Industrial Automation Products

Master Selection Guide

PHOTOELECTRIC SENSORS

AMPLIFIED PHOTOMICROSENSORS

PROXIMITY SENSORS

LIMIT SWITCHES

OTHER SENSOR SOLUTIONS

PUSHBUTTONS, SWITCHES AND PILOT DEVICES

SAFETY PRODUCTS

MEASUREMENT DEVICES

MACHINE VISION

AUTO IDENTIFICATION

TEMPERATURE AND PROCESS CONTROL INSTRUMENTATION

POWER SUPPLIES

TIMERS, COUNTERS, & PANEL METERS

PROGRAMMABLE CONTROLLERS

OPERATOR INTERFACES

MOTION AND MOTOR CONTROLS

INDUSTRIAL NETWORKING

WIRING SOLUTIONS

GENERAL PURPOSE RELAYS

OMRON®

An Industry Leader Makes a Great Automation Partner

Trust your automation needs to Omron, a global leader and innovator in industrial automation controls and systems. Your investment in Omron systems and training repays itself quickly with improved productivity, continued profitability and competitive manufacturing advantage.

What Makes Omron Different?

Quality

- All products 100% quality-tested before shipping
- Designed and manufactured to the highest ISO 9001, IPC and JIS standards

Stability

- Over 70 years in the controls business, founded in 1933
- $5.2 billion USD global technology leader (April 2004)
- 40% of business comes from industrial automation; social systems, electronic components, automotive components and healthcare make up the balance

Technology

- 7% of sales reinvested annually in R&D ensures leading edge solutions that improve our customers' productivity and profits
- Products offer security features to prevent tampering

Ease of use

- Simple menus enable quick setup, operation and changeover for controllers, inspection systems and communications
- Helpful software tools provide data tracking and production monitoring
- One software package programs all Omron PLCs

Flexibility

- More than 300,000 products help you design a complete automation solution from one source
- Easy forward/backward migration maintains the value of your automation investment

Support

- Global, regional and local support in 65 countries through 1,500 offices
- Documentation available on-line
- Training, phone support, 24/7 emergency services give you peace of mind

Omron Delivers End-to-End Automation from a Single Source

Our large global installed base of plant automation solutions combine sensors, programmable controllers, human machine interface terminals, RFID and other track-and-trace code readers, motion control and products to complete control panel installation.

Only the Best Products

This Master Selection Guide contains our latest and most popular products, and represents a fraction of what is available.

For More Information...

Internet

Visit **www.omron.com/oei** (USA and Latin America) or **www.omron.ca** (Canada) and go to the Document Library to browse specifications on Omron's full range of products. At the website, you can:

- Search product categories and download PDFs of documentation
- Search for Sales Contacts
- Order samples and literature, and request quotes

Phone

Call us toll-free, **866-88-OMRON** Monday through Friday, 7:30 AM to 5:00 PM Central Time for more detailed product information, the location of your local sales office or Omron distributor.

Contents

Close the Gap Between Product Selection and Operational System

Turnkey systems and customized standard products can help you achieve your productivity goals even faster.

Turnkey Systems and Panels

Let Omron package your control and inspection solutions in enclosures with control panels, displays and easy-to-install connections. We deliver fully assembled and tested panels to save you the engineering, integration and fabrication time.

Customized Standard Products

Purchase factory-modified products to meet your exact specifications. Use Omron as your OEM subcontractor. Typical projects cover a range of possibilities:

- Changing PLC supply voltage
- Custom I/O mixture and configuration
- Custom length safety light curtains
- Custom cables, connectors and brackets for sensors
- Custom potting to waterproof sensors and industrial switches
- Custom kitting to standardize servicing in the field

These products carry a standard Omron warranty.

How to Start a Project

Omron Manufacturing of America (OMA) in suburban Chicago provides full-service control panel and fabrication services using controls from Omron as well as your other preferred suppliers. Omron's on-staff engineers can coordinate the design and installation requirements with your regular systems integrators or we can also provide that service. Call 866-88-OMRON or your Omron sales representative to initiate a project.

◀ *Omron AC inverters and drives and PLCs control machine operations.*

▼ *Custom connectors on sensors and switches reduce field maintenance time and costs.*

OMA Facts

- ISO 9001 (2000) and ISO 14001
- UL Approved industrial control panel and wiring harness facility
- Full purchasing and manufacturing engineering capabilities
- Complete electronic assembly capabilities
- 16 years experience delivering 100% quality tested products

Additional Omron Services

- Repair service for all brands of industrial controls
- Free repair estimates
- Engineering and project management services
- Systems integration services and consultation with integrators to optimize Omron product performance

Photoelectric Sensors

Omron Smart Solutions

E3T
Subminiature low-cost sensor with built-in amplifier detects positioning and presence/absence in space-confined installations. *Page 4*

E3Z-B
Accurately detect PET bottles and transparent material. Omron offers sensors to solve many packaging-related problems. *Page 4*

E3NT
Rugged IP67-rated diffuse sensor detects objects of any color, texture or glossiness from any direction using programmable foreground and background suppression. *Page 5*

E3X-MDA
Save space with two fiber-optic amplifiers in a slim body; it offers large digital display and one-button teaching; over 100 sensing head/cables available. *Page 6*




	E3Z	E3Z-LS	E3Z-B	E3T
Dimensions mm (in)	31 H x 10.8 W x 20 D (1.22 x 0.43 X 0.79)	31 H x 10.8 W x 20 D (1.22 x 0.43 x 0.79)	31 H x 10.8 W x 20 D (1.22 x 0.43 x 0.79)	19 H x 12 W x 4 D (0.74 x 0.47 x 0.15)
Amplifier type	Built-in DC amplifier	Built-in DC amplifier	Built-in DC amplifier	Built-in DC amplifier
Features	• Sub-miniature sensor offers long sensing distances and high noise immunity • IP67 rated • Connector models available	• Foreground/background suppression • Pre-wired 2 m cable or M8 connector • Distance settable • Stable sensing regardless of target's color	• Detects PET bottles	• Micro-miniature space saving • Watertight IP67 • Pinpoint beam for detection of extremely small targets • 1 meter range • Hyper LED smallest visible red LED • Flat and rectangular body styles • CE conformance
Through-beam sensing distance	15 m (49.2 ft)	–	–	1 m (3.28 ft)
Retroreflective sensing distance	4 m (13.12 ft)	–	500 mm – 2 m depends on reflector	Polarized: 200 mm (7.88 in)
Diffuse reflective sensing distance	1 m (3.28 ft) or 5 to 100 mm (0.2 to 3.94 in)	20 mm to 200 mm (BGS) 40 mm to 200 mm (FGS)	–	30 mm (1.18 in) 15 mm on certain convergent beam models
Color sensing	–	–	–	–
Supply voltage	12 to 24 VDC	12 to 24 VDC	12 to 24 VDC	12 to 24 VDC
AC control output	–	–	–	–
DC control output type	NPN or PNP	NPN or PNP	NPN or PNP	NPN or PNP
Max. load	100 mA	100 mA max.	100 mA max.	50 mA max. at 24 VDC
Alarm	–	–	–	–
Response time	1 ms max.	Operation or reset: 1 ms max.	Operation or reset: 1 ms max.	2 ms ON/OFF
Materials: Lens Case Bracket Cover	Denatured polyallylate PBT plastic – –	Denatured polyallylate PBT plastic – –	Denatured polyallylate PBT plastic – –	Polycarbonate PBT plastic – Polycarbonate
Enclosure rating	IP67, 1200 PSI (NEMA ICS5, ANNEXF)	IEC 60529 IP67, 1200 PSI (NEMA ICS5, ANNEXF)	IEC 60529 IP67, 1200 PSI (NEMA ICS5, ANNEXF)	IP67
Light source	Pulse modulated infrared LED (860 nm) or visible red LED (680 nm)	Red LED (680 nm)	Red LED (680 nm)	Red "Pin Point" LED (670 nm)
Circuit protection	Load short circuit and reverse polarity	Reverse polarity, output short-circuit	Reverse polarity, output short-circuit	Load short circuit and reverse polarity
Mutual interference protection	On all except through-beam models	Yes	Yes	On all except through-beam models
Operation mode	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON separate models
Applications	General purpose sensing; Sub-miniature, long detection distances, noise immunity; IP67 rated; CE approved	General purpose; Material handling; Packaging; Background suppression	PET bottles and transparent objects	Flat or rectangular micro-miniature package; Washdown environments; Pinpoint beam for extremely small target detection; CE conformance; Latest generation technologies

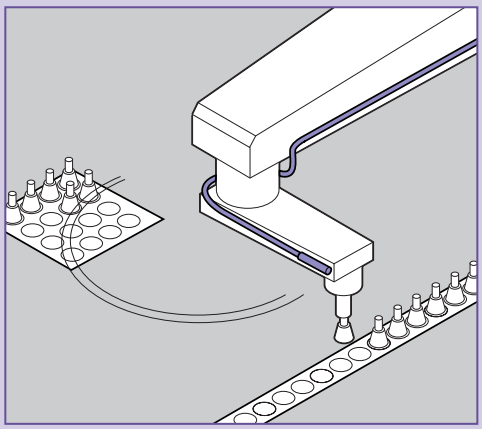
	 E3NT	 E3F2	 E3G-L1/L3	 E3S-A
Dimensions mm (in)	88.7 H x 27 W x 65.1 D (3.49 x 1.06 x 2.56)	18.5 dia. x 65 L (0.73 x 2.56)	40 H x 18.4 W x 27 D (1.57 x 0.72 x 1.06)	22.3 H x 12.4 W x 44 or 50 D (0.88 x 0.49 x 1.73 or 1.97)
Amplifier type	Built-in DC amplifier	Built-in AC or DC amplifier	Built-in DC amplifier	Built-in DC amplifier
Features	• Programmable BGS/FGS diffuse sensor • Digital, software configurable • Detects any color, texture, or glossiness from any direction • Double-triangulated optics • Rugged housing withstands extreme environment	• Rugged stainless, nickel plate brass, and plastic models are chemical resistant • Wide operating voltage range • AC/DC • UL, CSA, CE certified • Connector models available	• Distance settable pinpoint beam • TEACH mode for reliable detection of minute objects any color, material, or glossiness • IP67; NEMA 4; CE approved	• Fast response time • Selectable Light-ON / Dark-ON operation • Alarm output indicates deteriorating sensing conditions • Timer versions available
Through-beam sensing distance	–	To 7 m (22.97 ft)	–	7 m (23 ft)
Retroreflective sensing distance	–	To 2 m (6.56 ft)	–	Polarized: 0.1 to 2 m (0.33 to 6.56 ft)
Diffuse reflective sensing distance	0.2 m to 2 m	To 300 mm (11.81 in)	5 to 200 mm (0.19 to 7.87 in)	0 to 100 mm (0 to 3.94 in) 10 to 200 mm (0.04 to 7.87 in) 0 to 700 mm (0 to 27.56 in)
Color sensing	–	–	–	–
Supply voltage	10 to 30 VDC	24 to 240 VAC 50/60 Hz. or 10 to 30 VDC	10 to 30 VDC	10 to 30 VDC
AC control output	–	SCR 200 mA max.	–	–
DC control output type	NPN or PNP or complementary	NPN/PNP separate models	NPN or PNP	NPN or PNP
Max. load	100 mA max.	100 mA max. at 30 VDC	100 mA max. at 30 VDC	100 mA max. at 30 VDC
Alarm	Yes	–	–	50 mA max. NPN/PNP
Response time	≤ 2.5 ms	30 ms AC models; 2.5 ms DC models	1.5 ms or 2.5 ms model dependent	0.5 ms max.
Materials: **Lens** **Case** **Bracket** **Cover**	Housing: Powder-coated aluminum Front pane: Glass Keyboard: HTV silicone Seals: RTV silicone	Plastic ABS or nickel-plated brass or stainless steel –	Acrylic (PMMA) PBT plastic Stainless steel 304 –	Denatured polyarylate PBT plastic Stainless steel –
Enclosure rating	IP67 (EN 60529/IEC 529)	NEMA 1, 2, 4 (indoor) IP66 AC models; IP67 NEMA 6 Metal versions, IP66 NEMA 4 Plastic	IP67 NEMA 4	NEMA 4X, 6, IP67
Light source	Infrared LED (850-880 nm)	Infrared LED or Red LED	Infrared LED (860 nm) or red LED (670 nm)	Pulse modulated red and infrared LED
Circuit protection	Reverse polarity, overload, short-circuit	Reverse polarity, short circuit on DC power supply models only	Short-circuit, reverse polarity	Load short circuit and reverse polarity
Mutual interference protection	Yes	–	Yes	On all except through-beam models
Operation mode	Light-ON / Dark-ON programmable	Light-ON / Dark-ON selectable with control wire	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON switch selectable
Applications	Extreme conditions; Food & Beverage; Packaging; Material Handling; Car wash	General purpose sensing; Chemical resistant ABS version; Stainless or nickel-plated brass versions; Connector types; Cylindrical design; M18 mounting	Food and Bev, material handling, packaging applications; Multiple object detection	General purpose sensing; Washdown environment; Miniature size; High speed sensing 0.5 ms; Timers, vertical or horizontal mount versions

	 E3X-DAN/DAB	 E3X-DA-S	 E3X-MDA	 E3X-NA
Dimensions mm (in)	31.5 H x 10 W x 64.3 D (1.24 x 0.39 x 2.53)	32 H x 10 W x 70 D (1.26 x 0.39 x 2.75)	32 H x 10 W x 70 D (1.26 x 0.39 x 2.75)	-NA□□, -NA□□F, -NAG□□: 31.5 H x 10 W x 64.3 D (1.24 x 0.39 x 2.53) -NA□□V: 33 H x 12 W x 81.5 D (1.29 x 0.47 x 3.21)
Amplifier type	All purpose fiber-optic amplifier	All purpose fiber-optic amplifier	All purpose fiber-optic amplifier	Fiber-optic amplifier
Features	• User selectable displays: digital, percentage and analog display • Available in digital or dual analog/digital output • Digital display can be read right-side-up regardless of amplifier orientation	• Power tuning • Dual digital display • 4 element LED • 2 independent outputs • Counter function	• Power tuning • Dual digital display • 4 element LED • 2 channel amplifier • AND/OR control output	• Master/slave connector design affords connectivity up to 16 amplifiers • Wire saving amplifiers reduce installation time and minimize space requirements • LED bar display • Mutual interference protection • Excellent response time • M8 connector ready models and water resistant models
Through-beam sensing distance	Varies depending on the model and fiber chosen	Varies depending on the model and fiber chosen	Varies depending on the model and fiber chosen	Varies depending on the model and fiber chosen
Retroreflective sensing distance	Varies depending on the model and fiber chosen	Varies depending on the model and fiber chosen	Varies depending on the model and fiber chosen	Varies depending on the model and fiber chosen
Diffuse reflective sensing distance	Varies depending on the model and fiber chosen	Varies depending on the model and fiber chosen	Varies depending on the model and fiber chosen	Varies depending on the model and fiber chosen
Color sensing	Yes	Yes	Yes	Yes (E3X-NAG11/NAG41)
Supply voltage	12 to 24 VDC	12 to 24 VDC ±10%, Ripple (P–P) 10% max.	12 to 24 VDC ±10%, Ripple (P–P) 10% max.	12 to 24 VDC
AC control output	–	–	–	–
DC control output type	NPN or PNP	NPN or PNP	NPN or PNP	NPN or PNP
Max. load	50 mA max.	50 mA max.	50 mA max.	50 mA max.
Alarm	–	–	–	–
Response time	Standard mode: 1 ms High-speed mode: 250 µs Long-distance mode: 4 ms	48 µs	Standard mode: 1 ms	-NA□□, -NA□□V, -NAG□□: 200 µs; -NA□□F: 50 µs
Materials: **Lens** **Case** **Bracket** **Cover**	– PBT plastic – Polycarbonate	– PBT plastic – Polycarbonate	– PBT plastic – Polycarbonate	– PBT plastic – Polycarbonate (-NA□□) Polyethersulfone (E3X-NA□□V)
Enclosure rating	IP50/IP66	IP50	IP50	-NA□□, -NA□□F, -NAG□□: IP50; -NA□□V: IP66
Light source	Red LED	Red, green and blue LEDs available	Red LED	-NA□□, -NA□□V, -NA□□F: Red LED; -NAG□□: Green LED
Circuit protection	Short circuit, Reverse polarity	Short circuit, reverse polarity	Short circuit, reverse polarity	Reverse polarity; Output short-circuit; Mutual interference; -NA□□F: Reverse polarity; Output short-circuit
Mutual interference protection	Yes	Yes	Yes	Yes
Operation mode	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON selectable	Light-ON / Dark-ON (switch selectable)
Applications	All purpose, high speed, mark sensing, transparency detection, color discrimination, delicate level difference, minute object, high-precision positioning	All purpose, high speed, mark sensing, transparency detection, color discrimination, delicate level difference, minute object, high-precision positioning	All purpose, high speed, mark sensing	General purpose, high speed, mark sensing

Over 100 Fiber-Optic Sensor Cables

One exactly matches your requirements

Constant Flexing Applications



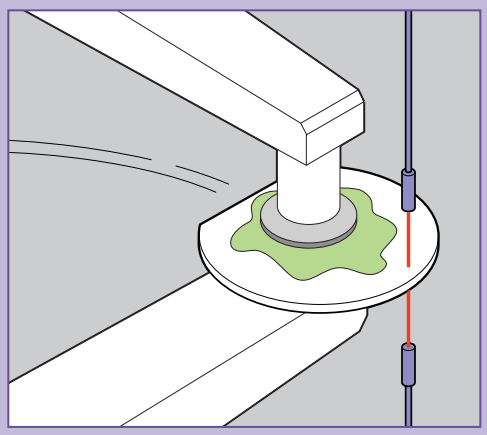
The special construction of these fiber-optic cables resists breaking and enables them to withstand the punishing effects of constant flexing or tight bending. The stranded fiber core can be bent to a radius as small as 4 mm with no loss in light intensity. They are ideal for use on moving and articulating equipment such as robotic arms.

Available Models

Through-Beam
E32-T11 (680 mm sensing distance, M4 threaded head)
E32-T21 (200 mm sensing distance, M3 threaded head)
E32-T22B (200 mm sensing distance, 1.5 mm dia. head)

Diffuse
E32-D11 (170 mm sensing distance, M6 threaded head)
E32-D21 (30 mm sensing distance, M3 threaded head)
E32-D21B (70 mm sensing distance, M4 threaded head)
E32-D22B (30 mm sensing distance, 1.5 mm dia. head)

Chemical Resistant Applications



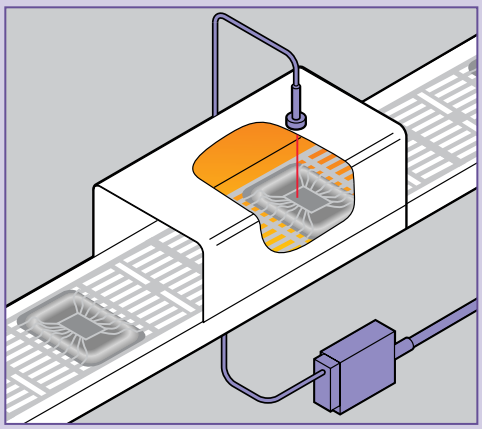
Teflon® coated fiber optic cables provide long lasting reliability in sensing environments where corrosive fluids and gasses are present. They are designed for use where strong chemicals are manufactured or being used for processing or cleaning.

Available Models

Through-Beam
E32-T11F (2000 mm sensing distance, 7.2 mm dia. head)
E32-T12 F (3000 mm sensing distance, 5 mm dia. head)
E32-T14F (400 mm sensing distance, 5 mm dia., side view head)
E32-T81F-S (700 mm sensing distance, 6 mm dia. head, to 200°C)

Diffuse
E32-D12F (95 mm sensing distance, 6 mm dia. head)

High Temperature Applications



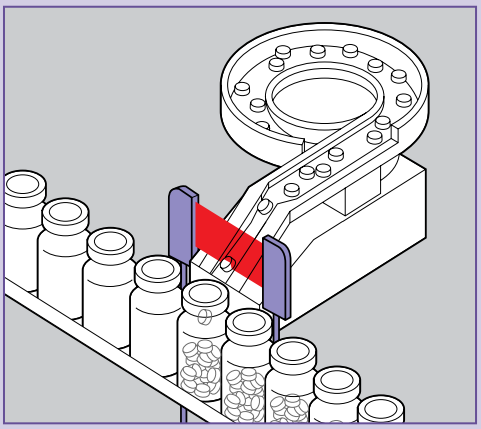
Omron offers a variety of heat resistant fiber optic cables that can operate reliably in temperatures up to 400°C (752°F). The fluororesin and armored stainless steel sheaths protect the fibers for use in ovens and other high heat applications.

Available Models

Through-Beam
E32-T51 (760 mm sensing distance, M4 threaded head, to 150°C)
E32-T54 (230 mm sensing distance, 2 mm dia., side view head, to 150°C)
E32-T61-S (450 mm sensing distance, M4 threaded head, stainless steel sheath, to 350°C)
E32-T84S-S (1300 mm sensing distance, 3 mm dia. L-shaped head, to 200°C)

Diffuse
E32-D51 (230 mm sensing distance, M6 threaded head, to 150°C)
E32-D61-S (90 mm sensing distance, M6 threaded heads, stainless steel sheath, to 350°C)
E32-D73-S (60 mm sensing distance, M4 threaded head, stainless steel probe, to 400°C)
E32-D81R-S (90 mm sensing distance, M6 threaded head, to 200°C)

Wide Area Sensing Applications

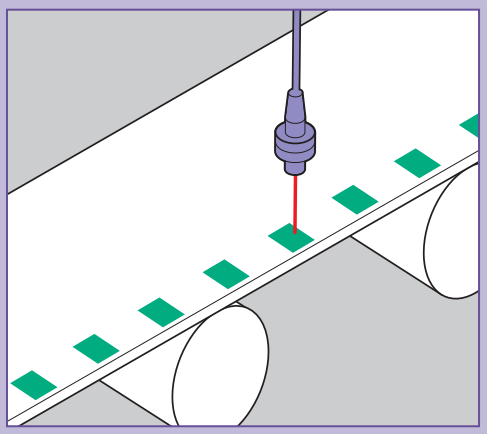


Applications that require a larger target area for sensing small, randomly positioned objects are ideal for Omron's wide area sensing fiber optic cables. They project a wide plane of light that can detect very small objects anywhere within the width of the beam. Use them for detecting pills in packaging and similar applications.

Available Models

Through-Beam
E32-M21 (610 mm sensing distance, four M3 heads)
E32-T16 (2800 mm sensing distance, 10 mm wide beam)
E32-T16P (1100 mm sensing distance, 11 mm wide beam)
E32-T16W (1800 mm sensing distance, 30 mm wide beam)
E32-T16J (1000 mm sensing distance, 11 mm wide beam, side view)
Diffuse
E32-D36P1 (100 mm sensing distance, 10.85 mm wide beam)

Precise Positioning Applications

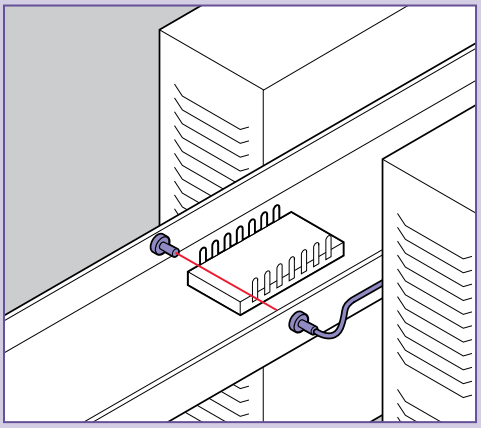


When it is critical to position objects or machinery accurately and consistently, Omron provides a solution with a unique coaxial cable design that surrounds the light emitting fiber with light detection fibers.

Available Models

Diffuse
E32-CC200 (300 mm sensing distance, M6 threaded head, 16 receivers)
E32-D32L (150 mm sensing distance, 3 mm dia. head, 16 receivers)
E32-D32 (75 mm sensing distance, 2 mm dia. head, 4 receivers)
E32-C31 (75 mm sensing distance, M3 threaded head, 4 receivers)
E32-C41 (35 mm range, M3 threaded head, 6 receivers)
E32-C42 (35 mm range, 2 mm dia. head, 6 receivers)

Detect Minute Objects

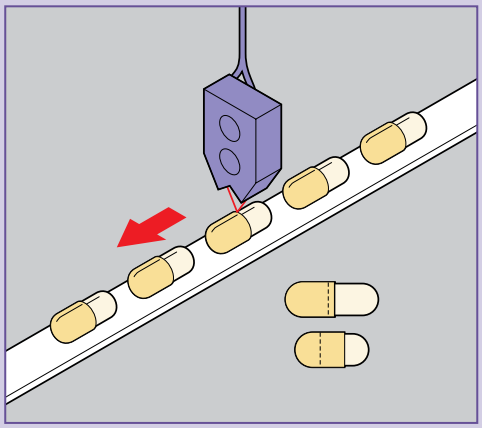


Detect extremely small objects, as small as 0.5 mm, in very space-restricted areas. Most are available with bendable "probe" tips that let you mount the head away from the detection area and bend the probe tip to the precise sensing area.

Available Models

Through-Beam
E32-T22 (220 mm sensing distance, 2 mm dia. head)
E32-TC200B (760 mm sensing distance, 1.2 mm dia. head, probe tip)
E32-TC200E (220 mm sensing distance, M3 threaded head)
E32-TC200F (220 mm sensing distance, 0.9 mm dia. head, probe tip)
Diffuse
E32-DC200B (300 mm sensing distance, 2.5 mm dia. head, probe tip)
E32-DC200E (80 mm sensing distance, M3 threaded head)
E32-DC200F (80 mm sensing distance, 1.2 mm dia. head, probe tip)
E32-D33 (16 mm sensing distance, 0.8 mm dia. head, probe tip)
E32-D331 (3 mm sensing distance, 0.5 mm dia. head, probe tip)

Background Suppression Applications



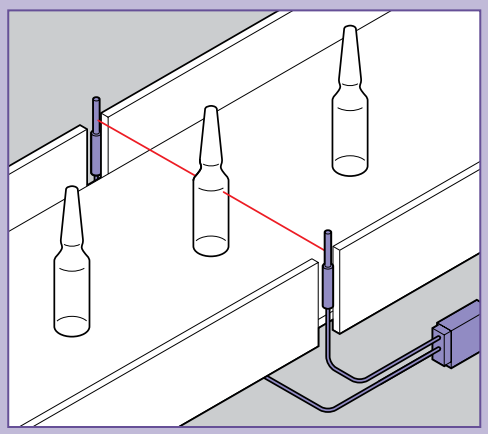
Fiber optic cables with convergent beam head configurations solve the problem of background reflections in space-restricted areas. These special cables can also be used for precise positioning of objects or machinery. Left- and right-side emitter models eliminate interference when using two or more E32-L56 sensing heads.

Available Models

Convergent Beam

E32-L24L (4±2 mm range, side view head, to 105°C)
E32-L24S (0-4 mm range, side view head)
E32-L25 (3.3 mm range, side view head)
E32-L25L (7.2±1.8 mm range)
E32-L25A (3.3 mm range)
E32-L56E☐ (4-12 mm range)
E32-L66 (5-18 mm range, sensing head to 300°C)

Long Range Detection of Small Objects



A wide variety of fiber optic cables with special sensing heads and lenses are available for detecting small objects over longer distances in space-confined areas. They are available in through-beam or diffuse versions with threaded and non-threaded heads for more versatile mounting.

Available Models

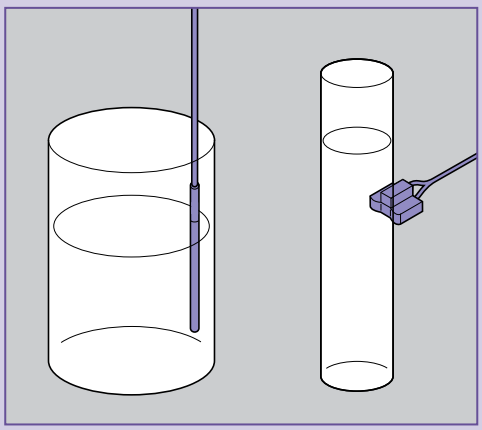
Through-Beam

E32-T11L (1330 mm sensing distance, M4 threaded head)
E32-T12L (1330 mm sensing distance, 3 mm dia. head)
E32-T14L (460 mm sensing distance, 3 mm dia., side view head)
E32-T17L (20,000 mm sensing distance, M14 threaded head)
E32-T21L (440 mm sensing distance, M3 threaded head)
E32-T22L (440 mm sensing distance, 2 mm dia. head)

Diffuse

E32-D11L (400 mm sensing distance, M6 threaded head)
E32-D12 (230 mm sensing distance, 3 mm dia. head)
E32-D16 (40 to 700 mm sensing distance, 17.5 mm square head)
E32-D21L (130 mm sensing distance, M4 threaded head)
E32-D22L (130 mm sensing distance, 3 mm dia. head)

Fluid Level Detection



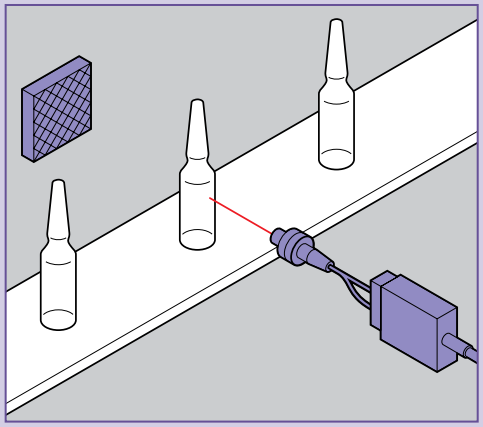
Omron offers two fiber optic sensing solutions for fluid level detection in space-confined areas: immersion style sensing heads can be submerged in the fluid to be monitored, and a tube-mounted sensing heads that can sense fluids through a clear tube.

Available Models

E32-D82F1 (Immersion type, 150 mm length)
E32-D82F2 (Immersion type, 350 mm length)
E32-A01 (External mount; 3.2, 6.4, 9.5 mm clear tube)
E32-A02 (External mount; 6 to 13 mm clear tube)
E32-L25T (External mount, 8 to 10 mm clear tube)
E32-D36F (External mount; clear tube, no diameter restriction)

Also consider EE-SPX613 Amplified Photomicrosensor

Transparent Object Detection

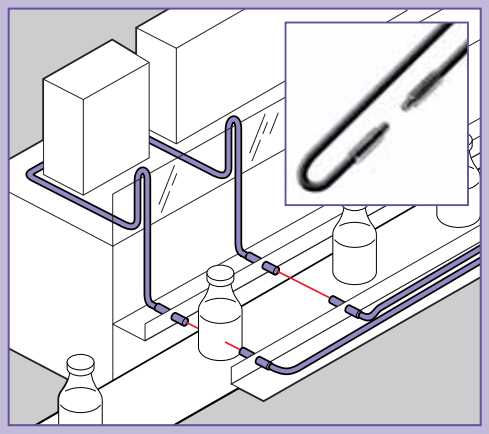


Sensing transparent objects is always a challenge. Omron solves this problem with fiber optic cables that are polarized and reflectors specially designed for sensing small transparent objects in tight spaces. They are ideal for sensing lenses, clear plastics, and transparent packaging materials.

Available Models

E32-R21 (Retroreflective, 10–250 mm range)
E32-R16 (Retroreflective, 150–1,500 mm range)

Extreme Bending Applications



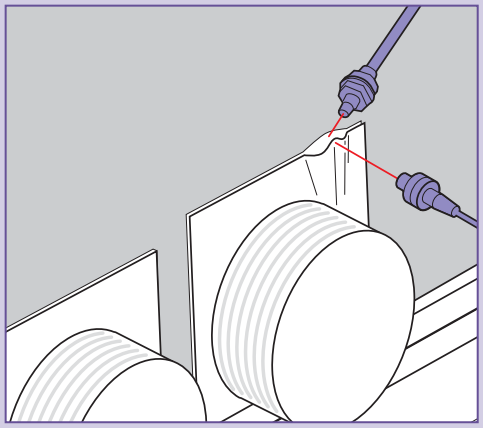
For machine applications that require extreme bending of fiber optic cables to conform to tight spaces, Omron offers a variety of cables that feature a unique multi-core construction. Unlike single-core cables that can lose their light transmission capability when bent tightly, the multi-core design ensures optimal light transmission even when bent 180° with a bending radius of 1 mm.

Available Models

Through Beam
E32-T11R (530 mm sensing distance, M4 threaded head)
E32-T12R (530 mm sensing distance, 3 mm dia. head)
E32-T14LR (210 mm sensing distance, 3 mm dia. head)
E32-T21R (130 mm sensing distance, M3 threaded head)
E32-T16WR (1300 mm sensing distance, 30 mm wide beam)
E32-T16JR (750 mm sensing distance, 11 mm wide beam, side view)
E32-T16PR (840 mm sensing distance, 11 mm wide beam)
E32-T22R (130 mm sensing distance, 2 mm dia. head)
E32-T24R (50 mm sensing distance, 1 mm dia. head, side view)

Diffuse
E32-D11R (170 mm sensing distance, M6 threaded head)
E32-D12R (170 mm sensing distance, 3 mm dia. head)
E32-D14LR (45 mm sensing distance, 6 mm dia. head, side view)
E32-D21R (30 mm sensing distance, M3 threaded head)
E32-D22R (30 mm sensing distance, 3 mm dia. head)
E32-D24R (15 mm sensing distance, 2 mm dia. head, side view)

General-Purpose Industrial Applications

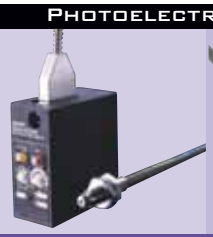


For most sensing applications, the space-saving combination of a fiber-optic amplifier and general-purpose fiber unit provides an economical solution.

Available Models

Through-Beam
E32-TC200 (760 mm sensing distance, M4 threaded head)
E32-TC200A (680 mm sensing distance, M3 threaded head)

Diffuse
E32-DC200 (300 mm sensing distance, M6 threaded head)

	E3XA analog fiber-optic amplifier	E3S-CL	E3JK	E3JM
				
Dimensions mm (in)	40 H x 20.4 W x 30 D (1.57 x 0.80 x 1.18)	42.6 H x 15.5 W x 40 D (1.7 x 0.61 x 1.57)	50 H x 17.6 W x 50 D (1.97 x 0.69 x 1.97)	65 H x 25 W x 75 D (2.56 x 0.98 x 2.95)
Amplifier type	Fiber-optic amplifier	Built-in amplifier	Built-in AC/DC amplifier	Built-in AC/DC amplifier
Features	• Ideal for detecting size, color and surface characteristics • Four turn controls allow fine adjustment of sensitivity and operating point	• Background suppression • Stable detection regardless of material color or size of object • Sensing unaffected by dirty lens • IP67 water resistant housing	• Complimentary relay output 1NO & 1NC or NPN/PNP • Slim housing ideal for narrow installation spaces • Universal AC/DC supply voltage	• Relay or transistor output available • Built-in timers available • Easy to wire terminal block • Universal AC/DC supply voltage
Through-beam sensing distance	Varies depending on the model and fiber chosen	–	5 m (16.4 ft)	10 m (32.8 ft)
Retroreflective sensing distance	Varies depending on the model and fiber chosen	–	0 to 3 m (9.8 ft) 0 to 5 m (16.4 ft)	Polarized 0 to 4 m (13.1 ft)
Diffuse reflective sensing distance	Varies depending on the model and fiber chosen	E3S-CL1: 5 to 200 mm E3S-CL2: 5 to 500 mm	0 to 300 mm (11.8 in)	0 to 700 mm (2.3 ft)
Color sensing	Yes	–	–	–
Supply voltage	12 to 24 VDC	10 to 30 VDC	24 to 240 VAC 50/60 Hz. and 12 to 240 VDC	24 to 240 VAC 50/60 Hz. and 12 to 240 VDC
AC control output	4 to 20 mA	–	Relay 3 A, 250 VAC	Relay 3 A, 250 VAC
DC control output type	NPN	NPN or PNP (switch selectable)	NPN/PNP wire selectable	NPN or PNP separate models
Max. load	Analog: 20 to 21.55 mA Digital: 100 mA max.	100 mA max.	100 mA at 300 VDC	100 mA at 48 VDC
Alarm	–	–	–	–
Response time	2 ms max. ON/OFF	2 ms max ON/OFF	30 ms relay output; 3 ms for transistor output	30 ms relay output; 5 ms for transistor output
Materials: Lens **Case** **Bracket** **Cover**	Plastic Plastic – –	Acrylic Zinc die cast Operating Panel: Sulfonated polyether Stainless Steel	Plastic PMMA Plastic ABS – Plastic PMMA	Plastic PMMA Plastic ABS – Plastic PMMA
Enclosure rating	IP66	IP67	NEMA 1, 2, 12, IP64	IP66
Light source	Red LED	E3S-CL1: Red LED; E3S-CL2: IR LED	Pulse modulated infrared LED; Pulse modulated red LED	Infrared LED; Polarized red LED on retro
Circuit protection	Short-circuit, reverse polarity	Short-circuit, reverse polarity	Reverse polarity on DC power supply only	Load short circuit on transistor output models only
Mutual interference protection	–	Yes	–	–
Operation mode	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON separate models	Light-ON / Dark-ON switch selectable
Applications	Food and Bev, material handling, semiconductor, electronics packaging applications	Food and Bev, material handling, packaging applications, rugged applications	Relay or transistor output; Detect shiny objects; Universal supply AC/DC	UL CSA; Easy to wire terminal block; Relay or transistor output models available; Built-in timers available; Universal supply AC/DC

	E3L	E3HT	E3X-NT/NM	E3X-NL
				
Dimensions mm (in)	55 H x 17 W x 50 D (2.17 x 0.67 x 1.97)	8.5 dia. x 41.5 L (0.33 x 1.63)	Single Channel: 32.5 H x 10 W x 59 D (1.28 x 0.39 x 2.32) Four Channel: 32.5 H x 32.2 W x 59 D (1.28 x 1.27 x 2.32)	Amplifier: 33 H x 32.2 W x 59 D (1.29 x 1.27 x 2.32) Sensing Head (short): 29 H x 10.4 W x 29 D (1.14 x 0.41 x 1.14) (long): 42 H x 20.4 W x 47 D (1.65 x 0.80 x 1.85)
Amplifier type	Built-in DC amplifier	Built-in DC amplifier	Fiber-optic amplifier	Fiber-optic amplifier
Features	• Laser beam provides long distance spot sensing • Class 1 versions require no additional protection • Stability indicator signals upon deteriorating conditions	• Ideal for space-confined installation 8 mm housing • Cost effective • Nickel plate brass construction • CE certified • Connector models available	• Remote teach function • Four fiber-optic cables can be mounted directly next to each other without mutual interference	• Ideal for sensing glossy objects • Easy-to-use TEACH function • Remote TEACH function • Mutual interference protection
Through-beam sensing distance	10 m (32.8 ft) 2 m (6.56 ft)	To 1 m (3.28 ft)	Varies depending on the model and fiber chosen	–
Retroreflective sensing distance	–	–	Varies depending on the model and fiber chosen	–
Diffuse reflective sensing distance	200 to 500 mm (7.90 to 19.7 in)	To 35 mm (1.38 in)	Varies depending on the model and fiber chosen	Short range: 10 ±3 mm Long range: 20 ±7 mm
Color sensing	–	–	–	–
Supply voltage	12 to 24 VDC	12 to 24 VDC	12 to 24 VDC	12 to 24 VDC
AC control output	–	–	–	–
DC control output type	NPN open collector or NPN constant current source or PNP open collector	NPN & TTL logic	NPN, PNP	NPN
Max. load	NPN 100 mA; NPN type: Load (relay, sink) logic: 80 mA Voltage (source) logic: 3 mA PNP type: Load (relay, source) logic: 80 mA	Relay (sink) 80 mA max.	100 mA max. at 30 VDC 100 mA max. at 40 VDC (E3X-VG)	100 mA
Alarm	NPN or PNP 50 mA at 24 VDC.	–	–	–
Response time	1 ms ON/OFF or 3 ms ON/OFF	10 ms ON/OFF through-beams; 6 ms ON/OFF diffuse models	500 µs	1 ms max.
Materials: **Lens** **Case** **Bracket** **Cover**	Plastic (PMMA) Zinc die cast – –	Plastic Nickel-plated brass – –	– PBT plastic – Polycarbonate	– PBT plastic – Polycarbonate
Enclosure rating	NEMA 4, IP67	NEMA 1, 3, 4X, 6, 12 IP66	IP50	IP50
Light source	Infrared pulse modulated laser diode (780 nm) or visible red pulse modulated laser diode (670 nm)	Pulse modulated infrared LED	Pulse modulated red LED	Red LED
Circuit protection	Load short circuit and reverse polarity	Reverse polarity and load short circuit	Short circuit and reverse polarity	–
Mutual interference protection	Standard level	–	Provided	Yes
Operation mode	Light-ON / Dark-ON wire selectable	Light-ON / Dark-ON separate models	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON switch selectable
Applications	Laser Photoelectric Prewired Sensor; Provides long distance detection of objects down to 0.1 mm dia.	CE certified; 8 mm cylindrical housing fits in compact spaces; Connector types available; Dual output NPN & TTL	General purpose, background suppression	Luster detection, tight space application

		E3S-C	E3S-CR	E3MC	E3M-V
					
Dimensions mm (in)		Horizontal: 23 H x 20.4 W x 57.5 D (0.91 x 0.80 x 2.24) Vertical: 57.5 H x 20.4 W x 23 D (2.24 x 0.80 x 0.91)	Horizontal: 57 H x 20.4 W x 23 D (2.24 x 0.80 x 0.91)	53.2 H x 30.4 W x 98 D (2.09 x 1.19 x 3.85)	68.5 H x 21 W x 47.7 D (2.70 x 0.83 x 1.46)
Amplifier type		Built-in DC amplifier	Built-in DC amplifier	Self-contained	Self-contained
Features		• Rugged metal body • 6 times normal sensing distance • NEMA 4X, 6P, IP67 • Vertical and horizontal body styles • Fuzzy logic mutual interference protection • CE conformance	• Clear material detection specially tuned for glass and plastic bottles • Compensates for "lens effects" • IP67 rating, versatile NPN/PNP, L.O., D.O., in one unit • Rugged die cast metal housing	• RGB color sensor detects subtle color differences • Remote TEACH function • Four-color storage capability • Lensed and fiber-optic versions	• Color mark sensor • Remote control setup • Green LED detects yellow on white • Stable operation on shiny surfaces
Through-beam sensing distance		30 m (98.43 ft)	–	Varies depending on the model and fiber chosen	–
Retroreflective sensing distance		Polarized: 3 m (9.84 ft)	250 mm (9.84 in) or 1 m (3.28 ft)	–	–
Diffuse reflective sensing distance		700 mm (27.56 in) and 2 m (6.56 ft)	–	Varies depending on the model and fiber chosen	10 mm ±3 mm
Color sensing		–	–	Yes	Yes
Supply voltage		10 to 30 VDC	10 to 30 VDC	24 to 240 VDC	10 to 30 VDC, 10% Ripple max.
AC control output		–	–	–	–
DC control output type		NPN or PNP selectable	NPN/PNP switch selectable	NPN, PNP	NPN/PNP
Max. load		100 mA max. at 30 VDC	100 mA at 30 VDC	100 mA	100 mA
Alarm		–	–	–	–
Response time		1 ms ON/OFF (2 ms ON/OFF for short range diffuse models)	2 ms ON/OFF	1 output: standard - 3 ms high-speed - 1 ms 4 output: standard - 6 ms high-speed - 2 ms	50 µs
Materials:	**Lens**	Acrylic	Acrylic	–	Acrylic
	Case	Zinc die cast	Zinc die cast	Zinc-diecast	PBT
	Bracket	Stainless steel	Stainless steel	Fiber Head: -X/MX: ABS	–
	Cover	Op. panel: Sulfonated Polyether	Panel: Sulfonated polyether	PES	–
Enclosure rating		NEMA 1,4X, 6P, 12, 13, IP67	NEMA 6P, IP67	IP66 w/ protective cover in place	IP67
Light source		Pulse mod. infrared (880 nm) Red LED (700 nm) on retro	Red LED (670 nm)	Red, green, and blue LED	Green LED
Circuit protection		Load short circuit and reverse polarity	Reverse polarity and load short circuit	Reverse polarity, short-circuit	Short circuit, reverse polarity
Mutual interference protection		On all except through-beam models	Provided	–	–
Operation mode		Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON switch selectable	Light-ON / Dark-ON, switch selectable
Applications		Washdown environments; Long range sensing 30 m; NPN /PNP selectable; CE conformance requirements; Highly shock resistant 100 g; Metal body	Clear material sensor; Rugged; Detects clear bottles reliably even with "lens effects"; Connector versions available	Color differentiation, Food and Bev, material handling, packaging applications	High-speed mark detection

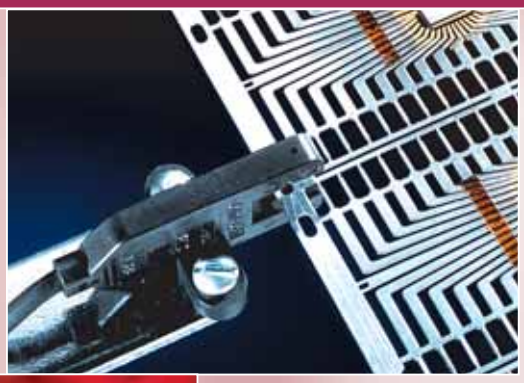
Photoelectric Sensors

	 E3S-LS3N	 E3C-V	 E3HF	 F3C-AA41
Dimensions mm (in)	19.0 H x 10.0 W x 34.0 D (0.79 x 0.39 x 1.33)	E3C-VS1G/ E3C-VS3R: 15 H x 10 W x 28 D (0.59 x 0.39 x 1.10) E3C-VM35R/ E3C-VS7R: 20 H x 10 W x 47 D (0.78 x 0.39 x 1.85)	28 H x 50 W x 7 D (1.10 x 1.97 x 0.28)	90 H x 18 W x 45 D (3.54 x 0.70 x 1.77)
Amplifier type	Printed circuit board sensor	Pinpoint/mark sensing head (Use separate amplifier)	Built-in DC amplifier	Roller conveyor sensor
Features	• Stable detection without being affected by holes or notches • Will detect any color PC board	• Accurately detects color marks against many different backgrounds • Pinpoint beam enables it to detect small objects, marks and wires as small as 0.2 mm	• Thin profile 7 mm thick flat pack style sensor • Can detect 0.5 mm (0.02 in) objects with included slits • Light-ON or Dark-ON versions • Top and side through holes for easy mounting	• Detects objects from underneath roller conveyor • M12 connector • Unique optical system for setting distance, eliminates background influences
Through-beam sensing distance	–	–	1 m (3.28 ft)	–
Retroreflective sensing distance	–	–	–	–
Diffuse reflective sensing distance	10 – 60 mm	E3C-VS1G: 10 ±2 mm E3C-VS3R: 30 ±5 mm E3C-VM35R: 35 ±5 mm (mark) 20 to 80 mm (spot) E3C-VS7R: 70 ±10 mm (mark) 40 to 110 mm (spot)	50 mm (1.97 in)	0 to 750 mm
Color sensing	Yes	Yes	–	–
Supply voltage	12 to 24 VDC ±10% Ripple max.	See E3C amplifiers	12 to 24 VDC	10 to 30 VDC
AC control output	–	See E3C amplifiers	–	–
DC control output type	NPN	See E3C amplifiers	NPN with pull-up resistor	NPN or PNP
Max. load	50 mA	See E3C amplifiers	NPN 80 mA relay sink logic NPN 3 mA voltage source logic	150 mA
Alarm	–	See E3C amplifiers	–	–
Response time	1 ms	See E3C amplifiers	6 ms ON/OFF or 10 ms ON/OFF on some models	10 ms max.
Materials: Lens	Acrylic	E3C-VS1G/VS3R: Plastic, polycarb.; E3C-VM35R/VS7R: Glass	Plastic	Acrylic
Case	ABS	Plastic	Plastic	ABS
Bracket	–	–	–	–
Cover	–	–	–	–
Enclosure rating	IP40	E3C-VS1G/VS3R: IP64 E3C-VM35R/VS7R: IP50	NEMA 1, 3, 4X, 12 IP64	IP40
Light source	Red LED	E3C-VS1G: Pulse modulated Green LED E3C-VS3R/VM35R/VS7R: Pulse modulated Red LED	Pulse modulated infrared LED	Infrared LED
Circuit protection	–	See E3C amplifiers	Reverse polarity and load short circuit	Load short circuit and reverse polarity
Mutual interference protection	–	See E3C amplifiers	–	Yes
Operation mode	Light-ON	See E3C amplifiers	Light-ON / Dark-ON separate versions	Light-ON / Dark-ON selectable
Applications	PC board detection	Color mark applications, inspection and accurate positioning	Thin profile 7 mm photoelectric sensor; Ideal for space constrained applications; Good for small object detection	Packaging, roller conveyor object detection, material handling

	F3C-AL	E3C-LDA	E3C-□□□□ Sensor Heads and Amplifiers
			 
Dimensions mm (in)	90 H x 18 W x 45 D (3.54 x 0.70 x 1.77)	Amplifier: 32 H x 10 W x 82.7 D (1.25 x 0.393 x 3.25) Sensing Head: 25 H x 12.8 W x 33 D (0.98 x 0.50 x 1.29)	**Sensor Heads: -S10**: 14 H x 5.8 W x 10 D (0.55 x 0.22 x 0.39) **-S20W**: 12.5 H x 2.8 W x 20 D (0.49 x 0.11 x 0.78) **-S30T**: 15 H x 3 W x 7.85 D (0.59 x 0.11 x 0.31) **-S30W**: 8.4 H x 3 W x 15 D (0.33 x 0.11 x 0.59) **-S50**: 13 H x 7 W x 11 D (0.51 x 0.28 x 0.43) **-1**: 12 H x 8 W x 25 D (0.47 x 0.31 x 0.98) **-2**: 16 H x 12.4 W x 36 D (0.63 x 0.49 x 1.42) **-DS5W**: 19.5 H x 2.8 W x 18 D (0.77 x 0.11 x 0.71) **-DS10**: 15 H x 10 W x 28 D (0.59 x 0.39 x 1.10) **Amplifiers: -A/C**: 82.5 H x 49 W x 48 D (3.24 x 1.93 x 1.89) **-JB4P/JC4P**: 32.5 H x 14 W x 60 D (1.28 x 0.55 x 2.36) **-GE4/GF4**: 35.5 H x 20.7 W x 27.2 D (1.39 x 0.81 x 1.07) **-WH4F**: 75 H x 22.5 W x 80 D (2.95 x 0.88 x 3.15)
Amplifier type	Distance setting laser photoelectric sensor	Separate amplifier	Separate amplifier
Features	• Laser diode • M12 connector • Spot diameter 1.5 x 4 mm at 700 mm	• Laser heads • Three beam types: spot, line and area • Beam focusable and adjustable optical alignment • Same programming as E3X-DA	**Sensor Heads:** • Miniature interchangeable sensing heads • Remote sensitivity adjustment **Amplifiers:** • Multiple sizes • Track mountable models, slim • 1/16 DIN size socket mount amplifier
Through-beam sensing distance	–	–	-S10: 100 mm (3.94 in); -S20W: 200 mm (7.87 in); -S30W: 300 mm (11.81 in); -S30T: 300 mm (11.81 in); -S50: 500 mm (19.7 in); -1: 1 m (3.28 ft); -2: 2 m (6.56 ft)
Retroreflective sensing distance	–	2 to 7 m	–
Diffuse reflective sensing distance	120 to 700 mm	30 to 1000 mm	-DS5W: 50 mm (1.97 in); -DS10: 100 mm (3.94 in)
Color sensing	–	–	–
Supply voltage	10 to 30 VDC	12 to 24 VDC	12 to 24 VDC; -A/C: 100 to 240 VAC
AC control output	–	–	-A/C: SPDT relay
DC control output type	NPN or PNP	NPN or PNP	-JB4P/GF4: PNP; -JC4P/GE4: NPN; -WH4F: NPN and PNP
Max. load	150 mA	50 mA max.	-JB4P/JC4P/GF4: 100 mA at 24 VDC -WH4F: 100 mA at 40 VDC; -GE4: 80 mA at 24 VDC
Alarm	–	–	-JB4P/JC4P: 50 mA at 24 VDC
Response time	10 ms max.	Standard mode: 1 ms High-speed mode: 100 µs High-resolution mode: 4 ms	-JB4P/JC4P: 2 ms or 41 ms max ON/OFF (Switch selectable) -GE4/GF4/WH4F: 2 ms or 4 ms max ON/OFF (Switch selectable)
Materials: Lens **Case** **Cover**	Acrylic ABS –	– PBT Polycarbonate	**Sensor Heads:** Lens: Plastic, polycarbonate; Case: Plastic, polycarbonate; -2: Zinc die cast; Cable Sheath: Plastic, polyethylene **Amplifiers:** Plastic case
Enclosure rating	IP40	IP50	**Sensor Heads:** -S10/S50/DS10: NEMA 1, 2, 12, IP64 -S20W/DS5W: NEMA 1, IP50; -S30: NEMA 1, IP60 -1/2: NEMA 1,2, 4, 4X, 12, IP66 **Amplifiers:** NEMA 1, IP20; -JB4P: NEMA 1, 2, IP50
Light source	Laser, Class 2, Red 670 nm	Laser, Class 2, Red diode 650 nm	Pulse modulated IR LED
Circuit protection	Load short circuit and reverse polarity	Short circuit and reverse polarity	Short circuit, and reverse polarity -A/C: Not available
Mutual interference protection	Yes	Yes	–
Operation mode	Light-ON / Dark-ON selectable	Light-ON / Dark-ON selectable	Light-ON / Dark-ON; switch or jumper selectable
Applications	General purpose, minute object detection, material handling, packaging	All purpose, high-speed, mark sensing, transparency detection, color discrimination, minute object, high-precision positioning	Space constraint applications **NOTE: Consult Omron for other models**

Amplified Photomicrosensors

Omron Smart Solutions



EE-SPX

Slotted sensors provide end-of-travel and home position signals for positioning tables and assembly robots. Choose connector-ready or pre-wired models with pulse-modulated or non-pulse-modulated light source in a wide range of mounting shapes. *Page 17*

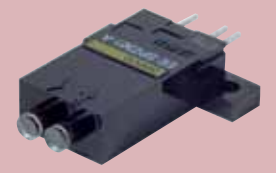
EE-SPY

Use diffuse sensors with pulse modulated light source to detect passing target objects; connector ready for easy installation. *Page 18*

EE-SPX613

Liquid level sensor easily mounts to clear clear sight glass; equipped with sensitivity selector to allow for pipe discoloration over time. *Page 19*

				
	Amplified	**Amplified**	**Amplified**	**Amplified**
Sub-category	Slotted, non-pulse modulated, connector ready	Slotted, non-pulse modulated, pre-wired	Slotted, pulse modulated, connector ready	Slotted, pulse modulated, pre-wired
Model numbers	EE-SX470, EE-SX471, EE-SX472, EE-SX473, EE-SX474, EE-SX670, EE-SX671, EE-SX672, EE-SX673, EE-SX674, EE-SX670A, EE-SX671A, EE-SX672A, EE-SX673A, EE-SX674A, EE-SX470P, EE-SX471P, EE-SX472P, EE-SX473P, EE-SX474P, EE-SX670P, EE-SX671P, EE-SX672P, EE-SX673P, EE-SX674P	EE-SX770, EE-SX771, EE-SX772, EE-SX870, EE-SX871, EE-SX872, EE-SX770A, EE-SX771A, EE-SX772A, EE-SX870A, EE-SX871A, EE-SX872A, EE-SX770P, EE-SX771P, EE-SX772P, EE-SX870P, EE-SX871P, EE-SX872P, EE-SX770R, EE-SX771R, EE-SX772R, EE-SX870R, EE-SX871R, EE-SX872R	EE-SPX301, EE-SPX303, EE-SPX401, EE-SPX403, EE-SPX303-1, EE-SPX740, EE-SPX840, EE-SPX741, EE-SPX841, EE-SPX742, EE-SPX842, EE-SPX743, EE-SPX843	EE-SPX302-W2A, EE-SPX304-W2A, EE-SPX305-W2A, EE-SPX306-W2A, EE-SPX402-W2A, EE-SPX404-W2A, EE-SPX405-W2A, EE-SPX406-W2A
Connection type	Connector or soldering terminals Available connectors:** Solder connector EE-1001, Connector with 2 m cable EE-1006/EE-1006A bracket	Pre-wired cable	Connector or soldering terminals Available connectors:** Solder connector EE-1001, Connector with 2 m cable EE-1006/EE-1006A bracket Connector with 1 m cable for 740/840 series EE-1013	Pre-wired cable
Features	• Standard, L-shaped, T-shaped and close mounting models • Built-in indicator	• Standard, L-shaped, and T-shaped models • UL, EMC and CE approvals • Compact size • Built-in indicator and optical axis guide	• Easily connects to TTLs, relays and PLCs • Range of slot widths • Built-in indicator • Light modulation reduces external light interference • Output of SPX301 / SPX401 / SPX303 / SPX403 can be converted to PNP	• Compact sensing heads • Built-in indicator • Light modulation reduces external light interference
Slot width/sensing distance mm (in)	5 (0.20)	5 (0.20)	3.6 (0.14) 5 (0.20) 13 (0.51)	3.6 (0.14) 5 (0.20)
Output logic	Light-ON/Dark-ON*	Light-ON or Dark-ON models	Light-ON or Dark-ON models	Light-ON or Dark-ON models
Supply voltage	5 to 24 VDC	5 to 24 VDC	5 to 24 VDC	5 to 24 VDC
Output type	NPN or PNP models	NPN or PNP models	NPN	NPN
Max. load current output	100 mA (NPN); 50 mA (PNP)	100 mA (NPN); 50 mA (PNP)	80 mA; 50 mA (SPX74/SPX84)	80 mA
Response frequency	1 kHz (3 kHz typical)	1 kHz	500 Hz	500 Hz
Enclosure ratings	IP50	IP60	IP50	IP50 except terminals
Ambient operating temperature	-25° to 55°C	-25° to 55°C	-10° to 55°C	-10° to 55°C
Ambient operating humidity	5% to 85% RH	5% to 85% RH	35% to 85% RH; 5% to 85% RH (SPX74/SPX84)	35% to 85% RH
	*The EE-SX67□ Series can be used as Light-ON when the L terminal and positive (+) are connected. For Dark-ON, do not connect the L terminal.			

				
	Amplified	**Amplified**	**Amplified**	**Amplified**
Sub-category	Diffuse, non-pulse modulated, connector ready	Diffuse, pulse modulated, connector ready	Convergent reflective, pulse modulated, connector ready	Diffuse retro-reflective, pulse modulated, connector ready
Model numbers	EE-SY671, EE-SY672, EE-SB5M, EE-SB5MC, EE-SB5V, EE-SB5VC, EE-SB5V-E	EE-SPY301, EE-SPY302, EE-SPY401, EE-SPY402	EE-SPY311, EE-SPY312, EE-SPY411, EE-SPY412	EE-SPZ301-A, EE-SPZ401-A
Connection type	Connector or soldering terminals Solder connector: EE-1001 Connector with 2 m cable: EE-1006/EE-1006A bracket	Connector or soldering terminals Solder connector: EE-1002 Connector with 1 m cable: EE-1003	Connector or soldering terminals Solder connector: EE-1001 Connector with 2 m cable: EE-1006/EE-1006A bracket PNP output conversion connector EE-2002	Connector or soldering terminals Solder connector: EE-1002 Connector with 1 m cable: EE-1003
Features	• Built-in sensitivity adjuster • Selectable Light-ON or Dark-ON operation • Output can be converted to PNP	• Easy connection to TTLs, relays and PLCs • Light-ON indicator simplifies adjustment and optical axis monitoring • Output can be converted to PNP	• Detects objects placed at least 20 mm in front of shiny backgrounds • Detects objects as thin as 0.05 mm-dia. copper wire • Detects dark-color objects • Output can be converted to PNP	• Long sensing distance • Easy sensitivity adjustment and optical axis monitoring with built-in indicator • Use with optional reflector or highly reflective target
Slot width/sensing distance mm (in)	1 to 5 (0.04 to 0.20) 5 (0.20) 19 (0.75)	5 (0.20)	2 to 6 (0.08 to 0.24) 5 (0.20)	200 (7.87) with E39-R1 reflector
Output logic	Light-ON or Dark-ON*	Light-ON or Dark-ON	Light-ON or Dark-ON models	Light-ON or Dark-ON models
Supply voltage	5 to 24 VDC (EE-SY) 5 to 12 VDC (EE-SB)	5 to 24 VDC	5 to 24 VDC	5 to 24 VDC
Output type	NPN	NPN	NPN	NPN
Max. load current output	100 mA (EE-SY) 80 mA (EE-SB)	80 mA	80 mA	80 mA
Response frequency	50 Hz	100 Hz	100 Hz	100 Hz
Enclosure ratings	IP50	IP50	IP50 except terminals	IP50 except terminals
Ambient operating temperature	-10° to 55°C (EE-SY) -25° to 55°C (EE-SB)	-10° to 55°C	-10° to 55°C	-10° to 55°C
Ambient operating humidity	45% to 85% RH	35% to 85% RH	35% to 85% RH	35% to 85% RH
	*EE-SY671 and EE-SY672 models can be used as Light-ON when the L terminal and positive (+) is connected. For Dark-ON, do not connect the L terminal.			

					
	Amplified	**Amplified**	**Amplified**	**Amplified**	**Amplified**
Sub-category	Through-beam, pulse modulated	Reflective displacement sensor, non-pulse modulated	Inductive unshielded proximity sensor, connector ready	Liquid level sensor, pulse modulated, pre-wired	Fiber-optic, pulse modulated, connector ready
Model numbers	EE-SPW311, EE-SPW321, EE-SPW321-A, EE-SPW411 EE-SPW421, EE-SPW421-A	Z4D-F04A, Z4D-F04D	E2R-A01	EE-SPX613	*EE-SPZ301, *EE-SPZ401, EE-SPZ301Y-01 EE-SPZ401Y-01, EE-SPZ301W-02 EE-SPZ401W-02, EE-SPZ301W-01 EE-SPZ401W-01
Connection type	Connector with 2 m cable for EE-SPW311/411 Emitter: EE-1006L Receiver: EE-1006D EE-SPW321/421 Pre-wired with 2 m cable	Connector with 1 m cable: EE-1010D	Connector with 1 m cable: E22-01	Pre-wired, 1 m cable	Solder terminal or connector: Solder terminal EE-1002 Connector with 1 m wire EE-1003
Features	• Provides long sensing distance in compact size • EE-SPW321/421 feature a cable amplifier with 0.5 or 1 m cable between amp and sensing heads	• Compact, micro-displacement sensor provides resolution to 5 mm • Analog or digital output models • Ideal for double- sheet detection, material remaining on a web or roll	• Non-contact unshielded inductive proximity sensor detects metal targets regardless of color or surface texture • Low profile space-saving shape	• Detects clear liquid presence by refraction • Easy to install: straps to clear or translucent tubing • Set sensitivity to match older pipe tinted by contents	• Sensing heads fit space-confined installations • Visible indicator simplifies optical axis adjustment and monitoring
Slot width/sensing distance mm (in)	EE-SPW311/411 1 m (3.28 ft) EE-SPW321/421 30 cm (11.81 in)	4±1.25 (0.16±0.05)	5 (0.20)	6 to 13 (0.24 to 0.52) OD tubing with minimum 1 (0.04) thick walls	EE-SPZ301/401: 20 (0.79) with E32-TC200 cable 1 to 6 (0.04 to 0.24) with E32-DC200 cable EE-SPZ□01W-01: 30 (1.18) EE-SPZ□01W-02: 5 (0.20) EE-SPZ□01Y-01: 1 to 3 (0.04 to 0.12)
Output logic	Light-ON or Dark-ON models	Light-ON	Normally open	Light-ON or Dark-ON, selectable	Light-ON or Dark-ON models
Supply voltage	5 to 24 VDC 12 to 24 VDC	12 to 24 VDC	5 to 24 VDC	12 to 24 VDC	5 to 24 VDC
Output type	NPN	1 to 5 V analog or NPN discrete	NPN	NPN	NPN
Max. load current output	100 mA	50 mA (NPN)	100 mA	100 mA	80 mA
Response frequency	1 ms max.	5 ms max. analog 1.5 ms max. NPN	5 kHz	–	100 Hz
Enclosure ratings	IP60 (311/411) IP64 (321/421)	IP50	IP50	IP50	IP50
Ambient operating temperature	-10° to 55°C (311/411) -20° to 55°C (321/421)	-10° to 55°C	-10° to 55°C	-10° to 55°C	-10° to 55°C
Ambient operating humidity	45% to 85% RH (311/411) 35% to 85%RH (321/421)	35% to 85% RH	35% to 85% RH	5% to 85% RH	35% to 85% RH
		E39-L69 mounting bracket is optional.		Includes cable ties and rubber anti-slip bands.	*Order E32-Series fiber-optic cables separately.

Proximity Sensors

Omron Smart Solutions

NEW! E2A

Cost-effective extended range proximity sensor features one-piece, threaded barrel construction with wrench flats. Choose connector or pre-wired versions; wide range of sizes and lengths.

Page 21

E2E

Inductive proximity sensors feature rugged thick barrel. Choose from standard sizes; DC 2-wire, DC-3-wire and AC 2-wire models; shielded and unshielded versions, pre-wired and connector-ready. *Page 21*

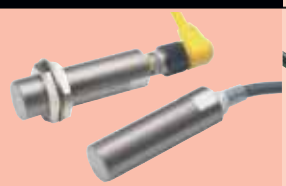
NEW! E2AW

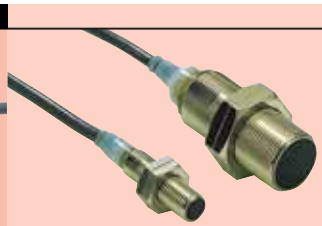
Weld field immune inductive proximity sensors that can withstand current at only 1 inch away from the 20,000-amp welding electrode. Available in cylindrical and square form factors.

Page 22

E2K-C

America's best-selling capacitive sensor detects objects regardless of material or color. Can be tuned to ignore a container wall. *Page 25*

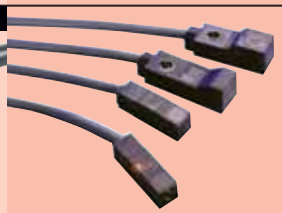


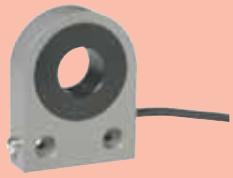


	E2E	E2E2	E2A
Product type	Short Barrel Cylindrical	Long Barrel Cylindrical	Extended Range OEM Proximity Sensor
Dimensions mm (in)	Dia. 4 x 25 (0.16 x 0.98); M5 x 25 (0.20 x 0.98); Dia. 5.4 x 25 (0.21 x 0.98); M8 x 26 (0.31 x 1.02); M12 x 33 (0.47 x 1.30); M18 x 38 (0.71 x 1.50); M30 x 43 (1.18 x 1.69)	M12 x 55 (0.47 x 2.17); M18 x 60 (0.71 x 2.36); M30 x 65 (1.18 x 2.56)	M8 Long and short barrel M12 Long and short barrel M18 Long and short barrel M30 Long and short barrel
Features	• Omron's flagship highest quality proximity sensor family • Vacuum potted internal circuitry • Multiple connector versions • Wrench flats for easy installation • Superior barrel thickness and highest tightening torques available • Pre-wired 2 m or 5 m cables • Multiple pigtail versions • Highly visible LED	• Vacuum potted internal circuitry • Multiple connector versions • Same solid construction and high quality as E2E with long barrel bodies • Fully threaded body • Pre-wired 2 m or 5 m cables • Multiple pigtail versions • Highly visible LED indication	• Extended sensing distances • Economical large quantity OEM pricing • Vacuum potted internal circuitry • One-piece housing • Stainless steel M8 barrel versions • Wrench flats for easy installation • Superior barrel thickness and highest tightening torques available • Easily customized • Pre-wired or connector versions
Shielded sensing distances	0.8, 1, 1.5, 2, 3, 5, 7, and 10 mm	2, 3, 5, 7, and 10 mm	2, 4, 8, and 15 mm
Unshielded sensing distances	2, 4, 5, 8, 10, 14, 18, and 20 mm	5, 8, 10, 14, 18, and 20 mm	4, 8, 16, 20, and 30 mm
DC supply voltage	12 to 24 VDC (10-30 VDC operating)	12 to 24 VDC (10-55 VDC operating)	12 to 24 VDC (10-32 VDC operating)
AC supply voltage	24 to 240 VAC or 90 to 140 VAC 50/60 Hz	24 to 240 VAC 50/60 Hz	N/A
2-wire DC output	NO, NC; 100 mA max.	NO, NC; 100 mA max.	N/A
3-wire DC output	NPN-NO, NPN-NC, PNP-NO, PNP-NC; 100 or 200 mA max.	NPN-NO, NPN-NC Open Collector PNP-NO, PNP-NC Open Collector 200 mA max.	NPN-NO, NPN-NC Open Collector PNP-NO, PNP-NC Open Collector 200 mA max
AC 2-wire output	NO, NC; 300 mA max.	NO, NC; 200 or 300 mA max.	N/A
Response frequency	25 Hz to 3 kHz	25 Hz to 1.5 kHz	100 Hz to 1.5 kHz
Connections	PVC Cables / Robotic Cables; Multiple M12 Micro Change® or M8 Nano Change® connectors; Multiple pigtail connectors	PVC Cable 2 m or 5 m; M12 Micro Change® connector	PVC Cable 2 m or 5 m; M12 Micro Change® connectors 4 Pin; M8 Nano Change® connectors 3 Pin; M8 only stainless steel or NPB barrel
Enclosure	Nickel plated brass barrel; Stainless steel barrel on M8 and smaller models; Sensing face is PBT; IEC IP67 / 1200 PSI Washdown; NEMA 1, 3, 4, 6, 12, 13	Nickel plated brass barrel; Sensing face is PBT; IEC: IP67/ 1200 PSI Washdown; NEMA: 1, 4, 6, 12, 13	Nickel plated brass barrel; Sensing face is PBT; IEC IP67
Agency approvals	UL, CSA, CE	UL, CSA, CE	UL, CSA, CE
Circuit protection	Output short circuit, surge absorber, reverse polarity specific model dependent	Output short circuit, surge absorber, reverse polarity specific model dependent	Output short circuit, surge absorber, power source reverse polarity, and output reverse polarity
Other	Self diagnostic versions; AC/DC versions; Alternate frequency versions; Custom cable lengths and connectors	Alternate frequency versions; Custom cable lengths and connectors	Yellow LED 4 x 90° on connector types; Highly visible yellow LED on pre-wired types; World standard prox
Application	Use when high quality, high reliability is needed; Standard distance inductive prox for ferrous metal sensing; 1200-PSI Washdown rated; Connector or pigtail versions; Easily customized; DC2W, DC3W, AC2W, AC/DC	Use when high quality, high reliability is needed in a long barrel body; Standard distance inductive prox for ferrous metal sensing; 1200-PSI Washdown Rated; DC2W, DC3W, AC2W	Use when extended range general purpose sensing is required; Extended distance inductive prox for ferrous metal sensing; Large quantity OEM pricing available Easily customized; DC3W

Inductive Proximity Sensors
Threaded Cylindrical — Weld Field Immune

	E2F	E2AW	E2QW
Product type	Threaded Plastic Cylindrical	Weld Field Immune Inductive	Weld Field Immune 9-Way Configurable Inductive
Dimensions mm (in)	M8 x 40 (0.31 x 1.57) M8 x 30 (0.31 x 1.18) M12 x 40 (0.47 x 1.57) M12 x 35 (0.47 x 1.38) M18 x 40 (0.71 x 1.57) M30 x 50 (1.18 x 1.97)	M12 x 76 M18 x 76 M30 x 76 M30 x 67	40 mm wide x 68.5 mm high
Features	• IP68 watertight construction withstands washdown • Plastic cylindrical inductive • AC 2-wire or DC 3-wire-NPN models • DC models have short-circuit protection and reverse polarity protection	• Weld field and noise immune • WFI circuitry is designed to operate within 1 inch of a resistance welding electrode at 20,000 Amperes RMS • NEMA 1, 3, 4, 6, 13 • AC/DC2W or DC3W-PNP type • M12, M18 M30 Barrel Sizes	• Weld field and noise immune • IP67 • AC/DC2W or DC3W-PNP type • Extended Range WFI Proximity • Rotatable head configurable in 9 different sensing directions • 15 mm to 35 mm sensing ranges
Shielded sensing distances	1.5, 2, 5, 10 mm	M12-2 mm, M18-5 mm, M30-10 mm	15 mm, 20 mm, 25 mm
Unshielded sensing distances	N/A	M12-4 mm, M18-8 mm, M30-15 mm	25 mm, 35 mm
DC supply voltage	12 to 24 VDC (10-30 VDC operating)	10 to 30 VDC	10 to 30 VDC
AC supply voltage	24 to 240 VAC (20 to 264 VAC operating)	20 to 230 VAC/DC	20 to 150 VAC/DC
2-wire DC output	N/A	–	–
3-wire DC output	NPN-NO, NPN-NC, PNP-NO, PNP-NC; 200 mA max.	PNP-NO, 200 mA max.	PNP-NO, 200 mA max.
AC 2-wire output	NO, NC; 100, 300 or 500 mA max.	N.O. 500 mA max.	N.O. 200 mA max.
Response frequency	25 Hz to 2 kHz	16 Hz	AC/DC-10 Hz, DC3W-150 Hz
Connections	PVC Cable 2 m standard, 5 or 10 m optional	4 Pin Euro for DC3W models 4 Pin Micro for DC3W models 3 Pin Micro for AC/DC models	4 Pin Euro for DC3W models 3 Pin Micro for AC/DC models
Enclosure	Polyallylate; IEC IP68; NEMA: 1, 3, 4, 6, 12, 13	Weld flash proof, hard coated metal housing; High temperature abrasion-resistant sensing face; NEMA: 1, 3, 4, 6, 13	Weld flash proof, hard coated metal housing; High temperature abrasion-resistant sensing face; NEMA: 1, 3, 4, 6, 13
Agency approvals	UL (on US models), CSA	UL, CSA	UL, CSA
Circuit protection	DC Models: Output short circuit, surge absorber, reverse polarity; AC Models: Add –53 for short circuit protection and add –US for UL listed version	DC models have non-latching short-circuit protection and reverse polarity protection; AC/DC2W models are latching SCP type with reverse polarity protection	DC models have non-latching short-circuit protection and reverse polarity protection; AC/DC2W models are latching SCP type with reverse polarity protection
Other	Alternate frequency versions; 5 m or 10 m cable lengths; Optional short circuit protection models; Optional UL listed AC versions	Cordsets available 2M, 5M, 10M straight or 90's PVC with E-coated or SS coupling nuts; PUR Black with E-coated or SS coupling nuts; TPE coated cables with E-coated or SS coupling nuts	Cordsets available 2M, 5M, 10M straight or 90's PVC with E-coated or SS coupling nuts; PUR Black with E-coated or SS coupling nuts; TPE coated cables with E-coated or SS coupling nuts
Application	Use when IP68 rating is needed; Use where metal barrels will corrode; Standard distance inductive prox for ferrous metal sensing DC3W or AC2W	Standard sensing distance; Weld field immune inductive proximity sensors for automotive weld lines and extremely harsh environments	Extended sensing distance; Weld field immune inductive proximity sensors for automotive weld lines and extremely harsh environments

	Inductive Proximity Sensors Harsh Environment		Miniature	
				
	E2EQ	**E2KQ**	**E2EC**	**E2SF**
Product type	Fluoroplastic-Coated Cylindrical Inductive	Fluoroplastic Cylindrical Capacitive	Subminiature Prox with In-Line Amp	Subminiature Rectangular Inductive Prox
Dimensions mm (in)	M12 x 38 (0.47 x 1.50) M18 x 47 (0.71 x 1.85) M30 x 56 (1.18 x 2.20)	M18 x 61.8 (0.71 x 2.43)	Dia. 3 x 12 (0.12 x 0.47) Dia. 5.4 x 18 (0.21 x 0.71) Dia. 8 x 18 (0.31 x 0.71) M12 x 18 (0.47 x 0.71)	5.5 x 5.5 x 19 (0.22 x 0.22 x 0.75) 7.4 x 8 x 23 (0.29 x 0.31 x 0.91) 8 x 8 x 26 (0.31 x 0.31 x 1.02)
Features	• Fluoroplastic-coated metal housing ensures high-tightening torque • Prewired versions available • Resistant to weld spatter • DC 2-wire • M12, M18, M30 barrel sizes • Long sensing distance type available: 4 mm to 15 mm	• Oil-resistant cable • Sensitivity adjustment allows sensing range from 6 to 10 mm • Fluoroplastic mounting nuts and brass washers allow easy installation/maintenance	• Subminiature cylindrical inductive prox with in-line amplifier • Robot cable for high-flex applications • DC 2-wire version reduces wiring time • Operation and stability indicator allows easy set-up and monitoring	• Extended sensing distances • Economical large quantity OEM pricing • Vacuum potted internal circuitry • One-piece housing • Stainless steel M8 barrel versions • Wrench flats for easy installation • Superior barrel thickness and highest tightening torques available • Easily customized • Pre-wired or connector versions
Shielded sensing distances	3, 7, 10 mm (standard)	–	0.5, 0.8, 1.5, 2.5, 3, 4 mm	2, 4, 8, and 15 mm
Unshielded sensing distances	–	6 to 10 mm	N/A	4, 8, 16, 20, and 30 mm
DC supply voltage	12 to 24 VDC	12 to 24 VDC	12 to 24 VDC	12 to 24 VDC (10-32 VDC operating)
AC supply voltage	–	–	N/A	N/A
2-wire DC output	NO; 100 mA max.	–	NO, NC; 100 mA max.	NO, NC; 50 mA max.
3-wire DC output	–	NPN-NO; 100 mA max.	NPN-NO, NPN-NC, PNP-NO, PNP-NC; 100 mA max.N/A	NPN-NO, NPN-NC, PNP-NO,PNP-NC; 50 mA max.
AC 2-wire output	–	–	N/A	N/A
Response frequency	0.4 kHz, 0.5 kHz, 1 kHz	–	1 kHz to 1.5 kHz	1 kHz
Connections	PVC cable, 2 m M12 Micro Change® connector	PVC cable, 2 m	Robotic Cable 2 m or optional 5 m; Optional pigtail versions	1 m cable standard
Ambient operating temperature	-13°F to 158°F	-13°F to 158°F	-13°F to 135°F	-13°F to 135°F
Enclosure	IEC: IP67	IEC: IP66	IEC: IP67 (IP64 for DC 3-wire); NEMA: 1, 3, 4, 6, 12, 13 (for DC 2-wire only)	IEC: IP67
Agency approvals	–	–	–	–
Circuit protection	Surge absorber and output short circuit	Reverse polarity connection and surge absorber	Surge absorber and output short circuit (DC 2-wire); Surge absorber (DC 3-wire)	Reverse polarity connection and surge absorber
Other	–	–	Alternate frequency versions	Alternate frequency versions; Front and end sensing models
Application	Automotive welding, machine tool	Oil and chemical resistant for use in metal cutting, chemical hardening and welding operations	Sub-miniature sensing head with in-line separate amplifier; Use when space is confined; Use in high-flex applications like robotic grippers; DC2W or DC3W	Smallest rectangular sensor available; Extremely economical; Use when space is confined DC2W or DC3W

	Inductive Proximity Sensors	
	Rectangular	Ring Sensor
		
	TL-W	**F2LP-W**
Product type	Miniature Rectangular Inductive	Ring-Shaped Inductive Sensing Head
Dimensions mm (in)	27 x 10 x 6 (1.06 x 0.39 x 0.24); 30 x 18 x 10 (1.18 x 0.71 x 0.39); 50 x 25 x 10 (1.97 x 0.98 x 0.39); 53 x 40 x 23 (2.09 x 1.57 x 0.91);	Amp: 75 x 67.5 x 74 (2.95 x 2.66 x 2.91) Sensors: 10 (0.39) ID: 37 x 24 x 10 (1.46 x 0.94 x 0.39) 20 (0.79) ID: 65 x 50 x 16 (2.56 x 1.97 x 0.63) 50 (1.97) ID: 96 x 110 x 26 (3.78 x 4.33 x 1.02) 75 (2.95) ID: 155 x 130 x 40 (6.10 x 5.12 x 1.57) 100 (3.94) ID: 185 x 170 x 45 (7.28 x 6.69 x 1.77)
Features	• Space-saving, flat-pack DC sensor fits tight spaces • Rugged diecast metal or low-profile plastic housing models available • Mounts directly to metal base or rail • DC 3-wire and DC 2-wire models	• Detects moving metal objects anywhere inside of the ring • Separate amplifier, can be surface or track mounted • Ideal for counting parts
Shielded sensing distances	5 mm	0.3, 2, 2.5, 3 mm min.
Unshielded sensing distances	3, 5, 20 mm	–
DC supply voltage	10 to 30 VDC	–
AC supply voltage	–	120 to 240 VAC
2-wire DC output	–	–
3-wire DC output	NPN-NO, NPN-NC, PNP-NO,PNP-NC; 100 or 200 mA max.	–
AC 2-wire output	–	SPDT relay; 3A max. NPN-NO; 100 mA max.
Response frequency	40 Hz to 600 Hz	75 to 125 ms between objects
Connections	2 m cable standard	Amp: Screw terminals; Sensors: 3 m cable standard
Ambient operating temperature	-13°F to 158°F	Amp: 14°F to 131°F Sensors: -13°F to 158°F
Enclosure	IEC: IP67 NEMA: 1, 2, 3, 4X, 6, 12, 13	IEC: IP67 (IP30 for amplifier)
Agency approvals	UL, CSA, CE	UL, CSA
Circuit protection	Reverse polarity connection and surge absorber (DC 3-wire); short circuit protection (DC 2-wire)	–
Other	–	Amplifier has 40 ms OFF delay and one-shot timing functions
Application	Space confined installations in conveyor rails, and end-of-travel and home position robotic applications	Small parts assembly, electronics assembly, automotive applications

				
	E2K-F	**E2K-X**	**E2K-C**	**E2J**
Product type	Flat-Pack Rectangular Capacitive	Threaded Cylindrical Capacitive	Adjustable Cylindrical Capacitive	Adjustable Flat Rectangular Capacitive
Dimensions mm (in)	50 x 20 x 10 (1.97 x 0.79 x 0.39)	M12 x 80 (0.47 x 3.15); M18 x 80 (0.71 x 3.15); M30 x 80 (1.18 x 3.15)	34 Dia. x 82 (1.34 x 3.23)	Amp: 59 x 12 x 29 (2.32 x 0.47 x 1.14) Sensors: 30 x 20 x 5.5 (1.18 x 0.79 x 0.22) 40 x 30 x 5.5 (1.57 x 1.18 x 0.22)
Features	• Flat, thin capacitive sensor fits space confined installations • Ideal for mounting directly to metal walls • Detects glass, plastic, wood, water, oil and metals • Fixed distance or adjustable models	• Threaded-body sensors detect glass, wood, water oil, plastic and metal • Fixed sensitivity for simple installation • Operation indicator, all models • AC 2-wire and DC 3-wire models	• Built-in amplifier allows adjustable detecting distances • Allows indirect detection of objects inside non-metallic containers • AC 2-wire and DC 3-wire models	• Separate amplifier with adjustable sensitivity • Compact sensing heads • Highly flexible robotic-grade cable • DC 3-wire NPN open collector
Shielded sensing distances	–	–	–	–
Unshielded sensing distances	10 mm	4, 8, 15 mm	3 to 25 mm adjustable	10 mm, 20 mm
DC supply voltage	10 to 30 VDC	10 to 30 VDC	10 to 40 VDC	24 VDC
AC supply voltage	–	90 to 250 VAC	90 to 250 VAC	–
2-wire DC output	–	–	–	–
3-wire DC output	NPN-NO, NPN-NC; 100 mA max.	NPN-NO, NPN-NC, PNP-NO,PNP-NC; 200 mA max.	NPN-NO, NPN-NC, PNP-NO, PNP-NC; 200 mA max.	NPN-NO/NC; 100 mA max.
AC 2-wire output	–	NO, NC; 200 mA max.	NO, NC; 200 mA max.	–
Response frequency	100 Hz	10 Hz to 100 Hz	10 Hz to 70 Hz	70 Hz
Connections	3 m cable standard	2 m cable	2 m cable	Amp: 2 m cable; Sensor: 1 m cable
Ambient operating temperature	14°F to 131°F	-13°F to 158°F	-13°F to 158°F	14°F to 131°F
Enclosure	IEC: IP66 NEMA: 1, 4, 12, 13	IEC: IP66 NEMA: 1, 4, 12, 13	IEC: IP66 NEMA: 1, 4, 12, 13	IEC: IP66 (IP50 for amplifier)
Agency approvals	–	UL	UL	–
Circuit protection	Reverse polarity connection	AC2W: Surge absorber; DC3W: Reverse polarity connection and surge absorber	AC2W: Surge absorber; DC3W: Reverse polarity connection and surge absorber	Output short circuit, surge absorber, reverse polarity connection
Other	New adjustable sensing distance models available	–	Mounting bracket included	–
Application	Sensing non-metallic target, ideal for semiconductor and plastics, level control applications	General purpose type for plastics, level control	Tank sight glass for level control; non-metallic container fill inspection	Ideal for robot hands and various built-in applications for material handling and assembly verification such as CD-ROMs in jewel cases

Limit Switches

Omron Smart Solutions

D4A-N

Heavy-duty, general-purpose limit switches feature plug-in construction for easy installation and long service life. *Page 27*

D4CC

Compact enclosed switch is triple sealed for reliable operation, and comes connector-ready for quick servicing or replacement without rewiring. *Page 28*

ZE/ZV/ZV2

Enclosed limit switch with large breaking capacity with wide range of actuators, also available in sealed versions. *Page 28*

			
	D4A-N	**WL**	**D4C**
Dimensions mm (in)	104.5 H x 42.0 W x 44 D (4.11 x 1.65 x 1.73)	94.1 H x 40.0 W x 41.5 D (3.70 x 1.57 x 1.63)	55 H x 40 W x 16 D (2.17 x 1.58 x 0.63)
Features	• Heavy-duty, general-purpose limit switch • Convenient plug-in construction for easy installation and field maintenance • Waterproof and oil-tight	• **CE approved** • General-purpose single pole/double break limit switch • Wide variety of standard, high-precision and overtravel types • Waterproof, oil-tight and dust-proof construction	• **CE approved** • Compact, high-precision prewired enclosed limit switch • Slim-line body design ideal for limited access areas and gang mounting
Switching capacity	10 A continuous – 120, 240, 480, 600 VAC, NEMA A600 (SPDT without indicator); 10 A continuous - 120, 240 VAC NEMA A300 (SPDT with indicator); 5 A continuous – 120, 240, 480 600 VAC NEMA B600 (DPDT, without indicator)	10 A, 125 VAC inductive load; NEMA A600	5 A, 125 VAC, resistive load; NEMA B300
Contact configuration	SPDT or DPDT double break	SPDT double break	SPDT (form C)
Mechanical service life (operations)	50 million minimum (SPDT); 30 million minimum (DPDT)	15 million minimum	10 million minimum
Connection	1/2-14 NPT conduit entrance, terminal screws	1/2-14 NPT conduit entrance, terminal screws	Prewired with 3 meters (9.8 ft.) cable
Enclosure rating	UL 3, 4, 4X, 6P and 13; NEMA 1, 2, 3, 3R, 4X, 5, 6P, 12 and 13; IP67	UL 3, 4 and 13; NEMA 1, 2, 3, 3R, 4X, 5 6P, 12 and 13; IP67	UL 3, 4 and 13; NEMA 1, 3, 3R, 4, 5, 6, 12 and 13; IP67
Actuators	Side rotary, use separate levers; Plain side plunger; Vertical side roller plunger; Horizontal side roller plunger; Adjustable side plunger; Plain top plunger; Top roller plunger; Adjustable roller plunger; Spring wire wobble lever; Plastic rod wobble lever; Cat whisker wobble lever; Coil spring wobble lever	Short, medium and long roller levers; Flush mounting roller lever; Flange mounting roller lever; Adjustable roller lever; Adjustable rod lever; Fork roller levers; Plain top plunger; Top roller plunger; Top ball plunger; Plain side plunger; Side roller plunger; Side ball plunger; Steel wire wobble lever; Nylon rod wobble lever; Coil spring wobble levers	Pin plunger; Sealed plunger; Roller plunger; Sealed roller plunger; Crossroller plunger; Sealed cross roller plunger; Bevel plunger; Coil spring; Roller lever

	D4CC	ZE/ZV/ZV2	ZC
			
Dimensions mm (in)	73.2 H x 40 W x 16 D (2.88 x 1.58 x 0.63)	102.1 H x 25.4 W x 86 D (4.02 x 1.00 x 3.39)	65.4 H x 21.5 W x 60 D (2.58 x 0.85 x 2.36)
Features	• Compact, connector-ready enclosed limit switch • Triple sealed construction • Quickly replace or service the switch without rewiring	• Enclosed limit switch with a large breaking capacity • Choose among side-mounting (ZE), diagonal side mounting (ZV2) and base-mounting (ZV) housings	• Ideal for gang mounting • Small high-precision limit switch that responds to small operating force • Models available with rubber seal boot to protect the actuator
Switching capacity	1 A, 125 VAC resistive load; 1 A, 30 VDC resistive load	15 A, 125 VAC, inductive load	10 A, 125 VAC, inductive load; NEMA A300
Contact configuration	SPDT (form C)	SPDT (form C)	SPDT (form C)
Mechanical service life (operations)	10 million minimum	10 million minimum	10 million minimum
Connection	Accepts Omron's Y96E or Brad Harrison MicroChange™ connector cordsets	1/2-14 NPT conduit entrance, terminal screws	Terminal screws or prewired with 1 m (3.28 ft) cable
Enclosure rating	UL 3, 4 and 13 (pending for DC types); NEMA 1, 3, 3R, 4, 5, 6, 12 and 13; IP67	NEMA 1, 2, 3, 4, 5, (-N type); 1 (-Q type); IP60 (-Q); IP65 (-N)	NEMA 1, 2, 3, 4, 5, 13; IP67
Actuators	Center rotary roller lever; Pin plunger; Roller plunger; Crossroller plunger; Bevel plunger; Low operating force roller lever; Sealed plunger; Sealed roller plunger; Sealed crossroller plunger; Panel mount pin plunger; Panel mount roller plunger; Panel mount crossroller plunger; Plastic rod lever	Top plunger; Roller plunger; Crossroller plunger; Roller arm lever; One-way action arm lever; Rod lever; Coil spring (ZE, ZV); Maintained contact plunger (ZE, ZV); **Sealed versions of all actuators available**	Pin plunger; Panel mount plunger; Panel mount roller plunger; Panel mount cross roller plunger; Sealed roller plunger; Sealed cross roller plunger; Short hinge lever; Hinge lever; Short hinge roller lever; Hinge roller lever; One-way action short hinge roller lever; One-way action hinge roller lever

Other Sensor Solutions

Omron Smart Solutions

Pressure

Compact sensors with or without digital displays help monitor gauge pressure, vacuum and differential pressure conditions. *Pages 30-31*

Encoders

Incremental and absolute encoders provide reliable positioning feedback for motors, lifts and other rotating equipment. *Pages 32-33*

Ultrasonic

Detect products regardless of color, texture or glossiness at long range. Also detects powder in storage tanks. *Page 34*

Pressure Sensors

	E8Y	E8F2	E8M/E8MS
Dimensions mm (in)	31 x 30 x 29.8 (1.22 x 1.18 x 1.17)	28 x 28 x 29 (1.10 x 1.10 x 1.14)	29.7 H x 15 dia. (max.) (1.17 x 59 dia. [max.]) 26 H x 19 W x 42.5 D (1.02 X 0.75 X 1.67) 31 H x 27.5 dia. (1.22 x 1.08)
Features	• Cube, miniature package • Easy-to-read LED display • Programmable teach modes • **CE approved**	• Mini-cube • Miniature and light weight • Digital and analog display • **CE approved**	• Miniature • Separate controller • Small and light weight • Programmable multi-channel outputs
Display units	psi or kPa	kPa, torr, psi	E8M = None, K3C = kPa, kgf/cm2, mmHg, mmH_2O
Pressure range available			
Differential pressure	0 to 0.29 psi (0 to 2 kPa) 0 to 0.725 psi (0 to 5 kPa)	–	0 to 0.145 psi (0 to 1kPa) [E8M-A1]
Positive pressure	–	0 to 14.5 psi (0 to 100 kPa) 0 to 145 psi (0 to 1 MPa)	0 to 14.5 psi (0 to 100kPa) [E8MS-01] 0 to 145 psi (0 to 1MPa)
Negative pressure	–	0 to -14.6 psi (0 to -101 kPa)	0 to -14.5 psi (0 to -101kPa)
Applicable material	Non-corrosive, non-flammable gases or air	Non-corrosive, non-flammable gases or air	Non-corrosive, non-flammable gases or air
Pressure port	4.5 mm dia. resin pipe or NPT 1/8	NPT 1/8 or M5	PT 1/8 or M5
Supply voltage	12 to 24 VDC	12 to 24 VDC	12 VDC sensor, 24 VDC controller
Output			
Analog	4 to 20 mA	1 to 5 V	1 to 5 V
On / Off	100 mA, NPN open collector	30 mA, NPN open collector	30 mA, NPN open collector
Enclosure	IP40	IP50	IP50

	E8CB	E8CC	E8EB
Dimensions mm (in)	15 x 26.8 x 52.5 (0.59 x 1.06 x 2.07)	15 x 29.5 x 67 (0.59 x 1.16 x 2.64)	17.5 x 30 x 44 (0.69 x 1.18 x 1.73)
Features	• Flat pack • Slim package, just 15 mm wide • Two-turn pressure adjustment	• Display flat pack • Slim package – 15 mm wide • DIN rail mount compatible • LCD display	• General purpose • Analog and digital outputs • NPN and PNP outputs available
Display units	None	kPa, kgf/cm^2, cmHg	None
Pressure range available			
Differential pressure	–	–	–
Positive pressure	0 to 14.2 psi (0 to 98 kPa)	0 to 14.2 psi (0 to 98 kPa) 0 to 142.1 psi (0 to 980 kPa)	0 to 14.2 psi (0 to 98 kPa) 0 to 142.1 psi (0 to 980 kPa)
Negative pressure	0 to -14.6 psi (0 to -101 kPa)	0 to -14.6 psi (0 to -101 kPa)	0 to -14.2 psi (0 to -98 kPa)
Applicable material	Non-corrosive, non-flammable gases or air	Non-corrosive, non-flammable gases or air	Non-corrosive, non-flammable gases or air
Pressure port	NPT 1/8 or M7	NPT 1/8 or M8	NPT 1/8
Supply voltage	12 to 24 VDC	12 to 24 VDC	24 VDC
Output			
Analog	1 to 5 V	1 to 5 V	1 to 5 V
On / Off	80 mA, NPN open collector	80 mA, NPN open collector	80 mA, NPN or PNP open collector
Enclosure	IP50	IP50	IP54




	E6A2	E6B2	E6C2-C	E6C3-CWZ□□H
Dimensions mm (in)	25 dia. x 29 L (0.98 x 1.14)	40 dia. x 39 L (1.57 x 1.54)	50 dia. x 60 L (1.97 x 2.36)	50 dia. x 38 L (1.97 x 1.50)
Shaft diameter mm (in)	4 (0.16)	6 (0.24)	6 (0.24)	8 (0.32)
Type	Incremental	Incremental	Incremental	Incremental
Features	• CE approved miniature sized encoder • Small operating torque • Ideal for small and high-density equipment • Zero index function for positioning applications available	• CE approved • Ideal for most general-purpose applications • Extended signal transmission distances • Zero phase can be easily adjusted using origin indicating function • Line driver output available	• Drip-proof construction • Shaft withstands heavy loads, 5 kgf radially, 3 kgf thrust (axially) • Short circuit protection • Space-saving, A-slant cable protrusion for ease of mounting	• CE approved and available with complimentary outputs for interfacing to NPN or PNP inputs • Drip-proof construction • Surge protection • Ideal for tough environments
Resolution	10 to 360 pulses/revolution	10 to 2,000 pulses/revolution	10 to 2,000 pulses/revolution	100 to 3,600 pulses/revolution
Output phase(s)	Output A; Outputs A & B (100, 200 pulses/rev only); Outputs A, B & Z (100, 200 pulses/rev only)	Outputs A, B and Z (reversible)	Outputs A, B, and Z (reversible) Line driver $A\bar{A}$, $B\bar{B}$, and $Z\bar{Z}$	Outputs A, B and Z (reversible)
Output phase difference	90°±45°	90°±45°	90°±45°	90°±45°
Maximum response frequency	300 kHz (30,000 pulses/sec)	100 kHz (100,000 pulses/sec)	100 kHz (100,000 pulses/sec)	100 kHz (100,000 pulses/sec)
Maximum rpm	5,000 rpm	3,000 rpm	6,000 rpm	6,000 rpm
Supply voltage	5 to 12 VDC, 12 to 24 VDC	5 to 12 VDC; 5 to 24 VDC; 5 VDC	5 to 12 VDC; 5 to 24 VDC; 5 VDC; 12 to 24 VDC	5 to 24 VDC
Current consumption	50 mA max.	50 mA max.	160 mA max.	100 mA
Output form and capacity	2 kΩ output impedance (voltage output); 30 mA (NPN open collector output)	2 kΩ output impedance (voltage output); 35 mA (NPN open collector output); -20 to 20 mA (line driver)	35 mA max. (NPN or PNP open collector); 2 kΩ output impedance (voltage output); -20 to 20 mA (line driver)	35 mA max. (NPN or PNP open collector)
Shaft loading: radial	1 kgf (7.2 ft-lbs.)	3 kgf (21.7 ft-lbs.)	5 kgf (11.0 ft-lbs.)	80 N
Shaft loading: axial	0.5 kgf (3.6 ft-lbs.)	2 kgf (14.5 ft-lbs.)	3 kgf (21.7 ft-lbs.)	50 N
Starting torque	10 g-cm (0.14 oz.-inch)	10 g-cm (0.14 oz.-inch)	100 gf x cm (9.8 mN x m) max. (7.2 m ft x lbf)	100 g-cm (1.39 oz.-inch)
Degree of protection: IEC 144	IP50	IP50	IEC IP64	IEC60925 IP65
Ambient operating temperature	-10° to 55°C (14° to 131°F)	-10° to 70°C (14° to 158°F)	-10° to 70°C (14° to 158°F) with no icing	-10° to 70°C (14° to 158°F)
Shaft coupler	E69-C04B supplied; two 4 mm dia. shafts	E69-C06B supplied, two 6 mm dia. shafts. Optional couplers for 8 and 10 mm dia. shafts	Order separately. E69-C06B 6 mm; E69-C68B 6 to 8 mm; E69-C06M metal 6 mm	Order separately. Choose E69-C08B for the 8 mm dia. shaft

				
	E6D	**E6C3-A**	**E6CP**	**E6F**
Dimensions mm (in)	55 dia x 50 L (2.17 x 1.97)	50 dia. x 38 L (1.97 x 1.50)	56 dia. x 50 L (2.21 x 1.97)	60 dia. x 60 L (2.36 x 2.36)
Shaft diameter mm (in)	6 (0.24)	8 (0.32)	6 (0.24)	10 (0.39)
Type	Incremental	Absolute	Absolute	Absolute
Features	• Super accuracy and high response frequency	• CE approved and now available with PNP outputs for interfacing to allow more flexible interfacing to other devices • High resistance to shock • Drip-proof construction • Heavy duty absolute encoder	• Reliable 8-bit resolution and gray code binary output	• Gray code binary output with 8-bit resolution or BCD output with 10-bit resolution • Direct connections to high-speed counters, position control modules for PLCs or Omron's H8PS cam positioner
Resolution	720 to 6,000 pulses/revolution	256, 360, 720, 1,024 pulses/revolution	256 pulses/revolution	256 or 360 pulses/revolution
Output phase(s)	Outputs A, B, and Z (reversible)	Gray code	Gray code binary	Gray code binary or BCD (detects in gray-codes; converts to BCD)
Output phase difference	90°±25°	–	–	–
Maximum response frequency (pulses per second)	200 kHz (200,000 pulses/sec)	20 kHz (20,000 pulses per second)	5 kHz (5,000 pulses per second)	5 (E6F-AB3C) or 10 (E6F-AG5C) kHz (5,000 or 10,000 pulses per sec.)
Maximum rpm	12,000 rpm	5,000 rpm	1,000 rpm	5,000 rpm
Supply voltage	5 VDC (voltage output); 12 VDC (open collector output)	12 to 24 VDC	5 to 12 VDC (A6CP-AG3C); 12 to 24 VDC (E6CP-AG5C)	5 to 12 VDC (E6F-AB3C); 12 to 24 VDC (E6F-AG5C)
Current consumption	150 mA max.	70 mA	90 mA max. (A6CP-AG3C); 70 mA (E6CP-AG5C)	50 mA max (E6F-AB3C); 70 mA (E6F-AG5C)
Output form and capacity	35 mA max. (voltage and NPN open collector output)	35 mA (NPN and PNP open collector)	16 mA (NPN open collector transistor)	35 mA (NPN open collector transistor)
Shaft loading: radial	5 kgf (36.2 ft-lbs.); 2 kgf (14.5 ft-lbs.) typical	80 N	3 kgf (21.7 ft-lbs.)	10 kgf (72.3 ft-lbs.)
Shaft loading: axial	3 kgf (21.7 ft-lbs.); 1 kgf (7.2 ft-lbs.) typical	50 N	2 kgt (14.5 ft-lbs.)	3 kgf (21.7 ft-lbs.)
Starting torque	100 g-cm (1.39 oz.-inch)	100 g-cm (1.39 oz.-inch)	10 g-cm (0.14 oz.-inch)	100 g-cm (1.39 oz.-inch)
Degree of protection: IEC 144	IP50	IEC60925 IP65	IP50	IP52
Ambient operating temperature	-10° to 70°C (14 to 158°F)	-10° to 70°C (14° to 158°F)	-10° to 70°C (14 to 158°F)	-10° to 70°C (14° to 158°F)
Shaft coupler	E69-C06B supplied, two 6 mm dia. shafts	Order separately. Choose E69-C08B for the 8 mm dia. shaft	E6CP-AG3C - E-69-C06B supplied, two 6 mm dia. shafts. Optional couplers for 8 and 10 mm dia. shafts. E6CP-AG5C – Order separately. Choose 6 mm dia. couplers for 6, 8, 10 mm dia. shafts	2 options: For E6F-AG5C, order sep. Choose 6 mm dia. couplers for 6, 8 & 10 mm dia. shafts. For E6F-AB3C, E69-CO6B supplied, Two 6 mm dia. shafts. Optional couplers for 8 & 10 mm dia. shafts





	E4A	E4B	E4C	E4E	E4R
Dimensions mm (in)	104 H x 50 W x 150 D (4.09 x 1.97 x 5.91)	61 H x 35 W x 79 D (2.40 x 1.38 x 3.11)	18 Dia. x 75 L (0.71 x 2.95)	36 H x 18 W x 25 D (1.42 x 0.71 x 0.98)	80 H x 46 W x 52D (3.15 x 1.81 x 2.05)
Amplifier type	Built-in amplifier	Built-in amplifier	Separate amplifier	Built-in amplifier	Separate amplifier
Features	Ultrasonic reflective; Mutual interference protection; Clear material detection; Photo sensitive film sensing	Ultrasonic through-beam and reflective; Narrow 8 degree beam; Zone and setting distance models	Ultrasonic through-beam and reflective; Compact threaded body; Mutual interference protection; Zone setting mode	Extremely compact self-contained ultrasonic sensor; Through-beam; Separate NO and NC models	Ultrasonic reflective sensor; Wide beam angle for granular and high viscosity materials
Detection method and sensing distance					
Through-beam type	–	1 m, 500 mm	500 mm	300 mm	–
Reflective	0.3 to 3 m	200 to 700 mm, 50 to 200 mm	100 to 350 mm	–	2.5 m
Supply voltage	120 and 240 VAC 12 to 24 VDC	12 to 24 VDC	12 to 24 VDC	12 to 24 VDC	12 VDC
Control outputs					
AC	3 A Relay, SPDT	–	–	–	4 A Relay, SPDT
DC	–	100 mA NPN or PNP open collector	100 mA, NPN/PNP open collector, selectable	100 mA, NPN open collector, NO or NC	–
Alarm	–	–	–	–	–
Response time	250 ms	10 ms	10 ms (200 Hz)	25 ms	150 ms
Materials	Plastic, ABS	Plastic, ABS	Plastic, ABS	Plastic, ABS	Plastic, ABS
Enclosure rating	IP60	IP66	IP66 sensor; IP40 amp.	IP66	IP10

Pushbuttons, Switches and Pilot Devices

Omron Smart Solutions

Pushbuttons

Easy-to-install illuminated and non-illuminated switches are available with momentary and alternate action types.

Switches

Selector switches and key switches are available in two- and three-position versions.

Pilot Devices

Indicator lights and buzzers help operators monitor status effectively.

Non-Illuminated

Shape	Pushbutton								Selector Switch
Part number	Round Flush A22-F	Round Extended A22-T	Round Full-Guard A22-G	Round Half-Guard A22-H	30 mm Mushroom A22-S	40 mm Mushroom A22-M	Square Extended A22-C	Square Full-Guard A22-D	2- or 3-position knob A22S
Appearance									
Color	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆

Shape	Selector Switch Extended Lever	Key Switch	Emergency Stop						
Part number	2- or 3-position knob A22S	2- or 3-position knob A22K	Push-pull 40 mm dia. A22E-MP	Push-pull 60 mm dia. A22E-LP	Push-lock, turn-reset 30 mm dia. A22E-S	Push-lock, turn-reset 40 mm dia. A22E-M	Push-lock, turn-reset 60 mm dia. A22E-L	Push-lock, key-reset 30 mm dia. A22E-SK	Push-lock, key-reset 40 mm dia. A22E-MK
Appearance									
Color	◆	◆	◆	◆	◆	◆	◆	◆	◆

Illuminated

Shape	Pushbutton					Selector Switch	Pilot Light		Emergency Stop
Part number	Round Extended A22L-T	Round Half-Guard A22L-H	Round Full-Guard A22L-G	Square Extended A22L-C	Square Full-Guard A22L-D	2- or 3-position knob A22W	Round M22-F	Square M22-C	Push-lock, turn-reset 40 mm dia. A22EL-M
Appearance									
Color	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆◆	◆

For more detailed descriptions on pushbuttons, switches and pilot devices visit our website at **www.omron.com/oei**.

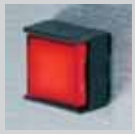
Non-Illuminated

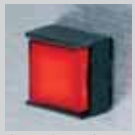
Shape	Pushbutton			Selector Switch			Key Switch		
	Round	Square	Rectangle	Round 2- or 3-position knob	Square 2- or 3-position knob	Rectangular 2- or 3-position knob	Round 2- or 3-position knob	Square 2- or 3-position knob	Rectangular 2- or 3-position knob
Part number	A165-T	A165-A	A165-J	A165S-T	A165S-A	A165S-J	A165K-T	A165K-A	A165K-J
Appearance									
Color	◆◆◆◆◆◆	◆◆◆◆◆◆	◆◆◆◆◆◆	◆	◆	◆	◆	◆	◆

Shape	Buzzer	Emergency Stop
	Rectangular Standard and high sound	Push-lock, turn-reset
Part number	M2BJ	A165E-S
Appearance		
Color	◆	◆ Also available: 40 mm dia. A165E-M

NOTE:
A16 - IP40
A165 - IP65 oiltight

Illuminated

Shape	Pushbutton			Selector Switch		
	Round	Square	Rectangle	Round 2- or 3-position knob	Square 2- or 3-position knob	Rectangular 2- or 3-position knob
Part number	A165L-T	A165L-A	A165L-J	A165W-T	A165W-A	A165W-J
Appearance						
Color	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆	◆◆◆	◆◆◆

Shape	Pilot Lights			Emergency Stop
	Round	Square	Rectangle	Push-lock, turn reset 30 mm dia.
Part number	M165-T	M165-A	M165-J	A165E-LS
Appearance				
Color	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆ Also available: 40 mm dia. A165E-LM

NOTE:
A16 - IP40
A165 - IP65 oiltight

Safety Products

Omron Smart Solutions

F3SN-A

Gold standard of safety light curtains for Type 4 guarding systems eliminates dead zone and offers front and side indicators for simple setup and troubleshooting. Custom lengths ship in 5 working days.

Page 39

NEW! F3SX

Safety controller simplifies connection to multiple light curtains and other safety devices, and integrates monitoring control.

Page 40

Safety Interlocks and Limit Switches

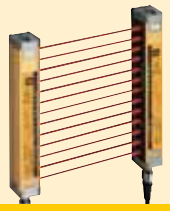
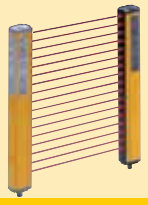
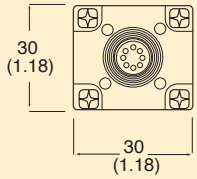
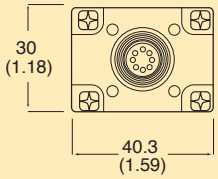
Detect open safety doors and guard gates to shut down machinery before operators can enter a hazardous area.

Pages 41 - 42

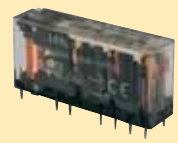
NEW! F3G

Just one safety area laser scanner protects a whole machine or process with a wide warning field and protective field.

Page 39

	Light Curtains		Laser Scanner
			
	F3SN-A	**F3S-B**	**F3G**
Dimensions mm (in)			137.5 H x 176 W x 115 D (5.41 x 6.93 x 4.53)
Protective height	207 mm; 297 mm; 307 mm; 405 mm; 457 mm; 495 mm; 607 mm; 621 mm; 729 mm; 757 mm; 801 mm; 907 mm; 909 mm; 999 mm; 1,057 mm; 1,107 mm; 1,207 mm; 1,357 mm; 1,507 mm; 1,657 mm; 1,807 mm	300 mm; 450 mm; 600 mm; 750 mm; 900 mm; 1,050 mm; 1,200 mm; 1,350 mm; 1,500 mm; 1,650 mm	
Features	• Type 4 safety light curtain • Features programmable fixed and floating blanking, outputs and serial connection • Meets OSHA, IEC and EN standards. Series connect models and auxiliary output	• Safety light curtain • F3S-B does not require a control box • Meets Type 2 requirements • Features blanking, instability indication, and interlock functions • Meets OSHA, IEC and EN standards	• 0 to 6m protective field • 0 to 7.5m warning field • 300 degree scanning angle • 70 mm detection capability • Safety relay outputs • Simple connection and set-up • EN954-1 type 3 • Operation temperature 0 – 50˚ C
Detection distance	0.2 to 7 m or 0.2 to 10 m	0.3 to 5.0 m	
Control output	2 X PNP @ 300 mA max.	2 X PNP @ 200 mA max.	
Response time	10 ms to 15.5 ms max.	20 to 45 ms	
Axis pitch mm (in)	9 (0.35), 15 (0.59), 30 (1.18), 60 (2.36), 300 (11.8)	25 (0.98)	
Enclosure rating	IP65	IP65	
Switching capacity			2A at 30 V
Supply voltage			Two SPST-NO (safety outputs)
Contact configuration			SPST-NO (non-safety output)
Mechanical service life (operations)			2,000,000 min.
Electrical service life (operations)			Power: 8-Pin Round Connector
Connection			Communications: 14-Pin Round Connector
Enclosure rating			
UL			–
NEMA			–
IEC 60529			IP65




	F3SX	G9SX	G9SA	G7SA	G7S-E
Dimensions mm (in)	111 H x 45 to 157.5 W x 113 D (4.37 x 1.77 to 6.20 x 4.45)	Main unit: 115 H x 35.5 W x 100 D (4.5 x 1.4 x 3.9) Expansion unit: 115 H x 23 W x 100 D (4.5 x 0.9 x 3.9)	111 H x 45 W x 76 D (4.37 x 1.77 x 2.99) 111 H x 17.5 W x 76 D (4.37 x 0.69 x 2.99)	24 H x 13 W x 40 D (0.94 x 0.51 x 1.57) 24 H x 13 W x 50 D (0.94 x 0.51 x 1.97)	37 H x 62 W x 22.5 D (1.46 x 2.44 x 0.89)
Features	• Safety controller meets IEC 61508 SIL3 standards and EN 954-1 Category 4 • Simplifies connection to multiple light curtains and other safety devices and integrates monitoring and control • Expandable: main modules offer solid state safety outputs or warning indicator output; expansion modules for input and output	• Logical AND function adds flexibility to I/O expansion • Facilitates partial or complete control system setup • Solid-state outputs (excluding Expansion Units) • Detailed LED indications enable easy diagnosis • TÜV Product Service certification for compliance with IEC/EN61508 (SIL3) and EN954-1 (Cat. 4)	• Force-guided safety relay unit with 3 and 5 poles, adjustable time-delay (7.5, 15 or 30s) and two-hand control models available • All units feature self-resetting fuses and are expandable to provide an additional 3 poles with or without time-delay	• Slim-profile force-guided relay, available with 4 or 6 poles in a variety of configurations • DIN rail and board-mount sockets available	• Forced-Guided Contacts
Switching capacity	Main contact: 3.15 A max. Auxiliary contact: 5 A 2 A, AC inductive load 1 A DC inductive load	Main outputs: 2 out @ 1 A DC load 3 out @ 0.8 A DC load Expansion unit rated load: 250 VAC, 3A/ 30 VDC, 3A	5A, 250 VAC	6 A, 250 VAC; 6 A, 30 VDC Min. permissible load: 5 VDC, 10mA	NO: 10A at 250 VAC, 10A at 30 VDC NC: 6A at 250 VAC, 6A at 30 VDC AC-15: 5A at 240 VAC DC-13: 2A at 24 VDC Min. 1mA at 5 VDC
Supply voltage	24 VDC	24 VDC	24 VAC/VDC or 100-240 VAC	24 VDC	–
Contact configuration	Main contact: DPST-NO Auxiliary contact: SPST-NC	Main outputs: instantaneous, 3 solid state; Expansion unit: 4PST-NO	3PST-NO, 5PST-NO	3PST-NO, SPST-NC; DPST-NO, SPST-NC; 5PST-NO, SPST-NC; 4PST-NO, SPST-NC; 3PST-NO, 3PST-NC	4PST-NO, DPST-NC 3PST-NO, 3PST-NC
Mechanical service life (operations)	10 million minimum	5 million minimum (Expansion unit)	5 million minimum	10 million minimum	10 million minimum
Electrical service life (operations)	100,000 minimum	100,000 minimum (Expansion unit)	100,000 minimum	100,000 minimum	100,000 minimum
Connection	Screw terminals	Detachable screw or spring mount terminals	Terminal screws	Plug-in socket	Plug-in Socket
Actuators	Emergency stop input; Reset input; Feedback input; Auxiliary input; DC solid state safety output; Auxiliary solid state output	–	–	–	–
Certifications					
UL	cULus listed, UL 508, UL 1998, IEC 61508	UL & CSA approved	–	–	–
NEMA	–	–	–	–	–
IEC 60529	Main body: IP40, Terminal block: IP20	–	Terminals: IP20, Enclosure: IP40	–	–

					
	D40B	**D4NL**	**D4GL**	**D4GS-N**	**D4BS**
Dimensions mm (in)	25 H x 48 W x 12 D (0.98 x 1.89 x 0.47)	95 H x 88.5 W x 35.5 D (3.74 x 3.48 x 1.40)	187 H x 43 W x 40 D (7.36 x 1.69 x 1.57)	85 H x 30 W x 17 D (3.35 x 1.18 x 0.67)	111.5 H x 40 W x 43 D (4.39 x 1.57 x 1.69)
Features	• Non-Contact detection of open/closed state of doors. • Meets EN954-1 Category 3 safety requirements	• Four head mounting directions • Direct Opening Contacts • Up to 5 contacts types available • IP67 degree of protection • Switches micro loads 1 mA at 5 VDC	• Four head mounting directions • Slim Safety Door style • M20 Conduit size styles available • Direct Opening Contacts • Up to 5 contacts types available • IP67 degree of protection • Switches micro loads 1mA at 5 VDC	• Slim-profile plastic-bodied keyed door switch featuring "positive-opening" on all NC contacts • 2 different styles available with top or side key entry complete with a 1, 3 or 5 m cable in 4 different contact configurations with up to 3 sets of NC contacts	• Rugged metal-bodied keyed door switch features positive opening on all NC contacts • Operation head rotates and mounts in 4 positions to orient side key entry to match installation site
Switching capacity	NO: 4A at 250 VAC, 2A at 30 VDC NC: 100mA at 230 VAC, 100mA at 24 VDC	A300 (120/240 VAC, 10 A, 7200 VA make, 720 VA break) Min. 1mA at 5 VDC	C300 (120/240 VAC, 2.5 A, 1800 VA make, 180 VA break) Q300 (120/240 Vdc, 2.5 A, 69 VA make, 69 VA break) Min. 4mA at 24 VDC	2.5 A, 120 VAC 2.5 A, 125 VDC NEMA C300, Q300	10 A, 125 VAC, inductive load NEMA A600
Supply voltage	–	–	–	–	–
Contact configuration	2 NO (safety), 1 NC (aux.)	2NC/1NO plus 1NC/1NO 2NC/1NO plus 2NC 3NC plus 1NC/1NO 3NC plus 2NC	2NC/1NO plus 1NC/1NO 2NC/1NO plus 2NC 3NC plus 1NC/1NO 3NC plus 2NC	DPST, 1NC/1NO DPST, 2NC DPST, 2NC/1NO DPST, 3NC	DPST 1NC/1NO DPST 2NC
Mechanical service life (operations)	1 million minimum	1 million minimum	1 million minimum	1 million minimum	1 million minimum
Electrical service life (operations)	100,000 minimum	500,000 minimum	500,000 minimum at 4 mA, 24 VDC 150,000 min. at 1 A, 125 VAC and 4 mA, 24 VDC in two ckts.	100,000 minimum	500,000 minimum
Connection	DIN rail	Conduit Entrance with terminal screws Pg13.5 G1/2 M20	Conduit Entrance with terminal screws Pg13.5 G1/2 M20	Prewired with 1 m (3.3 ft.), 3 m (9.8 ft.) or 5 m (16.4 ft.) cable	Conduit entrance, terminal screws
Actuators		Horizontal mount key; Vertical mount key; Adjustable key	Horizontal mount key; Vertical mount key; Adjustable key	Horizontal mount key; Vertical mount key; Adjustable key	Horizontal mount key; Vertical mount key; Adjustable key
Enclosure rating					
UL	–	Type 4X indoor	Type 4X indoor	Type 4X indoor or Type 12	3, 4, 4X, 6P and 13
NEMA	–	–	–	–	3, 4, 4X, 6P and 13
IEC 60529	IP67	IP67	IP67	IP67	IP67

	Interlocks & Switches				E-Stop
					
	D4NS	**D4BL**	**D4B-N**	**D4N**	**A22E**
Dimensions mm (in)	96 H x 31 W x 30 D (3.78 x 1.22 x 1.18)	123.5 H x 112 W x 46.3 D (4.86 x 4.40 x 1.82)	99.5 H x 40 W x 43 D (3.92 x 1.57 x 1.69)	64 H x 31 W x 30 D (2.52 x 1.22 x 1.18)	Dia. 40 x 86.7 L (1.57 x 3.41)
Features	• Plastic-bodied keyed door switch features top and side key entry in addition to 4 operation head mounting positions • Get maximum installation versatility with a single switch • Positive opening on all NC contacts	• Metal-bodied locking safety door switch with solenoid key lock features positive opening on all NC contacts • Operation head with side key entry rotates and mounts in 4 positions • Choose solenoid lock or solenoid release mechanism	• Heavy-duty limit switch features direct drive contacts that insure contacts open when welded due to overload currents • Snap-action switches retain high contact reliability during slow-moving operations • Slow-action switches have positive opening contacts for wider electrical separation between contacts • Three-conduit switch body available • Positive opening switch mechanism • Meets IEC, UL, CSA and VDE 0660 approvals	• General purpose limit switch featuring a direct-opening contact mechanism which forcibly opens contacts even when welding has occurred • Low cost, plastic-body switch meets many European safety directives • Wide operating temperature range • Positive opening switch mechanism	• Emergency-stop switch features direct opening contacts that prevent contact welding due to overloaded currents • Non-lighted and lighted models available • Push-lock, turn-reset mechanism ensures switch operation • Punch dia. 22 mm. 30, 40 and 60 dia. head sizes also available
Switching capacity	10 A, 120 VAC UL/CSA A300	10 A, 125 VAC inductive load, NEMA A300	10 A, 120 VAC NEMA A600	10 A, 120 VAC UL/CSA A300, Q300	AC15: 5 A, 110 VAC, resistive load; 10 A, 24 VAC, resistive load DC15: 0.5 A, 110 VDC, resistive load; 1.5 A, 24 VDC, resistive load
Contact configuration	1NC/1NO; 2NC; 2NC/1NC; 3NC	DPST 1NC/1NO+1NC DPST 2NC+1NC	SPDT, 1NC/1NO DPST, 2NC DPST 1NC/1NO	1NC/1NO; 2NC; 2NC/1NO; 3NC; 1NC/1NO MBB; 2NC/1NO MBB	SPST-NO + SPST-NC DPST-NC
Mechanical service life (operations)	1 million minimum	1 million minimum	30 million minimum	15 million minimum	300,000 minimum
Electrical service life (operations)	300,000 minimum	500,000 minimum	500,000 minimum	300,000 minimum	300,000 minimum
Connection	Conduit entrance, terminal screws	Conduit entrance, terminal screws	Conduit entrance, terminal screws	Conduit entrance, terminal screws	Terminal screws
Actuators	Horizontal mount key; Vertical mount key; Adjustable key	Horizontal mount key; Vertical mount key; Adjustable key	Side rotary nylon roller lever; Adjustable side rotary rubber roller lever; Adjustable side rotary nylon roller lever; Adjustable side rotary rod lever; Plain top plunger; Top roller plunger; Coil spring wobble lever; Plastic rod wobble lever	Standard roller lever; Adjustable roller lever; Vertical roller lever; Horizontal roller lever; Plain top plunger; Roller plunger; Cat whisker wobble lever; Plastic rod wobble lever	Dia. 40 red, push-pull; Dia. 60 red, push-pull; Dia. 30 red, push-lock, turn-reset; Dia. 40 red, push-lock, turn-reset; Dia. 60 red, push-lock, turn-reset; Dia. 30 red, push-lock, key-reset; Dia. 40 red, push-lock, key-reset; Dia. 40 red, push-lock, turn-reset with red LED; Dia. 40 red, push-lock, turn-reset with red LED, transformer
Enclosure rating					
UL	–	6P and 13	3, 4, 4X, 6P and 13	–	–
NEMA	–	6P and 13	3, 4, 4X, 6P and 13	–	–
IEC 60529	IP67	IP67	IP67	IP67	IP65

Measurement Devices

Omron Smart Solutions

NEW! ZFV

Smart CCD sensor with seven advanced matching functions offers built-in lighting and an amplifier with an embedded LCD monitor. Simple setup assures productive operation in minutes. *Page 44*

NEW! ZX-E

Inductive measurement sensor gauges metal objects to detect proper tightening, product jams between bag sealing jaws and more. Separate amplifier calculates application resolution showing results on a large digital display. *Page 44*

NEW! Z500

Industry's first high-precision profile measurement system that measures depth and width in one pass! Separate controller performs all data processing and calculations. *Page 44*





	ZFV	ZX-L	ZX-E	Z300	Z500
Sensor type	Matching CCD sensor with separate amplifier	Laser displacement and parallel beam sensor	Inductive displacement sensor	Laser displacement with 2-dimensional CCD	Unique laser profiling system with 2-dimensional CCD
Features	• Amplifier has built-in 1.8" LCD monitor • One-touch teaching • Sensing head has guide light, adjustable focus and built-in red LED lighting • 7 operation modes: pattern matching, area, width, count, character, position, brightness • Performs grayscale pattern matching	• Amplifier supports 3 through-beam and 8 displacement visible red sensing heads • Compact amplifier with dual digital resolution and measurement value display • 6 modes of operation	• Amplifier supports 3 unthreaded cylindrical versions, 2 threaded cylindrical versions, 1 flat version and 1 high temperature (200°C) threaded cylindrical type • Compact amplifier with dual digital resolution and measurement value display • Mutual interference protection, 5 sensors	• New 2 dimensional CCD technology allows stable measurement of transparent objects • The 2D CCD enables high-speed measurement • Z300 allows real-time monitoring and is used within an easy-viewing color display system.	• Unique wide beam sensing method provides a complete solution to profile measurements • Faster and more accurate than single-point laser scanning • Measures 2-point level difference, width, edge position • Z500 offers 4 ways to monitor measurement data
Resolution	468 H x 432 V pixels	Displacement: 2 microns @ 40 mm sensing distance; 16 microns @ 100 mm sensing distance; 300 microns @ 300 mm sensing distance Parallel beam: 4 microns	1 micron, with ±0.5% FS linearity	0.4 µm, 1 µm, 8 µm, and 40 µm	0.25 µm, 0.3 µm, and 1 µm
Sensing distance	Wide view: 38 to 194 mm distance; 10 x 9.2 mm to 50 x 46 mm field of view Narrow view: 34 to 49 mm distance; 5 x 4.6 mm to 9 x 8.3 mm field of view	Displacement: 40 mm sensing distance with ±10 mm range; 100 mm sensing distance with ±40 mm range; 300 mm sensing distance with ±200 mm range; Parallel beam: 0 to 2000 mm	Unthreaded: 0.5, 1, 2 mm; Threaded: 2, 7 mm; Flat: 4 mm; High-temp: 2 mm	Diffuse reflection mode: 100 mm ±20 mm, 600 mm ±350 mm, 5.2 mm ±1 mm, 50 mm ±5 mm	Diffuse reflection mode: 5.2 mm ±0.8 mm, 50 mm ±5 mm, 100 mm ±20 mm
Detectable object	Opaque or translucent objects; 1/1,000 to 1/4000 s shutter speed	Solid or liquid	Magnetic metals; ranges and linearities differ for non-magnetic metals	Opaque and transparent solid objects	Measurement solid regions (2 mm, 6 mm, and 17 mm)
Response time	Selectable: 4 ms to 15 ms	Selectable 0.3 ms to 614 ms	150 µs	500 µs max.	9.94 ms
Output	NPN, 50 mA PNP, 50 mA	Selectable linear analog output 4-20 mA, 1 to 5 VDC, 0 to 5 VDC, ±4 VDC, ±5 VDC; NPN or PNP high, pass, low set points	Selectable linear analog output 4-20 mA, 1 to 5 VDC, 0.5 VDC, ±4 VDC, ±5 VDC; NPN or PNP high, pass, low set points	On/Off RS-232C and Terminal (21 output points) AND Measurement RS-232C and Analog	On/Off RS-232C and Terminal (21 output points) AND Measurement RS-232C and Analog
Supply voltage	24 VDC	12 to 24 VDC	12 to 24 VDC	21.6 to 26.4 VDC	21.6 to 26.4 VDC
Enclosure rating	Sensor: IP65 Amplifier: IP20	IP40	Sensor: IP60, IP65, IP67	IP66 or IP67	IP64 or IP66
Light source	Visible red LED; green guide light	FDA class 1 and class 2 visible red laser (650 nm)	–	Visible laser (650 nm or 670 nm, 1 mW, Class 2) or (658 nm, 15 mW, Class 3B)	Visible wide beam laser (650 nm, 1 mW, Class 2) or (658 nm, 15 mW, Class 3B)

				
	Z4M-WR	**Z4M**	**Z4W-V25R**	**Z4D-F**
Sensor type	Laser displacement sensor	Laser displacement sensor	LED displacement sensor	LED micro displacement sensor
Features	• FDA class II • Visible beam eliminates the need for Z49 safety kit • Two measurement distances available: 40 mm and 100 mm • Automatic sensitivity setting minimizes sensing errors caused by color change	• Highest resolution 1.5 micron • Two measurement distances available: 40 mm and 100 mm • Automatic sensitivity setting minimizes sensing errors caused by color change	• LED displacement sensor with 10 micron resolution • Visible LED light source allows for easy setup and does not require safety precautions of laser products • Easy to use built-in amplifier	• LED micro-displacement sensor in a compact body • 5 µm resolution supported • Linear output over an analog output
Resolution	3, 20, or 80 microns at 40 mm; 16, 60, or 300 microns at 100 mm (depends on response time selected)	1.5, 10, or 40 microns at 40 mm; 8, 30, or 150 microns at 100 mm (depends on response time selected)	10 microns at 25 mm	5 µm or 40 µm
Sensing distance	40 mm sensing distance with ±10 mm measurement range; 100 mm sensing distance with ±40 mm measurement range	40 mm sensing distance with ±10 mm measurement range; 100 mm sensing distance with ±40 mm measurement range	25 mm sensing distance with ±4 mm measurement range	4 mm ±1.5 mm
Detectable object	Solid or liquid	Solid or liquid	Solid or liquid	Solid objects
Response time	60, 2, or 0.15 ms; 500, 20, or 0.7 ms	60, 2, or 0.15 ms; 500, 20, or 0.7 ms	5 ms	5 msec or 1.5 msec
Output	Linear analog 4 to 20 mA; NPN, 50 mA at 40 VDC	Linear analog -4 to +4 VDC; NPN, 50 mA at 40 VDC	Linear analog 4 to 20 mA displacement output; NPN, 50 mA at 30 VDC output when object is out of range	1 to 5 V or NPN open collector
Supply voltage	12 to 24 VDC	12 to 24 VDC	12 to 24 VDC	12 to 24 VDC
Enclosure rating	IP40	IP40	IP66	IP50
Light source	IEC class 2; FDA class II; Visible red 670 nm; Semiconductor laser	IEC class 3b; FDA class IIIb; Infrared 780 nm; Semiconductor laser	Visible red light emitting diode	Red LED (700 nm)

	E2CD	E2CA	E4PA	E4DA
				
Sensor type	Inductive inspection sensor	Inductive displacement sensor	Ultrasonic displacement sensor	Ultrasonic displacement sensor
Features	• High repeat accuracy ±1 to 5 mm (±0.00004 to 0.0002) • Low temperature drift • Digital setting amplifier with built-in TEACH function for easy setup • Two independent outputs for High/Pass/Low discrimination	• Linear 4 to 20 mA output for distance from object to sensor • Accurate to 0.6 micron • AC and DC amplifiers available • Adjustable detecting distance sensitivity	• Long range detection • Settable measurement range with temperature correction function • Sensing not affected by color.	• Narrow beam ultrasonic sensor provides linear analog output • Ultrasonic beam can detect objects regardless of color • Amplifier provides three inspection outputs • (High/Pass/Low) and analog 4 to 20 mA output
Resolution	0.5 to 5 microns	0.6 to 2 microns	0.172 mm at less than 705 mm OR actual distance divided 4.096 mm	200 microns
Sensing distance	0 to 5 mm	0.3 to 10 mm	60 to 500 mm 200 to 2,000 mm 500 to 4,000 mm 800 to 6,000 mm	30 to 70 mm
Detectable object	Metal objects	Metal objects	Standard size: 100 x 100 mm flat plate	Solid or liquid
Response time	8 ms	100 ms	35 ms or 100 ms or 300 ms or 500 ms	2 ms
Output	2 NPN open collector; 100 mA at 30 VDC	Linear analog 4 to 20 mA; Control output, transistor; 100 mA at 40 VDC	4 to 20 mA and 0 to 10 V	Linear analog 4 to 20 mA; Three discrimination outputs; Transistor; 80 mA at 30 VDC; Alarm output; 80 mA at 30 VDC
Supply voltage	12 to 24 VDC	90 to 264 VAC (E2CA-AN4☐) 10 to 30 VDC (E2CA-AL4☐)	10 to 30 VDC	12 to 24 VDC
Enclosure rating	IP67 sensor IP30 amplifier	IP67 sensor IP40 amplifier	IP65	IP66 sensor IP30 controller

	D5A	D5M	D5V
Sensor type	Contact displacement sensor	LVDT contact inspection sensor	Contact displacement sensor
Features	• 1 micron repeatability for accurate measurement of tool wear • LED indicator available for ease of use • Dry contact or solid state output available • Quick disconnect type available for quick installation or maintenance	• High repeat accuracy 5 mm or 10 mm sensing range ±0.5% linearity • IP67 protection, resists oil and water spray • Pin plunger or roller plunger actuator	• Works under a low operating force of 30 gf • Inexpensive high resolution sensor • Ball, pin and flat actuator types available
Resolution	1 to 3 microns	10 or 20 microns	10 micron (linear output) 1 micron (serial output)
Sensing distance	2 mm to 10.5 mm	5 mm or 10 mm	5 mm
Detectable object	Solid objects	Solid objects	Solid objects
Response time	–	6 ms max.	6 ms (linear output); 7 ms (serial output including transmission)
Output	Dry contact: 10 mA 24 VAC/12 VDC; PNP: 100 mA 5 to 24 VDC	Linear analog 4 to 20 mA	Linear analog 4 to 20 mA; B7A (16 bit) serial communications
Supply voltage	24 VAC 12 VDC for dry contact output; 5 to 24 VDC for PNP output	24 VDC	12 to 24 VDC
Enclosure rating	IP67 sensor	IP67 sensor	IP40 sensor

	Z4LB	Z4LC
Sensor type	Laser measurement sensor	Laser measurement sensor
Features	• Through-beam visible light source for easy optical alignment • Linear analog and discrimination outputs included for inspection and control • TEACH function provides one touch setup • Digital display of measured values and discrimination output indicators for easy operation	• Through-beam visible light source for easy optical alignment • Linear analog, digital and discrimination outputs included for inspection and control • Measurement mode selection for different sensing applications • Digital display of measured values and discrimination output indicators for easy operation
Resolution	5 to 30 microns	10 microns
Measurement width	10 mm or 30 mm beam width	28 mm beam width
Sensing distance	0 to 300 mm; 40 mm fixed	0 to 300 mm; 40 mm fixed
Detectable object	Solid objects	Solid objects
Response time	0.3 ms or 5 ms selectable	3.3 ms
Output	Analog +1 to +5 VDC; Two discrimination outputs: low and pass; NPN or PNP 100 mA at 30 VDC	Analog 4 to 20 mA; Digital 12 bit binary NPN 30 VDC 20 mA max; Three discrimination outputs: high, pass and low
Supply voltage	12 to 24 VDC	12 to 24 VDC
Enclosure rating	IP40 sensor IP20 amplifier	IP40 sensor IP20 amplifier
Light source	IEC class 1; FDA class II; Visible red 650 nm; Semiconductor laser	IEC class 1; FDA class II; Visible red 670 nm; Semiconductor laser

Omron Smart Solutions

NEW! F210 CF

Easiest date/lot code inspection system to set up and operate. Built-in character libraries eliminate teaching; calendar reference updates settings automatically.

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NEW! F270

High-speed processing with real-time, 360° rotation search provides 100% inspection capabilities regardless of position or angle presented.

Page 52

NEW! F500

Inspect high-value, high liability products with 1-megapixel digital camera for fine resolution images and ultra fast processing. Ethernet communications allows user-scheduled data reporting as well as remote setting and monitoring.

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	F-150-2	F-150-3
Features	• User selectable gray scale or binary processing (256 level) • 'Automatic' menu or user-customized 'Expert' menu • Capacity for 16 setup scenes with up to 16 inspection windows in each • Measurements include degree of defect, edge position, and edge pitch • Position compensation detects objects regardless of orientation • Easily connects to Omron's PLCs via RS-232C • Stores up to 23 images in memory • NPN, PNP, and DeviceNet controllers available	• Based on the same platform as the F150-2, the F150-3 offers the same user-selectable gray scale or binary processing with the industry's only modular two-camera capability • Use a two-camera splitter module to add a second camera • Split-screen processing allows both cameras to be processed at once • Configure and setup via on-screen menu system or optional drag-and-drop flow chart style, Vision Composer Windows® -based software for as many as 64 items per scene • Two additional cameras with controllable lighting angle and intensity with settings that can be saved in each scene • Easily connects to Omron's PLC via RS-232C • NPN, PNP and DeviceNet controller available
Field of view mm (in)	-SL20A 20 x 20 (0.79 x 0.79); -SL50A 50 x 50 (1.97 x 1.97); -S1A variable, determined by choice of lens (consult your Omron sales rep. for lens options)	-SL20 20 x 20 (0.79 x 0.79) -SL50 50 x 50 (1.97 x 1.97) -SLC20A 20 x 20 (0.79 x 0.79) -SLC50A 50 x 50 (1.97 x 1.97) -S1A variable, determined by choice of lens (consult your Omron sales rep. for lens options)
Shutter speeds	Electronic shutter; 1/100 S, 1/500 S, 1/2000 S, 1/10,000 S (menu selectable)	Electronic shutter; 1/100 S, 1/500 S, 1/2000 S, 1/10,000 S (menu selectable)
Measurement area (Pixels)	512 H x 484 V	512 H x 484 V
Inputs/Outputs	11 inputs/21 outputs (including control I/O points); NPN or PNP available	11 inputs/21 outputs (including control I/O points); NPN or PNP available
Communication	RS-232C	RS-232C (Formattable)
Applications	Detect PCB edge position; Count and measure pitch of component leads; Finding fiducial marks; Chip orientation and placement; Presence, absence or direction of components on PCB or features on assemblies; Plastic part inspection for extra parts, breakage, or dirt	Simultaneously inspect two sides of an object, i.e. boxes or assemblies or both bottle top opening and side label; Inspect bottle opening diameter; Increase field of view to inspect large electrical connectors or width dimension by both ends of wide object; Sort boxes or bottles by label or size; Object position feedback to robotics, multi-angle inspection and tooling monitoring for machining and robotics; Repeatable light setting using SLC20 or SLC50 cameras
Setting distance inch (mm)	-SL20A 2.4 to 2.8 (60.96 to 70.96) -SL50A 2.6 to 3.0 (66.04 to 76.20) -S1A variable, determined by C-mount lens choice	-SL20 2.4 to 2.8 (60.96 to 70.96) -SL50 2.6 to 3.0 (66.04 to 76.20) -SLC20A 0.59 to 0.098 (14.98 to 2.48) -SLC50A 0.64 to 1.04 (16.25 to 26.41) -S1A variable, determined by C-mount lens choice
Processing speed	Up to 1500 inspections per minute; Variable, determined by setup and measurements	Up to 1500 inspections per minute; Variable, determined by setup and measurements
Input power supply	24 VDC	24 VDC

			
	F160	**F210**	**F210-CF**
Features	• Industry's first dual-camera, high-speed vision sensor • Delivers 17 measurement tools to solve more demanding vision applications • Double-speed cameras capture images up to 4 times faster • High-speed processing generates results 2 to 10 times faster • New algorithms include: Omron's Quest OCR, "variable box" technology and Flexible Search • On-screen drop-down wizard-style menu or "expert" menu options • Cameras feature 8 user-selectable shutter speeds – two models with Intelligent Light Source options • Expandable storage memory up to 120 MB using Flash-RAM memory cards • Customized menus, "results" screen information, symbol, text colors • Connects to Omron PLC's via RS-232C or RS-422 • NPN or PNP controller I/O	• Delivers high-performance vision analysis using industry-leading inspection and location algorithms combined with high-speed one- or two-camera capability • The F210 setup software uses a flexible, easy-to-load tool set and flow-chart style drop down menu system to simplify configuring the inspection process • Edge code technology adds enhanced and ultra-precise detection performance to many of the F210's commonly used algorithms • Original Quest optical character recognition and verification algorithm uses built-in character libraries and can discern multiple characters simultaneously	• Omron's OCR/OCV dedicated Vision Inspection system • Original Quest optical character recognition and verification algorithm uses built-in character libraries and can discern multiple characters simultaneously • F210-CF vision sensor delivers high-performance vision analysis using industry-leading inspection and location algorithms combined with high-speed one-camera capability • The F210-CF setup software uses a flexible, easy-to-load tool set and flow-chart style drop down menu system to simplify configuring the inspection process
Field of view mm (in)	-SLC20 20 x 20 (0.79 x 1.79) -SLC50 50 x 50 (1.97 x 1.97) -S1 variable, determined by choice of lens (consult your Omron sales rep. for lens options)	-SLC20 0.79 x 0.79 (20 x 20); -SLC50 1.97 x 1.97 (50 x 50); -S1A variable, determined by choice of lens	-SLC20 0.79 x 0.79 (20 x 20); -SLC50 1.97 x 1.97 (50 x 50); -S1A Variable, determined by choice of lens
Shutter speeds	Electronic shutter; Select from 8 shutter speed settings 1/120 to 1/20,000 S (menu selectable)	1/120 S to 1/20,000 S (8 Total - menu selectable)	1/120 S to 1/20,000 S (8 Total - menu selectable)
Measurement area (Pixels)	512 H x 484 V	512 H x 484 V	512 H x 484 V
Inputs/Outputs	13 inputs and 22 outputs (including control I/O points); NPN or PNP available	13 inputs/22 outputs (including control I/O points) NPN or PNP available	13 inputs/22 outputs (including control I/O points) NPN or PNP available
Communication	RS-232C (Formattable); RS-422	RS-232C (Formattable); RS-422A	RS-232C (Formattable); RS-422A
Applications	Production lines requiring high-speed inspection and measurement; Simultaneously inspect two sides of an object or two angles of a process; Inspect shipping labels and sort containers by label or size; Inspect bottles for dimensions, defects and label data; Read Lot/Date code on bottles or pill blister packs; Inspect components and position of PCB's; Position feedback, wide-angle inspection and tooling monitoring for machining and robotics; Repeatable light setting using SLC20 or SLC50 cameras	Product sorting: Sorts multiple products by size or labels and inspect for quality; OCR and Packaging inspection: Seal presence/absence and label defect, lot/date code confirmation; High-speed Detection/Counting: Detect missing parts and count high quantity part lots; Part Gauging: Gauge object lengths, diameters and feature locations on assemblies;	OCR/OCV inspection: Can be used for lot/date code confirmation; Reliable text recognition: Quest has built-in libraries of commonly used fonts
Setting distance inch (mm)	-SLC20 0.59 to 0.098 (14.98 to 2.48) -SLC50 0.64 to 1.04 (16.25 to 26.41) -S1A variable, determined by C-mount lens choice	-SLC20 0.59 to 0.098 (14.98 to 2.48) -SLC50 0.64 to 1.04 (16.25 to 26.41) -S1A variable, determined by lens choice, uses C-mount lenses	-SLC20 0.59 to 0.098 (14.98 to 2.48) -SLC50 0.64 to 1.04 (16.25 to 26.41) -S1A variable, determined by lens choice, uses C-mount lenses
Processing speed	Up to 5000 inspections per minute; Variable, determined by setup and measurements, 3 - 34 ms	Variable and high speed, determined by setup and measurements	Variable and high speed, determined by setup and measurements
Input power supply	24 VDC	20.4 to 26.4 VDC (including ripple)	20.4 to 26.4 VDC (including ripple)

	F250	F270
Features	• New algorithms include Omron's advanced Edge Code Position and Defect Detection, Fine Matching and Quest OCR/OCV • On-screen, pull-down menu system using an easy to understand, flow chart style setup menu • On-line trending functions with definable limits • F160 Cameras feature 8 user-selectable shutter speeds and 3 models with Intelligent Light Source lighting options • 2 Expandable Flash-RAM memory slots up to 120MB each using Flash-RAM memory cards • Allows user customized menus, "results" screen information and symbol and text colors • Connects to Omron PLC's via 10based-T Ethernet, RS-232C or RS-422 and supports Omron's Host-Link protocol • NPN or PNP controller I/O available	• High-speed processing with the world's first real-time 360° rotation search and advanced algorithms resulting from vast experience and know-how • The F270 provides application solutions such as positioning and inspections that were difficult to achieve with conventional vision sensors • Newly implemented feature of support functions have been added to enable integrating measurement data into production management.
Field of view mm (in)	F150-SL20 20 x 20 (0.79 x 0.79); F150-SL50 50 x 50 (1.97 x 1.97); F150-SLC20 20 x 20 (0.79 x 0.79); F150-SLC50 50 x 50 (1.97 x 1.97); F150-S1A Variable, determined by choice of lens (consult your Omron sales representative for lens options) F160-SLC20 20 x 20 (0.79 x 0.79); F160-SLC50 50 x 50 (1.97 x 1.97); F160-S1 Variable, determined by choice of lens (consult your Omron sales representative for lens options)	F150-SL20 20 x 20 (0.79 x 0.79); F150-SL50 50 x 50 (1.97 x 1.97); F150-SLC20 20 x 20 (0.79 x 0.79); F150-SLC50 50 x 50 (1.97 x 1.97); F150-S1A variable, determined by choice of lens (consult your Omron sales representative for lens options) F160-SLC20 20 x 20 (0.79 x 0.79); F160-SLC50 50 x 50 (1.97 x 1.97); F160-S1 variable, determined by choice of lens (consult your Omron sales representative for lens options)
Shutter speeds	F160 camera electronic shutter; select from 8 shutter-speed settings (1/120 to 1/20,000 sec); F150 camera electronic shutter, select from 1/100 sec, 1/500 sec, 1/2000 sec, 1/10,000 sec using menu	F160 camera electronic shutter; select from 8 shutter-speed settings (1/120 to 1/20,000 sec); F150 camera electronic shutter, select from 1/100 sec, 1/500 sec, 1/2000 sec, 1/10,000 sec using menu.
Measurement area (Pixels)	512 H x 484 V	512 H x 484 V
Inputs/Outputs	21 inputs and 46 outputs (including control I/O points) NPN or PNP available	21 inputs and 46 outputs (including control I/O points) NPN or PNP available
Communication	Connects to Omron PLC's via 10based-T Ethernet, RS-232C or RS-422 and supports Omron's Host-Link protocol	Connects to Omron PLC's via 10based-T Ethernet, RS-232C or RS-422 and supports Omron's Host-Link protocol
Applications	Product packaging lines requiring high-speed inspection of product labels on bottles for proper label content or defects, lot code or date code verification, dimensional inspection with multiple angles and proper orientation with high-speed position compensation; Confirm Lot/Date code and verify label clarity on pharmaceutical containers or food containers at high-speed; Inspect for high accuracy defect detection for critical part surfaces on O-rings, sealing surfaces, bottles, food containers and critical edges; Inspect components, part or silk screened text and report board position of PCB's; Perform multiple position inspections on automotive engine blocks or transmission housings and assemblies:ultra-precise object position feedback to robotics, multi-angle inspection and tooling monitoring for machining and robotics; Easily settable and repeatable light setting using SLC20 or SLC50 cameras or external CCS America lighting using the CCS; Intelligent Lighting Adapter with the S1 or S1A cameras.	Quest character and lot number verification: Variation in characters reduces inspection accuracy; Saves a lot of working hours spent registering characters in dictionaries and registering models; Stable shape and constant measurements: 1/20 pixel repeatability allows great efficiency in production processes that require more-precise positioning; Prevents drops in production line operating rates resulting from measurement mistakes and increased working hours required for resetting for different models
Setting distance inch (mm)	F150 cameras, -SL20 2.4 to 2.8 (60.96 to 70.96) -SL50 2.6 to 3.0 (66.04 to 76.20) -SLC20A 0.59 to 0.098 (14.98 to 2.48) -SLC50A 0.64 to 1.04 (16.25 to 26.41) -S1A variable, determined by C-mount lens choice; F160 cameras, -SLC20 0.59 to 0.098 (14.98 to 2.48) -SLC50 0.64 to 1.04 (16.25 to 26.41) -S1 variable, determined by C-mount lens choice.	F150 cameras, -SL20 2.4 to 2.8 (60.96 to 70.96) -SL50 2.6 to 3.0 (66.04 to 76.20) -SLC20A 0.59 to 0.098 (14.98 to 2.48) -SLC50A 0.64 to 1.04 (16.25 to 26.41) -S1A variable, determined by C-mount lens choice; F160 cameras, -SLC20 0.59 to 0.098 (14.98 to 2.48) -SLC50 0.64 to 1.04 (16.25 to 26.41) -S1 variable, determined by C-mount lens choice.
Processing speed	Variable, determined by setup and measurements.	Variable, determined by setup and measurements.
Input power supply	20.4 to 26.4 VDC (including ripple)	20.4 to 26.4 VDC (including ripple)

	F400	F500
Features	• Hue, saturation, and intensity based color detection • Point and click color pickup for detecting up to 8 colors simultaneously or 5 color filter modes (red, green, blue, gray, and “Colorgray”) available • Industry’s first Colorgray filter detects fine differences in color even with light fluctuations • Image filtering including background suppression • On-screen menu-driven setup (no programming) • Many of the same measurements and functions as the F150-2 • Easily connects to Omron’s PLC via RS-232C • NPN or PNP controllers available	• Ethernet enabled F500 allows high-precision inspections and measurements in the factory and then goes further to support easy construction of a production and quality control system for quality traceability • 1-million-pixel Digital Interface camera provides clear images are obtained by greatly reducing noise in high-resolution video signals • Large storage capacity allows approx. 200 images to be stored right in the controller • Remote access and operation allows data such as the operating status of the vision sensor and images resulting from inspections to be remotely accessed
Field of view mm (in)	-S1 variable, determined by choice of lens (consult your Omron sales rep. for lens options)	-S1 variable, determined by choice of lens
Shutter speeds	Electronic shutter; 1/100 S, 1/500 S, 1/2000 S, 1/10,000 S (menu selectable)	10 speeds from 1/24 to 1/10,000 sec
Measurement area (Pixels)	512 H x 484 V	1392 H X 1040 V
Inputs/Outputs	11 inputs/21 outputs (including control I/O points); NPN or PNP available	11 inputs, 22 outputs
Communication	RS-232C	Ethernet 100Base; USB series B, RS-232C/422
Applications	Inspection for surface defects using fine differences in color undetectable with monochrome processing; Detection of fine differences in color even with fluctuations of light; Discrimination of different color labels or miswiring of a wire harness using color pickup processing; Detect and measure objects by the color of each edge; Check presence/absence of labels or objects based on color; Sort objects based on color	High resolution vision applications requiring fine detailed object inspection; Product defect inspections: Misshapen products, as well as contamination and scorching around molded products, can be detected; Printing defects: Minute imperfections can be inspected using the 1-million-pixel high-resolution inspections over a wide field of view; Positioning: Gravity and axis; Presence and direction: Density data, gray search; Appearance inspections: Area; Dimensions: Edge position, width and T-edge position.
Setting distance in	-S1 variable, determined by choice of lens	-S1 variable, determined by choice of lens
Processing speed	Variable, determined by setup and measurements	Variable, determined by setup and measurements
Input power supply	24 VDC	20.4 to 26.4 VDC (including ripple)

Auto Identification

Omron Smart Solutions

V500/V520

Linear bar code readers in fixed laser models and hand-held as well as fixed CCD models are a central part of track-and-trace solutions.

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V530

Two-dimensional code readers for printed and laser marked data matrices provide accurate decoding of model/lot/date/certification information. *Page 55*

V600/V670/V690

Radio frequency identification systems for industrial track-and-trace applications help monitor pallets and totes as well as work-in-process. V670 features high-speed communications and V690 offers long-range communications. *Page 57*

V700/V720

Multi-tag read/write systems offer cost-effective asset tracking for high value, easily counterfeited or frequently cycled objects. *Page 57*

	2-D Code Readers
	Handheld Series
Model numbers	V530-H301, V530-H302, V530-H303
Readable codes	Data matrix (ECC200): 10 x 10 to 26 x 26; QR code (models 1,2): versions 1 to 6 (21 x 21 to 41 x 41)
Field of vision	-H301: 3 x 3 mm; -H302 and-H303: 6 x 6 mm
Resolution	-H301: 50 µm; -H302 and-H303: 100 µm
Lighting method	-H301: coaxial lighting; -H302: oblique lighting; -H303: back lighting
Reading method	Touch
Ambient operating temperature	0 to 38˚C (with no icing or condensation)
Ambient operating humidity	35 to 85% (with no condensation)
Ambient operating environment	No corrosive gases
Storage temperature	-25 to 60˚C
Weight	Approx. 100 g (not including cable)
Case material	ABS resin (reading section: POM)
***Controller* Model numbers**	V530-C300E
Interface	RS-232C
Ambient operating temperature	0 to 50˚C (with no icing or condensation)
Ambient operating humidity	35 to 85% (with no condensation)
Ambient operating environment	No corrosive gases
Storage temperature	-25 to 60˚C
Power supply voltage	20.4 to 26.4 VDC
Current consumption	0.5 A
Number of pixels	512 (H) x 484 (V)
Number of scenes	2
Image memory function	Maximum of 24 images stored
Operation method	Menu selectable
Processing method	Gray
Readable direction	360˚ (all directions)
Monitor interface	1 channel (over scan monitor)
Weight	Approx. 500 g

	2-D and Linear Stacked Code Reader	2-D Code Readers
	Hand, Palm, Fixed	**Fixed Series**
Model numbers	V530-LG2	V530-R2000E-3, V530-R2000EP-3, V530-R160E, V530-R160EP
Input/output type	–	NPN: -R2000E-3, -R160E; PNP: -R2000EP-3, -R160EP
Features	• Reads both 2-dimensional and linear bar codes	• Compact flash • Now includes print quality data
Readable codes	2-D codes: Maxicode, PDF417, Data Matrix, QR Code, Micro PDF, GoCode, UCC RSS Composite, Aztec Code Linear bar codes: Code 39, Code 128, UPC/EAN/JAN, I 2 of 5, Codabar (NW7), Code 93, UCC RSS Postnet, Planet, Japanese Post, Australia Post	Data matrix (ECC200): 10 x 10 to 64 x 64, 8 x 18, 8 x 32, 12 x 26, 12 x 36, 16 x 36, 16 x 48; Data matrix (ECC000, 050, 080, 100, 140): 9 x 9 to 25 x 25; QR code (models 1, 2): 21 x 21 to 41 x 41 (version 1 to 6)
Readable direction	360˚	360˚
Number of pixels	1024 (H) x 1280 (V)	512 (H) x 484 (V)
Number of connectable cameras	–	2 ports built-in
Number of scenes	–	16
NG Image memory function	4000 reads (8 MB non-volatile memory)	Maximum of 24 (R150), 34 (R160) images stored
Operation method	Button	Menu selectable
Processing method	Gray	Gray
Monitor interface	–	1 channel (over scan monitor)
Communications	1 channel; RS-232; USB; Bluetooth	1 channel; R160 selectable RS-422/232
Parallel I/O	–	5 inputs/6 outputs including control I/O points
Power supply voltage	2.5 to 5.5 VDC	20.4 to 26.4 VDC
Enclosure rating	–	IEC 60529, IP 20
Current consumption	140 mA (310 mA max.)	Approx. 1.6 A
Ambient temperature	Operating 40 to -10˚C Storage: -28 to 60˚C (with no icing or condensation)	Operating 0 to 50˚C Storage: -25 to 65˚C (with no icing or condensation)
Ambient humidity	Operating/storage: 5 to 95% (with no condensation)	Operating/storage: 35 to 85% (with no condensation)
Weight	Approx. 190 g	Approx. 570 g

	Fixed Laser	Handheld CCD	Fixed CCD
Model numbers	V500-LPN5627-C/-P (single line laser), V500-LPR5627-C/-P (raster)	V500-LGP6125-C/-P	V500-LHA7127-C/-P
Dimensions mm (in)	43 L x 30 W x 21 H (1.7 x 1.2 x 0.83)	152 L x 72 W x 22 H (6.0 x 2.8 x 0.9)	47 L x 55 W x 20 H (1.9 x 2.2 x 0.8)
Decodable symbologies	Codabar, Code 39, Code 93, Code 128, Industrial 2 of 5, Interleaved 2 of 5, MSI-Plessey, WPC (UPC, EAN, JAN), IATA	WPC: EAN (EAN 13, EAN 8), UPC (UPC-A, UPC-E) Code 39, Codabar, Standard 2 of 5, Code 128, Code 93 MSI-Plessey, Industrial 2 of 5, Interleaved 2 of 5, ISBN, ISSN Matrix 2 of 5, IATA, Trioptics, Italian Pharmaceutical	Code 39, Code 93, Code 128, EAN-8 inc. +2, +5, EAN-13 inc. +2, _5, IATA, Industrial 2 of 5, Interleaved 2 of 5, MSI, NW-7, UPC-A inc. +2, _5, UPC-E inc. +2, +5, JAN
Readable digits	Symbology dependent	Symbology dependent	Symbology dependent
Resolution	6 mil at PCS 0.9	5 mil at PCS 0.9	0.13 mm at PCS 0.9
Reading distance	Up to 12.6 in.	Up to 3.2 in.	Nominal 1.4 in.
Scan rate	500 scans/sec	200 scans/sec	700 scans/sec
Raster scan	0.25 in. raster	–	–
Light source	Visible laser diode, 650 nm ±10 nm, CDRH Class II	Visible LED, 630 nm	Red LED, 660 nm
Decoder	Auto decode installed	Auto decode installed	Auto decode installed
Indicator	OK / NG	Multi-status LED	Multi-status LED
Interface*	RS-232	RS-232	RS-232C
Programming	Uses manual with scannable barcodes	Uses manual with scannable barcodes	Uses manual with scannable barcodes
Trigger input	5 V TTL or dry contact	5 V TTL or dry contact	5 V TTL or dry contact
Power supply	5 VDC	5 VDC	5 VDC
Current consumption	350 mA	30 mA	220 mA
Vibration resistance	10 to 150 Hz, 0.5 mm double amplitude for 8 min. each X, Y, Z direction. Completed 4 times with an acceleration of 7 F	10 to 150 Hz, 0.5 mm double amplitude for 8 min. each X, Y, Z direction. Completed 4 times with an acceleration of 7 F	10 to 150 Hz, 0.5 mm double amplitude for 8 min. each X, Y, Z direction. Completed 4 times with an acceleration of 7 F
Shock resistance	20 G, 3 times each ±X, ±Y, ±Z directions	20 G, 3 times each ±X, ±Y, ±Z directions	20 G, 3 times each ±X, ±Y, ±Z directions
Operating temperature	0 to 40°C (32 to 140°F)	0 to 40°C (32 to 140°F)	0 to 40°C (32 to 140°F)
Operating humidity	20 to 90% non-condensing	Up to 90% non-condensing	20 to 90% non-condensing
Enclosure rating	ISO9002, CDRH	ISO9002	ISO 9002
Approvals	CE	CE	CE

*Note: -C denotes female DB9 for computer (power adapter needed)
-P denotes male DB9 for Omron PLC (no power adapter needed)

Radio Frequency Identification

	V600	V670	V690	V700	V720
RFID system	Diverse product line; Combined controller/antenna available	High speed data communications to data carriers	Longe range communications; Multi-tag read/write (anti-collision); Combined controller/antenna available	Multi-tag read/write (anti-collision); Combined controller/antenna available, PDA interface	High volume cost-effective; Multi-tag read/write (anti-collision); Combined controller/antenna available, PDA interface
Data carriers**	High temperature; Chemical resistant; Environmentally resistant; Data carriers for use with metals; Wide range of available memory	Up to 1 billion writes to data carriers	Compact data carrier design	High temperature; Chemical resistant; Environmentally resistant	iCODE, iCODE-SLI, TAGIT chip - inlet technology; Custom data carriers available; Application dependent: Chemical resistant, and environmentally resistant
Operating frequency	530 kHz	13.56 mHz	2.45 gHz	125 kHz	13.56 mHz
Read/Write range mm	Up to 70 mm	5 to 23 mm	Up to 5000 mm	Up to 250 mm	*Up to 1 m see note below
Possible number of R/W heads	2	1	1	1	1
Data Carrier memory sizes	256, 2 K and 8 K bytes	128 bytes	8 K bytes	128 and 256 bytes	64 bytes / 128 bytes
Data Carrier memory types	EEPROM, SRAM	FeRAM	SRAM	EEPROM	EEPROM
Power requirements	See specific V600 products	24 VDC	24 VDC	24 VDC	24 VDC
Power/current consumption	See specific V600 products	7 W max.	15 W max.	20 W max.	20 W max.
Interface options	RS-232; RS-232 handheld; RS-422 Multi-drop; RS-485 Multi-drop; Portable reader; DeviceNet; Omron PLC card; Parallel PNP/NPN; Intelligent flag PNP/NPN	RS-232; Programming Console Compatible	RS-232; RS-422 Multi-drop; RS-485 Multi-drop	RS-232; RS-485 Multi-drop; Programming Console Compatible	RS-232; RS-485 Multi-drop
Approvals	UL, CSA, CE, FCC part 15	CE, FCC part 15. (Industry Canada approval pending)	FCC part 15. (Industry Canada approval pending)	CE, FCC part 15. (Industry Canada approval pending)	CE, FCC part 15, ISO 15693 compliant. (Industry Canada approval pending)

* The typical communications area is approximately 250 mm. This is directly dependent on the antenna type and the data carrier design.

** All Omron RFID systems utilize Passive Tag Technology. All Omron RFID tags have read and write capabilities.

Temperature and Process Control Instrumentation

Omron Smart Solutions

NEW! E5CN-T/E5CN-L

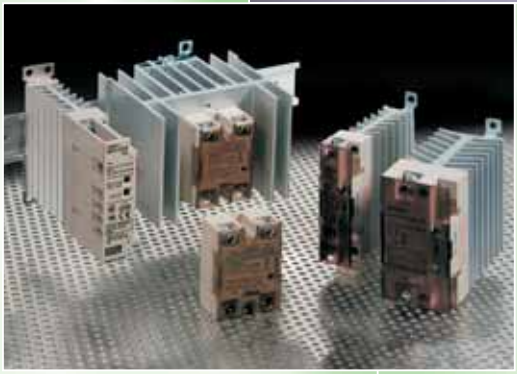
Compact 1/16 DIN size temperature and process controllers feature easy-to-read 11-segment LCD displays; PV can display 3 colors to reflect status. *Page 59*

NEW! E5CN-FR

Compact 1/16 DIN size Factory Mutual temperature limit switch prevents runaway heating and cooling control. *Page 59*

E5ZN

Control up to 32 zones with slim 22.5 mm wide modular dual-loop temperature controllers. Fast RS-485 serial communications connects directly to an Omron HMI, PLC or PC for a complete control panel installation. *Page 61*



SSRs

Compact DIN-track mounting solid state relays (SSRs) with built-in heat sinks support frequently cycling loads. Choose single-phase or three-phase models. *Page 62*




	E5CN-T/E5CN-U	E5CN-L	E5CN-FR	E5CS-X
Dimensions mm (in)	E5CN-T: 48 H x 48 W x 78 D (1.89 x 1.89 x 3.07) E5CN-U: 48 H x 48 W x 84.6 D (1.89 x 1.89 x 3.33)	48 H x 48 W x 78 D (1.89 x 1.89 x 3.07)	48 H x 48 W x 97 D (1.89 x 1.89 x 3.82)	48 H x 48 W x 100 D (1.89 x 1.89 x 3.94)
Features	• For general purpose applications • Fast, 250 ms sampling • PV display with settable three-color switching • Setting protection indicator • Connect to thermocouple, infrared, or platinum RTD • Three-phase heater burnout detection and SSR fault detection available • Voltage outputs for both heating and cooling control • Long-life relay output gives 10x conventional relay life • Plug-in (E5CN-U) models fit standard 11-pin round sockets	• Analog input process controllers for pressure, flow rate, level, humidity, and weight control • Transfer output allows easy connection to recorder or PLC analog I/O module • Setting protection indicator • Long-life relay output gives 10x conventional relay life	• Factory Mutual temperature limit switch prevents runaway heating or cooling control • Annunciator output for warning lights or buzzers • Reset limit remotely using event input • Trace error status • Two-color switching display	• Tamper-proof setting • Field-selectable auto-tuning PID or ON/OFF control • 8-function alarm • Input shift function
Product type	1/16 DIN temperature controllers	1/16 DIN process controllers	1/16 DIN size Factory Mutual temperature limit switch	1/16 DIN Temperature Controller
Inputs	Thermocouple: K, J, T, E, L, U, N, R, S, or B Platinum resistance thermometer: Pt100 ot JPt100 Infrared sensor: similar to Type K thermocouple	Current: 4 to 20 mA or 0 to 20 mA Voltage: 1 to 5 V, 0 to 5 V, 0 to 10 V	Thermocouple: K, J, T, E, L, U, N, R, S, or B Platinum resistance thermometer: Pt100 or JPt100 Infrared sensor: similar to Type K thermocouple	Thermocouple models: Types K (6 ranges), J (5 ranges), Platinum RTD (9 ranges), Thermistor (10 ranges)
Control modes	Auto-tuning 2 PID control or ON/OFF control	Auto-tuning 2 PID or ON/OFF control	Factory Mutual limit output relay	Auto-tuning PID or ON/OFF
Indication accuracy	Thermocouple and Platinum resistance thermometer: (±0.5% of indicated value or ±1°C, whichever is greater) ±1 digit max. Current transformer: ±5% FS ±1 digit max.	Analog input: ±0.5% FS ±1 digit max.	Thermocouple and Platinum resistance thermometer: (±0.5% of indicated value or ±1°C, whichever is greater) ±1 digit max.	±0.5% of full scale
Setting accuracy	–	–	–	–
Optional functions	Event inputs Serial communications Two voltage outputs Heater burnout detection SSR failure detection	Event inputs Serial communications	Event inputs (two) Serial communications	–
Supply voltage	100 to 240 VAC, 50/60 Hz, 24 VAC/VDC	100 to 240 VAC, 50/60 Hz, 24 VAC/VDC	100 to 240 VAC, 50/60 Hz	100 to 240 VAC, 50/60 Hz
Control outputs	Relay output: SPDT-NO, 3 A, 250 VAC SPDT, 3 A, 250 VAC (E5CN-U) Voltage output: 12 VDC; PNP; Max. load current: 21 mA with short circuit protection Current output: 4-20 mA DC load, 600 ohm max.; 2,700 resolution	Relay output: SPDT-NO, 3 A, 250 VAC SPDT, 3 A, 250 VAC Voltage output: 12 VDC; PNP; Max. load current: 21 mA with short circuit protection Current output: 4-20 mA DC load, 600 ohm max.; 2,700 resolution	FM Limit: SPST-NO, 3 A, 250 VAC Alarm: SPST-NO, 1 A, 250 VAC	Relay models (E5CS-R□□X): SPDT, 3 A, 250 VAC; Voltage models (E5CS-Q□□X): 12 VDC, 20 mA with short-circuit protection
PC software	CX-DNC Thermo	CX-DNC Thermo	–	–
Approvals	UL, CSA, CE	UL, CSA, CE	cULus, CE, FM3545/3810	UL, CSA

	E5CK	E5AK and E5EK	E5GN	E5C2
Dimensions mm (in)	48 H x 48 W x 100 D (1.89 x 1.89 x 3.94)	(E5AK) 96 H x 96 W x 100 D (3.78 x 3.78 x 3.94); (E5EK) 96 H x 48 W x 112 D (3.78 x 1.89 x 4.41)	24 H x 48 W x 100 D (0.94 x 1.89 x 3.94)	48 H x 48 W x 86.7 D (1.89 x 1.89 x 3.41)
Features	• Heat/cool or standard operation • Front panel programming • Ramp to set point • Field replaceable outputs and option boards • Water-resistant front panel meets NEMA 4X ratings • Heat only or heat/cool	• Field replaceable outputs and option boards • Six levels of security • Heater burnout function • Loop break alarm • Water-resistant front panel meets NEMA 4X ratings • Heat only or heat/cool	• For general purpose applications • Dual display • 22 different input types • Auto- and self-tuning functions	• Plug and Play temperature controller • ON/OFF or PD models • Dual scaling analog setting dial (°C or °F) • Fits standard 8-pin sockets
Product type	1/16 DIN Process Controller	1/4 DIN (E5AK) and 1/8 DIN (E5EK) Temperature and Process Controllers	1/32 DIN Temperature Controller	1/16 DIN Plug-in Temperature Controller
Inputs	Thermocouples: Types K1, K2, B, L1, L2, J1, J2, T/U, N, E, R/S, W, PI II; RTD: JPt100, Pt100	Thermocouples: Types K1, K2, B, L1, L2, J1, J2, T/U, N, E, R/S, W, PI II; RTD JPt100, Pt100	Thermocouples: Types K1, K2, B, L, J1, J2, T/U, N, E, R/S, ES1A non-contact, type K (four ranges); RTD: JPt100, Pt100	Thermocouples: Types K, J, Platinum RTD, Thermistor
Control modes	Fuzzy adaptive PID, PID, ON/OFF	Fuzzy adaptive PID, PID, ON/OFF	Auto-tuning PID or ON/OFF	ON/OFF or PD, separate models
Indication accuracy	±0.3% of set value	±0.3% of set value	Thermocouple and platinum resistance thermometer: (±5% of indication value or ±1%˚C, whichever is greater) ±1 digit max. Analog input: ±5%FS ±1 digit max. CT input: ±0.5%FS ±1 digit max.	–
Setting accuracy	–	–	–	±2% of full scale
Optional functions	Communications output: RS-232C, RS-422 or RS-485; Transfer output: 4 to 20 mA; Event input	Communications output: RS-232C, RS422, RS485, BCD; Transfer output: 4 to 20 mA; Event input	Communications output: RS-485	–
Supply voltage	100 to 240 VAC, 50/60 Hz, 24 VAC/DC	100 to 240 VAC, 50/60 Hz, 24 VAC/DC	100 to 240 VAC, 50/60 Hz; 24 VDC	110/120 or 220/240 VAC, 50/60 Hz
Control outputs	Relay/Relay: Pulse voltage/relay (NPN, PNP); Pulse voltage/ voltage (NPN/PNP); Linear current/relay (0 to 20, 4 to 20 mA); Linear Voltage/relay (0 to 10 VDC)	Relay: SPDT, 5 A, 250 VAC; SSR: SPST-NO, 1 A, 75 to 250 VAC; Voltage; 12 VDC, NPN, 40 mA, 24 VDC, NPN, 20 mA, 24 VDC, PNP, 20 mA; Linear current/relay (0 to 20, 4 to 20 mA); Linear voltage/relay (0 to 5, 0 to 10 VDC)	Relay output: SPDT-NO, 2 A, 250 VAC; Voltage output: 12 VDC (PNP); Max. load current: 21 mA with short circuit protection	Relay output: SPDT, 3 A, 250 VAC; Voltage output: 5 VDC, 10 mA
PC software	ThermoTools	ThermoTools	ThermoTools	–
Approvals	UL, CSA, CE	UL, CSA, CE	UL, CSA, CE	UL, CSA, SEV

				
	E5EN	**E5AN**	**E5ZN**	**E5AR and E5ER**
Dimensions mm (in)	48 W X 96 H X 78 D (1.89 X 3.77 X 3.07)	96 H X 96 W X 96 D (3.77 X 3.77 X 3.77)	Controller: 72.8 H x 22.5 W (2.87 x 0.89) With socket: 130 H x 22.5 W x 112 D (5.12 x 0.89 x 4.41)	E5AR: 96 H X 96 W X 96 D (3.77 X 3.77 X 3.77); E5ER: 48 W X 96 H X 78 D (1.89 X 3.77 X 3.07)
Features	• For general purpose applications • Dual digital display • NEMA 4X water-resistant construction • Heating or heating/cooling control	• For general purpose applications • Dual digital display • NEMA 4X water-resistant construction • Heating or heating/cooling control	• For applications that need multi-loop controlling • Can be programmed via communications (RS-485) or E5ZN-SDL display unit • Can combine 16 units for 32 temperature loops • Socket mountable	• Up to 6 event inputs • Up to 2 transfer outputs • RS-485 serial communications • Control up to 4 loops with a single unit
Product type	1/8 DIN size	1/4 DIN size	DIN Process Controller	DeviceNet Compatible Digital Controller
Inputs	Platinum resistance thermometer input: Pt100, JPt100. Thermocouple models: Type K1, K2, J1, T, E, L, U, N, R, S, B; ES1A Non-contact temperature sensor; Analog input: 10 to 50mV.	Platinum resistance thermometer input: Pt100, JPt100. Thermocouple models: Type K1, K2, J1, T, E, L, U, N, R, S, B; ES1A Non-contact temperature sensor; Analog input: 10 to 50mV.	Thermocouples: Types K, J, T, E, L, U, N, R, S, B; Infrared temperature sensor: 10 to 70˚C, 60 to 120˚C, 115 to 165˚C, 160 to 260˚C (ES1A series); Voltage input: 0 to 50 mV Platinum resistance thermometer: Pt100, JPt100	Thermocouple: K, J, T, E, L, U, N, R, S, B, W; Platinum resistance thermometer: Pt100; Current input: 4 to 20 mA DC, 0 to 20 mA DC (including remote SP input); Voltage input: 1 to 5 VDC, 0 to 5 VDC, 0 to 10 VDC (including remote SP input); (Input impedance: 150 Ω for current input, approx. 1 MΩ for voltage input)
Control modes	Auto-tuning PID control or ON/OFF control	Auto-tuning PID control or ON/OFF control	2-PID or ON/OFF control	2-PID or ON/OFF control
Indication accuracy	Thermocouple and Platinum resistance thermometer: (±0.5% of indicated value or ±1˚C, whichever is greater) ±1 digit max. Analog input: ±0.5% FS+1 digit max. CT input: ±5% FS ±1 digit max.	Thermocouple and Platinum resistance thermometer: (±0.5% of indicated value or ±1˚C, whichever is greater) ±1 digit max. Analog input: ±0.5% FS+1 digit max. CT input: ±5% FS ±1 digit max.	Thermocouple and platinum resistance thermometer: (±5% of indication value or ±1%˚C, whichever is greater) ±1 digit max. Analog input: ±5%FS ±1 digit max. CT input: ±0.5%FS ±1 digit max.	Thermocouple input with cold junction compensation: (±0.1% of PV or ±1°C, whichever is greater) ±1 digit max.; Thermocouple input without cold junction compensation: (±0.1% FS or ±1°C, whichever is smaller) ±1 digit; Analog input: ±0.1% FS ±1 digit max.; Platinum resistance thermometer input: (±0.1% of PV or ±0.5°C, whichever is greater) ±1 digit max.; Position-proportional potentiometer input: ±5% FS ±1 digit max.
Optional functions	Communications: RS-232C, RS-485; Multiple set-point event input board; Current transformer.	Communications: RS-232C, RS-485; Multiple set-point event input board; Current transformer.	Heater burn out detection, Multi-SP and run/stop switching using event input communications; Serial communications; RS-485	Communications: RS-485, DeviceNet; 4 event inputs board position proportional control
Supply voltage	100 to 240 VAC, 50/60 Hz; 24 VAC/VDC	100 to 240 VAC, 50/60 Hz; 24 VAC/VDC	24 VDC	100 to 240-VAC models: 50 A max.; 24 VAC/VDC models: 30 A max.DeviceNet power supply: 24 VDC
Control outputs	Relay: SPST-NO, 250 VAC, 3 amps max. (resistive load); Voltage output: 12 VDC (PNP), max. load current: 40 mA Current output: 4 to 20 mA DC	Relay: SPST-NO, 250 VAC, 3 amps max. (resistive load); Voltage output: 12 VDC (PNP), max. load current: 40 mA Current output: 4 to 20 mA DC	Voltage output: 12 VSDC ±15% (PNP); Max. load current: 21 mA, with short-circuit protection circuit; Transistor output: Max. operating voltage: 30 VDC; Max. load current: 100 mA; Residual voltage: 1.5V max.; Leakage current 0.4 mA max.	Voltage (pulse)output: 12 VDC, 40 mA max. with short-circuit protection circuit; Current output: 0 to 20 mA DC, 4 to 20 mA DC; load: 500 Ω max. (including transfer output) (Resolution: Approx. 54,000 for 0 to 20 mA DC; Approx. 43,000 for 4 to 20 mA DC);Relay output: Position-proportional control type (open, closed) N.O., 250 VAC, 1 A (including inrush current)
PC software	ThermoTools	ThermoTools	CX-DNC Thermo	ThermoTools
Approvals	UL, CSA, CE	UL, CSA, CE	UL, CSA, CE	cRUus, CE

	G3NA	G3PA	G3PB
Dimensions mm (in)	27 H x 58 L x 43 W (1.06 x 2.28 x 1.69)	Consult Omron for specific model dimensions	Consult Omron for specific model dimensions
Switching current range	5 A to 90 A	10 A to 50 A	15 A to 45 A
Features	• Ideal for industrial controls • Hockey puck design • Operation indicator standard	• Single-phase • Replaceable power element cartridges • Integrated heat sink • LED indicator and finger protection cover standard features	• Available in single-phase or three-phase • Integrated heat sink • LED indicator and finger protection cover standard features • DIN rail or panel mountable • Available in 240 VAC or 480 VAC outputs
Operating input	4-32 VDC; 75-264 VAC	4 to 30 VDC / 19.2 to 26.4 VAC	9.6 to 30 VDC
Dielectric strength	2,500 VAC	4,000 VAC; 50/60 Hz for 1 min.	2,500 VAC; 50/60 Hz for 1 min.
Zero crossing	Yes	Yes	Yes
Isolation	Phototriac, Photocoupler	Phototriac	Phototriac
Snubber circuit	Yes	Yes	Yes
Life expectancy (MTTF)	100,000 hours	100,000 hours	100,000 hours
Mounting	Panel	DIN rail and panel	DIN rail and panel
Termination	Screw	Screw	Screw
Heat sink	Optional: Y92B -N50, -N100, -N150, -P250, -P250NF	Integrated heat sink	Integrated heat sink
Approvals	UL, CSA, TUV	CE, UL, CSA, VDE	CE, UL, CSA, VDE

Power Supplies

Omron Smart Solutions

S8VS

Slim DIN track-mounting power supplies from 15 to 240 W are UL508 listed for operation at full rating. Digital display and preventive maintenance output available for load duration and power supply service life.

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S82K

Versatile power supplies offer 3 W to 100 W output in a wide range of voltages for general industrial applications. DIN track and bolt-on mounting.

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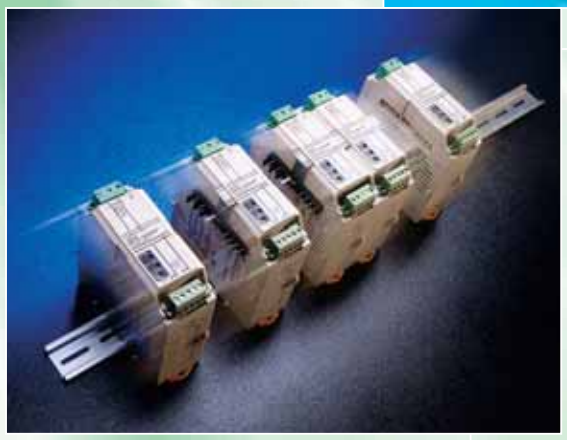

S8TS

Block-type power supply allows multiple configurations for custom voltages or mixed output loads using a few easily stocked parts.

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	S8VS	S82K	S8PS	S8TS
Features	• Small sized, DIN rail mount power supply with LED display • Suitable for any application and any environment • Digital displays to predict and schedule maintenance for improved uptime	• DIN rail mount power supply with a wide power range • Suitable for general purpose and rugged industrial applications • Lightweight for easy DIN rail mount installation	• Compact DIN rail mounting industrial power supply with high power capacity • Slim metal housing designed for rugged industrial application • A versatile unit that could be installed in many different ways	• High-end, block type power supply easily connects with multiple units and offers many output configurations • Ideal for applications where increase of power may be required
Mounting	DIN rail	DIN rail / Bolt-on	DIN rail / Bolt-on	DIN rail
Product type	Enclosed frame with metal and plastic housing	Enclosed frame with plastic housing	Open or covered frame with metal housing	Plastic housing, block-style configuration
Output	Single output	Single and dual output	Single output	Configures to user's choice
Power ratings	15, 30, 60, 90, 120, 180 and 240 W	3, 7.5, 15, 30, 50, 90 and 100 W	50, 100, 150, 300 and 600 W	25 W, 30 W, and 60 W per single unit; Expandable up to 240 W by ganging the units together
Output voltage/current	24 V: 2.5 A, 3.75 A, 5 A, 7.5 A, 10 A	5 V: 0.6A, 1.5A, 2.5A, 5.0A; 12 V: 0.25A, 0.6A, 1.2A, 2.5A; 15 V: 0.2A, 0.5A; 24 V: 0.13A, 0.3A, 0.6A, 1.3A, 2.1A, 3.75A, 4.2A, ±12 V/+0.3/-0.2A; ±15 V/+0.2/-0.2A	5 V: 10 A; 12 V: 4.2 A; 24 V: 2.1 A, 4.5 A, 6.5 A, 14 A, 27 A	5 V: 5 A, 12 V: 2.5 A, 24 V: 2.5 A (this is per unit values); When ganged together, values could go up to 12 V: 10 A, 24 V: 10 A
Input voltage	85 to 264 VAC, 47 to 450 Hz	85 to 264 VAC, 47 to 450 Hz; 85 to 132 VAC, 170 to 264 VAC (selectable), 85 to 253 VAC, 47 to 450 Hz (selectable)	85 to 264 VAC, 47 to 450 Hz	85 to 264 VAC, 47 to 63 Hz
Dimensions mm (in)	60 W: 95 H x 40 W x 108.3 D (3.74 x 1.57 x 4.26) 90 W: 115 H x 50 W x 121.3 D (4.53 x 1.97 x 4.78) 120 W: 115 H x 50 W x 121.3 D (4.53 x 1.97 x 4.78) 180 W: 115 H x 75 W x 125.3 D (4.53 x 2.95 x 4.93) 240 W: 115 H x 100 W x 125.3 D (4.53 x 3.94 x 4.93)	3 W, 7.5 W: 75 H x 37.5 W x 65 D (2.95 x 1.48 x 2.56); 15 W: 75 H x 45 W x 96 D (2.95 x 1.77 x 3.78); 30 W, 50 W: 75 H x 90 W x 96 D (2.95 x 3.54 x 3.78); 90 W, 100 W: 75 H x 145 W x 96 D (2.95 x 5.71 x 3.78)	50 W: 85 H x 40 W x 127 D (3.35 x 1.57 x 5.0); 100 W: 92 H x 50 W x 145 D (3.62 x 1.97 x 5.71); 150 W: 92 H x 50 W x 163 D (3.62 x 1.97 x 6.42); 300 W: 92 H x 110 W x 175 D (3.62 x 4.33 x 6.89); 600 W: 92 H x 170 W x 179 D (3.62 x 6.69 x 7.05)	120 H x 43 W x 120 D (4.72 x 1.69 x 4.72)
Display/indication	3-digit, 7-segment LED; LED status displays for output voltage, output current, peak current, lifetime years, run time hours	Two LED lights; one for power-on indicator and the other for output-on indicator	LED light for output-on indicator	Two LED lights; one for power-on indicator and the other for output-on indicator
Alarm output	90, 120, 180, 240 W models with display have NPN outputs	Relay output available on 90 and 100 W models.	None	NPN output for when the output voltage drops
Approvals	cULus, UL508 listed, Class 2 output (60 W only), CE, SEMI F47-0200	UL508 listed, Class 2 output (up to 90 W), CSA, CE	UL508 listed, CSA, VDE, CE	cULus, UL508 listed, VDE, CE

Timers, Counters, and Panel Meters

Omron Smart Solutions

H5CX Timers

Digital multifunction timer in 1/16 DIN size has a shallow mounting depth and NEMA 4/IP66 front panel without additional protection. Bi-color present value display can change from red to green to alert changes in output status.

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H7CX Counters

Digital 1/16 DIN counter with preset, total, batch and dual counting functions offers bi-color display to alert changes in output status. NEMA 4/IP66 front panel needs no additional protection.

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Digital Panel Meters

Display the results of analog inputs and get control outputs indicating good/no good status with Omron's 1/8 DIN size process, temperature, rate and weight meters.

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	H5CX	H3CA	H5BR	H3CR-A	H3CR-F
Dimensions mm (in)	48 H x 48 W x 100 D (1.89 x 1.89 x 3.94)	48 H x 48 W x 63.7 D (1.89 x 1.89 x 2.51)	72 H x 72 W x 100 D (2.83 x 2.83 x 3.94)	48 H x 48 W x 68 D (1.89 x 1.89 x 2.68)	48 H x 48 W x 66 D (1.89 x 1.89 x 2.62)
Features	• Advanced programmable display with twin timer function • PNP/NPN input • Programmable via front or dip switches on back • NEMA 4 front	• Digital set, solid-state timer • LCD time remaining bar graph and output status indicators • Switch selectable time unit, control mode and time limit setting • 1/16 DIN plug-in unit	• Batch counting function records the number of completed cycles • Nine field-selectable timing modes • Scroll-through menus access from front panel	• Shallow mounting depth and wide range of panel covers • Analog set, 1/16 DIN sized solid-state timer • NPN/PNP input • Wide AC/DC supply voltage	• Analog set, solid-state timer with combinations of independent ON/OFF time settings in a compact 1/16 DIN size • Models with ON start or OFF start operating functions • Fits standard 8- or 11-pin sockets
Product type	Multi-mode	ON-delay/Multi-mode	Multi-mode	ON-delay and one-shot Interval/Multi-mode	Twin timer
Control outputs	Time limit - SPDT, 5A at 250 VAC, Transistor, NPN, 100 mA at 30 VDC	Time limit - DPDT or SPDT, 3A 250 VAC; Instantaneous - SPDT, 3A, 250 VAC (H3CA-8H only)	1 SPDT relay and 2 NPN open collector transistor outputs	Time limit - DPDT, 5A, 250 VAC Transistor, 100 mA, 30 VDC (PNP/NPN) Instantaneous - DPDT, 5A, 250 VAC Transistor, 100 mA, 30 VDC (NPN/PNP)	Time limit - DPDT, 5A, 250 VAC; Instantaneous - DPDT, 5A, 250 VAC
Operation modes	12 selectable modes including ON-delay, repeat cycle, signal OFF-delay, interval, cumulative, ON/OFF duty adjustable cycle, twin timer	8 selectable modes including ON-delay only or multi-mode model with ON-delay, repeat cycle, signal interval/OFF-delay, 2 types of signal OFF-delay, interval, cycle and signal ON-delay/OFF-delay	9 selectable modes including ON-delay, repeat cycle, signal OFF-delay, interval, cumulative	Select 2-4-6 function models including ON-delay and one-shot, interval or selectable ON-delay, repeat cycle (two types), signal ON/OFF delay, signal OFF delay, interval	Repeat cycle: Independent ON or OFF time
Ranges	0.001 second to 9999 hours	0.1 second to 9990 hours (field selectable time units from 0.1 sec to 10 h x 3 digits)	0.001 second to 9999 hours (field selectable)	0.05 second to 300 hours or 0.1 second to 600 hours	0.05 second to 30 hours; 1.2 second to 300 hours
Display/indication	4-digit negative transmissive LCD; Programmable display color for output indication	LCD output status and percent time remaining bar graph	Alphanumeric 4-digit LCD display has 12 mm high characters and built-in backlight	Power ON, Output ON LEDs	Output ON and Output OFF LEDs
Supply voltage	100 to 240 VAC or 24 VAC / 12 to 24 VDC	24 to 240 VAC, 50/60 Hz and 12 to 240 VDC (8-pin model) 24, 100/110/120, 200/220/240 VAC, 50/60 Hz 12, 24, 48, 110 VDC	100 to 240 VAC, 50/60 Hz or 24 VAC, 50/60 HZ and 12 to 24 VDC	AC 100 – 240/ DC 100-125; DC 24 to 48/ DC 12 - 48	100 to 240 VAC, 50/60 Hz 12 VDC; 24 VAC/VDC
Mounting	Panel, track, surface	Panel, track, surface	Panel	Panel, track, surface	Panel, track, surface
Accessories	Sockets, panel mounting adapter, DIN rail	Sockets, protective covers, adapters for panel mounting, DIN rail	NEMA 4 waterproof cover, soft cover, shock prevention terminal cover	Sockets, panel covers in three colors, time setting ring, protective covers, adapters for panel mounting, DIN rail	Sockets, panel covers in three colors, time setting ring, protective covers, adapters for panel mounting, DIN rail
Approvals	cULus, cURus, CE	UL, CSA, SEV	UL, CSA, SEV, CE	UL, CSA, SEV, CE, VDE	UL, CSA, CE (LV)

				
	H3DE	**H3YN**	**H5S**	**H5L**
Dimensions mm (in)	75 H x 22.5 W x 100 D (2.95 x 0.89 x 3.94)	28 H x 21.5 W x 56.6 D (1.10 x 0.85 x 2.23)	72 H x 72 W x 49 D (2.83 x 2.83 x 1.93)	96 H x 96 W x 56.5 D (3.78 x 3.78 x 2.22)
Features	• Slim analog set timers with field-selectable ranges and multiple operation modes • Built-in DIN rail clamp for easy track mounting	• Subminiature analog solid-state time delay relay • Multiple time ranges and operating modes • Track solder terminal or wire-wrap terminal mounting via sockets • Fits MY socket	• AM/PM display with 24 program steps and quartz accuracy • ON/OFF, cycle and pulse operations • LCD shows output status and current or next program step	• Two independent 15-amp circuits • Manual override of outputs • Simple prompted programming • Fits 1/4 DIN panel cut out
Product type	Multi-mode	ON-delay/Interval/Repeat Cycle	Weekly timer	Weekly timer
Control outputs	Time limit - SPDT, 5A, 250 VAC or SPDT x 2 - programmable between time limiting and instantaneous	Time limit - DPDT, 5A, 250 VAC; 4PDT, 3A, 250 VAC	Time limit - SPST x 2, 15A, 250 VAC	Time limit - 15A, 125 VAC
Operation modes	ON-delay, Repeat cycle/signal OFF start, Repeat cycle/signal ON start, Signal ON/OFF-delay, Signal OFF-delay, Interval, one shot	ON-delay/Interval/Repeat Cycle	ON/OFF, repeat cycle, pulse	Repeat cycle, individual program for each circuit
Ranges	0.1 second to 120 hours	0.1 second to 10 minutes or 0.1 minute to 10 hours	1 week	1 minute to 23 hours 59 minutes
Display/indication	Power and Output ON LEDs	Power ON LED; Time UP LED	LCD; time, day, output status, program step	LCD; day, time, program, circuit status
Supply voltage	24- 230 VAC/VDC	24, 100/120, 200/230 VAC; 50/60 Hz; 12, 24 VDC	100 to 240 VAC, 50/60 Hz	100 to 240 VAC, 50/60 Hz
Mounting	Track	Panel, track, surface	Panel, surface, track	Panel, track, surface
Accessories	DIN rail	Sockets, panel mounting adapter, DIN rail	Protective cover, track adapter, DIN rail	Protective cover, DIN rail
Approvals	UL, CSA, CE	UL, CSA, CE (LV)	UL, CSA	UL, CSA, SEV





	H7CX	H7BR	H7EC	H7ET	H7ER
Dimensions mm (in)	48 H x 48 W x 100 D (1.89 x 1.89 x 3.94)	72 H x 72 W x 100 D (2.83 x 2.83 x 3.94)	24 H x 48 W x 53.5 D (0.94 x 1.89 x 2.11)	24.0 H x 48 W x 53.5 D (0.94 x 1.89 x 2.11)	24.0 H x 48 W x 53.5 D (0.94 x 1.89 x 2.11)
Features	• Advanced programmable display • PNP/NPN input • Prescaling function • Up/down counting • Programmable via front or dip switches on back • NEMA 4 front	• Multi-function digital counter with backlit LCD display • Single and double preset and ± range • Batch counter • Contact and transistor outputs available	• 7 segment LCD with or without backlight • Large display height 8.6 mm (0.338 in.) • NEMA 4 front	• 7 segment LCD with or without backlight • Large display height 8.6 mm (0.338 in.) • NEMA 4 front	• 7 segment LCD with or without backlight • Large display height 8.6 mm (0.338 in.) • NEMA 4 front
Number of digits	4 or 6	6	8	7	4 or 5
Operation modes	UP, DOWN, reversible, tachometer, totalizer, dual-counter, batch, single or dual presets	UP, DOWN, reversible	UP counting	UP counting	UP counting
Counter input	NPN/PNP selectable	No voltage or voltage	PNP/NPN DC voltage; AC voltage; No-voltage contact	PNP/NPN DC voltage; AC voltage; No-voltage contact	PNP/NPN DC voltage; No voltage contact
Count speed	30 cps, 5 Kcps, 10 Kcps (prescale)	30 cps, or 1, 5, or 10 Kcps	20 cps (AC/DC voltage); 30 cps/1 Kcps selectable (NPN/PNP DC voltage)	1 sec.	1 Kcps or 10 Kcps; 1 pulse/rev., 60 pulses/rev., or 600 pulses/rev.
Ranges	0 to 9999 (4 digits) 0 to 999,999 (6 digits)	0 to 999,999 for preset models, and -99,999 to 999,999 for ±	0 to 99,999,999	Selectable between 999,999.9 hrs. and 3,999 days 23.9 hrs.; 999 hrs. 59 min. 59 sec. and 9,999 hrs. 59.9 min.	0 to 1,000 rps; 1,000.0 rpm; 1,000.0 rps; 10,000 rpm
Supply voltage	100-240 VAC or 24 VAC / 12 to 24 VDC	100 to 240 VAC, 50/60 Hz or 24 VAC/ 12 to 24 VDC	Not required for non-backlight models; 24 VDC required for backlight models	Not required for non-backlight models; 24 VDC required for backlight models	Not required for non-backlight models; 24 VDC required for backlight models
Control output	Contact, transistor or both (programmable)	Contacts: 3A, 250 VAC; Transistor: Open collector, 100 mA at 30 VDC max. Residual voltage 2 V Max.	–	–	–
Connections	Screw terminals or 11-pin socket	Screw terminals	Screw terminals or wire wrap; 8 solder terminals	Screw terminals or wire wrap	Screw terminals
Mounting	Panel, track or surface	Flush mount	Panel	Panel	Panel
Approvals	cULus, cURus, CE	UL, CSA, CE	UL, CE, CSA, VDE	UL, CE, CSA, VDE	UL, CSA, CE, VDE

				
	K3HB-S	**K3HB-X**	**K3HB-H**	**K3HB-V**
Dimension	48 H x 96 W x 95 D (1.89 x 3.78 x 3.74)	48 H x 96 W x 95 D (1.89 x 3.78 x 3.74)	48 H x 96 W x 95 D (1.89 x 3.78 x 3.74)	48 H x 96 W x 95 D (1.89 x 3.78 x 3.74)
Features	• Advanced inspection controller with high speed response of 2,000 times per second • This is ideal for high-speed measurement with discrimination from 1 or 2 independent analog inputs • Sampling period is measured at 0.5 ms with an output response time of 1 ms max.	• Intelligent signal processor for AC or DC signal or voltage • Multiple ranges can be covered by a single meter • Programmable via serial communications or front panel • Field replaceable output	• High-speed temperature indicator with high accuracy input resolution for both Platinum resistance and Thermocouples • This unit is also equipped with simple input shift using two points, hysteresis, peak/hold value, and more	• Ideal weighing indicator for making good/no-good judgments • Could measure pressure, load, torque, and weight by using load cell signal input
Product type	Linear Sensor Indicator	Process Meter	Temperature Meter	Weighing Meter
Input type	Dual analog inputs: DC current: 0-20 mA, 4-20 mA DC voltage: 0-5 V, 1-5 V, ±5 V, ±10 V	DC voltage: 199.99 V, 19,999 V, 1.9999 V, 1.0000 to 5.0000 V; AC voltage: 0.0 to 400.0 V, 0.00 to 199.99 V, 0.000 to 19.999 V, 0.0000 to 1.9999 V; DC current: 199.99 mA, 19.999 mA, 1.9999 mA, 4.000 to 20.000 mA; AC current: 0.000 to 10.000 A, 0.0000 to 1.9999 A, 0.00 to 199.99 mA, 0.000 to 19.999 mA	Thermocouples: K, J, T, E, L, U, N, R, S, B, W; Platinum resistance: Pt100	DC voltage: 0.00 to 199.99 mV, 0.000 to 19.999 mV, ±100.00 mV, ±199.99 mV
Display	5-digit, 7-segment Negative Transmissive LCD	5-digit, 7-segment Negative Transmissive LCD	5-digit, 7-segment Negative Transmissive LCD	5-digit, 7-segment Negative Transmissive LCD
Setting Options	Front pushbuttons or Serial communications	Front pushbuttons or Serial communications	Front pushbuttons or Serial communications	Front pushbuttons or Serial communications
Event Inputs	5 point NPN; 8 point NPN; 5 point PNP; 8 point PNP	5 point NPN; 8 point NPN; 5 point PNP; 8 point PNP	5 point NPN; 8 point NPN; 5 point PNP; 8 point PNP	5 point NPN; 8 point NPN; 5 point PNP; 8 point PNP
Control outputs				
Combination output boards with Power Supply (PS)	SPDT and 12 VDC PS; SPDT and 10 VDC PS; 0-20 mA and 12 VDC PS; 0-20 mA and 10 VDC PS; 0-5, 0-10 VDC and 12 VDC PS; RS-232C and 12 VDC PS; RS-232C and 10 VDC PS; RS-485 and 12 VDC PS; RS-485 and 10 VDC PS	SPDT and 12 VDC PS; SPDT and 10 VDC PS; 0-20 mA and 12 VDC PS; 0-20 mA and 10 VDC PS 0-5, 0-10 VDC and 12 VDC PS; RS-232C and 12 VDC PS; RS-232C and 10 VDC PS; RS-485 and 12 VDC PS; RS-485 and 10 VDC PS	SPDT and 12 VDC PS; SPDT and 10 VDC PS; 0-20 mA and 12 VDC PS; 0-20 mA and 10 VDC PS; 0-5, 0-10 VDC and 12 VDC PS; RS-232C and 12 VDC PS; RS-232C and 10 VDC PS; RS-485 and 12 VDC PS; RS-485 and 10 VDC PS	SPDT and 12 VDC PS; SPDT and 10 VDC PS; 0-20 mA and 12 VDC PS; 0-20 mA and 10 VDC PS; 0-5, 0-10 VDC and 12 VDC PS; RS-232C and 12 VDC PS; RS-232C and 10 VDC PS; RS-485 and 12 VDC PS ; RS-485 and 10 VDC PS
Power Supply	12 VDC only or 10 VDC only	12 VDC only or 10 VDC only	12 VDC only or 10 VDC only	12 VDC only or 10 VDC only
Relay	2-SPDT; 4-SPST	2-SPDT; 4-SPST	2-SPDT; 4-SPST	2-SPDT; 4-SPST
Transistor	5-NPN; 5-PNP	5-NPN; 5-PNP	5-NPN; 5-PNP	5-NPN; 5-PNP
DeviceNet	Yes	Yes	Yes	Yes
Approvals	cULus, CE	cULus, CE	cULus, CE	cULus, CE



	K3MA-J	K3MA-L	K3MA-F
Dimensions mm (in)	48 H x 96 W x 97 D (1.89 x 3.78 x 3.81)	48 H x 96 W x 97 D (1.89 x 3.78 x 3.81)	48 H x 96 W x 97 D (1.89 x 3.78 x 3.81)
Features	• Multi-range DC voltage/current input • Front-panel key operation • Scaling, front-panel forced-zero, zero-limit functions • Short 80 mm depth front panel • Water and dust-proof NEMA 4X front panel • 2-color LEDs	• Wide input range • 2 types of platinum-resistance thermometers and 10 types of thermocouples • Front-panel key operation • Water and dust-proof NEMA 4X front panel • 2-color LEDs • Temperature input shift and temperature unit selection functions • Short 80 mm depth front panel	• Wide input range: contact, NPN, PNP, or voltage pulse • Front-panel key operation • Scaling, auto-zero time, startup compensation time functions • Short 80 mm depth front panel • Water and dust-proof NEMA 4X front panel • 2-color LEDs
Product type	Process meter	Temperature meter	Frequency/rate meter
Input type	DC voltage: 1.000 to 3.000 V, 0.000 to 5.000 V, -5.000 to 5.000 V, -10.000 to 10.00 V; DC current: 4.00 to 20.00 mA, 0.00 to 20.00 mA	Thermocouple: K, J, T, E, L, U, N R, S, B RTD: Pt100, JPt100	Rotary pulse
Display	7-segment LCD backlit, red and green LEDs	7-segment LCD backlit, red and green LEDs	7-segment LCD backlit, red and green LEDs
Setting options	Front-panel key	Front-panel key	Front-panel key
Control outputs			
Relay	2 SPST-NO	1 SPDT	2 SPST-NO
Transistor	N/A	N/A	N/A
BDC	N/A	N/A	N/A
Linear	N/A	N/A	N/A
Alarm	N/A	N/A	N/A
Serial communications outputs	N/A	N/A	N/A
PC software	N/A	N/A	N/A
Approvals	cULus, CE	cULus, CE	cULus, CE

Programmable Controllers

Omron Smart Solutions

CJ1

Compact, rackless modular controller is ideal for high-speed and retrofit applications requiring between 160 to 2560 local I/O and large program memory requirements. Full communications capability is available throughout the line. *Page 72*

CS1

Mid-size rack system offers industry's fastest processing, easiest programming and most flexible data exchange among controllers. *Page 72*

CPM2C

Space-saving micro controller delivers high-speed distributed control for up to 192 I/O and offers communication for programming and status reporting to PCs and HMIs. Available as DeviceNet Slave and Remote I/O Master. *Page 75*

ZEN

Compact and expandable "nano" controllers with simple setup provide off-the-shelf sequencing control for 10 to 44 I/O, ideal for small stand-alone equipment. *Page 75*

Big PLC Capabilities in Space-Saving Micro Size

Get big PLC performance from a product the size of the smallest micro controller on the market. Omron's CJ1/CJ1-M requires just 40% of the panel space of traditional mid-size PLCs. Processor speeds and I/O counts exceed the performance of most rack style controllers to provide the highest level of control and productivity. The communication options associated with larger PLC platforms are all available on CJ1/CJ1-M. Omron's unique FINS protocol transparently ties Ethernet, Controller Link, serial and device level networks together for data exchange and programming. The CJ1/CJ1-M uses CX-Programmer software, the same program development and monitoring package supporting the entire Omron PLC product line.

CJ1/CJ1-M Series PLCs

- **One platform can meet all your control needs**: The CJ1 platforms can be scaled for systems from simple to the most sophisticated
- **60 to 40% smaller** than typical mid-size PLCs, CJ1 frees up panel space without sacrificing performance
- **Slim I/O modules connect module-to-module** using simple locking connectors
- **Rack-less design** eliminates the need for a PLC rack, simplifying configuration and lowering system costs
- **Control up to 2560 I/O**: typical of mid-sized PLC products
- **Fast processor speeds** as low as 20 nanoseconds per basic instruction
- **Flash Memory Cards** store up to 64 MB for easy program transfer and data storage
- **Ethernet, DeviceNet and Controller Link** communications supported
- **Industry-leading networking**: Omron's FINS protocol routes data across networks with low setup requirements
- **Conforms to CE; UL and cUL approved, Class I, Div. 2 Hazardous Locations**
- **Function Block/Structured Text** programmimg languages supported

Mid-Size Rack PLC

The CS1 combines the functionality of large PLCs and the extensive communication connectivity of "open" and PC-based control solutions into a powerful mid-sized package. With support for multiple network types and modules within one system, CS1 can serve as a gateway within a plant environment. The high-speed processor allows basic instruction execution times of 0.02 microseconds to meet your production speed requirements for years to come.

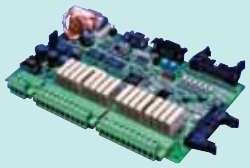
CS1 Series PLCs

Seven features increase productivity at both machine and plant levels:

- **Duplex Capability** provides redundant CPU, Power Supply and Communications Units that can be replaced under power with "bumpless" transfer and restoration to primary unit. Basic and Special I/O units can also be replaced under power.
- **Enhanced design and development environment** using CX-Programmer allows data entry and program development by importing Microsoft® Excel symbols and comments, and mnemonic programs from a text editor like Notepad.
- **Powerful information management** allows program storage/data transfer by flash memory cards and the sending of customized email messages, error log, production data to a desired individual's PC, pager or other device.
- **Flexible communications and connectivity** offer fast, powerful and open connections to your automation environment by supporting Ethernet Version-2, ControllerLink, DeviceNet, Profibus-DP and CompoBus/S network types. CS1 supports up to 34 serial connections allowing interface with Omron and third-party field devices, and software support to create custom communication sequences to interface with field devices.
- **Superior performance** by dual RISC processors provides high-speed I/O bus exchange and dedicated scans of logic for up to 5120 local I/O points. Program memory up to 250 K steps with up to 448 K words of data memory on board supports complex functions including floating point math.
- **Extensive up-time maintenance functionality** includes access to module revision data, program tasks and data memory information of multiple controllers through PC connections; logging up to 20 of the most recent errors with time stamp; and a data trace function for monitoring selected addresses on a scheduled or cyclic time chart basis.
- **Easy migration from existing Omron systems.** A dual bus I/O backplane supports both CS1 and C200H I/O modules; CS1 connects directly to existing C200H Alpha and CVM1 network types; and CX-Programmer software has a program conversion utility to convert existing program files to the open channel assignment.
- **Conforms to CE, UL and cUL, Class I, Div. 2 Hazardous Locations**
- **Function Block/Structured Text** programmimg languages supported

	CS1 Series	CJ1 Series	CJ1-M Series
Features	• Duplex hotbacks CPU's and networks • Fast execution times • Variety of I/O and communications options including Ethernet and Protocol Macro • Process Loop Control CPUs	• Ultra-compact "rackless" interlocking design • High-end processors with a variety of I/O and communications options including Ethernet • Process Loop Control CPUs	• "Rackless" interlocking design • Used for simpler applications with fewer I/O and memory requirements • 10/100 MB Ethernet built-in CPUs
Number of available CPU's	15	6	6
Control method	Stored program	Stored program	Stored program
Programming method	Ladder program	Ladder program	Ladder program
Number of instructions	Approx. 400	Approx. 400	Approx. 400 + pulse I/O instructions
Program memory capacity	Up to 250K words	Up to 120K words	Up to 20K words
Execution time (basic inst.)	0.02 to 0.04 µs	0.02 to 0.04 µs	0.1 µs
Execution time (advanced inst.)	As low as 0.06 µs	As low as 0.06 µs	0.3 µs
Data memory	Up to 448K words	Up to 256K words	Up to 32K words
Local I/O capacity	Up to 5120 + RIO*	2560 + RIO*	Up to 640
Communications ports included	Peripheral port and RS-232C	Peripheral port and RS-232C	Peripheral port and RS-232C
Memory storage and backup	Up to 64M (Flash) EEPROM, Battery	Up to 64M (Flash) EEPROM, Battery	Up to 64K (Flash) EEPROM, Battery
Power supplies	100 to 240 VAC, 24 VDC	100 to 240 VAC, 24 VDC	100 to 240 VAC, 24 VDC
Number of expansion racks	Up to 7 racks; 3, 5, 8, 10 slots	Up to 3	Up to 1
Special I/O	Yes, limit depends on mix. Analog I/O, Temperature Control, Position Control, Process Control, ASCII/BASIC, and many others	Yes, limit depends on mix. Analog I/O, Temperature Control, Position Control, High Speed Counter, and many others	Yes, limit depends on mix. Analog I/O, Temperature Control, Position Control, High Speed Counter, and many others
Communications and networking	CompoBus/S, RS-232C, 422/485, Ethernet, DeviceNet, Controller Link, Profibus-DP, Protocol Macro, Gateway Routing	CompoBus/S, RS-232C, 422/485, Ethernet, DeviceNet, Controller Link, Protocol Macro, Profibus-DP	CompoBus/S, RS-232C, 422/485, Ethernet, DeviceNet, Controller Link, Protocol Macro, Profibus-DP
Suggested programming tools, peripheral devices	CX-Programmer, Hand Held Terminal, NS Series HMI, CX-Simulator	CX-Programmer, Hand Held Terminal, NS Series HMI, CX-Simulator	CX-Programmer, Hand Held Terminal, NS Series HMI, CX-Simulator

* Note: "RIO" refers to Remote I/O capacity, utilizing Omron options for remote or distributed I/O such as SYSMAC Bus Remote I/O.



	CPM1A-V1	CPM2A	CPM2B
CPU I/O	10, 20, 30, 40	20, 30, 40, 60	32, 40
Max I/O points (with expansion)	100	120	168
AC power supply	100 to 240 VAC	100 to 240 VAC	–
DC power supply	24 VDC	24 VDC	24 VDC, 12 VDC
Memory backup	No	Yes	Yes
Max. program cap.	2K	4K	4K
Basic instruction execution time	.72 µsec	.64 µsec	.64 µsec
No. of instructions	91	119	119
AC inputs	No	No	No
DC inputs	Yes	Yes	Yes
# of inputs (max.)*	60 max.	72 max.	88 max.
# of outputs (max.)*	40 max.	48 max.	80 max.
Relay outputs (CPU)*	40 max.	48 max.	48 max.
Transistor outputs*	40 max.	8 max.	80 max.
High speed counter	5kHz	20kHz	20kHz
Pulse output	2kHz	10kHz (Synchronized)	10kHz
Analog I/O	Expansion Module	Expansion Module	Expansion Boards
Real time clock	No	Yes	Yes
External interrupts	2, 4	2, 4	4
Network connectivity	RS-232C/422, Hostlink, 1:1 NT Link, CompoBus/S Slave, DeviceNet Slave, Profibus-DP Slave	RS-232C/422, Hostlink, 1:1 NT Link, CompoBus/S Slave, DeviceNet Slave, Profibus-DP Slave	RS-232C/422, Hostlink, 1:1 NT Link
Suggested programming tools	CX-Programmer, Hand Held Terminal, NT/NS Series HMI	CX-Programmer, Hand Held Terminal, NT/NS Series HMI	CX-Programmer, Hand Held Terminal, NT/NS Series HMI
Built in comm. ports	Peripheral	Peripheral/RS-232C	Peripheral/RS-232C
Approvals	UL/CSA, CE	UL/CSA, CE	UL/CSA, CE

* Note: Indicates CPU only. Higher I/O may be available with expansion.

	CPM2C	CPM2C-S	ZEN
CPU I/O	10, 20, 32	10	10
Max I/O points (with expansion)	192	96 local expansion 256 remote expansion	44
AC power supply	100 to 240 VAC	–	100 to 240 VAC
DC power supply	24 VDC	24 VDC	24 VDC
Memory backup	Yes	Yes	Yes
Max. program cap.	4K	4 K	96 lines
Basic instruction execution time	.64 µsec	.64 µsec	.85 ms
No. of instructions	119	119	15
AC inputs	Yes (with relay terminal)	Yes (with relay terminal)	Yes
DC inputs	Yes	Yes	Yes
# of inputs (max.)*	96 max.	186 max.	18 max.
# of outputs (max.)*	96 max.	180 max.	16 max.
Relay outputs (CPU)*	48 max.	152 max.	16 max.
Transistor outputs*	96 max.	180 max.	16 max.
High speed counter	20 kHz	20 kHz	No
Pulse output	10 kHz (Synchronized)	10 kHz	No
Analog I/O	Expansion Module	Expansion and remote	2 points
Real time clock	Yes	Yes	Yes
External interrupts	2, 4	2	No
Network connectivity	RS-232C/422, Hostlink, 1:1 NT Link CompoWay/F, CompoBus/S Slave	RS-232C/422, Hostlink, 1:1 NT Link, CompoWay/F, CompoBus/S Master, CompoBus/S Slave, DeviceNet Slave	No
Suggested programming tools	CX-Programmer, Hand Held Terminal, NT/NS Series HMI	CX-Programmer Hand Held Terminal NS Series HMI	ZEN Support Software
Built in comm. ports	Peripheral/RS-232C	Peripheral/RS-232C, DeviceNet	–
Approvals	UL/CSA, CE	UL/CSA, CE	UL/CSA, CE

* Note: Indicates CPU only. Higher I/O may be available with expansion.

Operator Interfaces

Omron Smart Solutions

NS-Series

Touch screens offer built-in Ethernet communications, exceptional alarming/recipe/data logging capabilities and live video input capabilities.

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NT2S Displays

These message displays work with PLCs from multiple vendors, and offer password-protected screens and programmable function keys.

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	NS12	**NS10**	**NS8**	**NS5**
Dimensions mm (in)	241 H x 315 W x 48.5 D (9.49 x 12.40 x 1.91)	241 H x 315 W x 48.5 D (9.49 x 12.40 x 1.91)	177 H x 232 W x 48.5 (6.97 x 9.13 x 1.91)	142 H x 195 W x 54 D (5.59 x 7.68 x 2.13)
Features	• Smart Active Parts • 256-color display • 32,768 bitmap color display • Built-in Ethernet • FTP functionality supported • Controller Link option • Video input unit available as plug-in • ATA CF card • Alarming, recipes, data logging capabilities • 16 simultaneous language support • NS-Designer, Windows®-based software	• Smart Active Parts • 256-color display • 32,768 bitmap color display • Built-in Ethernet • FTP functionality supported • Controller Link option • Video input unit available as plug-in • ATA CF card • Alarming, recipes, data logging capabilities • 16 simultaneous language support • NS-Designer, Windows®-based software	• Smart Active Parts •256-color display • 32,768 bitmap color display • Built-in Ethernet • FTP functionality supported • ATA CF card • Alarming, recipes, data logging capabilities • 16 simultaneous language support • NS-Designer, Windows®-based software	• Smart Active Parts • 256-color display • 4,096 bitmap color display • Built-in Ethernet • FTP functionality supported • ATA CF card • Alarming, recipes, data logging capabilities • 16 simultaneous language support • NS-Designer, Windows®-based software
Display size	12.1" diagonal	10.4" diagonal	8" diagonal	5.7" diagonal
Display type	256-color TFT	256-color TFT	256-color TFT	256-color TFT
Image display	32,768 bitmap color display	32,768 bitmap color display	32,768 bitmap color display	4,096 bitmap color display
Display resolution	800 x 600 pixels	640 x 480 pixels	640 x 480 pixels	320 x 240 pixels
Interface	Touch screen	Touch screen	Touch screen	Touch screen
Touch cells	1900/screen	1200/screen	768/screen	300/screen
Memory type	Flash EEPROM	Flash EEPROM	Flash EEPROM	Flash EEPROM
Memory size	20 MB	20 MB	20 MB	6 MB
Max. # of screens	3,999	3,999	3,999	3,999
Graphic capabilities				
Freeform drawing	Yes	Yes	Yes	Yes
Bitmap display	Yes	Yes	Yes	Yes
Window tiling	Yes	Yes	Yes	Yes
Bar graph	Yes	Yes	Yes	Yes
Line trending	Yes	Yes	Yes	Yes
Thumbwheel	Yes	Yes	Yes	Yes
Text and numeric	Yes	Yes	Yes	Yes
Real time clock	Yes	Yes	Yes	Yes
Printer port	USB Interface	USB Interface	USB Interface	Yes
Programmable console	Yes	Yes	Yes	Yes
Programmable LEDs	–	–	–	–
Audible alarm	Yes	Yes	Yes	Yes
Function keys	–	–	–	–
Field replaceable backlight	–	–	–	–
Recipe	Yes	Yes	Yes	Yes
Background math	Yes	Yes	Yes	Yes
Input object lockout	Yes	Yes	Yes	Yes
Analog needle gauge	Yes	Yes	Yes	Yes
4-channel video display	Yes	Yes	–	–
RGB/2-channel video display	Yes	Yes	Yes	–
Controller Link board	Yes	Yes	Yes	–
FTP support	Yes	Yes	Yes	Yes
Compact flash storage	Yes	Yes	Yes	Yes
Communications	NT Link (1:1, 1:N); Port A and Port B (1:2); Serial, Ethernet, Controller Link (M:N)	NT Link (1:1, 1:N); Port A and Port B (1:2); Serial, Ethernet, Controller Link (M:N)	NT Link (1:1, 1:N); Port A and Port B (1:2); Serial, Ethernet	NT Link (1:1, 1:N); Port A and Port B (1:2); Serial, Ethernet, Controller Link (M:N)
Ratings	NEMA 4, IP65F	NEMA 4, IP65F	NEMA 4, IP65F	NEMA 4, IP65F
Approvals	cULus Class 1, Div. 2 Group A, B, C, D; Class 1, Zone 2 Group IIC and EC Directives	cULus Class 1, Div. 2 Group A, B, C, D; Class 1, Zone 2 Group IIC and EC Directives	cULus Class 1, Div. 2 Group A, B, C, D; Class 1, Zone 2 Group IIC and EC Directives	cULus Class 1, Div. 2 Group A, B, C, D; Class 1, Zone 2 Group IIC and EC Directives




	NT21-ST121(B)-E	NT11-SF121(B)-EV1	NT2S 6-KEY	NT2S 8-KEY
Dimensions mm (in)	190 H x 110 W x 53.5 D (7.56 x 10.83 x 2.80)	113 H x 218 W x 38.2 D (4.45 x 8.58 x 1.50)	60 H x 109 W x 28 D (2.36 x 4.29 x 1.10)	106.9 H x 106.9 W x 35.9 D (4.21 x 4.21 x 1.41)
Features	• Memory transfer unit • Recipe • High-speed NT-link 115 kbaud • Long backlight life–50,000 hrs.	• Password protected screens • Global function keys • Bar graph capability • Large characters • Long backlight life–50,000 hrs.	• PLC message display • Programmable F-keys, Password protected screens • 2 Programmable LEDs • 5 VDC power from PLC port	• PLC message display • Programmable F-keys, Password protected screens • 5 VDC power from PLC port
Display size	5.2" diagonal	4 line x 20 character	2 line x 16 character	2 line x 16 character
Display type	Backlit monochrome STN LCD	Backlit monochrome STN LCD	LED backlit LCD	LED backlit LCD
Display resolution	260 x 140 pixels	160 x 64 pixels	–	–
Interface	Touch screen	4 F-keys, number pad	6 Function keys	8 F-keys, number pad
Touch cells	91/screen	–	–	–
Memory type	Flash EEPROM	Flash EEPROM	EEPROM	EEPROM
Memory size	512 kB	32 KB	24 KB	24 KB
Max. # of screens	3,999	250	750	750
Graphic capabilities				
Freeform drawing	Yes	–	–	–
Bitmap display	Yes	–	–	–
Window tiling	Yes	–	–	–
Bar graph	Yes	Yes	Yes	Yes
Line trending	Yes	–	–	–
Thumbwheel	Yes	–	–	–
Text and numeric	Yes	Yes	Yes	Yes
Real time clock	Read from PLC or host	–	Yes	Yes
Printer port	–	Yes	Yes	Yes
Programmable console	Yes	–	–	–
Programmable LEDs	–	–	Yes	–
Audible alarm	Yes	Yes	–	–
Function keys	–	Yes	Yes	Yes
Field replaceable backlight	–	–	–	–
Recipe	Yes	–	–	–
Background math	Yes	–	–	–
Input object lockout	Yes	–	–	–
Analog needle gauge	Yes	–	–	–
4-channel video display	–	–	–	–
Compact flash storage	Yes (Program transfer only)	–	–	–
Communications	Host Link, NT Link (1:1), NT Link (1:N), High-speed NT Link (115 kbaud), Memory Link (PC)	Host Link, NT Link (1:1)	Host Link, Multi-vendor PLC	Host Link, Multi-vendor PLC
Ratings	NEMA 4	NEMA 4, IP65	IP65	IP65
Approvals	UL, CSA, CE, Class I, Div. 2	UL, CSA, CE, Class I, Div. 2	UL, CSA, CE, Class I, Div. 2	UL, CSA, CE, Class I, Div. 2

Motion and Motor Controls

Omron Smart Solutions

Servo Motors & Drives

Get high-resolution motion control for precise positioning applications for conveyors, pick-and-place, indexing and packaging equipment. *Page 80*

Inverters

Compact AC inverters and larger variable frequency drives provide energy-saving control of motors in many industrial applications. *Page 81*

Soft Starters

Prevent damage to conveyed products or mixer or pump impeller blades by limiting motor current for a soft start. Soft stop and kick start functionality is also available. *Page 81*

		
	W-Series/WN-Series	**SMARTSTEP Servo**
Drive features	• Mechatrolink II Network support • High resolution control • Ultra-small package • High performance 32-bit micro-processor • Built-in keypad and display • Auto-tuning automatically adjusts the control system gain according to machine characteristics	• Simple to use and easy to set-up using on-board selector switches and DIP switches • Auto-tuning available to automatically adjust servo gain parameters to load characteristics • 7-segment alarm display helps in troubleshooting • Pulse input
Motor features	• Low rotor inertia design yields a high power rate • Reduced cogging torque for smooth motor rotation at low speeds	• Low rotor inertia design yields a high power rate • Reduced cogging torque for smooth motor rotation at low speeds
Product power range	30 W to 15 kW	30 W to 750 W
Voltage supply	100/115 VAC (single phase) or 200/230 VAC (single phase and three phase)	100/115 VAC (single phase); 200/230 VAC (single phase); 200/230 VAC (three phase for 750 W only)
Command inputs accepted	Capable of handling analog speed, analog torque, and pulse-train input all in one single drive	Capable of handling pulse-train inputs
Motor features and options	Standard features include 1000, 1500 and 3000 RPM rated speed motors, high-resolution serial incremental encoders up to 17-bit. Options include 17-bit absolute encoders, holding brakes, keyways and water resistant slim profile motors	Motor rated speed is 3000 RPM and continuous torques are between 0.09 to 2.39 Nm; Pre-quadrature encoder resolution is 2000 ppr; Holding brake option available
Approvals	UL, cUL CE, TUV	UL, cUL, CE
Application suggestions	Conveyors; Pick and place machines; Lathes; Winding; Point-to-point positioning; Indexing; Cut to length; Packaging and filling machines	Conveying; Pick and place; Point-to-point positioning; Indexing; Cut to length; Packaging
Stand-alone servo with integrated position control	W-Series is field upgradable to integrate position control and DeviceNet connectivity by adding the R88A-NCW152-DRT, DeviceNet Option Unit Note: Only for amplifiers with firmware version 14 or later (1-axis)	Not yet available
Motion control PLC modules ±10 V analog signal	CS1W-MC221 (2-axis); CS1W-MC421 (4-axis); C200H-MC221 (2-axis); CS1W-MCH71 (30-axis); CJ1W-MCH71 (30-axis)	Not applicable
Position control PLC modules pulse train signal	CS1W-NC1□3 (1-axis); CS1W-NC2□3 (2-axis); CS1W-NC4□3 (4-axis) CJ1W-NC1□3 (1-axis); CJ1W-NC2□3 (2-axis); CJ1W-NC4□3 (4-axis); CJ1W-NCFH (16-axis) C200HW-NC113 (1-axis); C200HW-NC213 (2-axis) C200HW-NC413 (4-axis)	CS1W-NC1□3 (1-axis); CS1W-NC2□3 (2-axis); CS1W-NC4□3 (4-axis) CJ1W-NC1□3 (1-axis); CJ1W-NC2□3 (2-axis); CJ1W-NC4□3 (4-axis) C200HW-NC113 (1-axis); C200HW-NC213 (2-axis) C200HW-NC413 (4-axis)
PC software	WMon config/monitor; CX-Motion programming for MC; CX-Position config/monitor for CS1/CJ1-NC; NCT config/monitor for C200HW-NC; MC-MIEL for CS1W-MCH71	WMon V2.0 config/monitor; CX-Position config/monitor for CS1/CJ1-NC; NCT config/monitor for C200HW-NC
Sample capabilities	Point-to-point positioning; Speed control; Electronic gearing; Linear, circular, and helical interpolation	Point-to-point positioning; Speed control; Electronic gearing; Linear interpolation
Networks	Mechatrolink II Interface FNY-NS115 Mechatrolink II Cables FNY-W6003-XX Mechatrolink II Terminator FNY-W6002 **Note:** WN-Series has built-in Mechatrolink II Interface	–

	Inverters			Soft Starters	
			 AVAILABLE IN CANADA ONLY		
	3G3JV	**3G3MV**	**G5+ & P5+**	**G3JA-C**	**G3JA-D**
Features	• Compact size • Easy-to-use Digital Operator that controls all parameter selections and settings • Quick Start LEDs for quick setup and troubleshooting • Potentiometer on digital operator to fine-tune the speed to match the application's requirements • Ideal for simple small motor control • Modbus serial communications standard	• Compact size • Intuitive Digital Operator that controls all parameter selections and settings • Quick Start LEDs for quick setup and troubleshooting • Standard PID control • Modbus serial communications standard with optional DeviceNet communications unit • Potentiometer on digital operator to fine-tune the speed to match the application's requirements • Optional 3G3MV-P10CDT(3)-E mounts on-board to add the power and flexibility of a full-featured PLC	• 2-line alphanumeric Digital Operator with English menus and fault displays • PID control • Energy savings control • Modbus serial communications standard with optional communications units available, including: **G5+:** DeviceNet, Profibus-DP, Modbus Plus, and Interbus-S. **P5+:** APOGEE, Metasys, and LonWorks. **G5+** • Flux Vector capable (with option card) • Dynamic Braking terminals • Zero servo mode **P5+** • Quick Start menu access for quick setup and troubleshooting	• Multifunction soft starter for 3-phase inductive motors • Soft start adjusts initial torque to 15% to 65% of locked rotor torque • Kick start delivers 450% of full load current • Soft stop has selectable voltage ramp-down of 1x to 3x startup time • Protective functions include protection against overload and phase loss • Space-saving: 45 mm wide • DIN rail or panel mounting	• Current limit starter for 3-phase, 3-lead motors • Adjustable current limit of 150%, 250%, 350% or 450% of full load current • Star-delta and protective functions (overload and phase loss) are included in this single unit, reducing complicated wiring. • Space-saving: 45 mm wide • Hybrid control to reduce power loss uses a thyristor during starting or stopping and a bypass relay during stable operation • DIN rail or panel mounting
Voltage class	Three-phase (230 VAC and 460 VAC); Single phase (230 VAC)	Three-phase (230 VAC and 460 VAC), Single phase (230 VAC);	Three-phase (230 VAC, 460 VAC and 575 VAC)	Three-phase (200-480 VAC)	Three-phase (200-480 VAC)
Enclosure type	IP20	NEMA 1	NEMA 1, Open chassis	IP20	IP20
Max. applicable motor output (HP)	0.13 to 5HP	0.13 to 12.5HP	0.75 to 500HP	–	–
Rated output current (A)	0.8 to 17.5 A	0.8 to 33 A	**G5+:** 1.9 to 605 A **P5+:** 1.9 to 675 A	1 to 37 A	1 to 64 A
Max. output frequency (Hz)	400 Hz (programmable)	400 Hz (programmable)	**G5+** 400 Hz (programmable), 1400Hz (with custom software) **P5+** 400 Hz (programmable)	60 Hz	60 Hz
Selectable control method	V/Hz	V/Hz or open loop vector	**G5+** Open loop V/Hz, closed loop V/Hz, open loop vector, closed loop flux vector (Closed loop modes require a PG feedback option card) **P5+** V/Hz	Soft start Kick start Soft stop Current limit start	Current limit start
			Models available in Canada - 600V up to 200 HP **Contact: Omron Canada Inc. for more information. See back cover.**		

Industrial Networking

Omron Smart Solutions

DeviceNet

Omron DRT2 smart I/O blocks capitalize on DeviceNet's capabilities to automatically collect error history and condition data that can be used for preventive maintenance.

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CompoBus/S

This high-speed deterministic network connects up to 32 communications blocks for effective distributed control.

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Ethernet

Omron PLC Ethernet modules take advantage of the high-speed open communications and flexibility of the full TCP/IP capabilities. *Page 89*

DRT2-AD02

DRT2-ID16 and XWT-OD16

DRT2-OD08C

DeviceNet Smart Slaves

Omron's DRT2 Smart DeviceNet Slaves offer diagnostic intelligence within the slave module. These diagnostic capabilites support an easy-to-use interactive maintenance focus that reduces network setup and startup time; provides a preventative maintenance focus to ensure no loss in production up-time; and provides a predictive maintenance focus to isolate and repair any network problems.

Smart DeviceNet Slave Features

- Use Configurator software to access diagnostic information from DRT2 slave devices
- Access diagnostic status information within the connected PLC without the need for Configurator software. Display bit status information on a panel or through CX-Programmer
- Fully utilize the maintenance focus of the modules by displaying all diagnostic information using Smart Active Parts within Omron's NS-Series HMIs eliminating the need for HMI programming
- Utilize Automatic Baud Rate Detection, Network Power Voltage, Last Maintenance Date Storage, the Naming of Each Smart Slave Device, the Naming of Connected Devices, a Contact Operation Counter and many others to improve production

Smart DeviceNet Slave Offering

• General Purpose Slaves

– 16 pt. Digital I/O Basic Slave Devices	DRT2-ID16 (-1)* DRT2-OD16 (-1)*
– 8 pt. and 16 pt. Digital I/O Expansion Unit	XWT-ID08 (-1)* XWT-ID16 (-1)* XWT-OD08 (-1)* XWT-OD16 (-1)*
– 16 pt. Relay Output Slave	DRT2-ROS16
– 16 pt. I/O and Mixed I/O 3-Tier Slave Devices	DRT2-ID16TA (-1)* DRT2-OD16TA (-1)* DRT2-MD16TA (-1)*
– 32 pt. I/O and Mixed I/O Mil-Style Connector Slaves	DRT2-ID32ML (-1)* DRT2-OD32ML (-1)* DRT2-MD32ML (-1)*
– 16 pt. Input and Mixed I/O Sensor Connector Input Slaves	DRT2-ID16S (-1)*

• Analog Slaves

– 4 pt. Analog Input Unit	DRT2-AD04
– 2 pt. Analog Output Unit	DRT2-DA02
– 4 pt. High Resolution Analog Input Unit	DRT2-AD04H

• Environment Resistive Slaves

– 8 pt. I/O and 16 pt. Input IP67 Rated Environment Resistive Slave Units	DRT2-ID08C (-1)* DRT2-OD08C (-1)* DRT2-HD16C (-1)*

*(-1) symbolizes PNP; without NPN

Smart DeviceNet Slave Offering

• Screwless Clamp Terminal with Transistors

– 32 pt. Input Unit Without Detection	DRT2-ID32SL (-1)*
– 32 pt. Output Unit Without Detection	DRT2-OD32SL (-1)*
– 16 pt. Input/16 pt. Output Unit Without Detection	DRT2-MD32SL (-1)*
– 32 pt. Input Unit With Detection	DRT2-ID32SLH (-1)*
– 32 pt. Output Unit With Detection	DRT2-OD32SLH (-1)*
– 16 pt. Input/16 pt. Output Unit With Detection	DRT2-MD32SLH (-1)*

• Temperature Input Terminals

– 4 pt. Thermocouple Input Unit	DRT2-TS04T
– 4 pt. Platinum Resistance Thermometer Input Unit	DRT2-TS04P

*(-1) symbolizes PNP; without NPN

CJ1W-DRM21

CS1W-DRM21-V1

DeviceNet Master

DeviceNet offers a high-speed, open, device-level network optimized for applications that require control of I/O on factory floor machinery. Omron's DeviceNet Master Modules provide the best possible DeviceNet LAN performance while simplifying network setup and configuration.

Capabilities

- Control up to 32,000 points (2,000 word) per master
- Supports automatic allocation of up to 63 nodes without the need for Configurator software
- Up to 16 DeviceNet Master Modules can be mounted for each CPU
- DeviceNet Master Modules support Poll, Bit-Strobe, COS, cyclic communications and explicit messaging
- Using DeviceNet Master Modules, setup files can be transferred from or downloaded to compact flash, allowing for swift onsite response
- DeviceNet Master Modules utilize Omron's FINS messaging allowing for peer-to-peer PLC message communications or remote programming and monitoring
- DeviceNet Master Modules can be used as both a master and slave simultaneously
- Utilize DeviceNet Configurator software for simple network setup and I/O allocation

DeviceNet Masters

CS1 DeviceNet Master	CS1W-DRM21-V1
CJ1 DeviceNet Master	CJ1W-DRM21

DeviceNet Configurator

Omron's powerful Configurator software provides a user-friendly GUI (graphical user interface) for configuring slave devices and assigning memory.

- Use the interactive monitoring capability to identifiy the health of the network or to troubleshoot lost nodes
- Automatically or manually allocate PLC memory for each DeviceNet Slave device
- Easily configure Omron or third party DeviceNet slave devices
- Communicate and configure your network locally via serial communications or remotely via Ethernet communication

DeviceNet Configurator Software

Windows®98, 2000, ME, XP compatible	WS02-CFDCI-E*

*Website upgrades available for registered users

Wireless DeviceNet I/O Link

Allocate Omron's Wireless DeviceNet units to any DeviceNet Master/Scanner and utilize wireless subnetwork communications to remote DeviceNet slave devices up to 240m away.

Capabilities

- 60m line of sight wireless link expandable up to 240m (trunk line extension also supported) utilizing additional wireless slave devices as wireless network repeaters
- Up to 64 wireless slave units can be allocated to each wireless master unit
- Connect up to 3200 I/O (1600 in/1600 out) to each wireless master unit
- Utilize up to 1024 points per slave module (512 in/512 out)
- Utilize explicit messaging to remote DeviceNet slave devices connected to the wireless slave subnetwork to acquire paramter settings and send specific commands (i.e. read, write, etc.)

Wireless DeviceNet Modules

Wireless DeviceNet Subnetwork Master Unit with explicit messaging capabilites and pencil-style antennas	WD30-ME
Wireless DeviceNet Subnetwork Slave Unit with explicit messaging capabilites and pencil-style antennas	WD30-SE
Wireless DeviceNet Subnetwork Master Unit with pencil-style antennas (no explicit messaging capabilities)	WD30-M
Wireless DeviceNet Subnetwork Slave Unit with pencil-style antennas (no explicit messaging capabilities)	WD30-S
Wireless DeviceNet Subnetwork Master Unit with explicit messaging capabilites and remote magnetic antennas	WD30-ME01
Wireless DeviceNet Subnetwork Slave Unit with explicit messaging capabilites and remote magnetic antennas	WD30-SE01

Decentralized DeviceNet Controller

Modular, intelligent, programmable DeviceNet slave that expands I/O both locally and over a "flexible back-plane" link, CompoBus/S.

Capabilities

- Up to 362 I/O (106 local I/O and 256 CompoBus/S I/O)
- Supports NT Link 1:1 and HostLink protocols for connnection to serial devices
- CPU has 10 built-in I/O points (6 inputs and 4 transistor outputs) Includes:
  - 2 high-speed, interrupt inputs or 1 high-speed counter input
  - 2 high-speed pulse outputs
- Utilizes FINS communications for pass through programming access in Omron DeviceNet network

Decentralized DeviceNet Controller Modules

Modular PLC with CompoBus/S Master and DeviceNet Slave (NPN outputs)	CPM2C-S10DC-DRT
Modular PLC with CompoBus/S Master and DeviceNet Slave (PNP outputs)	CPM2C-S11DC-DRT

Multiple I/O

DeviceNet multiple I/O configuration utilizes the DRT1-COM module to concentrate up to 1,024 points in one node.

Capabilities

- DRT1-COM communication module used as a communication gateway to a maximum of 8 GT1 units and 1,024 I/O points in one node
- 8, 16, and 32 points discrete; 4 and 8 point analog; 8 and 16 point relay; counter unit

Multiple I/O Modules

DeviceNet I/O Concentrator	DRT1-COM

GT1 Product Offering - Please refer to the Industrial Networking and Communications section of the PLC catalog (R301-E3-1)

DeviceNet Serial Interface

Communicates with peripheral serial devices (bar code readers, RFID readers, etc.) over DeviceNet.

Capabilities

- Dual port RS-232C module that connects serial compatible peripheral devices over DeviceNet
- Supports individual setting parameters for each serial port
- Supports individual explicit messaging for each serial port to set the unit and trigger the acquisition of data

DeviceNet Serial Interface Module

DeviceNet	DRT1-RS232C2

Photoelectric Sensors

DeviceNet-ready communication unit connects up to a maximum of 16 fiber-optic sensors.

Capabilities

- Up to 16 fiber-optic photo sensors (E3X-DA6 and E3X-DA8 series) on one communication unit
- Mobile programming console for simple setting and monitoring locally
- Remote setting, monitoring, and operating through DeviceNet Configurator software
- Supports explicit message communications

DeviceNet Photelectric Sensor Module

DeviceNet Photoelectric Sensor Communication Module	E3X-DRT21

Inverter and Servo Drives

Install these optional DeviceNet Communications Units to provide open network compatibility for AC servo drives and compact AC inverters.

Capabilities

- Monitor AC inverter status and reduce wiring
- Inverter unit offers sensor-free vector control function
- AC servo unit provides both DeviceNet communications and Position Control function
- Unifies management of all servo system operating information
- Both contribute to error prediction and diagnosis

DeviceNet Units for Inverters and Servo Drives

DeviceNet Unit for W-Series Servo Drives	R88A-NCW152-DRT
DeviceNet Unit for 3G3MV Inverters	3G3MV-PDRT2

DeviceNet Multi-Loop Process Controller

The DeviceNet communications unit for modular E5ZN temperature controllers allows the user to monitor process values, write parameters, and control operation.

Capabilities

- Up to 16 temperature controllers can be connected to one DeviceNet communications unit
- DeviceNet communications unit is able to exchange I/O data with the DeviceNet master/scanner
- Remote I/O communications can be set up without DeviceNet Configurator (when using Omron master unit)
- Communication and temperature controller units parameter settings can be configured using DeviceNet Configurator
- Support explicit message communications
- CompoWay/F serial communications commands are supported
- Automatic baud rate detection
- Supports a wide range of DeviceNet maintenance features (SAP available for NS-series HMI)
- Unit power is supplied from the DeviceNet network

DeviceNet Multi-Loop Process Controller Models

DeviceNet Multi-Loop Process Control Communications Unit	E5ZN-DRT-DC24

DeviceNet Temperature Controllers

R-series temperature controllers offer multi-loop control with high precision and very high-speed response.

Capabilities

- 50 ms sampling response
- 0.01°C high input temperature resolution
- 0.1% PV accuracy
- Programmable using intuitive “ThermoTools” programming software
- 8 banks store 8 PID sets for operational flexibility and quick changeover
- Position proportional control models support floating control and closed control
- Supports explicit message communications
- CompoWay/F serial communications commands are supported
- Unit power is supplied from the DeviceNet network
- Configurable using DeviceNet Configurator
- Automatic baud rate detection

DeviceNet Temperature Controller Models

2-Loop Control Unit with pulse voltage output control and pulse voltage/current output transfer	E5ER-QTW-DRT-AC100-240V
2-Loop Control Unit with current output control and current output transfer	E5ER-CTW-DRT-AC100-240V
Basic Loop Controller Units (1 loop):	
– 2 output points: pulse voltage and pulse voltage/current	E5AR-Q4B-DRT-AC100-240V E5AR-Q4B-DRT-AC24V
– 2 output points: current and current	E5AR-C4B-DRT-AC100-240V E5AR-C4B-DRT-AC24V
– 4 output points: pulse volage (1 point) and pulse voltage/current and current (2 points each)	E5AR-QC4B-DRT-AC100-240V E5AR-QC4B-DRT-AC24V
2-Loop Control Unit with 4 output points: pulse voltage (1 point) and pulse voltage/current (2 points each)	E5AR-QQ4W-DRT-AC100-240V E5AR-QQ4W-DRT-AC24V
4-Loop Control Unit with 4 output points: current output (4 points)	E5AR-CC4WW-DRT-AC100-240V
Position-proportional control (1 loop)	
– Relay output (1 open, 1 close)	E5AR-PR4F-DRT-AC100-240V E5AR-PR4F-DRT-AC24V
– Relay output (1 open, 1 close) and current (transfer) output (1 point)	E5AR-PRQ4F-DRT-AC100-240V E5AR-PRQ4F-DRT-AC24V

Profibus

Profibus is a vendor-independent, open fieldbus standard suitable for a wide range of applications in manufacturing, process and building automation.

Capabilities

- Supports up to 125 slave nodes per master
- Utilizes FDT/DTM technology
- Max. number of Profibus I/O available per PLC: 7,168 words max.
- High-speed transmission: 12,000 kbps at 100 m max.
- Long-distance transmission: 93.75 kbps at 1200 m max.

Profibus Masters

CJ1 Modular Unit	CJ1W-PRM21
CS1 Rack Style	CS1W-PRM21

Profibus Slaves

I/O Link for CJ1	CJ1W-PRT21
I/O Link for CS1 and C200H Alpha	C200HW-PRT21
I/O Link for Micro PLC	CPM1A-PRT21
Multiple I/O for up to 1,024 points on one node	PRT1-COM

*Refer to R301-E3-01 for more information

CompoBus/S

This high-speed, deterministic network is configured in a “bus” topology. Connect up to 32 communications blocks with a possible 16 I/O points each for a total of 256 I/O on a network. Analog I/O is available.

- High-speed transmission: 750 kbps at 100 m max.
- Long-distance transmission: 93.75 kbps at 500 m
- Use twisted-pair cable or flat cable media
- Transistor, relay and analog slave modules; terminators and accessories

CompoBus/S Masters

CJ1 modular unit	CJ1W-SRM21
CS1, C200H Alpha, C200HS rack style	C200HW-SRM1-V1
CQM1H modular unit	CQM1-SRM21-V1
CPM2C-S with CompoBus/S I/O	CPM2C-S1□0C
Board PLC for computers (C200H Alpha capabilities)	C200PC-ISA□3-SRM-E

CompoBus/S Slaves

Transistor terminal blocks; 4, 8, 16 inputs, NPN or PNP	SRT2-ID□□-□
Transistor terminal blocks; 4, 8, 16 outputs, NPN or PNP	SRT2-OD□□-□
Transistor terminal blocks with individual commons for each point, 16 inputs, NPN or PNP	SRT2-ID16T-□
Transistor terminal blocks with individual commons for each point, 8 inputs/8 outputs, NPN or PNP	SRT2-MD16T-□
Transistor terminal blocks with individual commons for each point, 16 outputs, NPN or PNP	SRT2-OD16T-□
Plug-in relay output blocks; 8 or 16, electromechanical relays	SRT2-ROC□□
Plug-in relay output blocks; 8 or 16, MOS FET relays	SRT2-ROF□□
Slim, vertical remote terminal blocks; 8 or 16 inputs	SRT2-VID□□S-□
Slim, vertical remote terminal blocks; 8 or 16 outputs	SRT2-VOD□□S-□
Analog input terminal, 1 to 4 inputs; six current and voltage ranges	SRT2-AD04
Analog output terminal, 1 or 2 outputs; five current and voltage ranges	SRT2-DA02
CompoBus/S I/O Link module, 8 inputs/8 outputs	CPM1A-SRT21
CompoBus/S I/O Link module, 8 inputs/8 outputs	CPM2C-SRT21

Ethernet

Omron's high-speed, open communications Ethernet modules support the full TCP/IP Ethernet model for maximum flexibility and speed in data exchange.

Capabilities

- Compatible with 100 Base-TX (100 Mbps) and 10 Base-T (10 Mbps)
- Both TCP/IP and UDP/IP protocols are supported
- 254 total nodes possible
- SNTP client functionality for automatic clock adjustment
- DNS client functionality to specify servers by host name
- Host computers can utilize dynamic IP addressing (DHCP)
- Using the built-in FTP server, files can be read from or written to the compact flash memory card
- Using FINS communications, connectivity with devices on other Omron networks is seamless (no programming required)
- Transmit e-mail attachments from the Ethernet module using an SMTP server to acquire user-created data, error log data, and module status data
- Using a POP3 server, the user can send file attachment data or FINS commands directly to the Ethernet module

Ethernet Characteristics

- Four Ethernet modules can be mounted per PLC system
- Fast, 100 Mbps baud rate
- 100 m max. transmission distance between hub and node
- Data packets up to 2,012 bytes max. can be sent via FINS or socket service
- 2000 bytes can be transferred from PLC to PLC in 12 ms

Ethernet Communication Modules

100 Base-TX, 10 Base-T CS1 Ethernet Module	CS1W-ETN21
100 Base-TX, 10 Base-T CJ1 Ethernet Module	CJ1W-ETN21

Controller Link

Deterministic control-level network supports automatic or manual data links between two or more PLCs or between PLCs and host computers, as well as links for programmed data transfers and PLC program transfer. Use shielded twisted pair or optical fiber communication media. Controller Link is available as a BUS unit module for PLCs or as a PCI or ISA board for PCs.

Capabilities

- Maximum 62 nodes per network utilizing RPT unit (Note 1)
- Message service can send/receive up to 2,012 bytes of data using FINS messaging
- Number of Data Link words per module: 12,000 words max. (Note 1)
- Fast baud rate or long transmission distance available:

	With Repeaters	Without Repeaters
2 Mbps:	500 m	1.5 Km
1 Mbps:	800 M	2.4 Km
500 Kpbs:	1.0 Km	3.0 Km

- Use economical shielded twisted pair cable or optical fiber media
- Automatic and manual data links move large amounts of data and can be set so nodes receive only desired data (without the need for programming)

Controller Link Modules

Wired Ring Controller Link Module for CS1	CS1W-CLK21-V1
Wired Ring Controller Link Module for CJ1	CJ1W-CLK21-V1
Optical Ring Controller Link Module for CS1	CS1W-CLK12/52-V1
Controller Link Support Board for PCI Bus Computers	3G8F7-CLK12/21/52-EV1 (Note 2)
Controller Link Support Board for ISA Bus Computers	3G8F5-CLK11/21-E (Note 3)
Wired Ring Controller Link for CV/CVM1	CVM1-CLK21 (Note 1)
Optical Ring Controller Link for CV/CVM1	CVM1-CLK12/52 (Note 1)
Wired Ring Controller Link for C200H Alpha	C200HW-CLK21 (Note 1)
Wired Ring Controller Link for CQM1H	CQM1H-CLK21 (Note 1)

Repeater Units

Controller Link Shielded Twisted Pair Repeater Unit	CS1W-RPT01
Controller Link H-PCF Optical Fiber Repeater Unit	CS1W-RPT02
Controller Link GI Optical Fiber Repeater Unit	CS1W-RPT03

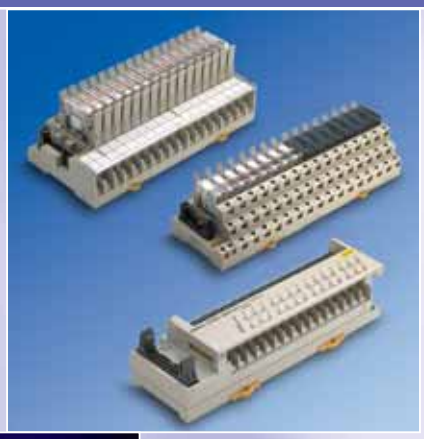
Note 1:
- 32 nodes max. per network with or without repeater unit
- Number of Data Link words per module: 8,000 words max.

Note 2: Number of Data Link words per module: 62,000 words max.

Note 3: Number of Data Link words per module: 32,000 words max.

Wiring Solutions

Omron Smart Solutions



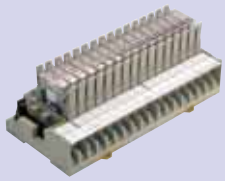
Relay Terminal Blocks

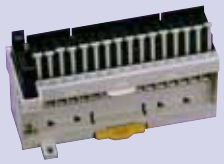
These blocks use plug-in replaceable relays that require no tools for servicing. Install a mix of electromechanical and solid state relays in the same terminal base. *Page 91*

Wiring Terminals and Cables

Organize wiring for efficient installation and servicing using screw terminal blocks and pre-terminated cables. It reduces wiring errors and termination points are readily identifiable. *Page 91*

Relay Terminal Blocks

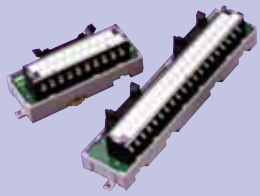


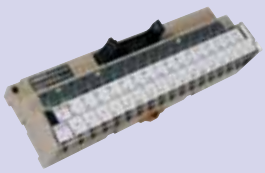


	G7TC & P7TF	G70A	G70D
Features	• G7TC Relay Blocks with G7T installed & P7TF Relay Bases: 8 point Output & 16 point Input and Output relay blocks • All connect via industry standard flat ribbon cable connectors to anyone's controller • Standard electromechanical and solid state relays are available in a wide variety of coil voltages	• 10 Amp Relay Blocks: 16 point Input and Output relay blocks • Up to 10 A switching capacity and both SPST and SPDT configurations available • All connect via industry standard flat ribbon cable connectors to anyone's controller • Electromechanical and solid state relays are available in a wide variety of coil voltages	• Miniature Relay Output Blocks: Miniature PCB style electromechanical and solid state relays • Significant space savings for relay output blocks and switching capacity up to 3 A • All versions connect via industry standard flat ribbon cable connectors to anyone's controller
Types available	Input & Output	Input & Output	Output
No. of I/O	8 & 16 pt	16 pt	16 pt
Max. switching (amps)	5 A	10 A	3 A
LED indication (base)	Yes	No*	Yes
Switching	SPST	SPST & SPDT	SPST
Surge suppression	Yes	No*	Yes
Connection method	Snap in cable connector	Snap in cable connector	Snap in cable connector
Relays used	EMR=G7T; SSR=G3TA	EMR=G2R; SSR=G3R	EMR=G6D; SSR=G3DZ
Primary advantage	Large selection	Switching amperage	Compact size

*Note: LED indication and Surge Suppression are not built into the G70A base, but both are available in selected relays that plug into this base.

Wiring Solutions





	XW2E	XW2B	XW2C	XW2Z
Features	• Three-tiered input terminal block for Omron PLCs • Individual common terminals simplify wiring	• Wide variety of wiring terminals that connect to a controller via industry-standard ribbon cable connectors • M3 or M3.5 screw terminals	• 16-point input with screw terminals for Omron PLCs	• Single, bifurcated, and three-connector cables for XW2B screw terminal blocks, XW2C input screw terminals, and motion/servo applications*
No. of contacts	16	20, 34, 40, 50, or 60	16, NPN input; (-) common	N/A
Cables used	XW2Z-□□□D, bifurcated 20 contacts for Omron PLCs XW2Z-□□□N, bifurcated 20 contacts for Omron PLCs	XW2Z-□□□A, single 20 contacts for Omron PLCs XW2Z-□□□B, 40 contacts for Omron PLCs XW2Z-□□□H1, 60 contacts for Omron PLCs XW2Z-□□□F, 20 contacts with crimp hooks; connects to any control device	XW2Z-□□□A, single 20 contacts for Omron PLCs XW2Z-□□□D, bifurcated 20 contacts for Omron PLCs	N/A
Primary advantage	Simplifies wiring for 16 inputs	Simplifies wiring up to 60 inputs or outputs with a single, connectorized cable	Connects 16 inputs to Omron PLCs; Shows input status with LEDs	Connects up to 48 points to wiring blocks

*Note: For motion/servo see accessory information with servo and motion modules

General-Purpose Relays

Omron Smart Solutions

MY Relay Series

Ideal for sequence control and power switching applications, these compact relays offer a long service life and feature a large nameplate and mechanical indicator.

Page 93

G2R-S (S) Relay Series

Slim I/O relay features a nameplate and flag indicator for efficient monitoring and servicing. Meets RoHS requirements for Pb-free/Cd-free construction. *Page 94*

MJN Relay Series

Square-base, high load switching relays handle 10- to 30-amp loads and meet UL508 standards for Industrial Control Equipment and motor controls up to 600 VAC. *Page 95*

Sockets and Accessories

Omron offers a complete range of conventional and screwless clamp terminal sockets, mounting brackets and DIN rail track to complete your panel installation. *Page 96*

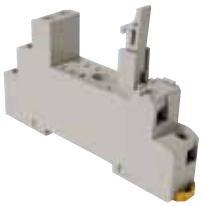
			
	MK	**MY**	**LY**
Dimensions mm (in)	52.58 H x 34.54 L x 34.54 W (2.07 x 1.36 x 1.36)	36 H x 28 L x 21.5 W (1.42 x 1.10 x 0.85)	35.56 H x 27.94 L x 21.59 W (1.40 x 1.10 x 0.85)
Switching	10 A max.	10 A max. (2 pole); 5 A max. (4 pole)	15 A max.
Features	• Octal base plug-in • Exceptional reliability • Push-to-test button standard	• Ideal for sequence control and power switching applications • Name plate and mechanical indicator standard • Variations include push-to-test, LED and bifurcated contacts • Hermetic version available (MY4H)	• Compact power relay • LED, Push-to-test button, bifurcated contacts and other features available
Contact Ratings			
Contact form	2 Form C, 3 Form C	2 Form C, 4 Form C	1 Form C, 2 Form C, 3 Form C, 4 Form C
Contact type	Single button	Single button, bifurcated button	Single button
Contact material	Ag	AgNi	Ag Alloy
Max. operating current under resistive load	10 A	10 A (DPDT); 5 A (4PDT)	15 A (SPDT); 10 A (DPDT, 3PDT, 4PDT)
Max. operating voltage	250 VAC, 250 VDC	250 VAC, 125 VDC	250 VAC, 125 VDC
Max. switching capacity under resistive load	2 pole: 2,500 VA, 280 W; 3 pole: 2,500 VA/1,250 VA 280 W	2 pole: 2,500 VA, 300 W; 4 pole: 1,250 VA, 150 W	1 pole: 1,700 VA, 360 W; 2, 3, 4 poles: 1,100 VA, 240 W
Minimum permissible load	100 mA, 1 VDC	2 pole: 1 mA, 5 VDC; 4 pole: 1 mA, 1 VDC	100 mA, 5 VDC
Rated load (under resistive load)	2 pole: 10 A at 250 VAC, 28 VDC; 3 pole: 10 A at 250 VAC, 28 VDC	2 pole: 5 A at 250 VAC, 30 VDC; 4 pole: 3 A at 250 VAC, 30 VDC	1 pole: 15 A at 110 VAC, 24 VDC; 2, 3, 4 pole: 10 A at 110 VAC, 24 VDC
Coil Ratings			
Coil voltage	12, 24, 110/120, 220/240 VAC; 12, 24, 48, 100 VDC	6, 12, 24, 48, 110/120, 220/240 VAC; 6, 12, 24, 48, 100/110 VDC	12, 24, 110/120, 220/240 VAC; 12, 24, 48, 100 VDC
Power consumption	2.7 VA, 1.5 W	Approx. 1.1 VA, 0.9 W	1.1 VA, 0.9 W (1 pole); 1.1 VA, 0.9 W (DPDT); 1.6 VA, 1.4 W (3PDT); 1.95 VA, 1.5 W (4PDT)
Dielectric strength (50/60 Hz for 1 minute)	2,000 VAC	2,000 VAC	2,000 VAC
Electrical service life (operations)	100,000 minimum	2P 500,000 at 5 A, 100,000 at 10 A; 4P 500,000 at 3 A, 100,000 at 5 A	200,000 minimum, 500,000 minimum (2P)
Terminal choices	Plug-in	PCB terminal, plug-in	Track mounted sockets PCB terminal, plug-in
Accessories	Sockets and clips for track mounted sockets with screw terminals and back connecting sockets with solder and PCB terminals	Sockets and clips for track mounted sockets with screw terminals and back connecting sockets with solder and PCB terminals Note: PYF-S series screwless clamp terminal socket available	Sockets and clips for track mounted sockets with screw terminals and back connecting sockets with solder and PCB terminals
Approved standards	UL, CSA, TUV, VDE	UL, CSA, SEV, CE, VDE	UL, CSA, SEV, VDE, CE

General Purpose

			
	G2R-S (S)	**G7J**	**G7L**
Dimensions mm (in)	35.5 H x 29 L x 13 W (1.40 x 1.14 x .51)	64 H x 53.5 L x 34.5 W (2.52 x 2.11 x 1.36)	49.02 H x 68.58 L x 34.54 W (1.93 x 2.70 x 1.36)
Switching	1 pole: 10 A max. 2 pole: 5 A max.	25 A max.	30 A max.
Features	• Pb-free, Cd-free • Nameplate and mechanical flag indicator standard • LED diode, and lockable test button available	• Ideal for 3 phase motor control • 4 pole mini contactor • DIN rail mountable	• Low cost, high power relay • 3 mm contact gap • Conforms to IEC 950/UL 1950 • Class B insulation standard
Contact Ratings			
Contact form	1 Form C 2 Form C	4 Form A, 3 Form A/1 Form B, 2 Form A/2 Form B	1 Form A-DM, 2 Form A-DM
Contact type	Single button	Single button	Single button
Contact material	Ag Alloy	Ag Alloy	Ag Alloy
Max. operating current under resistive load	1 pole: 10 A 2 pole: 5 A	25 A (NO contacts), 8 A (NC contacts)	30 A (SPST-NO), 25 A (DPST-NO)
Max. operating voltage	250 VAC, 30 VDC	250 VAC, 125 VDC	250 VAC
Max. switching capacity under resistive load	1 pole: 2,500 VA, 300 W 2 pole: 1,250 VA, 150 W	5,500 VA (NO contacts), 1,760 VA (NC contacts)	1 pole : 6,600 VAC; 2 pole: 5,500 VAC
Minimum permissible load	100 mA, 5 VDC	100 mA, 24 VDC	100 mA, 5VDC
Rated load (under resistive load)	1 pole: 10 A @ 30 VDC 10 A @ 250 VAC 2 pole: 5 A @ 30VDC 5 A @ 250 VDC	25 A at 220 VAC (NO contacts); 8 A at 220 VAC (NC contacts)	1 pole: 30 A at 250 VAC; 2 pole: 25 A at 220 VAC
Coil Ratings			
Coil voltage	6, 12, 24, 48 VDC; 24, 120, 240 VAC	12, 24, 100/120, 200/240 VAC; 12, 24, 48, 100 VDC	12, 24, 100/120, 200/240 VAC; 12, 24, 48, 100 VDC
Power consumption	0.9 VA, 0.53 W	1.8 to 2.6 VA, 2.0 W	1.7 to 2.5 VA, 1.9 W
Dielectric strength (50/60 Hz for 1 minute)	1 pole: 5,000 VAC (coil and contacts) 1,000 VAC (same polarity) 2 pole: 5,000 VAC (coil and contacts) 3,000 VAC (different polarity) 1,000 VAC (same polarity)	4,000 VAC	4,000 VAC
Electrical service life (operations)	100,000 minimum	100,000 minimum	100,000 minimum
Terminal choices	Plug-in	Quick-connect, screw, PCB	Quick-connect, screw, PCB
Accessories	Sockets for track mounted sockets with screw terminals and back connecting sockets with solder and PCB terminals Note: P2RF-S series screwless clamp terminal socket available	R99-04-FOR-G5F W bracket	R99-07G5D E bracket; P7LF-D adapter; P7LF-06 front connecting socket
Approved standards	UL, CSA, VDE	UL, CSA, TUV, CE	UL, CSA, VDE, CE

	General Purpose	
		
	MGN	**MJN**
Dimensions mm (in)	Short Base: 55.88 H x 63.50 L x 63.50 W (2.20 x 2.50 x 2.50) Long Base: 60.45 H x 84.33 L x 63.50 W (2.38 x 3.32 x 2.50)	48.38 H x 35.56 L x 38.73 W (1.91 x 1.40 x 1.53)
Switching	30 A max.	30 A max.
Features	• 30 Amp heavy duty power relay • Class F coil insulation system for 155°C (311°F) total temperature • Coil molded in DuPont Rynite® for environmental protection • Rugged construction rivets terminals to base	• Rugged power driver offers superior 3/16" through-air and 3/8" over-surface spacing • Interlocked frame and contact block prevent contact misalignment during plug-in • Open or dust covered available with indicator lamps and push-to-operate buttons
Contact Ratings		
Contact form	–	1 Form C, 2 Form C, 3 Form C (non-latching); 1 Form C, 2 Form C (latching/unlatching)
Contact type	Single button	Single button
Contact material	5/16" diameter Ag Alloy	3/16" diameter Ag Alloy
Max. operating current under resistive load	–	–
Max. operating voltage	–	–
Max. switching capacity under resistive load	–	–
Minimum permissible load	–	–
Rated load (under resistive load)	30 A or 1-1/2 HP at 120 or 240 VAC; 2 HP at 240 VAC; 3,600 W at 120 or 240 VAC (ballast); 30 A at 240 VAC, 100,000 cycle (resistive), 20 A at 600 VAC; 30 A at 28 VDC	10 A at 28 VDC and 120/240 VAC at 80% pf; 1/3 HP at 120 VAC; 1/2 HP at 277/240/480/600 VAC 36 LRA-8.5FLA at 18 VDC; 3 A at 480/600 VAC at 80% pf; 10 A at 277 VAC resistive; 20 A at 28 VDC and 120/240/277 VAC; 10 A at 480/600 VAC; 3/4 HP at 120 VAC; 1-1/2 HP at 240 VAC, 17 FLA, 65 LRA, 300 VDC; 30 A at 28 VDC; 15 A at 480/600 VAC; 1 HP at 120 VAC; 1-1/2 at 240 VAC
Coil Ratings		
Coil voltage	6, 12, 24, 120, 240, 480 VAC; 6, 12, 24, 48, 110 VDC	6, 12, 24, 120, 240 VAC; 5, 6, 24, 48, 110 VDC
Power consumption	9.5 VA nominal (AC); 2 W nominal (DC)	Latching/Non-latching AC 1.7 VA nominal (1, 2PDT); 2.0 VA (3PDT) Non-latching DC 1.2 W nominal
Dielectric strength (50/60 Hz for 1 minute)	2200 VRMS, 60 Hz between contacts; 2200 VRMS, 60 Hz between other elements	Greater than 750 VAC, RMS 60 Hz across open contacts; greater than 2500 VAC, RMS 60 Hz all other mutually insulated elements
Electrical service life (operations)	100,000 minimum	100,000 minimum
Terminal choices	Screw type	Quick-connect
Accessories	Dust Cover - sealed knock-out holes for standard conduit fittings. Relay mounts on pre-drilled base. Constructed of aluminum. Snap action cover release 127 W x 76.20 H x 101.60 D (5 x 3 x 4)	PTF11PC Socket; PTF11QDC Socket; PTF21PC Socket; PTFPCB Socket; PYMJN-PCB Hold Down Springs; PYMJN-S Hold Down Springs
Approved standards	UL recognized	UL, CSA

Socket Selection - Quick Reference Chart



Relay Type	Track Mount Sockets	Back Connecting Sockets	
		Solder terminals	PCB terminals
G2R-1-S	P2RF-05 P2RF-05-E P2RF-05-S	P2R-05A	P2R-05P
G2R-2-S	P2RF-08 P2RF-08-E P2RF-08-S	P2R-08A	P2R-08P
LY1, LY2	PTF08A-E	PT08	PT08-0
LY3	PTF11A	PT11	PT11-0
LY4	PTF14A-E	PT14	PT14-0
MK2	PFO83A-E	PL08	PLR08-0
MK3	PF113A-E	PL11	PLE11-0
MY2	PYF08A-E PYF08A-N PYF08-S	PY08	PY08-02
MY3	PYF11A	PY11	PY11-02
MY4	PYF14A-E PYF14A-N PYF14S	PY14	PY14-02
MY2K	PYF14A-E	PY14	PY14-02
MY4(Z)H	PYF14A-E	–	–

NOTES:
1. -E and -N models are finger-protect construction. Round terminals cannot be used. Use Y-shaped terminals.
2. -S types are screwless terminal styles.

Relay Type	Mounting Bracket	Track Mount Adaptor	Track Mount Socket
G7J-(ALL)	R99-04-FOR-G5F W bracket	–	–
G7L-1A-T	R99-07G5D E bracket	P7LF-D	P7LF-06
G7L-1A-TJ			P7LF-06
G7L-1A-B			–
G7L-1A-BJ			–
G7L-2A-T			P7LF-06
G7L-2A-TJ			P7LF-06
G7L-2A-B			–
G7L-2A-BJ			–

Mounting Track	Length
PFP-100N	1 meter
PFP-50N	.5 meter

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