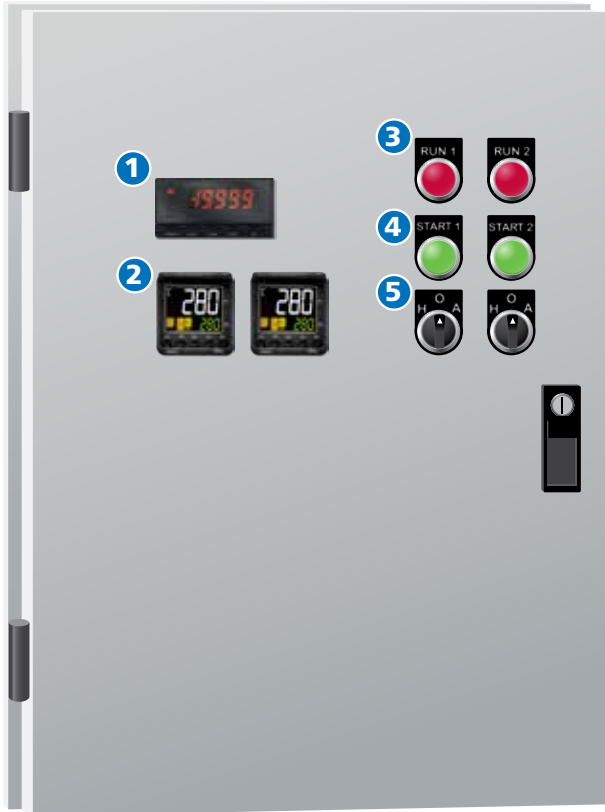# OMRON
AUTOMATION & SAFETY

Panel Builder Guide

- » Pushbuttons and Indicators
- » Power Supplies
- » Temperature Controllers
- » Monitoring/Protective Relays
- » Fiber-Optic Sensors

- » Programmable Relays
- » Timers
- » Digital Panel Meters
- » Relays

# Industrial Components Designed for OEMs

PANEL DOOR

1. K3MA Digital Panel Indicator
2. E5_C Temperature Controller
3. M22R Indicator light
4. A22N Pushbuttons
5. A22NS/A22NW (Lighted or Non-lighted) Selector Switches

INSIDE PANEL

6. S8VK-G Power Supplies
7. K8AK Monitoring Relays
8. E3X Fiber Optic Amplifiers
9. ZEN Programmable Relay
10. H3DK Timer
11. G3NA Relay
12. MY Relays
13. G2RV & G3RV Relays
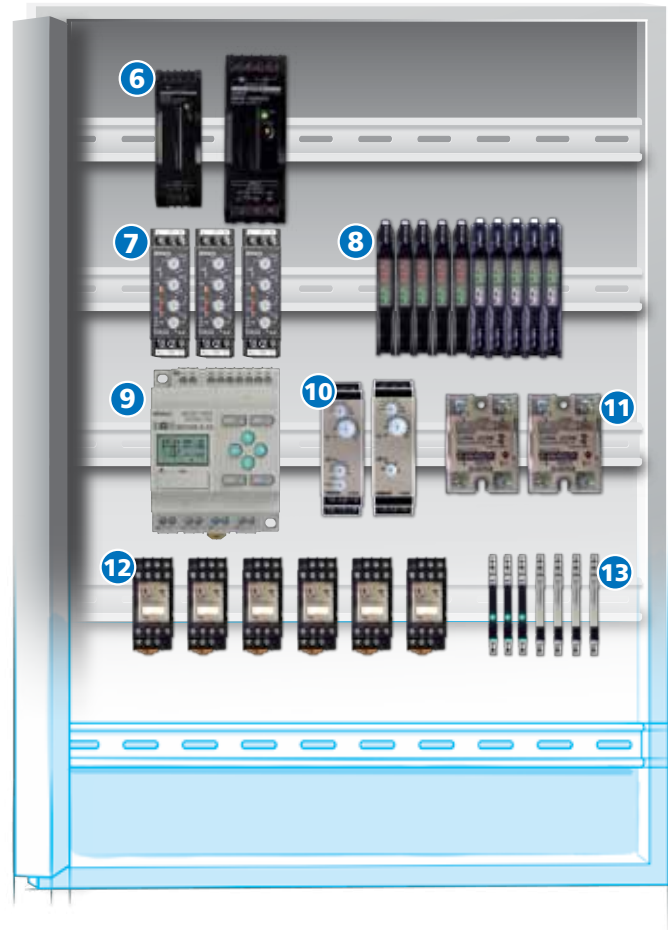
More Profit from Your Control Panel

A22N Series Pushbuttons, Selector Switches and M22N Indicator lights

Panel builders and machine designers like the aesthetic appeal of switches with the metal bezels. Omron's A22N series delivers that appearance with simple installation and NEMA 4X (IP66) rating, in a selection of popular colors and switching functions. The A22N series includes 22 mm diameter pushbuttons, selector switches and pilot lights to match most control panel needs.

A22N and M22N Easier to Stock

Omron's A22N series of 22 mm pushbuttons, provides panel builders with a variety of options when designing panels for new installations. Our concise product offering makes product selection easier and reduces unwanted parts which leads to internal cost reductions.

FEATURES

- Round shape only
- Easy to expand and customize standard switches by adding switch units (Contact Blocks)
- Flat and projected pushbuttons
- A22NN Non-lighted pushbutton in white, green, red, yellow, blue and black
- A22NL Lighted pushbuttons in white, green, red, yellow, blue
- A22NS Selector switches in black, green, red, yellow and blue
- A22NW Lighted selected switch green, red, yellow and blue
- A22NK Keyed selector switch
- M22N Pilot lights in white, green, red, yellow and blue

A22N series of cost-effective 22 mm diameter pushbuttons and selector switches with a gleaming metal bezel that offers panel builders a tasteful appearance for machine controls. The switch units allow configuration changes to match contact requirements, and are quickly serviced with plug-in replacements. The A22N switches are designed with "no tools required" installation. Omron's innovative two-piece, snap-together construction for A22N switch series reduces installation time, wiring time, and panel depth requirements.

A22NL   A22NW
A22NK   A22NN
A22NS   M22N

For complete specifications and additional models and accessories visit omron247.com

3

Power Supplies That are Tough, Easy & Compact

S8VK Tough

Increased temperature range provides stable operation wherever the S8VK is installed. The wide operating temperature range of between -40 to 70°C (-40 to 158°F) guarantees operation in any environment where other power supplies may start to fail. The robust design advantages don't end there because the S8VK also offers high resistance to the vibration transmitted by machinery up to 5 G's. Designed to international safety standards for global markets, the S8VK even has approvals for marine applications (Lloyds approval) and carries an across-the-board, 5 year warranty on all models no matter which country your machine is exported to!

S8VK-G48024

S8VK-G12024

S8VK-G01524

S8VK Easy

Simply click onto a standard DIN rail using one hand to mount in a flash. Effortless and time saving!

Another key feature of S8VK is the double set of DC output terminals (three for negative terminal), making wiring quicker and easier. Universal input voltage (100 -240 VAC and 90 to 350 VDC) allows S8VK to be used in almost any application.

S8VK Compact

Omron understands size is important for panel builders and machine designers, which is why we applied our thermal simulation process and placed the DC output terminals at the top of our S8VK series. This allows internal heat to escape quicker, allowing S8VK to last longer in applications.

S8VK-G UL Class 2

15W to 60W models

Omron's UL Class 2 S8VK-G switching power supplies, available in 15W to 60W output models, are designed for limited DC power source applications to prevent fire hazards. They are UL508 listed and offer overload and overvoltage protection.

4

# Power Supplies Offer Diagnostic Displays

S8VS with Remaining Service Life or Total Run-Time Indication

Omron's S8VS-Series switching power supplies with built-in diagnostic displays support preventive maintenance programs and shorten trouble-shooting inside the control panel. The UL508 listed power supply combined with a built-in Smart Display provides operators with at-a-glance status of output voltage, output current and peak hold current.

The S8VS meets international safety standards, including UL, cUL, UL508 Listed and CE. All models have a universal input 100 to 240 VAC (85 to 264 VAC operating range). Depending on model, the display and alarm output indicate the power supply's remaining service life signaling time for maintenance or replacement, or indicate total run-time of the connected load to alert operations management to schedule replacement of critical consumable parts such as motor brushes. The single-phase, single output AC/DC power supplies are available with display on models ranging from 60 to 480W. In addition, the S8VS features overload and overvoltage protection. For increased safety, the overload protection function allows the power supply to shutdown automatically if the outputs are shorted or if there is excessive current flow in the output.

S8VS-12024BP

Output voltage	Output current	Peak hold current
24.0	1.3	2.5

Remaining service life	or	Total run-time of the load
1.5		7
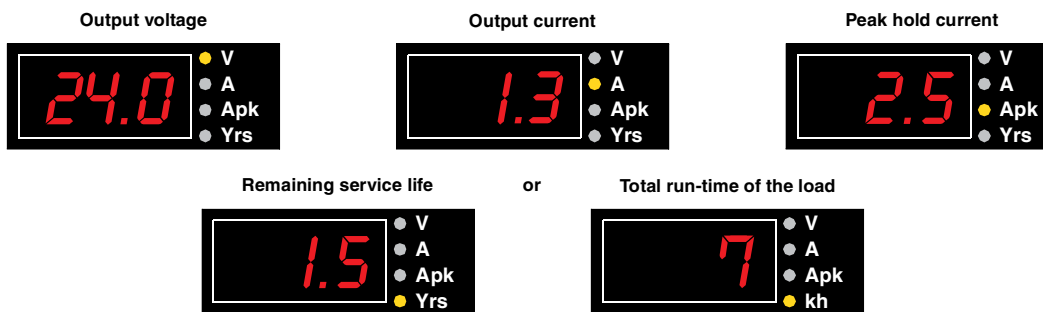
Power Supply Selection Tips

1. Collect information about your application. Input voltage and frequency? Output voltage? Wattage or power (in amperes) needed? Don't forget to take into account the peak loading (inrush) of the output.
2. Calculate the power (wattage) of the DC power supply you need. If more than one output is required, do the following calculation: Multiply the Voltage times the Amperage of each output to calculate the Wattage of each output. Next, add together the Wattage of each output to get the Total Wattage for the supply.
3. Check the enclosure style, connections and physical size of the power supply to ensure it is suitable for the intended application.
4. What special capabilities or requirements are needed to perform in the application? This can include monitoring length of load ON periods, power supply life, custom power ratings or mixed voltages.

Selection Worksheet

Input: _____ Volts _____ Hz
Output:
_____ VDC x _____ A = _____Watts
_____ VDC x _____ A = _____Watts
_____ VDC x _____ A = _____Watts
_____ VDC x _____ A = _____Watts   Add Watts from each output to calculate Total Wattage

The New Standard in Temperature Controllers

E5_C Accurate and Responsive

The E5_C series delivers accurate and responsive control usually found on advanced temperature controllers by using a fast 50 ms sampling time and Omron's 2-PID control algorithm. This powerful and patented algorithm provides enhanced control stability, which guarantees consistent product quality. For less demanding applications, the E5CC controllers also support ON/OFF control.

High-contrast LCD display for best visibility

To enhance visibility, large white characters (15.2 mm high for E5CC) are used to show present value (PV). Viewing angle range and contrast ratios have also been enhanced with the new LCD such that the display can be easily read from greater distances and in less favorable lighting conditions. Easy set-up, quick and intuitive operation, Auto-tuning algorithms and Omron's intuitive CX-Thermo support software make setup easy. They enable fast parameter setting and straightforward device adjustment that also greatly simplifies maintenance. A timesaving "digit shift function" makes it easier to adjust target values by setting each digit independently.

E5CC

E5EC

Easy set-up and operation

Connect the E5_C controller to any computer by using the optional USB communication cable to increase productivity and reduce labor time. The controllers incorporate a range of new, useful standard features to maximize their versatility. These features are complemented by model specific operations. Some models have up to 3 auxiliary outputs, transfer outputs, 4 event inputs, and remote set-point inputs.

Where multiple general-purpose controllers were required, now a single E5_C series controller can replace them and reduce maintenance time as well as inventory costs.

Incoming Power Management

K8AK Monitoring Relays for Single- and 3-Phase Power

Protect control panel circuits from damaging supply voltage faults with Omron's K8AK monitoring and protective relays. They score with a space-saving: Two SPDT outputs in a slim 22.5 mm wide, DIN-track mounting unit. Many applications require the individual upper and lower limit outputs that are normally available only in larger relays. Omron's K8AK relays not only offer advantages such as 3-phase power supply compatibility and a resistive load contact capacity of 6 A at 250 VAC, but they also reduce panel production cost by 20% because they use 50% less space than some competitors models. OMRON's Low-voltage Monitoring Relays can be used to monitor 3-phase, 3 or 4 wire input power, simply by changing DIP switch settings.

K8AK-VW Pre-alarm Monitoring Mode Provides Advanced Warning

In plants and other sites that operate 365 days a year, unexpected shutdowns must be kept to an absolute minimum. OMRON addresses this with the K8AK-VW featuring a two-level pre-alarm monitoring mode with individual trip outputs and pre-alarm warning settings (H/HH alarm and L/LL alarm). The K8AK-VW makes scheduled maintenance viable because the pre-alarm monitoring mode provides advance warning of impending trip alarms.

K8AK Overvoltage & Undervoltage Monitoring Flexibility

Omron's K8AK monitoring relays offer full-span overvoltage and undervoltage range settings for unprecedented voltage monitoring flexibility.

Line up of the K8AK/K8DS Series

K8AK/K8DS series has a selection of Temperature monitoring relay, Phase-sequence/ -loss relay, Phase-asymmetry, Voltage-monitoring relay, Current-monitoring relay.

		For monitoring								
		For Three-phase					For Single-phase			
		K8DS-PH	K8AK-PH	K8AK-PA	K8AK-PM	K8AK-PW	K8AK-VS	K8AK-VW	K8AK-AS	K8AK-AW
Detection function	Phase-sequence	Yes	Yes	Yes	Yes	—	—	—	—	—
	Phase-loss	Yes	Yes	Yes	Yes	—	—	—	—	—
	Over voltage	—	—	—	Yes	Yes	Yes (Switchable)	Yes (Simultaneous Monitoring)	—	—
	Under voltage	—	—	—	Yes	Yes	Yes (Switchable)		—	—
	Phase-asymmetry	Yes (Fixed)	Yes (Fixed)	Yes (Adjust)	—	—	—	—	—	—
	Over current	—	—	—	—	—	—	—	Yes (Switchable)	Yes (Simultaneous Monitoring)
	Under current	—	—	—	—	—	—	—	Yes (Switchable)	
	Relay output	One SPDT	One SPDT	One SPDT	Two SPDT	Two SPDT	One SPDT	Two SPDT	One SPDT	Two SPDT

*For details, refer to the K8AK/K8DS Series datasheet.

Fiber-Optic Sensors – Space and Wire Saving Solutions for Multiple Inspections

When you need to sense in tight spaces or need to leave the electronics in a less hostile environment, choose an Omron fiber-optic sensor. All amplifiers are designed for maximum space savings with a slim 10 mm width. But the reductions go even farther. What are the fewest wires you need for a multi-sensor inspection? Can you set all sensors and their different parameters from one place? Omron designed fiber-optic amplifiers to trim time and material costs from gang mounting multiple sensors. All measure 10 mm wide to save maximum space within the panel.
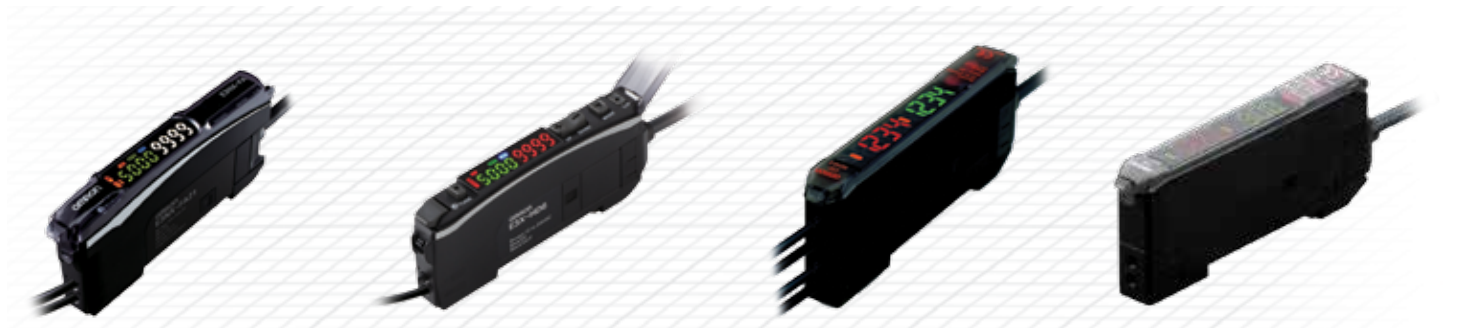
E3NX-FA
High-performance digital fiber amplifier solves the most challenging fiber-optic sensing applications

E3X-HD
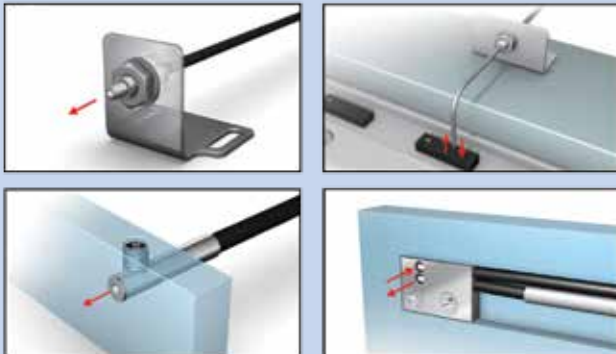Stable detection and intuitive operation for standard fiber applications

E3X-MDA
Ultra space-saving 2-in-1 amplifier offers AND, OR logic of two input signals

E3X-DAC-S
White LED and RGB ration comparison for challenging color and mark detection
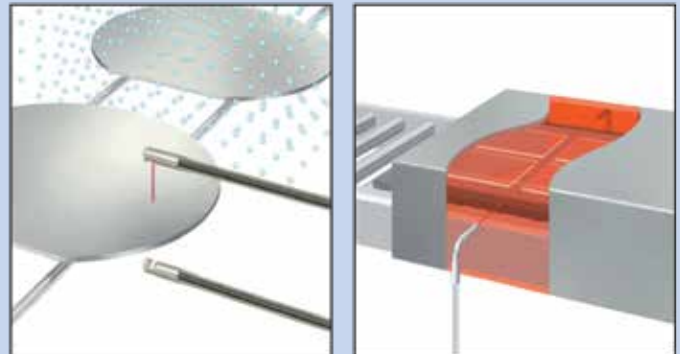
Mounts Anywhere

Wide Variety
Variously-shaped, compact heads allow installation in any small space.

Suitable for Harsh Environments
Fiber Sensors are available for various installation conditions and can be installed as is, even in harsh environments.

Programmable Relay – the Simplest Way to Handle Complex Timing Jobs

Any time you have more than 4 discrete timers and relays, you can find an affordable substitute with Omron's ZEN multi-functional programmable relay. This is especially true if the job calls for more than 16 day/date start-and-stop combinations. Setup and testing of machines is much simpler, compared to a panel full of discrete components. A built-in display verifies ladder logic program steps and changes can be made using front-panel buttons.

System Advantages

- Delivers the flexibility and functionality of separate timers, counters, and relays for control applications with up to 44 I/O.
- Economy CPU models – perfect for applications that require less than 10 or 20 points of I/O. (Does not accept expansion units).
- Save time by using the memory cassette to transfer programs between ZEN units and standardize updates to end users.
- Reduce wiring and engineering time using simple ladder logic programming with the push of a button or click of the mouse.
- Easily add up to 3 ultra-slim 35 mm, 8 I/O expansion units when more points of control are required.

ZEN-10C1AR-A-V2

Multiple Time Ranges for More Flexibility

The H3DK product family offers 4 series of timers which range from single operation mode to multi-functional operational modes. Models include a wide-range power supply input from 24 to 240 VAC/DC or models 12 VDC.

1. H3DK-M (8 operating modes)
2. H3DK-S2/S2 (4 operating modes)
3. H3DK - F (Twin Timer)
4. H3DK-G (Star Delta Timer)
5. H3DK-H (Power Off Delay Timer)

① ② ③ ④ ⑤

Digital Panel Indicators

Omron's K3MA panel meter series is cost effective and space-saving. For those applications needing display and a single output only, K3MA series is the ideal solution.

This product family consists of a process meter, a temperature meter, and a frequency/rate meter.

The K3MA is rated NEMA 4X and will fit into most existing 1/8 DIN (92 W x 48 H mm) panel cutouts with a depth measurement of 80 mm. Other quality features of the K3MA are face mounted operating keys, highly visible 7-segment digital LCD display with selectable two-color LEDs, start-up compensation time, display auto-return time, and teaching function.

FEATURES

- Compact size allows the users to save panel space
- Diverse inputs allows the K3MA-F to be used in many applications
- Two color LEDs can be programmed to change according to the status of the comparison criterion.
- The startup compensation time cancels measurement for a predetermined time when turning power ON. This prevents unwanted output due to temporary input fluctuations.
- Auto-zero time sets the time for the display to return to zero when input pulses stop

Advanced Panel Meters

K3HB series is an advanced product family in the Omron's panel meter product line. If the application requires faster sampling rate, event input functions and communication capability, then consider the K3HB series.

Models:

- K3HB-X: Process Indicator
- K3HB-V: Weighing Indicator
- K3HB-H: Temperature Indicator
- K3HB-S: Linear Sensor Indicator

FEATURES

- Clearly "visible in sunlight" LCD display with back light
- Programmable Red/Green 2-color PV display
- Dual display: Main (PV) display and Sub (SV) display
- Equipped with a position meter to display Increase/decrease or deviation from reference value
- High resolution for temperature indicator K3HB-H: 0.01°C with resistance temperature meter; 0.1°C with thermocouple
- Communication capability for RS-485, RS-232C or DeviceNet available on option boards
- Event input for holding, timing, force zero, reset, startup compensation timer and SV bank selection
- Modular construction with plug-in output, communications and event input boards offers a wide combination of variations for output and optional functions.

Electromechanical Relays

G2RV 6A-rated 6 mm wide relay with reinforced pins

The G2RV relay perfectly meets the needs of manufacturers like panel and machine builders looking to cut costs by reducing panel size. Its slim width allows modules to be downsized and the number of I/O lines to be increased while continuing to utilize a standard platform for a range of control loads, from a powerful 6A to an accurate 10 mA signal. Relay and socket are sold as a combination, with relays available separately for maintenance purposes.
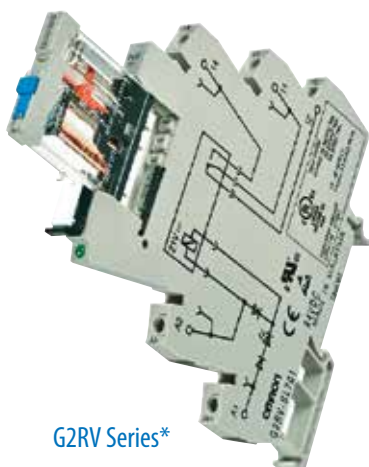

G2RV Series*

* Also available in G3RV Series Solid State Relay.

MY Relay

Omron's MY series relay has been the industry leader for over 15 years. Along with its world wide recognition, diverse contact configuration (DPDT 4PDT) and many different coil voltages (10 different AC and DC), it also includes standard options such as: push to test button, mechanical indicator, LED indicator and write-on nameplate.
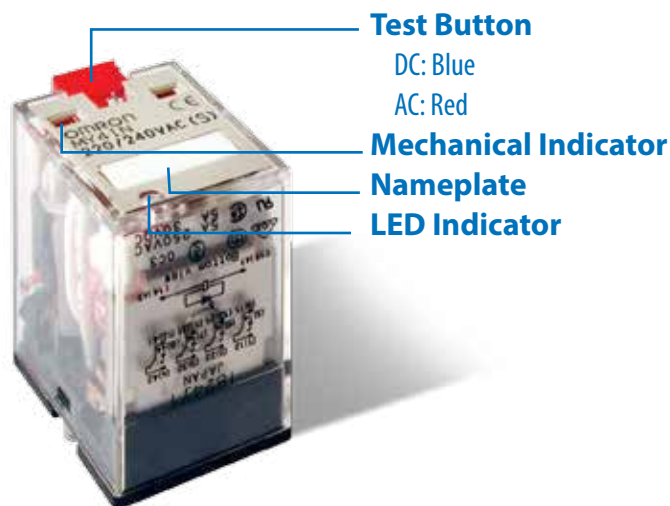
Test Button
DC: Blue
AC: Red
Mechanical Indicator
Nameplate
LED Indicator

MY Series

Solid State Relays

Take advantage of Solid State Relay's (SSR's) long service life and fast response times for your process control applications. Omron offers industry-standard models as well as slim track mount models with built-in heat sinks. Typical applications for SSR's are HVAC, motion control, machine tool, or process and temperature control.

Omron's G3NA and G3NE SSR's are great fits for commercial in-line toasters and food heating applications. These SSRs are clearly a good fit for switching any large current/resistive loads that cycle on/off regularly and for similar equipment that is on for extended periods. If heat build-up and high ambient temperature are issues, models are available with optional heat sinks.

FEATURES

- Industry-standard foot print
- Same compact dimensions for all models
- Available with input voltages of 5-24 VDC or 100-120 VAC
- Rated output load of 24 to 240 VAC
- Operation indicator allows monitoring of operation
- Zero-crossing function minimizes inrush loads
- Separate heat sinks available to maximize performance

G3NA Series

OMRON

AUTOMATION & SAFETY

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• Ultrasonic Sensors • Vision Sensors

Industrial Components
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• Limit and Basic Switches • Timers • Counters • Metering Devices
• Power Supplies

Safety
• Laser Scanners • Safety Mats • Edges and Bumpers • Programmable Safety
Controllers • Light Curtains • Safety Relays • Safety Interlock Switches