 5)	NC contacts (4 to 6)
Red Lit	ON	OFF
Not lit	OFF	ON

Dimensions

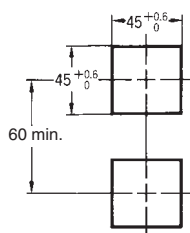
Note: All units are in millimeters unless otherwise indicated.



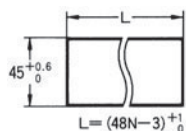
Dimensions with Flush-mounting Adapter (Accessory), and Back Connecting Socket (Sold Separately)



Panel Cutout



Side-by-side Mounting of N Controllers



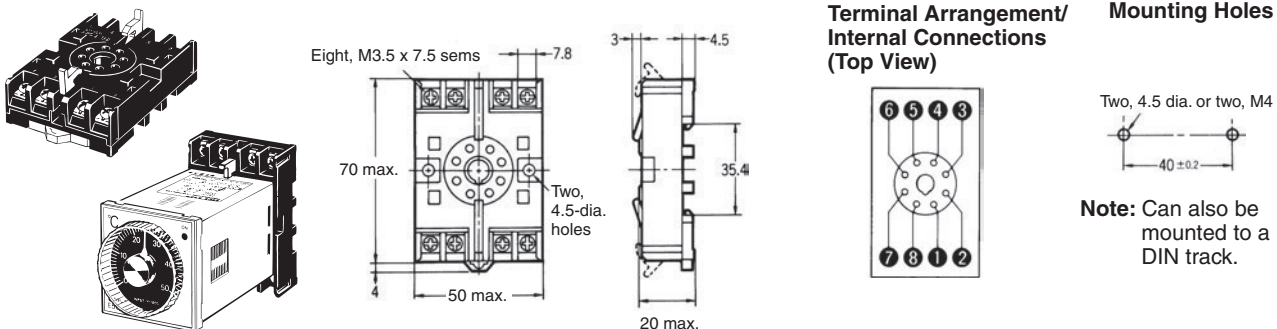
Qty.	2	3	4	5	6
L	93 ⁺¹ ₀	141 ⁺¹ ₀	189 ⁺¹ ₀	237 ⁺¹ ₀	285 ⁺¹ ₀

- Note: 1. Recommended panel thickness is 1 to 4 mm.
- 2. Close side-by-side mounting is possible (in a single direction).

Accessories (Order Separately)

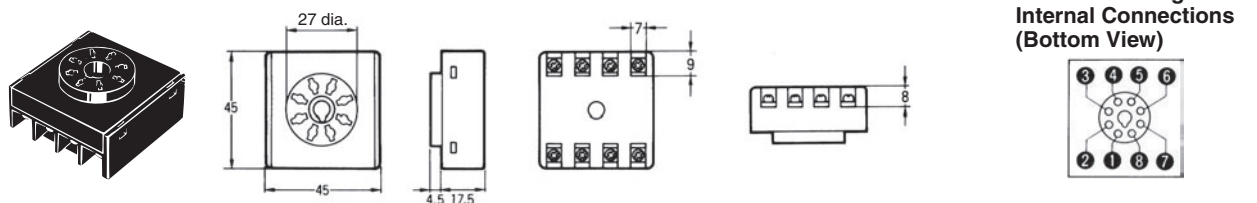
Connection Sockets

P2CF-08 Front Connecting Socket



Note: A finger-protection model (P2CF-08-E) is also available.

P3G-08 Back Connecting Socket (for Flush Mounting)

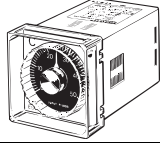


Note: A Protective Cover for finger protection (Y92A-48G) is also available.

Hard Protective Cover

A Hard Protective Cover (Y92A-48B) is available. It can be used in the following cases.

- To protect the setting section, against dust and dirt
- To prevent accidentally changing settings by touching the front of the Controller.
- To protect the Controller from water drips

Appearance	
Model	Y92A-48B

Applicable Thermistor

Connect a Thermistor with a replaceable element (E52-THE5A, E52-THE6D, or E52-THE6F) to the E5C2-R20G. Refer to E52 for details.

Safety Precautions

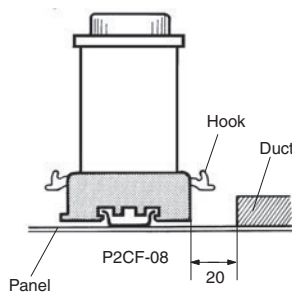
Refer to *Safety Precautions for All Temperature Controllers*.

■ Correct Use

Mounting

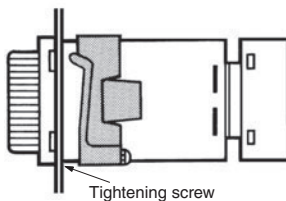
Track Mounting (E5C2 with P2CF-08)

When mounting two or more E5C2 models with track-mounting sockets, leave a space of approximately 20 mm on both sides of the sockets where hooks are located.

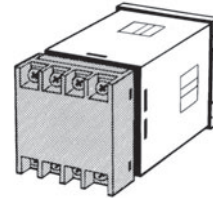


Flush Mounting

Insert E5C2 into the square hole of the panel and insert an adapter from the back so that there will be no space between E5C2 and the panel. Then, secure the E5C2 with a screw.

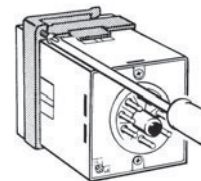


The P3G-08 can be wired in the same way as the P2CF-08.



Dismounting

If flush mounted, loosen the screw of the adapter and disengage the hooks for dismounting.



Temperature Setting

Do not turn the temperature setting knob of the E5C2 with excessive force, otherwise the stopper of the knob may break.

Others

- Do not remove the housing of the E5C2, otherwise the housing may break.
- To clean the surface of the E5C2, use a soft cloth wet with neutral detergent or alcohol. Do not use any organic solvent, such as paint thinner or benzene, strong acid or strong alkali to clean the surface of the E5C2, otherwise the surface of the E5C2 will become damaged.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

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

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

1. **Suitability of Use.** Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given: (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document. (ii) Use in consumer products or any use in significant quantities. (iii) 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. (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this Product. NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON'S PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
2. **Programmable Products.** Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
3. **Performance Data.** Data presented in Omron Company websites, catalogs and other materials 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 user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.
4. **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 part 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 part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.
5. **Errors and Omissions.** Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

OMRON CANADA, INC. • HEAD OFFICE

Toronto, ON, Canada • 416.286.6465 • 866.986.6766 • www.omron247.com

OMRON ELECTRONICS DE MEXICO • HEAD OFFICE

México DF • 52.55.59.01.43.00 • 01-800-226-6766 • mela@omron.com

OMRON ELECTRONICS DE MEXICO • SALES OFFICE

Apodaca, N.L. • 52.81.11.56.99.20 • 01-800-226-6766 • mela@omron.com

OMRON ELETRÔNICA DO BRASIL LTDA • HEAD OFFICE

São Paulo, SP, Brasil • 55.11.2101.6300 • www.omron.com.br

OMRON ARGENTINA • SALES OFFICE

Cono Sur • 54.11.4783.5300

OMRON CHILE • SALES OFFICE

Santiago • 56.9.9917.3920

OTHER OMRON LATIN AMERICA SALES

54.11.4783.5300

OMRON EUROPE B.V. • Wegalaan 67-69, NL-2132 JD, Hoofddorp, The Netherlands. • +31 (0) 23 568 13 00 • www.industrial.omron.eu