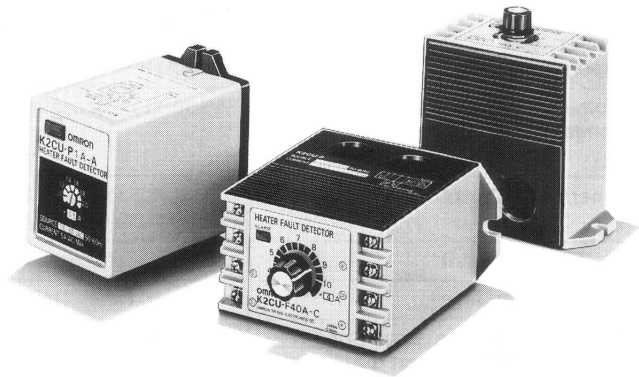


Accurate Detection of Heater Element Burnout Regardless of Heater Capacities

- Accurately detects a burned heater element or elements incorporated by a molding machine or packing machine and outputs an alarm signal.
- Precisely singles out the burned element even if one heater element among several heater elements has been burned out.
- Applicable to small- to large-capacity heater elements.
- All K2CU-F large-capacity, built-in current transformer models work with both single-phase and three-phase heaters.
- Voltage fluctuation compensation function eliminates false alarms due to variations in the supply voltage.



Ordering Information

K2CU-F□□A-□GS Model with Gate Input Terminals

Control supply voltage		Operating current			
		4 to 10 A	8 to 20 A	16 to 40 A	32 to 80 A
100 VAC	With voltage fluctuation compensation	K2CU-F10A-CGS	K2CU-F20A-CGS	K2CU-F40A-CGS	K2CU-F80A-CGS
110 VAC		K2CU-F10A-DGS	K2CU-F20A-DGS	K2CU-F40A-DGS	K2CU-F80A-DGS
200 VAC		K2CU-F10A-EGS	K2CU-F20A-EGS	K2CU-F40A-EGS	K2CU-F80A-EGS
220 VAC		K2CU-F10A-FGS	K2CU-F20A-FGS	K2CU-F40A-FGS	K2CU-F80A-FGS

K2CU-F Large-capacity, Built-in Current Transformer Models

Control supply voltage		Operating current			
		4 to 10 A	8 to 20 A	16 to 40 A	32 to 80 A
100 VAC	With voltage fluctuation compensation	K2CU-F10A-C	K2CU-F20A-C	K2CU-F40A-C	K2CU-F80A-C
110 VAC		K2CU-F10A-D	K2CU-F20A-D	K2CU-F40A-D	K2CU-F80A-D
200 VAC		K2CU-F10A-E	K2CU-F20A-E	K2CU-F40A-E	K2CU-F80A-E
220 VAC		K2CU-F10A-F	K2CU-F20A-F	K2CU-F40A-F	K2CU-F80A-F

K2CU-P Small-capacity, Plug-in Models

Control supply voltage		Operating current			
		0.25 to 0.5 A	0.5 to 1 A	1 to 2 A	2 to 4 A
100/ 200 VAC	With voltage fluctuation compensation	K2CU-P0.5A-A	K2CU-P1A-A	K2CU-P2A-A	K2CU-P4A-A
	Without voltage fluctuation compensation	---	K2CU-P1A-A	K2CU-P2A-A	K2CU-P4A-A
110/ 220 VAC	With voltage fluctuation compensation	K2CU-P0.5A-B	K2CU-P1A-B	K2CU-P2A-B	K2CU-P4A-B
	Without voltage fluctuation compensation	---	K2CU-P1A-B	K2CU-P2A-B	K2CU-P4A-B

Specifications

■ Ratings

Item	K2CU-F	K2CU-P
Control supply voltage	100, 110, 200, 220 VAC	100/200, 110/220 VAC
Rated frequency	50/60 Hz	
Carry current	1.25 times as large as each model's maximum operating current	2.5 A for K2CU-P0.5A-A/-B; 5 A
Operating voltage range	85% to 110% of control supply voltage	
Voltage fluctuation compensation range	85% to 110% of control supply voltage	85% to 110% of control supply voltage (applicable only on models with voltage fluctuation compensation)
Operating current	4 to 10 A, 8 to 20 A, 16 to 40 A, 32 to 80 A (continuously variable)	0.25 to 0.5 A, 0.5 to 1 A, 1 to 2 A, 2 to 4 A (continuously variable)
Releasing current	105% max. of operating current	110% max. of operating current
Operate time	0.5 s max. (when current changes from 150% to 0%)	
Gate input voltage range (for models with gate input terminals)	5 to 30 VDC	---
Control output	2 A at 220 VAC, SPDT ($\cos\phi = 0.4$)	
Power consumption	Input: 0.5 VA max. Power supply: 5 VA max.	Input: 1 VA max. Power supply: 4 VA max.

■ Characteristics

Setting accuracy	±7% max.
Repeat accuracy	±3% max.
Influence of temperature	±10% max. (at 20°C±30°C)
Influence of voltage	Models without voltage fluctuation compensation: ±3% max. of the value measured at the control supply voltage, on condition that the voltage fluctuation is 85% to 110% of the control supply voltage Models with voltage fluctuation compensation: ±5% max. of the logical value, on condition that the voltage fluctuation is 85% to 110% of the control supply voltage. (see note)
Influence of frequency	±3% max. (at ±5% of rated frequency)
Insulation resistance	10 MΩ min. (at 500 VDC) between electric circuits and mounting panel
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min between electric circuits and mounting panel
Overcurrent	20 times of max. set value of operating current for 2 s
Vibration resistance	Destruction: 16.7 Hz, 1-mm double amplitude for 10 min each in X, Y, and Z directions
Shock resistance	Destruction: 100 m/s ² (approx. 10G)
Ambient temperature	Operating: -10°C to 55°C (with no icing)
Ambient humidity	Operating: 45% to 85%
Weight	K2CU-F: approx. 390 g; K2CU-P: approx. 300 g

Note: The logical value is an operating value within a range of 0.85 to 1.1 with a voltage fluctuation of 85% to 110%, based on the value at the control supply voltage measured as 1.

Operation

K2CU-F A- GS Series

When power is supplied to the heater (when the SSR is ON), a current flows through the wires to the heater elements. At the same time, a voltage is imposed on the gate circuit and the K2CU-F□□A□GS begins monitoring the current flowing through the heater wires.

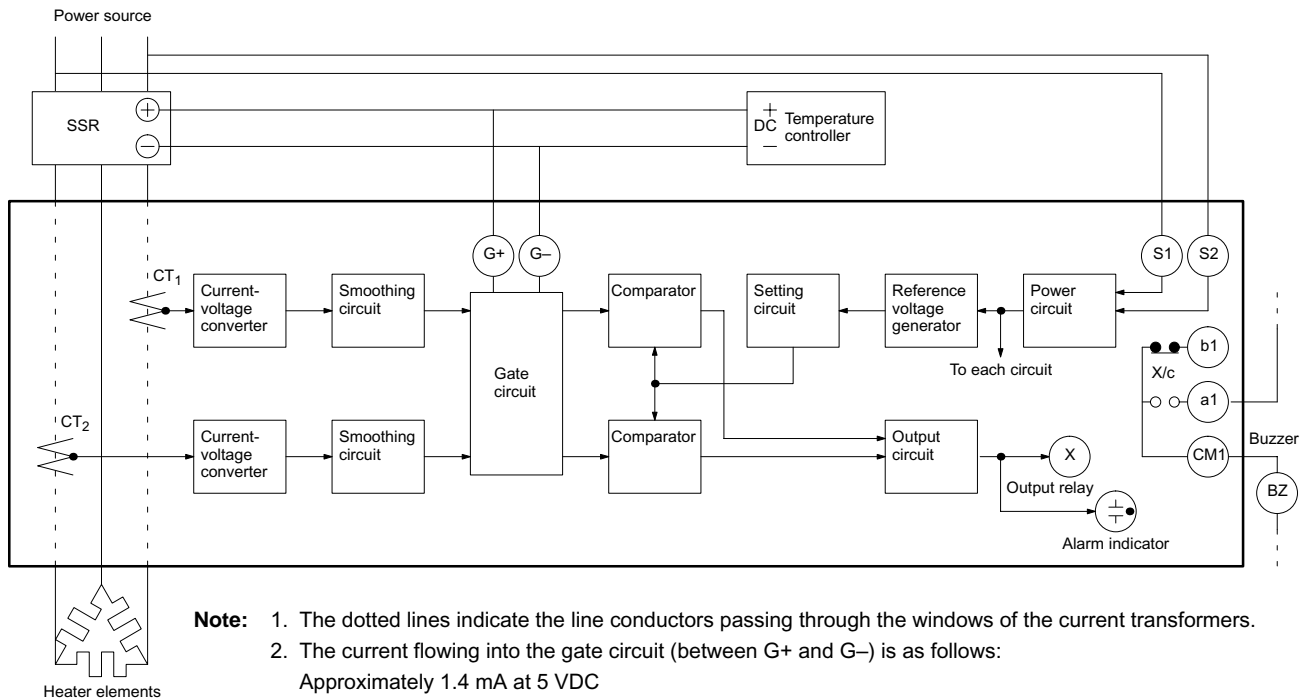
The current flowing to the heater wires is detected by the detector sections through each Current Transformer (CT) incorporated by the K2CU-F□□A□GS.

The current signals transmitted by the two CTs are sent to the current-voltage converters, smoothing circuits, and comparators as shown in the diagram.

The signal generated by the reference voltage generator is sent to the setting circuit to provide a reference value. The reference value is sent to the comparators. Each comparator compares its heater element current input and the reference value. If the input is lower than the reference value, a signal is sent to the output circuit.

There are two detector sections operating independently. If either of the input signals from the CTs is lower than the reference value, the output relay and alarm indicator will be activated.

The K2CU-F□□A□GS incorporates a voltage fluctuation compensation function which automatically corrects the reference value if the supply voltage fluctuates.



- Note:**
1. The dotted lines indicate the line conductors passing through the windows of the current transformers.
 2. The current flowing into the gate circuit (between G+ and G-) is as follows:
 Approximately 1.4 mA at 5 VDC
 Approximately 3.4 mA at 12 VDC
 Approximately 6.7 mA at 24 VDC
 3. When using a K2CU which has the model number suffix "GS" (a model that incorporates gate input terminals), the control output of the temperature controller must be a voltage output type.

K2CU-F Series

When power is supplied to the heater (when the contactor is ON), a current flows through the wires to the heater elements. At the same time, a voltage is imposed on the power circuit of the K2CU-F.

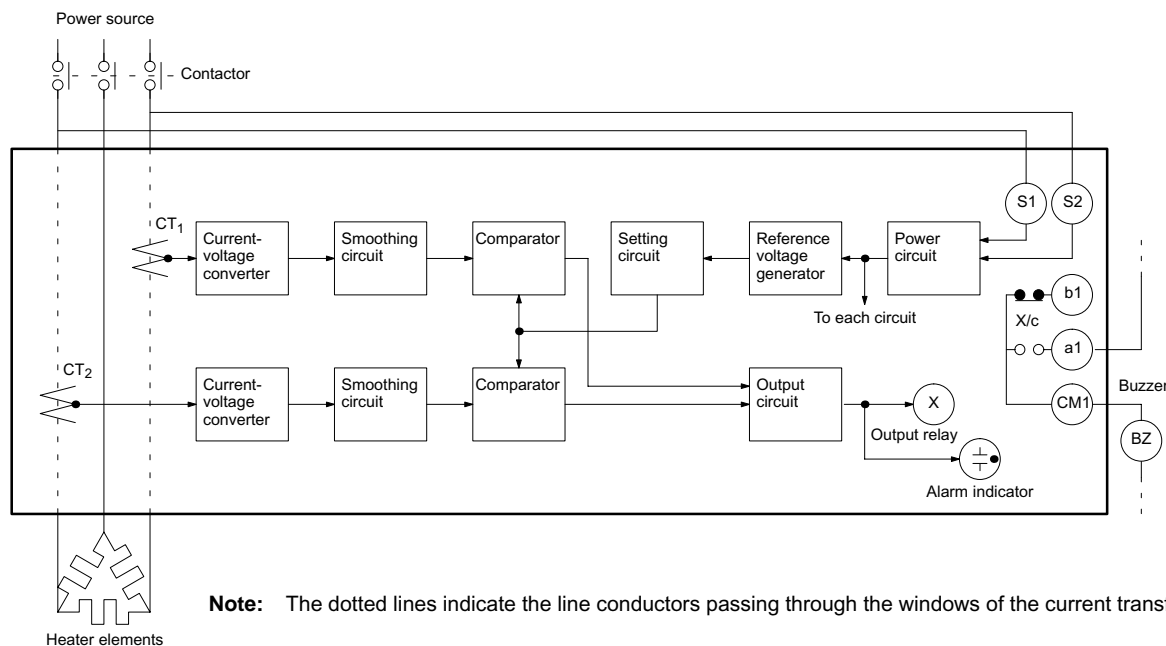
The current flowing to the heater wires is detected by the detector sections through each Current Transformer (CT) incorporated by the K2CU-F.

The current signals transmitted by the two CTs are sent to the current-voltage converters, smoothing circuits, and comparators as shown in the diagram.

The signal generated by the reference voltage generator is sent to the setting circuit to provide a reference value. The reference value is sent to the comparators. Each comparator compares its heater element current input and the reference value. If the input is lower than the reference value, a signal is sent to the output circuit.

There are two detector sections operating independently. If either of the input signals from the CTs is lower than the reference value, the output relay and alarm indicator will be activated.

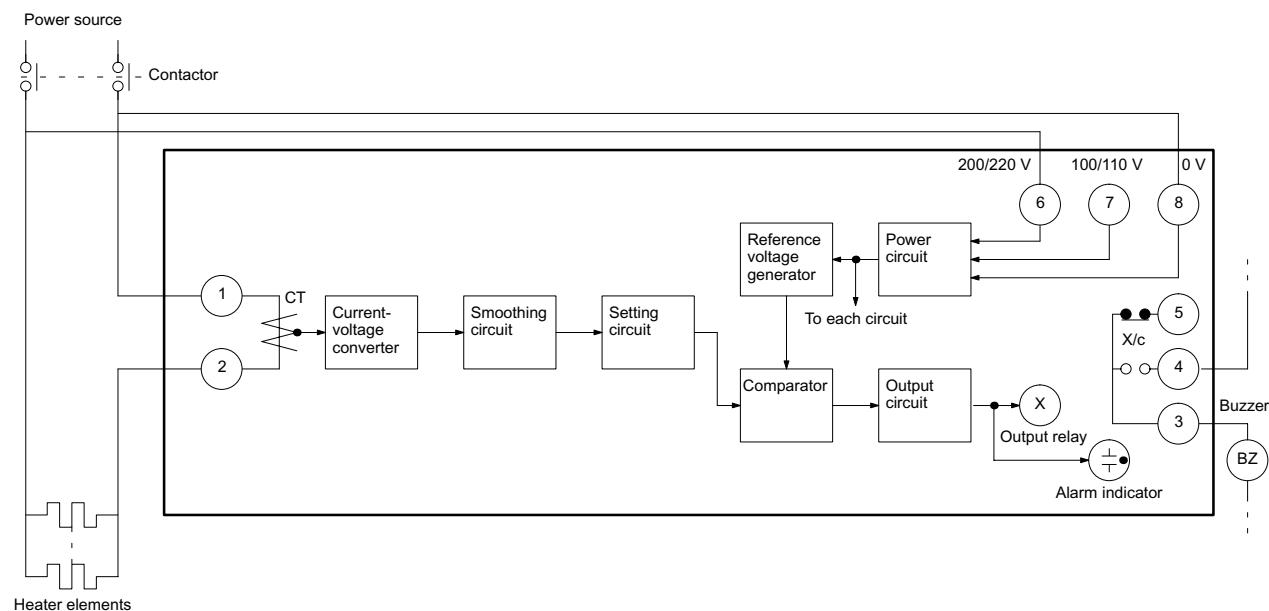
The K2CU-F incorporates a voltage fluctuation compensation function which automatically corrects the reference value if the supply voltage fluctuates.



K2CU-P Series

The K2CU-P operates basically in the same way as the K2CU-F.

The comparator compares external current signals and the reference value and outputs the result of the comparison to the output circuit.



■ Setting of Operating Current

Use the potentiometer on the front panel to set the operating current.

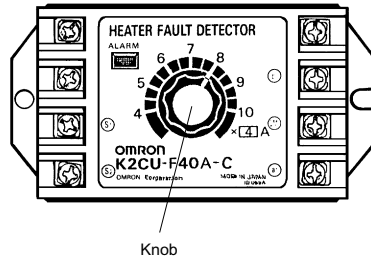
Rotate the knob to set the desired current value at which the Heater Burnout Detector should operate. Do not exceed the maximum and minimum positions.

The K2CU-F's scale is divided into 12 graduations including sub-graduations and the K2CU-P's scale is divided into 5 graduations.

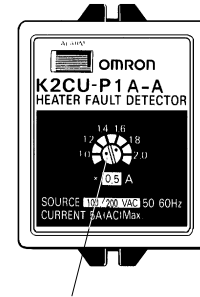
The knobs of the K2CU-F and K2CU-P as shown in the illustrations are set to 32 A and 0.7 A respectively.

The set operating current is defined as the mean value of the heater current under normal operating conditions and the heater current under a burnout or abnormal condition.

$$\text{Set value} = \frac{\text{Normal current} + \text{abnormal current}}{2}$$



Knob



Red point (indicates the set value)

■ Heater Connection and Current

The following table shows the different connections possible. The formula under each illustration indicates the electrical current value of the heater elements under normal and abnormal conditions.

Phase		Normal condition	Abnormal condition	
Single phase				
Three phase	Delta network	<p>$(5 A \times \sqrt{3})$</p>	<p>$(5 A \times \sqrt{3} \times \frac{\sqrt{3}}{2})$</p>	<p>$(5 A \times \sqrt{3} \times \frac{1}{3})$</p>
	Star network	<p>$(5 A \times \frac{1}{3})$</p>	<p>$(5 A \times \frac{1}{3} \times \frac{\sqrt{3}}{2})$</p>	<p>$(5 A \times \frac{1}{3} \times \frac{\sqrt{3}}{2})$</p>
	V network	<p>$(5 A \times \sqrt{3} = 8.7 A)$</p>	<p>$(5 A \times 1/2)$</p>	<p>$(5 A \times 1)$</p>

Note: Values in this table are correct when a 200 VAC, 1 kW heater is used on a single-phase or three-phase current.

■ Operation Check

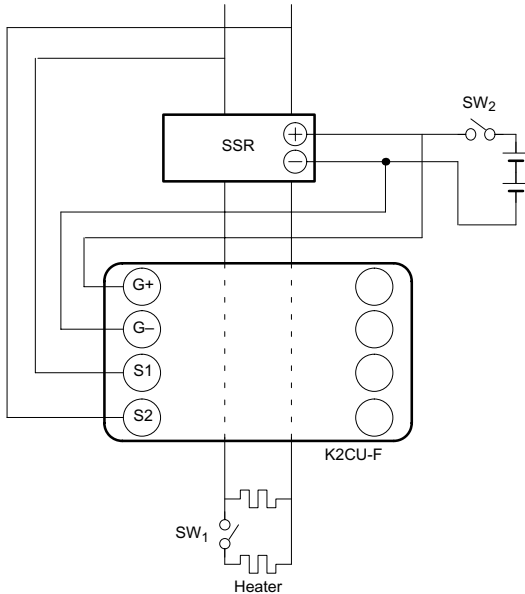
K2CU-F A- GS

The operation of the heater burnout detector can be easily checked as follows:

In a Single-phase Circuit

Set the operating current to be 0.6 to 0.55 times the heater current. Close the SW₂ with switch SW₁ turned on. Confirm that the alarm indicator remains off.

Turn off SW₁ and confirm that the alarm indicator comes on, and that the output relay operates.

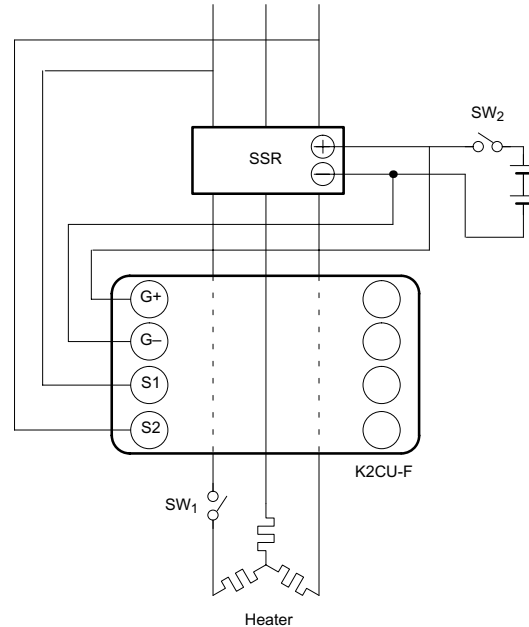


In a Three-phase, Star Network

Set the operating current to be 0.9 times the heater current.

Close the SW₂ with switch SW₁ turned on. Confirm that the alarm indicator remains off.

Turn off SW₁ and confirm that the alarm indicator comes on, and that the output relay operates.



In a Three-phase, Delta Network

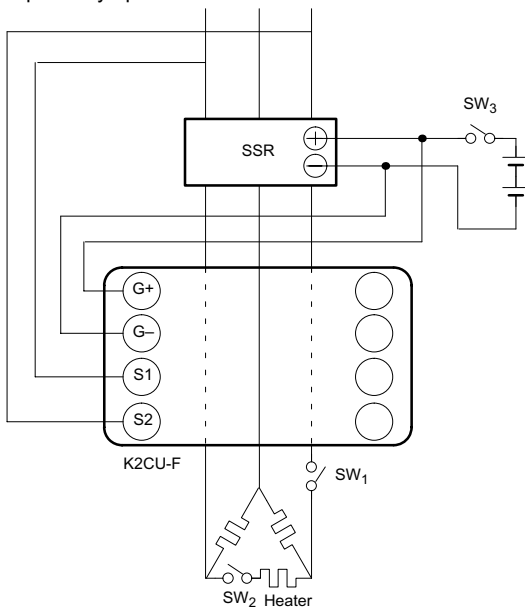
Set the operating current to be 0.6 times the heater current.

Close the SW₃ with switches SW₁ and SW₂ turned on. Confirm that the alarm indicator remains off.

Turn off SW₂ and confirm that the alarm indicator comes on, and that the output relay operates.

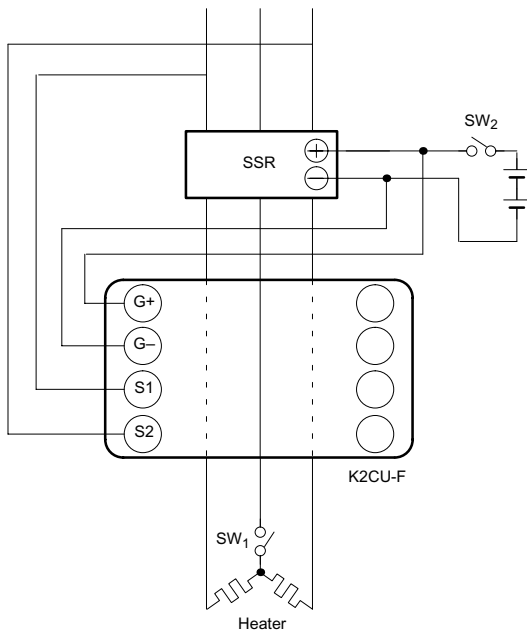
Turn on SW₁ set the operating current to be 0.9 times the heater current, and confirm that the alarm indicator goes off and the output relay releases.

Turn off SW₁ and confirm that the alarm indicator comes on, and that the output relay operates.



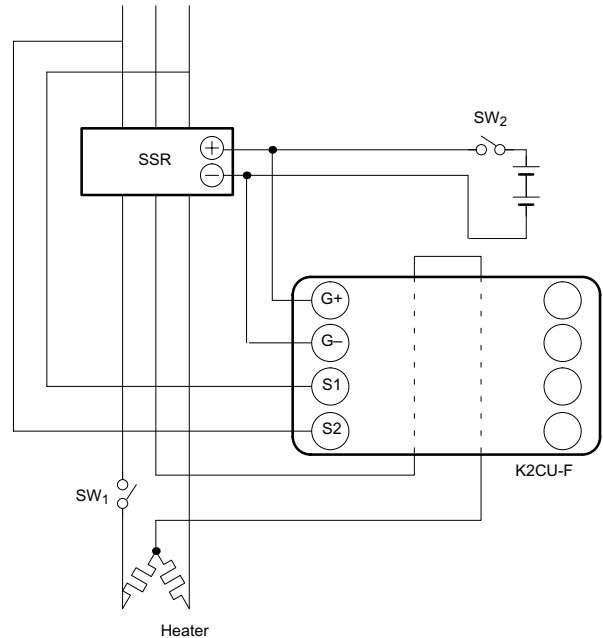
In a Three-phase, V Network 1

Set the operating current to be 0.3 to 0.35 times the heater current.
 Close the SW₂ with switch SW₁ turned on. Confirm that the alarm indicator remains off.
 Turn off SW₁ and confirm that the alarm indicator comes on, and that the output relay operates.



In a Three-phase, V Network 2

Set the operating current to be 0.6 times the heater current (of the phase connected between terminals 1 and 2, or the one passed through the window of the window-type Current Transformer of the heater burnout detector).
 Close the SW₂ with switch SW₁ turned on. Confirm that the alarm indicator remains off.
 Turn off SW₁ and confirm that the alarm indicator comes on, and that the output relay operates.



K2CU-F, K2CU-P

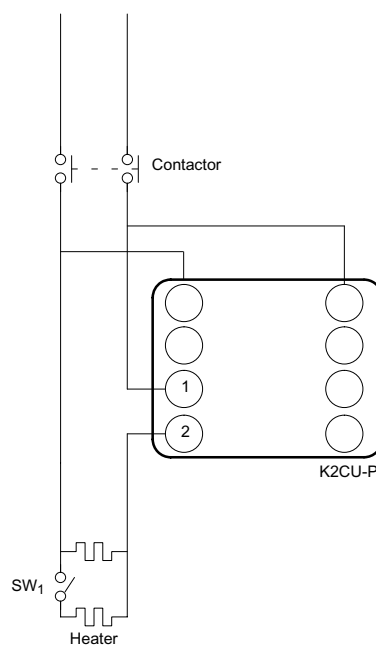
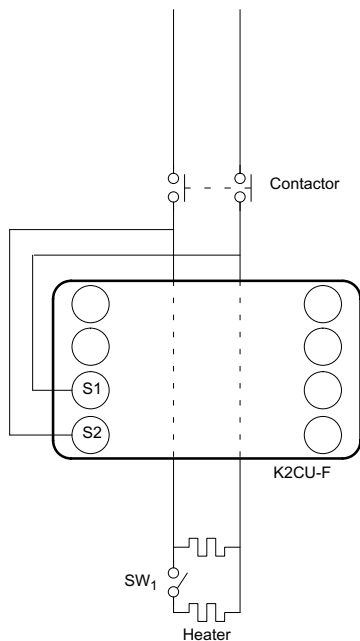
The operation of the heater burnout detector can be easily checked as follows:

In a Single-phase Circuit

Set the operating current to be 0.55 to 0.6 times the heater current.

Close the contactor with switch SW₁ turned on. Confirm that the alarm indicator remains off.

Turn off SW₁ and confirm that the alarm indicator comes on, and that the output relay operates.



In a Three-phase, Delta Network

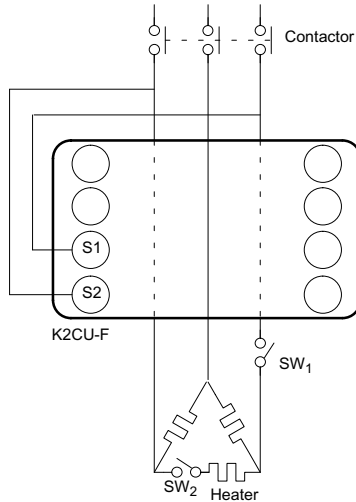
Set the operating current to be 0.6 times the heater current.

Close the contactor with switches SW_1 and SW_2 turned on. Confirm that the alarm indicator remains off.

Turn off SW_2 and confirm that the alarm indicator comes on, and that the output relay operates.

Turn on SW_1 set the operating current to be 0.9 times the heater current, and confirm that the alarm indicator goes off and the output relay releases.

Turn off SW_1 and confirm that the alarm indicator comes on, and that the output relay operates.

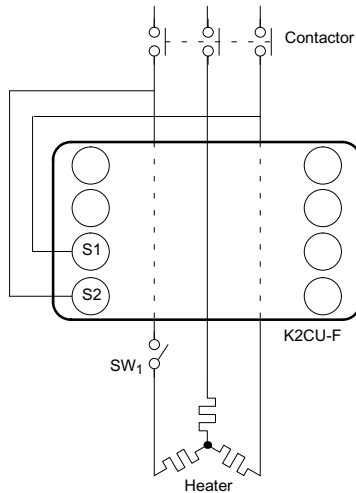


In a Three-phase, Star Network

Set the operating current to be 0.9 times the heater current.

Close the contactor with switch SW_1 turned on. Confirm that the alarm indicator remains off.

Turn off SW_1 and confirm that the alarm indicator comes on, and that the output relay operates.

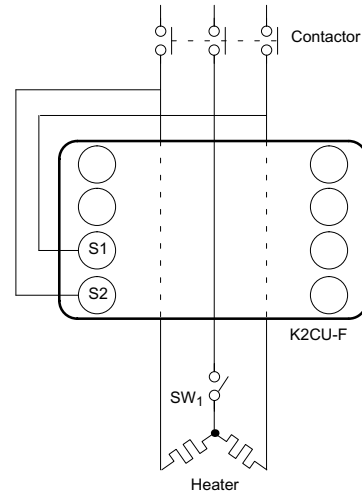


In a Three-phase, V Network 1

Set the operating current to be 0.3 to 0.35 times the heater current.

Close the contactor with switch SW_1 turned on. Confirm that the alarm indicator remains off.

Turn off SW_1 and confirm that the alarm indicator comes on, and that the output relay operates.

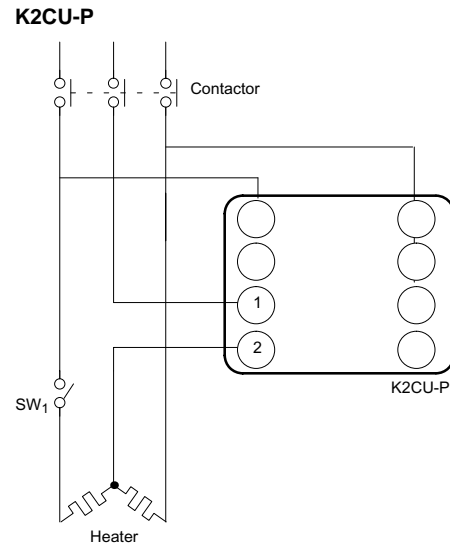


In a Three-phase, V Network 2

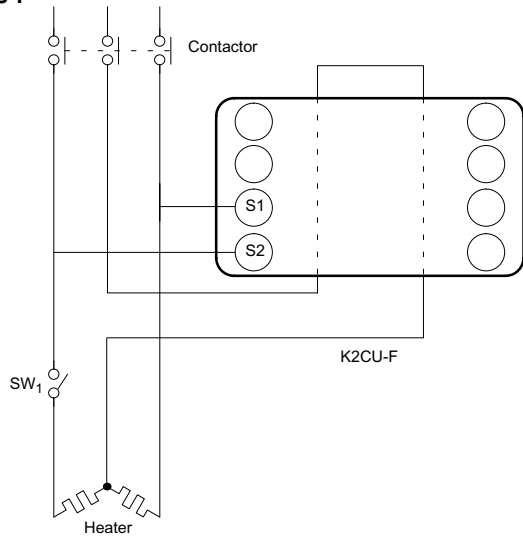
Set the operating current to be 0.6 times the heater current (of the phase connected between terminals 1 and 2, or the one passed through the window of the window-type Current Transformer of the heater burnout detector).

Close the contactor with switch SW_1 turned on. Confirm that the alarm indicator remains off.

Turn off SW_1 and confirm that the alarm indicator comes on, and that the output relay operates.



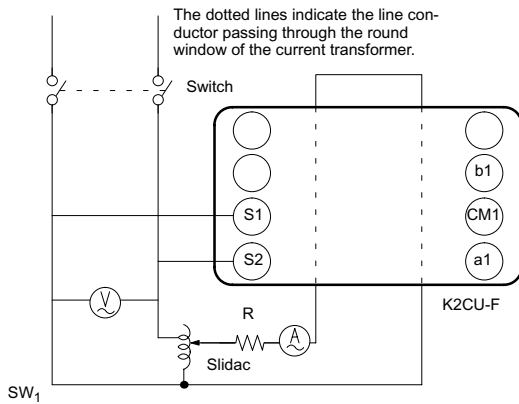
K2CU-F



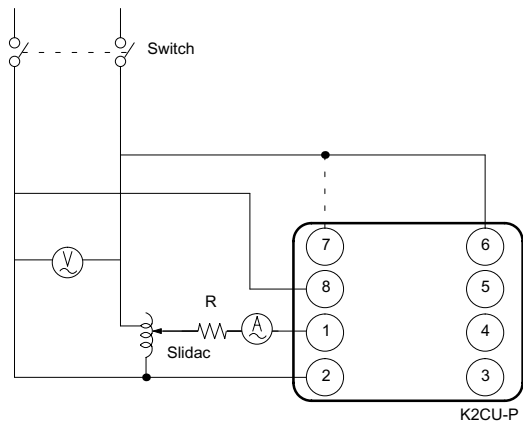
■ Test Circuit

To check the operation in detail, use the following circuit.

K2CU-F



K2CU-P

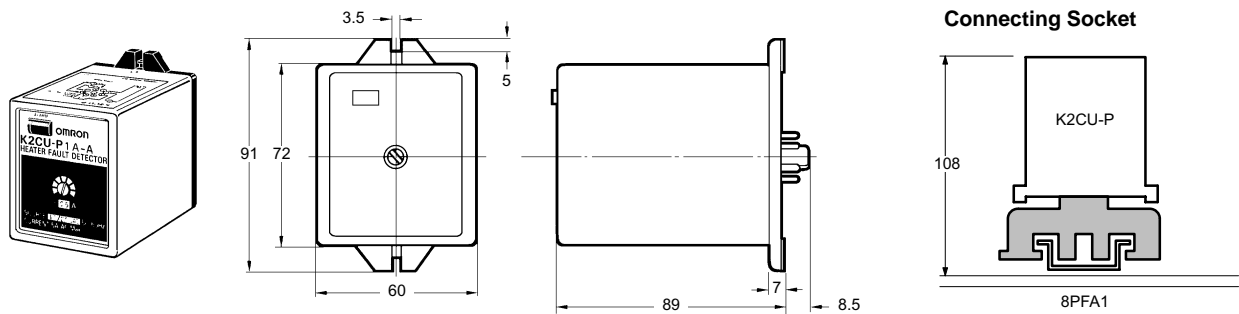


Note: Determine the value of R according to the specifications of the K2CU to be used. The dotted line indicates the connection at a supply voltage of 100 or 110 VAC.

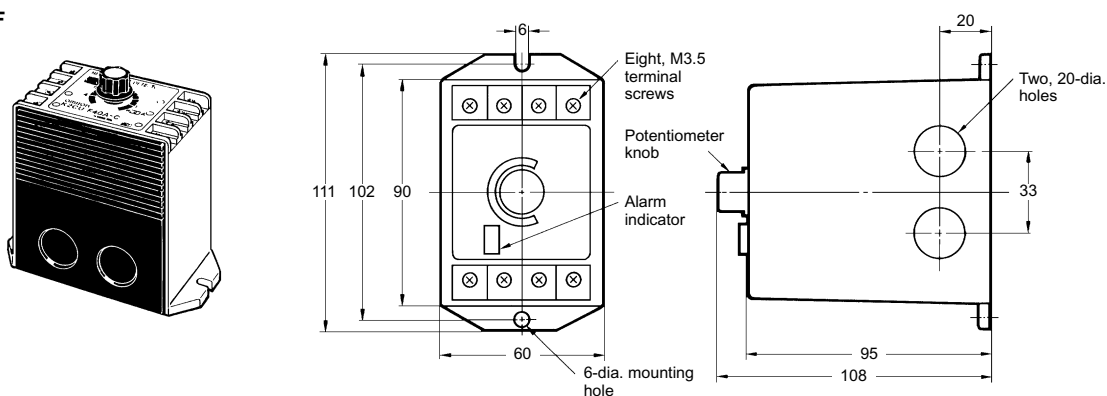
Dimensions

Note: All units are in millimeters unless otherwise indicated.

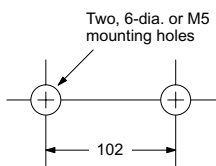
K2CU-P



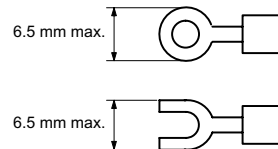
K2CU-F



Mounting Holes



- Note:**
1. Install the K2CU-F on a flat surface.
 2. When solderless terminal lugs are desired, use ones having an outer diameter of 6.5 mm maximum.

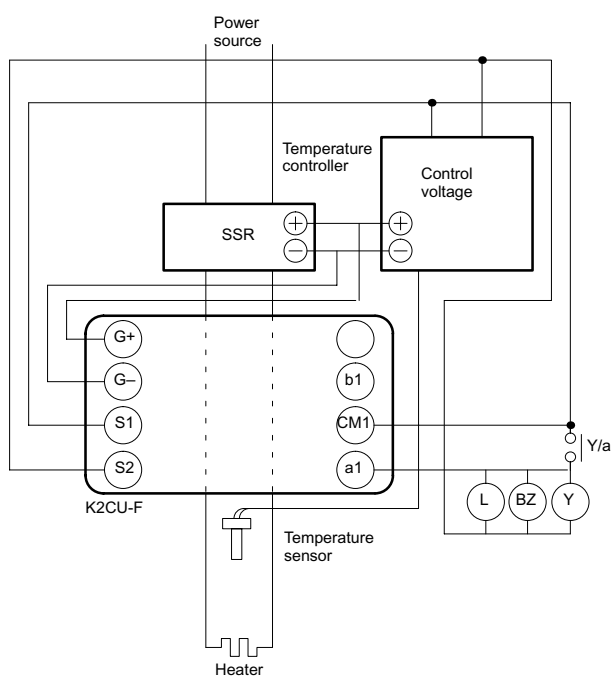


Installation

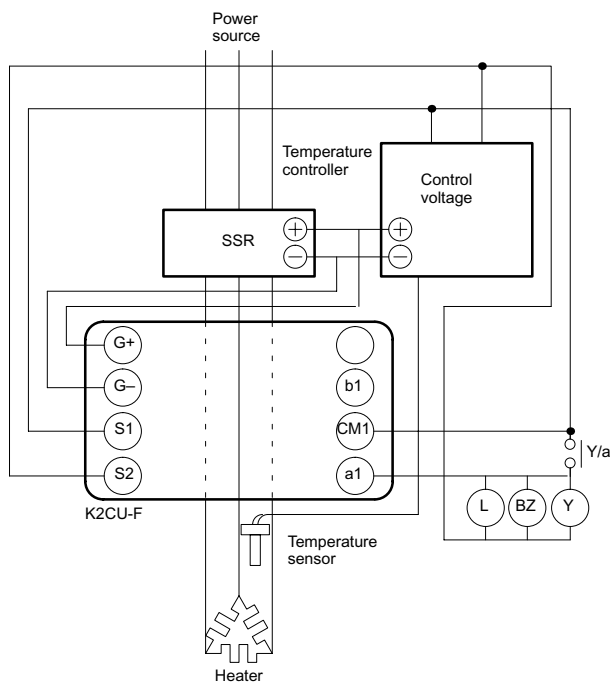
External Connections

K2CU-F A- GS

Single-phase Heater

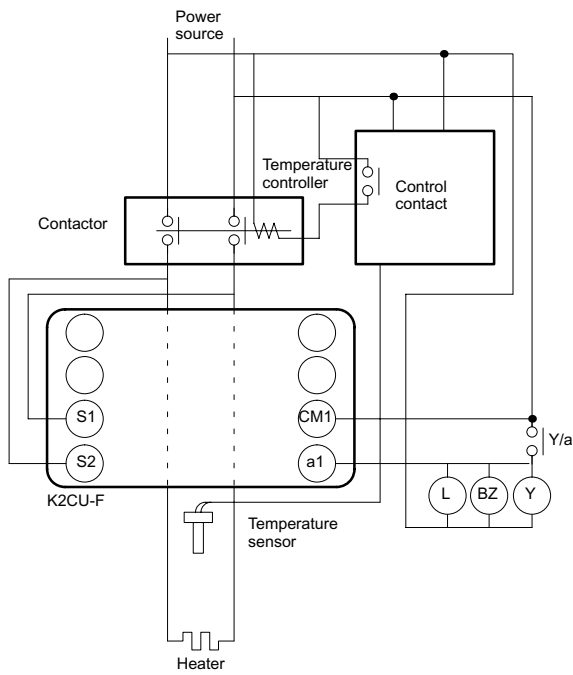


Three-phase Heater

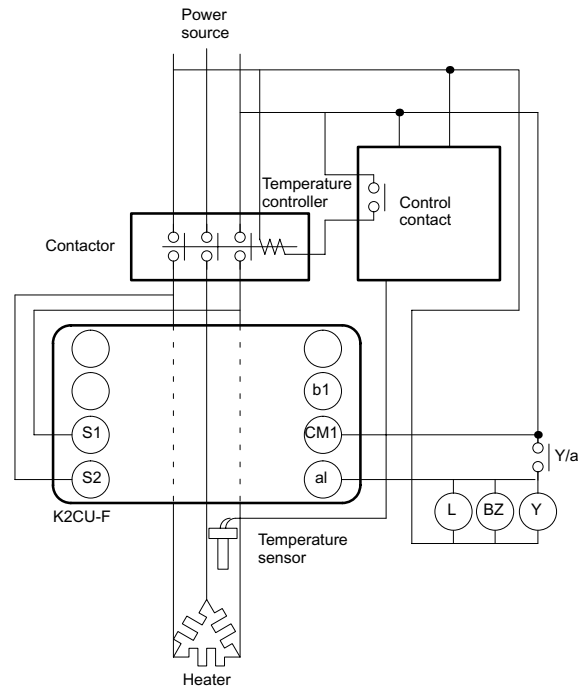


K2CU-F

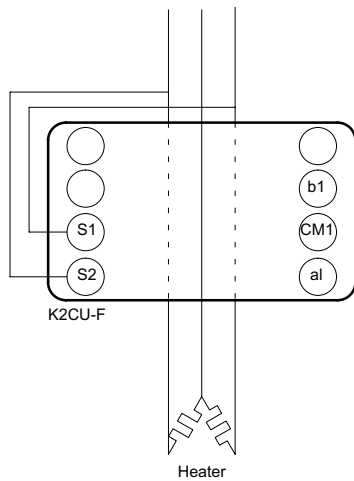
Single-phase Heater



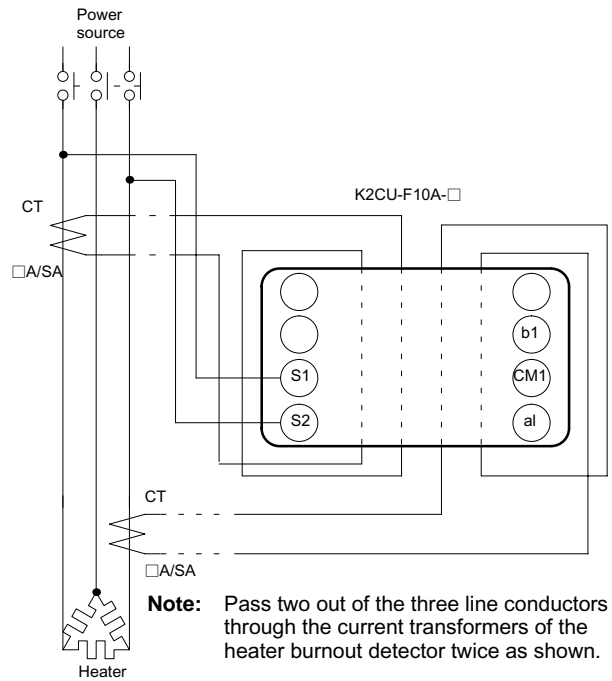
Three-phase Heater



Three-phase, V-connected Heater



With External Current Transformer



General

Refer to "External Connections" before using the K2CU with external CTs.

When a temperature controller is used in combination with the K2CU (except for the K2CU-F□□A-□GS), the heater element(s) must be turned ON or OFF for 1 s or longer (although the heater element(s) can be turned ON for 0.5 s according to the specifications).

The K2CU cannot be used with a phase-control circuit, inverter circuit, frequency-count circuit, cycle-control unit, or a motor load.

Mounting

Securely mount the K2CU as horizontally as possible although there is no particular limitation of mounting directions.

Connection

Solderless-type terminal must be connected to the terminals securely.

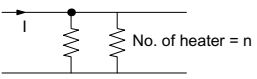
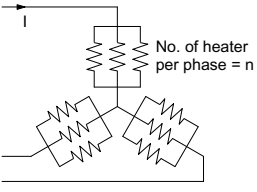
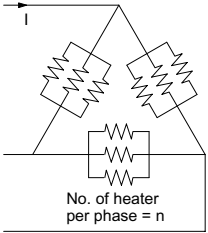
Wire the terminals correctly by referring to the external connections. The terminals have no polarity. Be sure to connect 100 (or 110) V to the 100-V (or 110-V) terminals and 200 (or 220) V to the 200-V (or 220-V) terminals of the K2CU-P or the K2CU-P may malfunction.

The control power source for the K2CU (except for the K2CU-F□□A-□GS) must be supplied from the load side via a contactor.

Be sure to impose a voltage between the 0-V terminal and 100-V (or 110-V) terminal or the 0-V terminal and 200-V (or 220-V) terminal of the K2CU-P, otherwise the K2CU-P will not operate.

Operating Current Setting when Several Heaters are Used

The following table shows relative values of changes in the current when any one of several heaters connected in parallel has burned out. The current value under normal condition is 1. Use this table as a guideline in determining the operating current.

Connection		n = 1	n = 2	n = 3	n = 4	n = 5
		0	0.5	0.67	0.75	0.8
	Current in burned-out phase	0	0.6	0.75	0.82	0.86
	Current in other phases	0.87	0.92	0.95	0.96	0.97
	Current in burned-out phase	0.58	0.77	0.84	0.88	0.91
	Current in other phases	1	1	1	1	1
	Current in burned-out phase	0.58	0.77	0.84	0.88	0.91

- Note:**
1. This table shows the respective change rates in current when any one of several heaters connected in parallel has burned out.
 2. The current value under the normal condition is 1.
 3. The values in this table are logical values. Actually, these values may vary slightly because of influence of unbalanced loads (heaters). It is therefore recommended to test the actual current values and the load condition before determining the operating current, especially when the current under the normal condition and that under an abnormal condition do not significantly differ.

Terms and Conditions of Sale

- 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.
- 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.
- 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.
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- Orders.** Omron will accept no order less than \$200 net billing.
- 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.
- 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.
- 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.
- Cancellation; Etc.** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Omron against all related costs or expenses.
- 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.
- Shipping; Delivery.** Unless otherwise expressly agreed in writing by Omron:
 - Shipments shall be by a carrier selected by Omron; Omron will not drop ship except in "break down" situations.
 - Such carrier shall act as the agent of Buyer and delivery to such carrier shall constitute delivery to Buyer;
 - 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;
 - Delivery and shipping dates are estimates only; and
 - Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
- 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.
- 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://oeweb.omron.com> or contact your Omron representative for published information.
- 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.
- 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.
- 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.
- 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.
- 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

- 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:
 - Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
 - Use in consumer products or any use in significant quantities.
 - 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 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.
- Programmable Products.** Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
- 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.
- 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.
- 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.

Complete "Terms and Conditions of Sale" for product purchase and use are on Omron's website at www.omron.com/oei – under the "About Us" tab, in the Legal Matters section.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

OMRON[®]

OMRON ELECTRONICS LLC

1 Commerce Drive
Schaumburg, IL 60173
Tel: 847.843.7900

For U.S. technical support or other inquiries: 800.556.6766

OMRON CANADA, INC.

885 Milner Avenue
Toronto, Ontario M1B 5V8
Tel: 416.286.6465

MEXICO SALES OFFICES

Mexico, D.F. 555.660.3144
Ciudad Juárez 656.623.7083
Monterrey, N.L. 818.377.4281
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