

Industrial Automation Selection 2016



Components & Systems for Automation

Welcome to our world

Our best-in-class devices for your automation system

Welcome to Omron's world of advanced industrial automation. The INDUSTRIAL AUTOMATION SELECTION is your essential tool to select best-in-class devices for your automation system. It highlights our core competence in sensing, control, visualisation, motion and panel components.

Of course, Omron offers a much larger range of products than you can find in this catalogue. For more products and information on services and company competence visit our website.

Here you will find:

- Latest product news
- Technical product specifications
- 2D / 3D CAD Library
- Customer references
- Technology concepts
- Supporting product documentation
- Knowledge Base - "myOmron"
- Events Calendar
- Contact information

Find information fast!

Quick Links shortens your search. Quick Links are unique codes assigned to Omron products listed in this guide. Enter Quick Link codes in the search box on industrial.omron.eu to access detailed information on products in this guide.



Quick Link

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“To the machine the work of the machine,
to man the thrill of further creation.”

Kazuma Tateisi, founder of Omron

Omron at a glance

200.000 products ranging
input, logic and output

Sensing, Control Systems, Visualization, Drives, Robots, Safety,
Quality Control & Inspection, Control and Switching Components

7%

Investment in Research & Development

Innovation track
record of 80 years

Top 150 global patent assignee

1.200 employees dedicated to R&D

11.000 + issued and pending patents

37.000

Employees worldwide

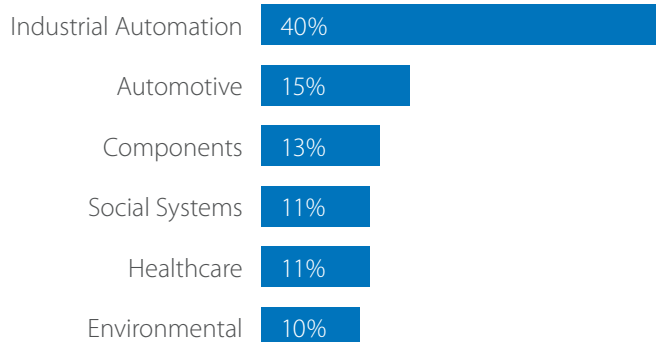
210

Locations worldwide

22

Countries in EMEA

Working for the
benefit of society



Close to your needs

Technical training & seminars, technical support, Automation Technology Centers, online community (MyOmron), online catalogues and technical documentation, customer service & sales support, inter-operability labs (Tsunagi), safety services, repairs.

Your needs, our focus

Solutions perfectly matching your needs

We asked ourselves: 'What do you need in sensors and components?' Well, first you need reliability. Then a variety and choice of performance levels. You may also want advanced functionality, with special features defined by you – or you may want standardized solutions, with highly competitive prices.

Whatever it is, it can all add up to a wish list that is difficult to fulfil. Until now. That's because our new 361° Approach not only provides a complete all-round offer without gaps, it also puts you at the very centre of the product selection process. It's an approach that leads to a Perfect Match – one with the extra degree of confidence that comes from choosing Omron.

361° in one view



Quality



Line-up



Application



Customization



Global availability



Specs

	Quality	Line-up	Application	Customization	Global availability	Specs
PRO^{plus}	Premium	Tailored	Special	Yes	Yes	Application oriented
PRO	Premium	Complete	Advanced	Yes	Yes	Above Standard
LITE	Premium	Standard	Basic	No	No	Basic
	'Quality' refers to the standard of manufacturing and the materials used – this translates into reliability	'Line-up' refers to the number of model types	'Application' indicates the complexity of the automation	'Customization' is the possibility to modify the product		'Specs' refers to the choice of performance levels

The extra degree of advantage

Three distinct lines of sensors and components

Three distinct lines

361° Approach offers three distinct lines within each sensor or component product category. LITE products are cost-effective without any compromise in quality. PRO products represent the “install & forget” option, offering longer lifetime, higher protection, and more features. While PROplus products are designed for specific applications or customer demands.

Optimized reliability

All three lines are backed by the Omron commitment to quality, so even when you need a price-competitive advantage, you can be confident that they will never let you down.

Solutions that perfectly match your needs

The 361° Approach ensures that you can quickly and easily identify the perfect match solution to your needs – nothing more, nothing less.

Optimized costs

Your sensor and component costs are also minimized – because it eliminates over-specification.

Why an extra 1°?

The extra degree is what you get when you do business with Omron, and that means different things to different customers – all depending on their needs. For example, if you need specification advice, the extra degree is ‘service’. But ultimately, to everyone it means “an extra degree of confidence in the perfect match”.



Sysmac: A fully integrated platform

Integration and Functionality

Sysmac is an integrated automation platform dedicated to providing complete control and management of your automation plant. At the core of this platform, the Machine Controller series offers synchronous control of all machine devices and advanced functionality such as motion, robotics and database connectivity. This multidisciplinary concept allows you to simplify solution architecture, reduce programming and optimize productivity.



Machine Automation Controller

FACTORY
AUTOMATION

MACHINE
CONTROL



Motion



Filling line

- Motion Control: Integrated within the IDE, and operating in real-time
- Standard PLCopen Function Blocks plus Omron generated motion FB's
- Direct Synchronous control for Position, Speed and Torque



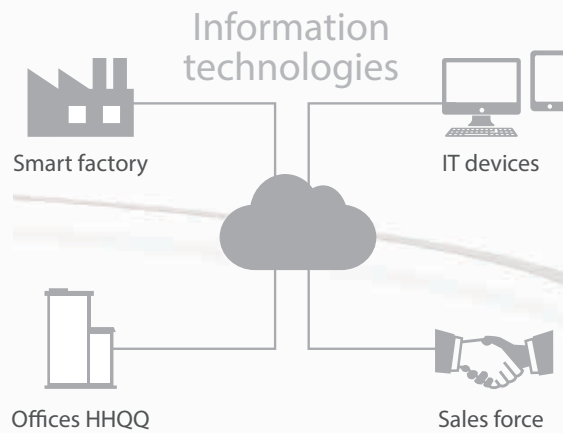
Safety



Assembly

- All safety related data is synchronized with the whole network
- Safety functions such as muting, guard locking, EDM and valve monitoring are simple to manage

- ✓ **One Integrated Development Environment software** for Configuration, Programming, Simulation and Monitoring



Information



Pills blister packing

- Sysmac communicates in real-time with Databases such as SQL
- Secure Data: In the event of a server going down or losing communications, data is automatically stored in internal memory
- Sysmac operates with Databases at high speed [1000 table element/ 100 ms] ensuring realistic Big Data Processing to improve productivity and aid predictive maintenance etc.

✓ Integrated Automation Control:

The Sysmac platform is scalable and provides the performance and functionality for a wide range of solutions from simple machines through to manufacturing cells

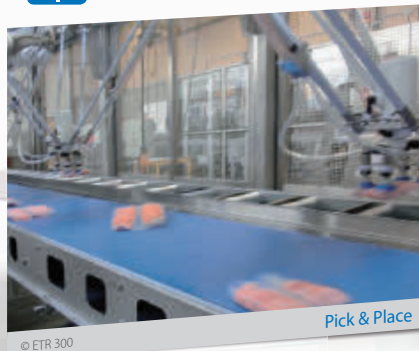
Vision



Quality inspection

- Higher resolution images available without increasing the vision processing time
- Shape search technology: Provides more stable and accurate object detection for Pick & Place projects

Robotics



Pick & Place

- Up to 8 Delta robots with one controller
- Time-based Robotic Function Blocks make programming easier

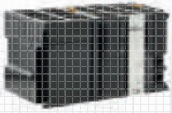
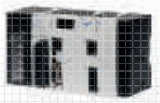
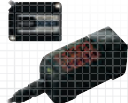
Sensing



Presence detection of the rubber seal

- Full control of the process parameter setting and predictive maintenance functions
- High precision detection and positioning data synchronized on the network

Product selection table

Automation systems	 10 Machine automation controller	 14 Programmable logic controllers (PLC)	 18 Remote I/O	 22 Human machine interfaces (HMI)
Motion & Drives	 32 Motion controllers	 36 Servo systems	 54 Robots	 58 Frequency inverters
Sensing	 78 Photoelectric sensors	 110 Mark and Color sensors	 116 Lightcurtains and area sensors	 120 Fiber optic sensors and amplifiers
Quality control & Inspection	 164 Inspection & Ident systems	 178 Measurement sensors		
Safety	 184 Emergency stop and control devices	 194 Safety limit switches	 202 Safety door switches	 226 Safety sensors
Control components	 280 Temperature controllers	 294 Power supplies	 306 Uninterruptible power supplies (UPS)	 314 Timers
Switching components	 350 Electromechanical relays	 362 Solid state relays	 372 Low voltage switchgear	 388 Monitoring products
Software	 408 Software			



136 Inductive sensors



148 Mechanical sensors/Limit switches



156 Rotary encoders



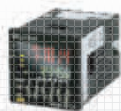
162 Cable connectors



264 Safety logic control systems



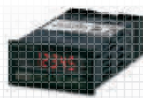
276 Safety outputs



324 Counters



334 Programmable relays



338 Digital panel indicators



342 Energy monitoring devices



346 Photovoltaic



396 Pushbutton switches

Machine automation controller

NX7/NJ-SERIES MACHINE AUTOMATION CONTROLLER

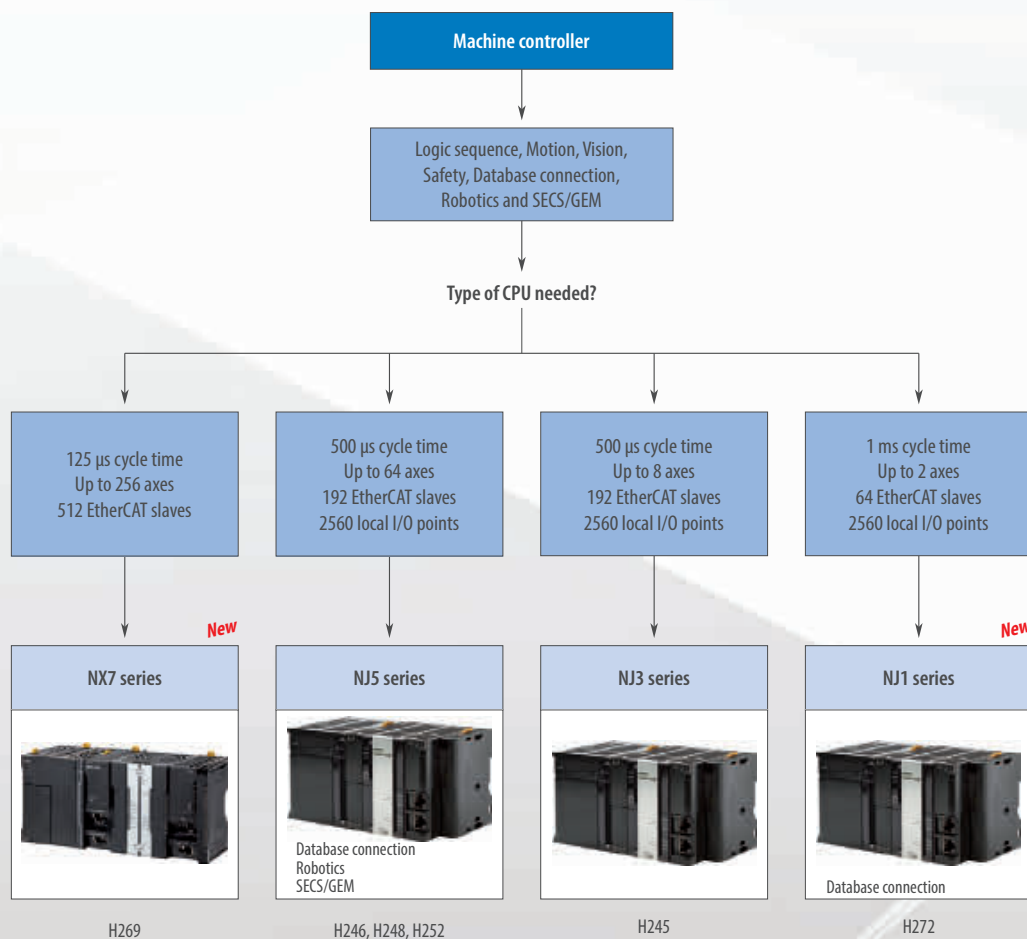
Complete and robust machine automation

The Machine Automation Controller is at the heart of the Sysmac platform. One integrated machine controller that offers speed, flexibility, scalability of software and a centric architecture without compromising on the traditional reliability and robustness that you have come to expect from Omron PLCs. The Machine Controller is designed to meet extreme machine control requirements in terms of fast and accurate motion control, accuracy, communication, security and system robustness. You just create...

- Fastest cycle time: 125 µs
- Up to 256 synchronized axes
- Fully conforms with IEC 61131-3 standards
- PLCopen Function Blocks for Motion Control
- Advanced motion with Robotics functionality
- Built-in EtherCAT and EtherNet/IP ports



SYSMAC
always in control



	Machine automation controller			
				
Model	NX7	NJ5	NJ3	NJ1
Fastest cycle time	125 µs	500 µs	500 µs	1 ms
Number of axes	256, 128	64, 32, 16	8, 4	2, 0
Task	Multi-tasking program			
Motion core	2 synchronized motion cores	Synchronized motion core		
Functions	- Logic sequence - Motion	- Logic sequence - Motion - Robotics - Database connection - SECS/GEM	- Logic sequence - Motion	- Logic sequence - Motion - Database connection
Software tool	Sysmac Studio			
Programming languages	- Ladder - Structured Text - In-Line ST			
Standard programming	- IEC 61131-3 - PLCopen Function Blocks for Motion Control			
Program capacity	80 MB	20 MB	5 MB	3 MB
SD memory card	SD and SDHC memory card			
Built-in port	- EtherNet/IP - EtherCAT - USB 2.0			
EtherCAT slaves	512	192		64
Servo drive	Accurax G5/EtherCAT			
Motion control	- Axes groups interpolation and single axis moves - Electronic cams and gearboxes - Direct position control for axis and groups			
Robotics	–	Up to 8 Delta robot control	–	
Supported SQL servers	–	- Microsoft SQL Server - Oracle - IBM DB2 - MySQL - Firebird	–	- Microsoft SQL Server - Oracle - IBM DB2 - MySQL - Firebird
Local I/O points	–	2560		
Mounting	DIN rail			
Global standards	CE, cULus	CE, cULus, NK, LR		
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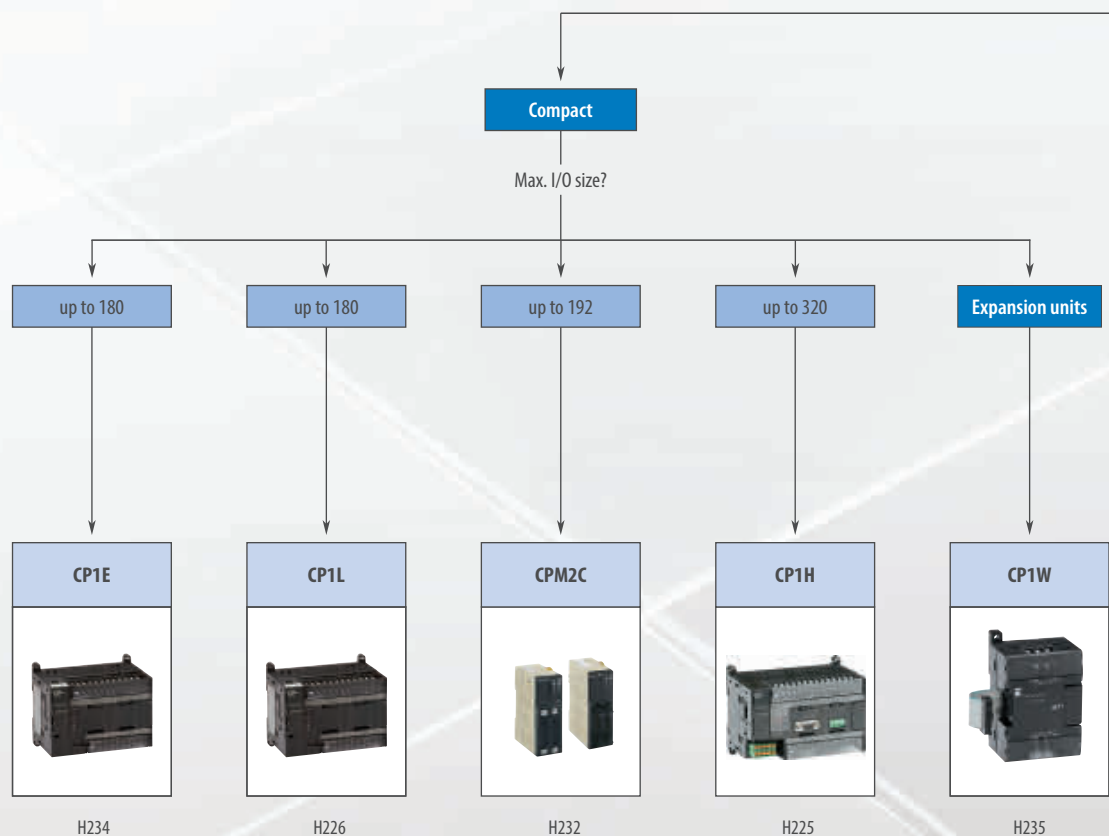
Programmable logic controllers (PLC)

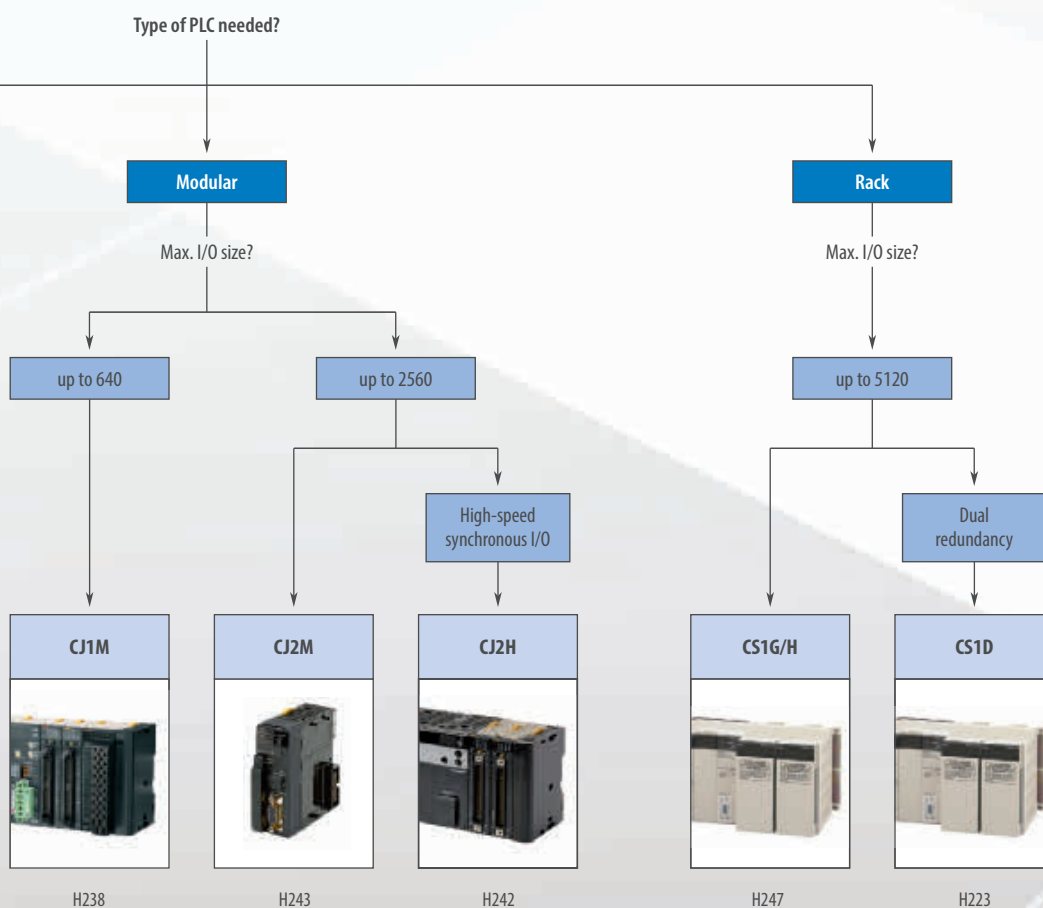
KNOW ONE ... KNOW THEM ALL!

Whether your automation requires a simple and economical solution, or your target is advanced, high-speed control, you can find what you need in Omron's line-up of Programmable Controllers.

And if your systems grow, or change due to market demand, you will find that only Omron offers a full range of Compact PLCs and Modular PLCs that share the same architecture. Therefore your programs are fully upward compatible, both in memory allocation and instruction set.

- One scalable PLC family to always match exactly with your application
- Transparent communication routing through different networks
- The best size/performance ratio in the industry





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Selection table

Compact PLC series					
					
Model		CPM2C	CP1E	CP1L	CP1H
Max digital I/O points* ¹		192	180	180	320* ²
Built-in	Digital I/O	10 to 32	10 to 60	10 to 60	20 or 40
	Interrupt inputs	2 or 4	4 or 6	2, 4, or 6	6 or 8
	Counter inputs	2 or 4	5 or 6	4	2 or 4
	Pulse outputs* ¹	2	2	2	2 or 4
CPU features* ¹		Compact size Expansion units Quick-response inputs High-speed counter Pulse output with PWM RS-232C port Real time clock	USB port Expansion I/O units Quick-response inputs High-speed counter Pulse output with PWM RS-232C port RS-485 port Real time clock 2 Analog adjusters See Analog I/O section	USB or Ethernet port Expansion I/O units Quick-response inputs High-speed counter Pulse output with PWM Up to 2 serial option boards Real time clock 1 Analog adjuster See Analog I/O section	USB port Expansion I/O units CJ-series Special I/O Units CJ-series CPU Bus Units Quick-response inputs High-speed counter Pulse output with PWM RS-232C port Option board slots Real time clock 1 Analog adjuster LED display, 2 digit See Analog I/O section
Instruction Execution time (bit instruction)		0.64 µs	1.19 µs	0.55 µs	0.10 µs
Program memory		4K words	2 or 8K steps	5 or 10K (+10K Function block) steps	20K steps
Data memory		2K words	2 or 8K words	10 or 32K words	32K words
External memory		Expansion memory unit	–	Memory cassette	Memory cassette
Analog I/O		Analog I/O unit Temperature sensor unit	Built-in for E-NA model (2 in + 1 out) Analog I/O Expansion Units Temperature Input Expansion Units	Built-in for EL/EM model (2 inputs) Analog I/O Expansion Units Temperature Input Expansion Units	Built-in for XA model (4 in + 2 out) Analog I/O Expansion Units Temperature Input Expansion Units CJ Analog I/O Units CJ Temperature Units
Special function units		–	–	–	CJ-series Special I/O Units CJ-series CPU Bus Units
Fieldbus master		–	ModBus	Ethernet ModBus	Ethernet EtherNet/IP Controller Link DeviceNet PROFIBUS-DP PROFINET ModBus CompoNet CompoBus/S CAN (freely configurable)
Fieldbus I/O		CompoBus/S DeviceNet	PROFIBUS-DP CompoBus/S DeviceNet	PROFIBUS-DP CompoBus/S DeviceNet	PROFIBUS-DP CompoBus/S DeviceNet
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*¹ Some features listed are not available for all CPU types within each series. Please review specifications for more information on CPU features and performance.

*² Represents local I/O capacity. If a fieldbus master is used more I/O is possible.

		Modular PLC series			Rack PLC series	
						
Model		CJ1M/G	CJ2M	CJ2H	CS1G/H	CS1D
Max. digital I/O points*1		1280	2560	2560	5120	5120
Built-in*1	Digital I/O	16	–			
	Interrupt inputs	4	–			
	Counter inputs	2	–			
	Pulse outputs	2	–			
CPU features*1		Compact size No backplane required Large program capacity Easy backups Built-in pulse I/O Loop control CPU type Real time clock	USB port Ethernet/IP port High-speed I/O units Option board plug-in Structures and arrays Tag data links Compact size No backplane required Large program capacity Function Block memory Easy backups Real time clock	USB port Ethernet/IP port High-speed I/O units Structures and arrays Tag data links Synchronous I/O Compact size No backplane required Extra Large program capacity Easy backups Real time clock	High I/O capacity Inner board support Large program capacity Backwards compatible Easy backups Real time clock	Redundant CPU Redundant power supply Hot swapping High I/O capacity Inner board support Large program capacity Backwards compatible Easy backups Real time clock
Instruction Execution time (bit instruction)		0.10/0.04 µs	0.04 µs	0.016 µs	0.04/0.02 µs	0.04/0.02 µs
Program memory		5 to 60K steps	5 to 60K steps	50 to 400K steps	10 to 250K steps	10 to 250K steps
Data memory		32 to 128K words	64 to 160K words	160 to 832K words	64 to 448K words	64 to 448K words
CompactFlash memory		Up to 512 MB				
Analog I/O		Analog I/O unit Temperature sensor unit Temperature control unit				
Special function units		Temperature control High-speed counters (500 kHz) SSI encoder input Position control Protocol macro RFID sensor unit Weighing unit Data collection & storage unit	Temperature control High-speed counters (500 kHz) SSI encoder input Position control Protocol macro RFID sensor unit High-speed I/O Synchronised Position Data collection & storage unit	Temperature control High-speed counters (500 kHz) SSI encoder input Position control Motion control Process control Protocol macro RFID sensor unit Data collection & storage unit		
Fieldbus master		Ethernet EtherNet/IP Controller Link DeviceNet PROFIBUS-DP PROFINET ModBus CompoNet CompoBus/S CAN (freely configurable)				
Fieldbus I/O		DeviceNet PROFIBUS-DP CAN (freely configurable)				
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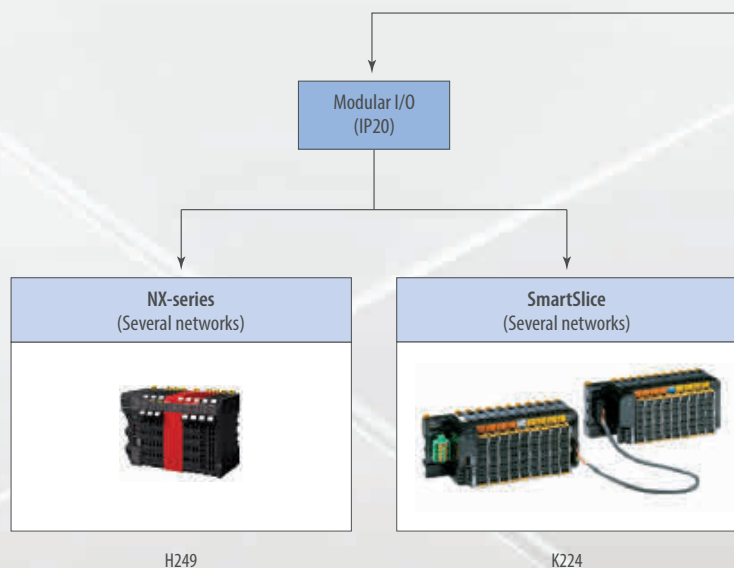
*1 Some features listed are not available for all CPU types within each series. Please review specifications for more information on CPU features and performance.

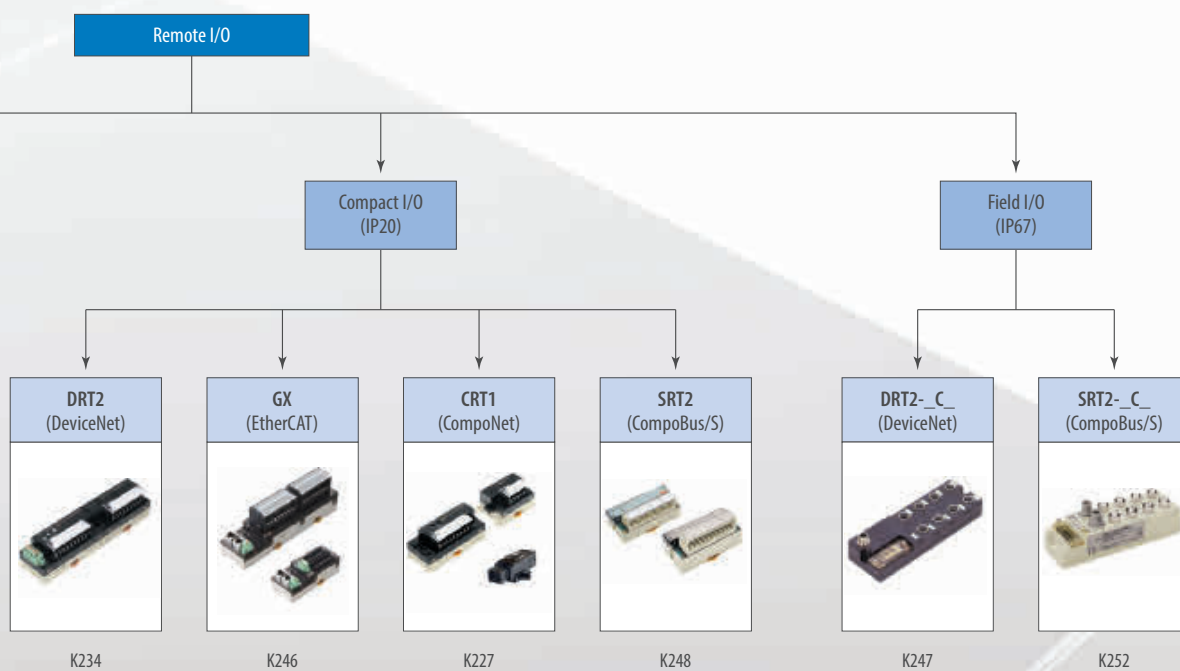
I/O SYSTEMS TO MEET EVERY NEED

Choose by network, style and flexibility

Compact remote I/O units combine a fixed number of I/O points in a space-saving housing. Built-in smart monitoring functions for voltage level, broken wire, actuator and cycle time will assist in planning preventive maintenance for machines and eliminating costly downtime. Compact smart slaves are available for the open EtherCAT, DeviceNet and CompoNet networks whilst Omron's CompoBus/S offers a more simple and cost-efficient solution.

Modular remote I/O systems offer the possibility to install just the right number and type of I/O's where you need them. I/O modules range from basic and economical digital I/O's to high-performance modules with intelligent functions. With a choice of communication couplers for various open networks, you can adapt to existing installations and end-user demands, or make the right trade-off between performance and ease-of-use. Besides EtherCAT as main machine automation network, Omron offers connectivity to EtherNet/IP, DeviceNet, CompoNet, PROFINET IO, PROFIBUS DP, and MECHATROLINK-II.





	Modular I/O		Compact I/O		
					
Model	NX-series	SmartSlice	GX	DRT2	CRT1
Network connection	EtherCAT in- and outgoing connections by RJ45 ethernet ports, EtherNet/IP with built-in Ethernet switch and 2 RJ45 ports	DeviceNet, CompoNet, PROFIBUS DP, PROFINET I/O, EtherCAT, MECHATROLINK-II	EtherCAT in- and outgoing connections by RJ45 ethernet plug	DeviceNet with open-style push-in terminal block	CompoNet, unshielded 4-wire flat cable and IDC connectors, or general-purpose 2-wire cable by screw terminals
I/O types	Digital standard and high-speed synchronous, analog standard and high-speed, temperature, encoders, pulse output, safety I/O	Digital I/O, analog I/O, temperature inputs, high-speed counter with control outputs	8 DI + 8 DO 16 DI+extension 16 DO+extension 16 relay out 4 AI (V/I) 2 AO (V/I) Incremental encoder (24 V/line driver)	8/16 DI+extension, 8/16 DO+extension, 8 DI + 8 DO 16 relay out, 4 AI (V/I, TC, Pt100), 2 AO (V/I),	8/16 DI+extension, 8/16 DO+extension, 8 DI + 8 DO 4 AI, 2 AO, 2 DI, 2 DO
I/O connection technology	Push-in wiring on removable terminal block, MIL connectors, M3 screw terminals and Fujitsu connectors	Push-in wiring on removable terminal block	M3 screw terminals (1- or 3-wire DI)	M3 screw terminals (1- or 3-wire DI)	M3 screw terminals
Smart features	Synchronous I/O and time-stamping on EtherCAT, safety I/O	I/O and power supply diagnostics, operation timers and counters per I/O point	Automatic or fixed address allocation	I/O and power supply diagnostics, operation timers and counters per I/O point, analog value calculations and alarms	I/O and power supply diagnostics, operation timers and counters for each I/O point, analog value calculations and alarms
Ingress Protection class	IP20 (DIN rail mounting in cabinets)	IP20 (DIN rail mounting in cabinets)	IP20 (DIN rail mounting in cabinets)	IP20 (DIN rail mounting in cabinets)	IP20 (DIN rail mounting in cabinets)
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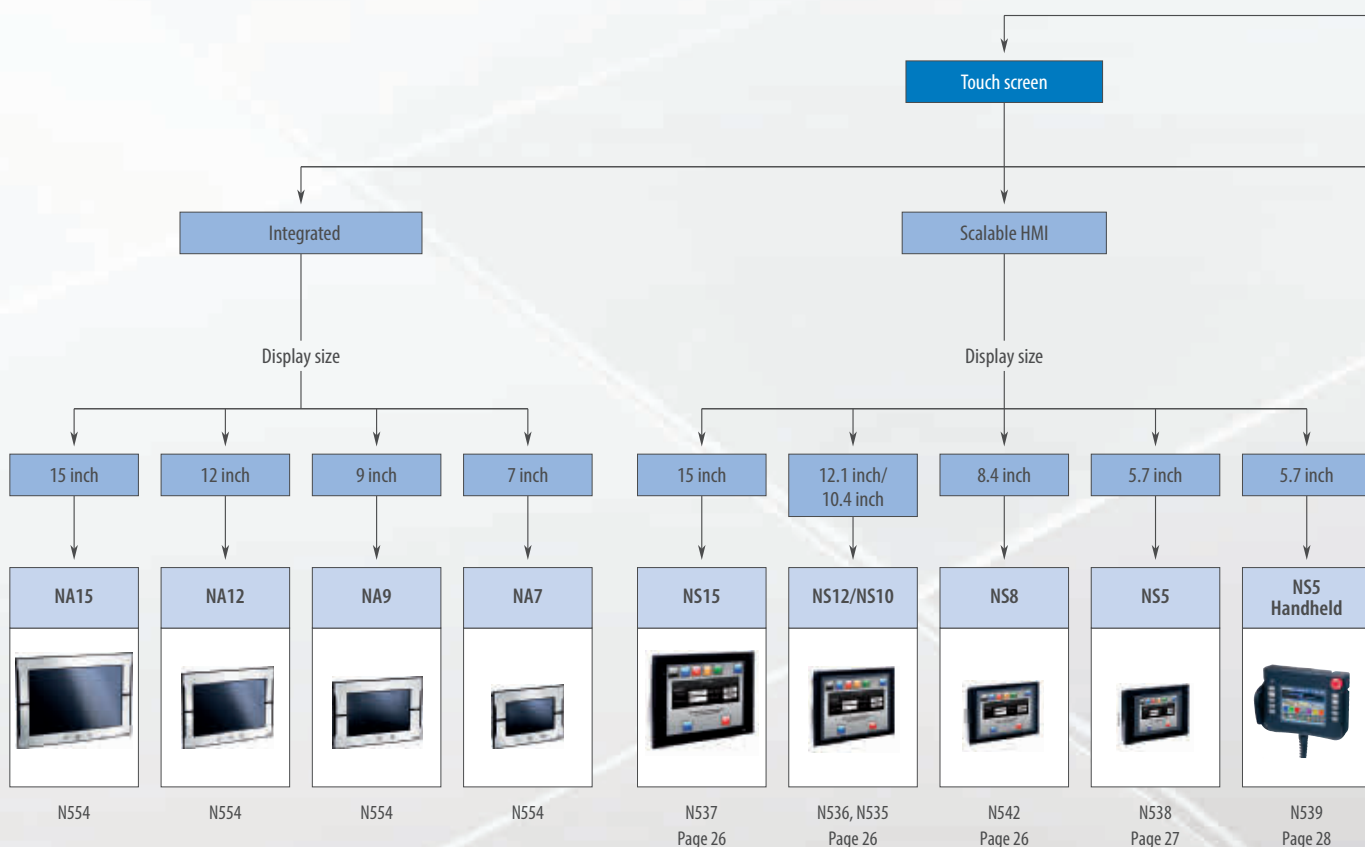
	Compact I/O	Field I/O	
			
Model	SRT2	DRT2- _C_	SRT2- _C_
Network connection	CompoBus/S, (2-wire + power) by M3 screw terminals	DeviceNet with M12 micro connector	CompoBus/S, by 4-wire M12 connector, unshielded
I/O types	4/8/16 DI, 4/8/16 DO, 8/16 relay out, 4 AI (V/I) 2 AO (V/I)	8/16 DI, 8/16 DO, 8DI + 8 DO	4/8 DI, 4/8 DO
I/O connection technology	M3 screw terminals (1- or 3-wire DI)	M12, 1 or 2 I/O signals per connector, 7/8" I/O Power connector	M12 connectors, one I/O point per connector
Smart features	I/O isolation, status indication	I/O and power supply diagnostics, operation timers and counters per I/O point	I/O isolation, status indication
Ingress Protection class	IP20 (DIN rail mounting in cabinets)	IP67, flat mounting by two M5 screws	IP67, flat mounting by three M5 screws
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Human machine interfaces (HMI)

NA AND NB SERIES

If you are looking for a smart and dependable HMI for use with our compact and modular PLC's, look no further than the NB series. It offers you - among various other features – an LED backlighted TFT LCD, a portrait and landscape mode and USB memory stick support. It is available with screen sizes from 3.5 to 10 inches.

For faster, more efficient control and monitoring, the scalable NA series HMI offers a more natural, proactive machine/operator environment that will evolve to meet your ever-changing needs. Based on the Sysmac Platform, the NA series is fully aware of the total machine and brings together all areas of automation including: logic, motion, vision, safety and visualization. It gives you a clear view in one integrated project. The high resolution wide screens are available in 7" and 9" (800 × 480 pixel) as well as 12" and 15" (1280 × 800 pixel)





Interaction type

Function keys

Compact HMI

Display size

10.1 inch

7 inch

5.6 inch

3.5 inch

NB10W

NB7W

NB5Q

NB3Q

4 lines

2 lines

NT11

NT25

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Selection table

Integrated HMI				
				
Model	NA15	NA12	NA9	NA7
Display	15 inch widescreen TFT color	12 inch widescreen TFT color	9 inch widescreen TFT color	7 inch widescreen TFT color
Resolution	1280 × 800 pixels	1280 × 800 pixels	800 × 400 pixels	800 × 400 pixels
Colors	24 bit	24 bit	24 bit	24 bit
Communication	3 × USB 2 × Ethernet 1 × RS-232 SD Card 24 VDC	3 × USB 2 × Ethernet 1 × RS-232 SD Card 24 VDC	3 × USB 2 × Ethernet 1 × RS-232 SD Card 24 VDC	3 × USB 2 × Ethernet 1 × RS-232 SD Card 24 VDC
Dimensions in mm (H×W×D)	420×291 391×267 (cut-out)	340×244 309×220 (cut-out)	290×190 260×165 (cut-out)	236×165 196×140 (cut-out)
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Scalable HMI						
						
Model	NS15	NS12	NS10	NS8	NS5	NS5 handheld
Display	15 inch TFT color	12.1 inch TFT color	10.4 inch TFT color	8.4 inch TFT color	5.7 inch TFT color	5.7 inch STN color
Resolution	1024 × 768 pixels (XGA)	800 × 600 pixels (SVGA)	640 × 480 pixels (VGA)	640 × 480 pixels (VGA)	320 × 240 pixels (QVGA)	320 × 240 pixels (QVGA)
Number of colors	256 (32,768 for image data)	256 (32,768 for image data)	256 (32,768 for image data)	256 (32,768 for image data)	256 (32,768 for image data)	256 (4,096 for image data)
Memory Size	60 MB screen memory	60 MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60 MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60 MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60 MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60 MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory
Options	Controller Link, Video input board (NS-CA002)	Ethernet, Controller Link, Video input board (RGB/Composite)	Ethernet, Controller Link, Video input board (RGB/Composite)	Ethernet, Video input board (RGB/Composite)	Ethernet	RS-232 or RS-422 communication depending on cable
Dimensions in mm (H×W×D)	300×400×80	241×315×48.5	241×315×48.5	177×195×48.5	142×195×54	176×223×70.5 (excl. emergency button)
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Compact HMI				
				
Model	NB10W	NB7W	NB5Q	NB3Q
Display	10.1 inch Wide TFT LCD	7 inch Wide TFT LCD	5.6 inch TFT LCD	3.5 inch TFT LCD
Resolution	800 × 480 pixels	800 × 480 pixels	320 × 234 pixels	320 × 240 pixels
Number of colors	65,536	65,536	65,536	65,536
Memory	128 MB (including system area)	128 MB (including system area)	128 MB (including system area)	128 MB (including system area)
Communication ports	Serial Communication	1 × RS-232C & 1 × RS-232C/422A/485	1 × RS-232C & 1 × RS-232C/422A/485	1 × RS-232C/422A/485
	USB (USB Host only on TW01 model)	1 × USB Host & 1 × USB Slave	1 × USB Host & 1 × USB Slave	1 × USB Host & 1 × USB Slave
	Ethernet	1 × Ethernet	1 × Ethernet (TW01 model)	1 × Ethernet (TW01 model)
Dimensions in mm (H×W×D)	210.8×268.8×54.0	148×202×46	142×184×46	103.8×129.8×52.8
Page/Quick Link	30/N547	30/N548	30/N549	30/N552

Function-key HMI				
				
Model	NT11	NT25		
Type of Display	LED backlight LCD	LED backlight LCD		
Number of F-keys	22	6 or 20 depending on model		
Number of characters	20 × 4 lines	16 × 2 lines		
Printer connection	Yes	Depending on model		
Number of screens	250	65,000 (limited by memory)		
Size in mm (H×W×D)	113×218×38.2	6 F-keys 60×109×43 20 F-keys 107×107×43		
Page/Quick Link	N526	N527		



One-touch machine management

The NS-series is our advanced HMI series that covers a large range from 5.7" Monochrome STN to 15" TFT. Easily programmed it offers advanced features like, multiple communication possibilities, good synergy with our PLC's and other devices with Ladder monitor, Smart Active Parts and proven reliability.

- Perfect clarity and fast switching screens
- Extremely long backlight life (up to 50,000 hours)
- Support all European languages, Asian and Cyrillic
- Easy data logging on compact flash
- Large Memory size (60 MB)
- Support for several non-Omron PLC's

Ordering information

Type			Order Code
TFT, 15", 1024 x 768 pixels	with Ethernet	Black	NS15-TX01B-V2
		Silver	NS15-TX01S-V2
TFT, 12", 800 x 600 pixels	no Ethernet	Black	NS12-TS00B-V2
		Ivory	NS12-TS00-V2
	with Ethernet	Black	NS12-TS01B-V2
		Ivory	NS12-TS01-V2
TFT, 10", 640 x 480 pixels	no Ethernet	Black	NS10-TV00B-V2
		Ivory	NS10-TV00-V2
	with Ethernet	Black	NS10-TV01B-V2
		Ivory	NS10-TV01-V2
TFT, 8.4", 640 x 480 pixels	no Ethernet	Black	NS8-TV00B-V2
		Ivory	NS8-TV00-V2
	with Ethernet	Black	NS8-TV01B-V2
		Ivory	NS8-TV01-V2

Note: For the accessories, please refer to page 29

Specifications

Item	NS15	NS12	NS10	NS8
Display type	15 inch color TFT	12 inch color TFT	10 inch color TFT	8 inch color TFT
Display resolution	1024×768 (XGA)	800×600 (SVGA)	640×480 (VGA)	
Number of colors	256 (32,768 for image data)			
Backlight	2×CCFL	1×LED		
Backlight lifetime	Min. 50000 hours			
View angle	Left/right ±85°, Top 70°, Bottom 80°	Left/right ±60°, Top 45°, Bottom 75°	Left/right ±60°, Top 35°, Bottom 65°	Left/right ±65°, Top 50°, Bottom 60°
Touch panel	Analog resistive touch	Matrix resistive touch		
Number of functional keys	3	—		
Dimensions in mm (H×W×D)	304×405×75.8	241×315×48.5		177×232×48.5
Weight	4.2 kg max.	2.5 kg max.		2.0 kg max.
Screen data capacity	60 MB			
Internal memory	Bit memory: 32,767 bits, Word memory: 32,767 words, Retentative memory: 8,192 bits and 8,192 words.			
Memory card interface	1 slot ATA Compact Flash card			
Printer connection	PictBridge support			
Serial (COM1)	1×RS-232			
Serial (COM2)	1×RS-232/422/485	1×RS-232		
USB Slave	For programming & printing			
Ethernet	IEEE 802.3u 10Base-T/100Base-TX			
Expansion module	Optional network/video unit			Optional video unit
Line voltage	24 VDC ±15%			
Power consumption	45 W max.	25 W max.		
Battery	CJ1W-BAT01			
Battery lifetime	5 years (at 25°C)			
Enclosure rating (front side)	IP65F (equivalent to NEMA4)			
Obtained standards	UL 1604 Class 1 Diff. 2, cUL, CE, Lloyds, DNV			
Operating environment	No corrosive gases			
Noise immunity	Conforms to IEC61000-4-4, 2 KV (power lines)			
Ambient operating temperature	0 to 50°C ^{*1}			
Ambient operating humidity	35% to 85% (0 to 40°C) with no condensation, 35% to 60% (40 to 50°C) with no condensation			

*1 see manual for details.



More power, smaller size

The smallest NS HMI is available in two brightness variations, both with a vivid color TFT touchscreen. It is equipped with a USB connection for project download/upload and the possibility to communicate over Ethernet. One great advantage with the NS is that you can make use of Omron's unique Smart Active Parts (SAP) that save you time when configuring, commissioning and maintaining your machine. SAP are pre-programmed, pre-tested visualisation objects with embedded communication code, bringing 'drag and drop' simplicity to HMI design.

- Perfect clarity and fast switching screens
- Extremely long backlight life (up to 75,000 hours)
- Support all European languages, Asian and Cyrillic
- Easy data logging on compact flash
- Large Memory size (60 MB)
- Support for several non-Omron PLC's

Ordering information

Type				Order Code
NS5-TQ	TFT, 5.7", 320×240 pixels	no Ethernet	Black	NS5-TQ10B-V2
			Ivory	NS5-TQ10-V2
		with Ethernet	Black	NS5-TQ11B-V2
			Ivory	NS5-TQ11-V2
NS5-SQ	TFT, 5.7", 320×240 pixels	no Ethernet	Black	NS5-SQ10B-V2
			Ivory	NS5-SQ10-V2
		with Ethernet	Black	NS5-SQ11B-V2
			Ivory	NS5-SQ11-V2

Note: For the accessories, please refer to page 29

Specifications

Item	NS5-TQ	NS5-SQ
Display type	5.7 inch color TFT	
Display resolution	340×240 (QVGA)	
Number of colors	256 (32,768 for image data)	
Backlight	LED	
Backlight lifetime	Min. 75000 hours	
View angle	Left/right ±80°, Top 80°, Bottom 60°	
Touch panel	Matrix resistive touch	
Number of functional keys	–	
Dimensions in mm (H×W×D)	142×195×54	
Weight	1.0 kg max.	
Screen data capacity	60 MB	
Internal memory	Bit memory: 32,767 bits, Word memory: 32,767 words, Retentative memory: 8,192 bits and 8,192 words.	
Memory card interface	1 slot ATA Compact Flash card	
Printer connection	PictBridge support	
Serial (COM1)	1×RS-232	
Serial (COM2)	1×RS-232	
USB Slave	For programming & printing	
Ethernet	IEEE 802.3u 10Base-T/100Base-TX	
Expansion module	–	
Line voltage	24 VDC ±15%	
Power consumption	15 W max.	
Battery	CJ1W-BAT01	
Battery lifetime	5 years (at 25°C)	
Enclosure rating (front side)	IP65F (equivalent to NEMA4)	
Obtained standards	UL 1604 Class 1 Diff. 2, cUL, CE, Lloyds, DNV	
Operating environment	No corrosive gases	
Noise immunity	Conforms to IEC61000-4-4, 2 KV (power lines)	
Ambient operating temperature	0 to 50°C ^{*1}	
Ambient operating humidity	35% to 85% (0 to 40°C) with no condensation, 35% to 60% (40 to 50°C) with no condensation	

^{*1} See manual for details.



NS5 handheld, suitable for use in harsh conditions

The NS series has evolved into a mobile format. Based on the standard 5.7" TFT color version, we can offer a handheld version of the NS series. Offering 10 Function keys for the most used functions and with a protection degree of IP65 it is the product to use in harsh environment where freedom of movement is needed.

- 10 Function keys, 4 hardwired for inching
- Emergency switch on front plus enable switch on back of unit
- Well protected against water, IP65
- Compact Flash, Serial and USB interface

Ordering information

Type			Order code
NSH5	TFT, 5.7", 320×240 pixels	Black	NSH5-SQR10B-V2

Accessories

Type	Order code
Bracket NS handheld protecting emergency button from accidental activation	NSH5-ATT01
Bracket NS handheld for wall mounting	NSH5-ATT02
Cable NS handheld, RS-422, 10m UL	NSH5-422UL-10M
Cable NS handheld, RS-232, 10m UL	NSH5-232UL-10M
Cable NS handheld, RS-232, 3m UL	NSH5-232UL-3M

Specifications

Memory card interface	1 slot ATA Compact Flash card
Serial (COM1)	1×RS-232/RS-422A
USB Slave	For programming
Line voltage	24 VDC ±15%
Power consumption	10 W max.
Battery	CJ1W-BAT01
Battery lifetime	5 years (at 25°C)
Enclosure rating	IP65 ^{*1}
Obtained standards	UL 1604 Class 1 Diff. 2, cUL, CE, NEMA equivalent
Operating environment	No corrosive gases
Noise immunity	Conforming to IEC 61000-4-4: 2 kV (power supply line)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	35% to 85% max. (with no condensation)
Vibration resistance (during operation)	10 to 57 Hz with amplitude of 0.075 mm, 57 to 150 Hz with acceleration of 9.8 m/s ² three minutes each in X, Y, and Z directions
Shock resistance (during operation)	147 m/s ² three times each in X, Y, and Z directions
Drop test ^{*1}	Dropped from 1 m. Conforming to JIS B 3502/IEC61131-2

^{*1} see manual for details.

Ordering information

Type	Description		Order code
Cable	Serial programming cable		XW2Z-S002
	USB programming cable, 2 m		CP1W-CN221
PT-to-PLC Connecting Cable	PT connection: 9 pins	Length: 2 m	XW2Z-200T
	PLC connection: 9 pins	Length: 5 m	XW2Z-500T
Accessories	Video input	Inputs: 4 channels NTSC / PAL	NS-CA001
		Inputs: 2 channels NTSC / PAL, 1 channel RGB	NS-CA002
	Cable to connect NS-CA00_ to Video console unit		F150-VKP (2 m)
			F150-VKP (5 m)
	Controller link interface unit		NS-CLK21
	RS-422A/485 adapter (50 m)		CJ1W-CIF11
	RS-422A adapter (500 m)		NS-AL002
	Anti-reflection sheets (5 sheets)	NS15	NS15-KBA04
		NS12/10	NS12-KBA04
		NS8	NS7-KBA04
		NS5	NT30-KBA04
	Anti-reflection protective covers (5 pack)	NS12/10	NS12-KBA05
		NS8	NS7-KBA05
		NS5	NT31C-KBA05
	Transparent protective covers (5 pack)	NS15 (1 cover)	NS15-KBA05N
		NS12/10	NS12-KBA05N
		NS8	NS7-KBA05N
		NS5	NT31C-KBA05N
	Chemical-resistant cover (1 cover)	NS5	NT30-KBA01
	Attachment adapter	(NT625C/631/631C series to NS12 series)	NS12-ATT01
		(NT625C/631/631C series to NS12 series) Black	NS12-ATT01B
		(NT620S/620C/600S series to NS8 series)	NS8-ATT01
		(NT600M/600G/610G/612G series to NS8 series)	NS8-ATT02
	Memory card	128 MB	HMC-EF183
		256 MB	HMC-EF283
		512 MB	HMC-EF583
	Memory card adapter for PC		HMC-AP001
	Battery		CJ1W-BAT01



The feature-rich, cost-effective HMI

The combination of high quality and rich features add up to give outstanding value for an HMI in the economy class. The NB-Designer software to create your HMI application is free of charge and can be downloaded from our website.

- More than 65,000 display colors TFT touch screen
- Available in sizes ranging from 3.5 to 10 inches
- Long-life LED backlight
- Serial, USB or Ethernet communication
- USB memory stick support (TW01 model only)
- 128 MB internal memory
- Vector and bitmap graphics

Ordering information

HMI panels

Product name	Specifications	Order code
NB3Q	3.5 inch, TFT LCD, Color, 320 × 240 dots	NB3Q-TW00B
	3.5 inch, TFT LCD, Color, 320 × 240 dots, USB Host, Ethernet	NB3Q-TW01B
NB5Q	5.6 inch, TFT LCD, Color, 320 × 234 dots	NB5Q-TW00B
	5.6 inch, TFT LCD, Color, 320 × 234 dots, USB Host, Ethernet	NB5Q-TW01B
NB7W	7 inch, TFT LCD, Color, 800 × 480 dots	NB7W-TW00B
	7 inch, TFT LCD, Color, 800 × 480 dots, USB Host, Ethernet	NB7W-TW01B
NB10W	10.1 inch, TFT LCD, Color, 800 × 480 dots, USB Host, Ethernet	NB10W-TW01B

Options

Product item	Specifications	Order code
NB-to-PLC Connecting cable	For NB to PLC via RS-232C (CP/CJ/CS), 2m	XW2Z-200T
	For NB to PLC via RS-232C (CP/CJ/CS), 5m	XW2Z-500T
	For NB to PLC via RS-422A/485, 2m	NB-RSEXT-2M
Software	Supported Operating Systems: Windows 7, Windows Vista [*] , Windows XP ^{*1} (SP1 or higher). Download from the Omron website.	NB-Designer ^{*2}
Display protective sheets	For the NB3Q contains 5 sheets	NB3Q-KBA04
	For the NB5Q contains 5 sheets	NB5Q-KBA04
	For the NB7W contains 5 sheets	NB7W-KBA04
	For the NB10W contains 5 sheets	NB10W-KBA04
Attachment	Mounting bracket for NT31/NT31C series to NB5Q series	NB5Q-ATT01

^{*1} Except for Windows XP 64-bit version

^{*2} The NB5Q-TW01B and NB7W-TW01B are supported by NB-Designer version 1.10 or higher.
The NB3Q-TW01B and NB10W-TW01B are supported by NB-Designer version 1.20 or higher.

Model	Panel cutout (H × V mm)
NB3Q	119.0 (+0.5/-0) × 93.0 (+0.5/-0)
NB5Q	172.4 (+0.5/-0) × 131.0 (+0.5/-0)
NB7W	191.0 (+0.5/-0) × 137.0 (+0.5/-0)
NB10W	258.0 (+0.5/-0) × 200.0 (+0.5/-0)

Note: Applicable panel thickness: 1.6 to 4.8 mm.

Specifications

HMI

Specifications	NB3Q		NB5Q		NB7W		NB10W
	TW00B	TW01B	TW00B	TW01B	TW00B	TW01B	TW01B
Display type	3.5 inch TFT LCD		5.6 inch TFT LCD		7 inch TFT LCD		10.1 inch TFT LCD
Display resolution (H×V)	320×240		320×234		800×480		800×480
Number of colors	65,536						
Backlight	LED						
Backlight lifetime	50,000 hours of operating time at the normal temperature (25°C) ^{*1}						
Touch panel	Analog resistive membrane, resolution 1024×1024, life: 1 million touch operations						
Dimensions in mm (H×W×D)	103.8×129.8×52.8		142×184×46		148×202×46		210.8×268.8×54.0
Weight	310 g max.	315 g max.	620 g max.	625 g max.	710 g max.	715 g max.	1,545 g max.

^{*1} This is the estimated time when the luminous intensity is decreased by 50% per LED at room temperature and humidity. It is a typical value.

Functionality

Specifications	NB3Q		NB5Q		NB7W		NB10W
	TW00B	TW01B	TW00B	TW01B	TW00B	TW01B	TW01B
Internal memory	128MB (including system area)						
Memory interface	–	USB Memory	–	USB Memory	–	USB Memory	USB Memory
Serial (COM1)	RS-232C/422A/485 (not isolated), Transmission distance: 15m Max. (RS-232C), 500m Max. (RS-422A/485), Connector: D-Sub 9-pin		RS-232C, Transmission distance: 15 m Max., Connector: D-Sub 9-pin				
Serial (COM2)	–		RS-232C/422A/485 (not isolated), Transmission distance: 15m Max. (RS-232C), 500m Max. (RS-422A/485), Connector: D-Sub 9-pin				
USB Host	Equivalent to USB 2.0 full speed, type A, Output power 5V, 150mA						
USB Slave	Equivalent to USB 2.0 full speed, type B, Transmission distance: 5m						
Printer connection	PictBridge support						
Ethernet	–	10/100 base-T	–	10/100 base-T	–	10/100 base-T	10/100 base-T

General

Specifications	NB3Q		NB5Q		NB7W		NB10W
	TW00B	TW01B	TW00B	TW01B	TW00B	TW01B	TW01B
Line voltage	20.4 to 27.6 VDC (24 VDC –15 to 15%)						
Power consumption	5 W	9 W	6 W	10 W	7 W	11 W	14 W
Battery lifetime	5 years (at 25°C)						
Enclosure rating (front side)	Front operation part: IP65 (Dust proof and drip proof only from the front of the panel)						
Obtained standards	EC Directives, KC, cUL508						
Operating environment	No corrosive gases.						
Noise immunity	Compliant with IEC61000-4-4, 2KV (Power cable)						
Ambient operating temperature	0 to 50°C						
Ambient operating humidity	10% to 90% RH (without condensation)						

Applicable Controllers

Brand	Series
OMRON	Omron C Series Host Link
	Omron CJ/CS Series Host Link
	Omron CP Series
Mitsubishi	Mitsubishi Q-QnA (Link Port)
	Mitsubishi FX-485ADP/485BD/422BD (Multi-station)
	Mitsubishi FX0N/1N/2N/3G
	Mitsubishi FX1S
	Mitsubishi FX2N-10GM/20GM
	Mitsubishi FX3U
	Mitsubishi Q series (CPU Port)
	Mitsubishi Q00J (CPU Port)
	Mitsubishi Q06H
Panasonic	FP series
Siemens	Siemens S7-200
	Siemens S7-300/400 (PC Adapter Direct)
Allen-Bradley ^{*1} (Rockwell)	AB DF1 AB CompactLogix/ControlLogix

^{*1} AB and GE will be supported by NB-Designer version 1.20 or higher.

Brand	Series
Schneider	Schneider Modicon Uni-TelWay
	Schneider Twido Modbus RTU
Delta	Delta DVP
LG (LS)	LS Master-K Cnet
	LS Master-K CPU Direct
	LS Master-K Modbus RTU
	LS XGT CPU Direct
	LS XGT Cnet
GE Fanuc Automation ^{*1}	GE Fanuc Series SNP GE SNP-X
Modbus	Modbus ASCII
	Modbus RTU
	Modbus RTU Slave
	Modbus RTU Extend Modbus TCP

Note: For details, refer to NB Series Host Connection Manual (Cat.No V108).

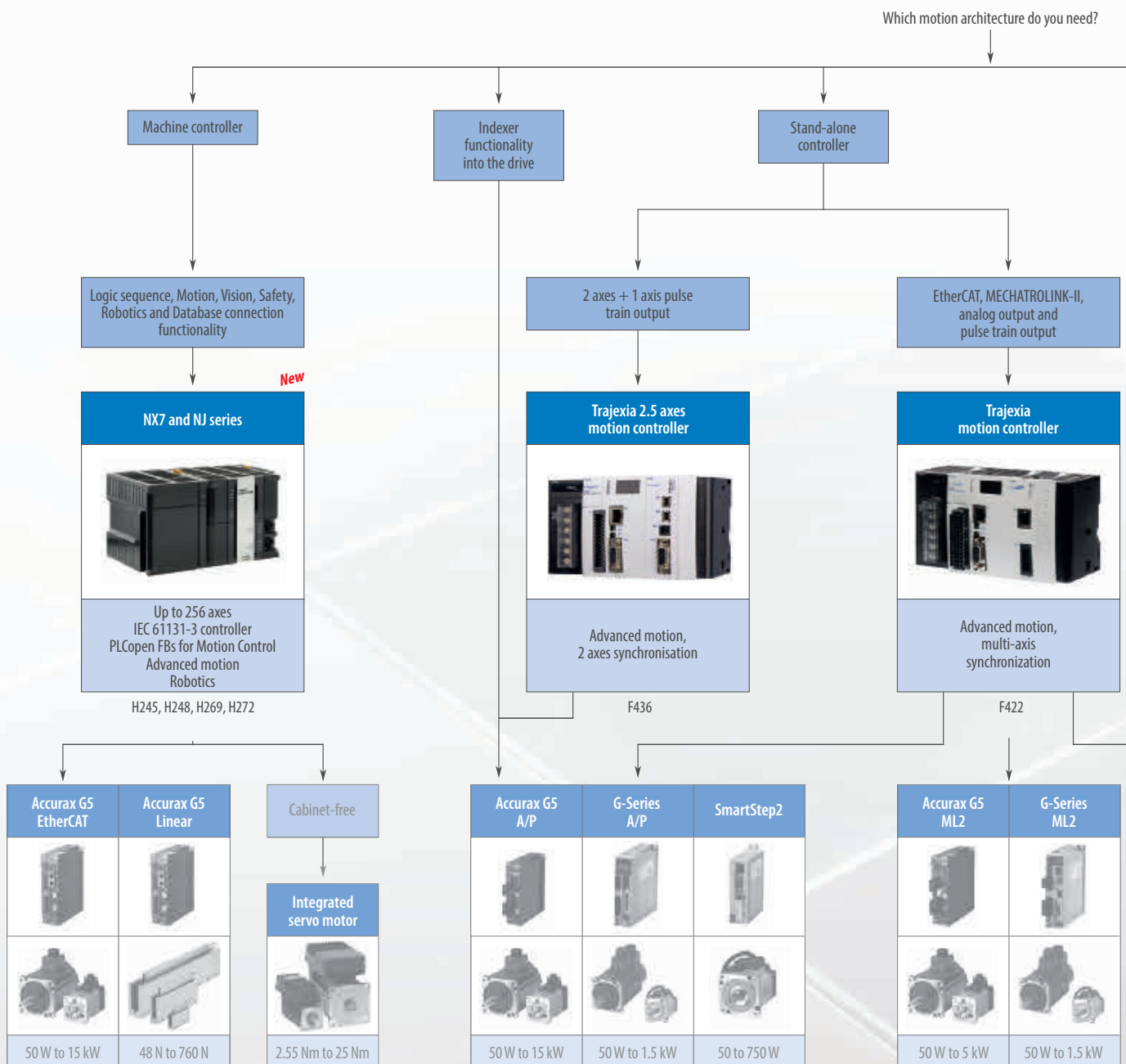
Motion controllers

NX7/NJ series machine controller

- Integration of logic and motion in one Intel CPU
- Scalable motion control: CPUs from 2 up to 256 axes
- Fully conforms with IEC 61131-3 standards
- PLCopen Function Blocks for Motion Control
- Advanced motion with Robotics functionality
- Built-in EtherCAT and EtherNet/IP ports



SYNMAC
always in control



Trajexia with EtherCAT

- Motion control of 64 axes
- Scalability with EtherCAT masters for 4, 16 and 64 axes
- Supports servos, inverters, vision systems and distributed I/O modules

EtherCAT®



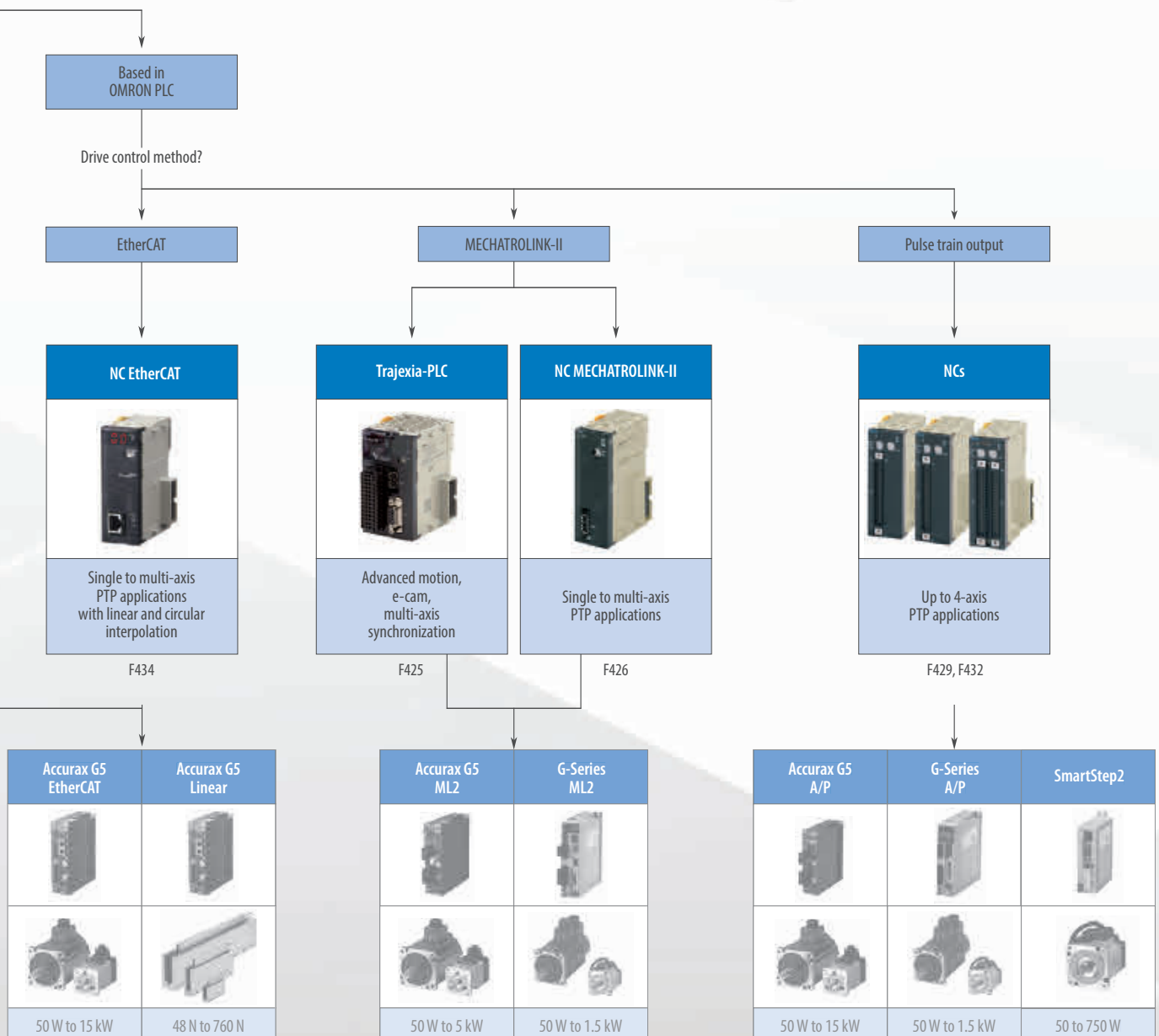
CJ-Series PLC with EtherCAT

- Position control unit CJ1W-NC with EtherCAT
- Support for up to 16 axes and 64 inverters, vision systems and distributed I/O modules



EtherCAT®

Motion controllers



Motion controllers				
				
Model	NX and NJ series machine controller	Trajexia stand-alone		NC EtherCAT
	Logic sequence, Motion, Robotics and Database connection functionality	The advanced stand-alone motion controller	Trajexia 2.5 axes motion controller	16-axis point-to-point positioning controller
Axes control method	EtherCAT	EtherCAT, MECHATROLINK-II, analog output and pulse-train output	2 axes for position, speed and torque control and 1 axis for pulse train output in open loop	EtherCAT
Number of axes	2, 4, 8, 16, 32, 64, 128, 256	4, 16, 64	2	2, 4, 8, 16
Applicable servo drive	Accurax G5 and Integrated servomotor	Accurax G5 and G-Series	Accurax-G5	Accurax G5
Application	Advance motion including robotics	Advanced motion, e-cam, ELS, Phase shift, Registration	Advanced motion, e-cam, ELS, Phase shift, Registration	From simple PTP to multi axis PTP with linear and circular interpolation
Servo control mode	Position, speed and torque	Position, speed and torque	Position, speed and torque	Position, speed and torque
PLC series	NX and NJ series	Stand-alone motion controller: Serial and Ethernet/IP built-in, PROFIBUS-DP, DeviceNet and CANopen communication options	Stand-alone motion controller: Serial and Ethernet/IP built-in, PROFIBUS-DP, DeviceNet and CANopen communication options	CJ
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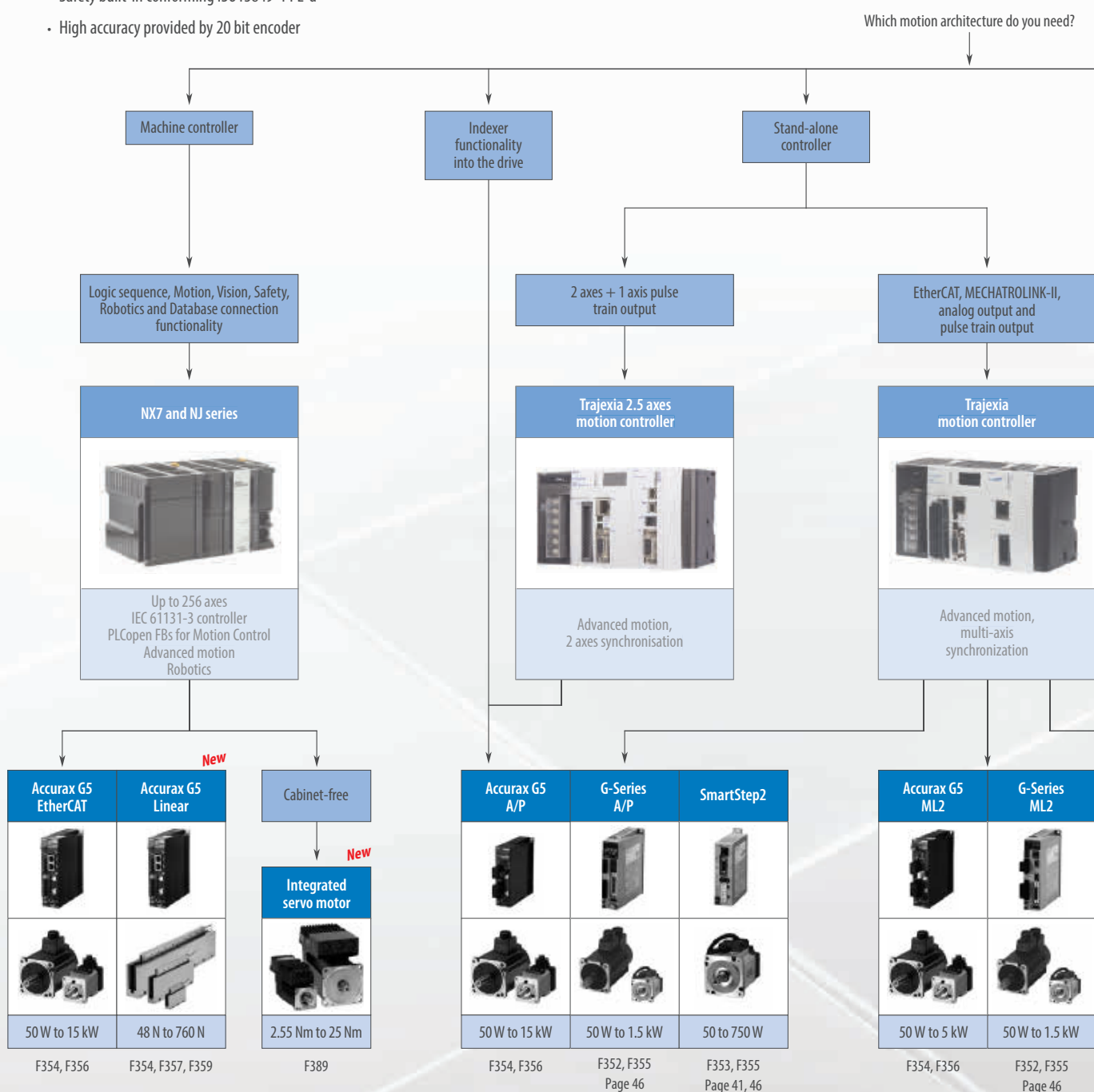
Motion controllers				
				
Model	Trajexia-PLC	NC MECHATROLINK-II	CJ1W-NC__3	CJ1W-NC__4
	Advanced multi-axes motion controller in a PLC	16-axis point-to-point positioning controller	4-axis point-to-point positioning controller	4-axis point-to-point positioning controller with synchronization
Axes control method	MECHATROLINK-II	MECHATROLINK-II	Pulse train output	Pulse train output
Number of axes	4, 30	2, 4, 16	1, 2, 4	2, 4
Applicable servo drive	Accurax G5 and G-Series	Accurax G5 and G-Series	SmartStep 2 and Accurax G5	SmartStep 2 and Accurax G5
Application	Advanced motion, e-cam, ELS, Phase shift, Registration	From simple PTP to multi axis PTP coordinated systems	Point to point applications	Point-to-point with complex interpolations
Servo control mode	Position, speed and torque	Position, speed and torque	Open loop position with linear interpolation	Open loop position with linear and circular interpolation
PLC series	CJ	CJ and CS1	CJ an CS1	CJ
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EXTREME MECHATRONICS MEETS X-STREAM AUTOMATION

At the heart of every great machine

Great machines are born from a perfect match between control and mechanics. Accurax G5 gives you the extra edge to build more accurate, faster, smaller and safer machines. You will benefit from an almost 25% reduction in motor weight, and gain 50% cabinet space. You will achieve sub micron precision and ms settling time. Some might call it perfection, we just call it tireless innovation to help you build great machines.

- EtherCAT, ML-II and analog/pulse models
- High response frequency of 2 kHz
- Safety built-in conforming ISO13849-1 PL-d
- High accuracy provided by 20 bit encoder





Based in
OMRON PLC

Drive control method?

EtherCAT

MECHATROLINK-II

Pulse train output

NC EtherCAT



Single to multi-axis
PTP applications
with linear and circular
interpolation

Trajexia-PLC



Advanced motion,
e-cam,
multi-axis
synchronization

NC MECHATROLINK-II



Single to multi-axis
PTP applications

NCs



Up to 4-axis
PTP applications

Accurax G5
EtherCAT



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Accurax G5
Linear



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New

Accurax G5
ML2



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G-Series
ML2



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Accurax G5
A/P



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G-Series
A/P



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SmartStep2



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Selection table

Servo drives				
				
	Accurax G5		G-Series	SmartStep 2
	Rotary servo drive	Linear servo drive	Compact size and ML2 motion bus	Pulse train input with ultra-compact size
Ratings 230 V single-phase	100 W to 1.5 kW	200 W to 1.5 kW	100 W to 1.5 kW	100 W to 750 W
Ratings 400 V three-phase	600 W to 15 kW	600 W to 5 kW	N/A	N/A
Applicable servomotor	Accurax G5 and G-Series rotary motors	Accurax linear motors	G-Series	G-Series
Position control	EtherCAT, MECHATROLINK-II or Pulse train input	EtherCAT	MECHATROLINK-II or Pulse train input	Pulse train input
Speed control	EtherCAT, MECHATROLINK-II or Analog input ± 10 V	EtherCAT	MECHATROLINK-II or Analog input ± 10 V	N/A
Torque control	EtherCAT, MECHATROLINK-II or Analog input ± 10 V	EtherCAT	MECHATROLINK-II or Analog input ± 10 V	Torque limits only
Drive programming	Embedded indexer functionality (Only for G5 Analog/Pulse model)	N/A	N/A	N/A
Safety approvals	PLd (EN ISO 13849-1) SIL2 (IEC 61508)	PLd (EN ISO 13849-1) SIL2 (IEC 61508)	N/A	N/A
Safety function	STO	STO	N/A	N/A
Full closed loop	Built-in	N/A	N/A	N/A
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Accurax G5 servo motors				
				
	Standard models			
	3,000 r/min motor	2,000 r/min motor	1,500 r/min motor	1,000 r/min motor
Rated speed	3,000 rpm	2,000 rpm	1,500 rpm	1,000 rpm
Maximum speed	4,500 to 6,000 rpm	3,000 rpm	2,000 to 3,000 rpm	2,000 rpm
Rated torque	0.16 Nm to 15.9 Nm	1.91 Nm to 23.9 Nm	47.8 Nm to 95.5 Nm	8.59 Nm to 28.7 Nm
Sizes	50 W to 5 kW	400 W to 5 kW	7.5 kW to 15 kW	900 W to 6 kW
Applicable servo drive	Accurax G5 servo drive	Accurax G5 servo drive	Accurax G5 servo drive	Accurax G5 servo drive
Encoder resolution	20-bit incremental/ 17-bit absolute	20-bit incremental/ 17-bit absolute	17-bit absolute	20-bit incremental/ 17-bit absolute
IP rating	IP67	IP67	IP67	IP67
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Accurax G5 servo motors			
			
	High inertia models		
	3,000 r/min motor	2,000 r/min motor	1,500 r/min motor
Rated speed	3,000 rpm	2,000 rpm	1,500 rpm
Maximum speed	5,000 rpm	3,000 rpm	2,000 to 3,000 rpm
Rated torque	0.64 Nm to 2.4 Nm	4.77 Nm to 23.9 Nm	47.8 Nm
Sizes	200 W to 750 W	1 kW to 5 kW	7.5 kW
Applicable servo drive	Accurax G5 servo drive	Accurax G5 servo drive	Accurax G5 servo drive
Encoder resolution	20-bit incremental/ 17-bit absolute	20-bit incremental/ 17-bit absolute	17-bit absolute
IP rating	IP65	IP67	IP67
Page/Quick Link	F356		

	G-Series servo motors – Cylindrical type –			G-Series servo motors – Flat type –
				
	3,000 r/min motor	2,000 r/min motor	1,000 r/min motor	3,000 r/min motor
Rated speed	3,000 rpm	2,000 rpm	1,000 rpm	3,000 rpm
Maximum speed	4,500 to 5,000 rpm	3,000 rpm	2,000 rpm	5,000 rpm
Rated torque	0.16 Nm to 4.77 Nm	4.8 Nm to 7.15 Nm	8.62 Nm	0.32 Nm to 1.3 Nm
Sizes	50 to 1,500 W	1 to 1.5 kW	900 W	100 to 400 W
Applicable servo drive	SmartStep 2, G-Series and Accurax G5 servo drives	SmartStep 2, G-Series and Accurax G5 servo drives	SmartStep 2, G-Series and Accurax G5 servo drives	SmartStep 2, G-Series and Accurax G5 servo drives
Encoder resolution	10,000 pulses/revolution or 17-bit absolute/incremental	10,000 pulses/revolution or 17-bit absolute/incremental	10,000 pulses/revolution or 17-bit absolute/incremental	10,000 pulses/revolution or 17-bit absolute/incremental
IP rating	IP65	IP65	IP65	IP65
Page/Quick Link	46/F355			

	Accurax linear motors	
		
Type	Iron-core linear motor	Ironless linear motor
Continuous force range	48 N to 760 N	29 N to 423 N
Peak force range	105 N to 2000 N	100 N to 2100 N
Maximum speed	1 to 10 m/s	1.2 to 16 m/s
Magnetic attraction force	300 N to 4440 N	Zero
Applicable servo drive	Accurax G5 linear drive	
Page/Quick Link	F357, F359	

	Integrated servo motors
	
Rated torque	2.55 Nm to 25 Nm
Rated speed	3,000 rpm
Maximum speed	4,000 rpm
Encoder resolution	15-bit incremental/18-bit absolute
IP rating	IP65
Page/Quick Link	F389



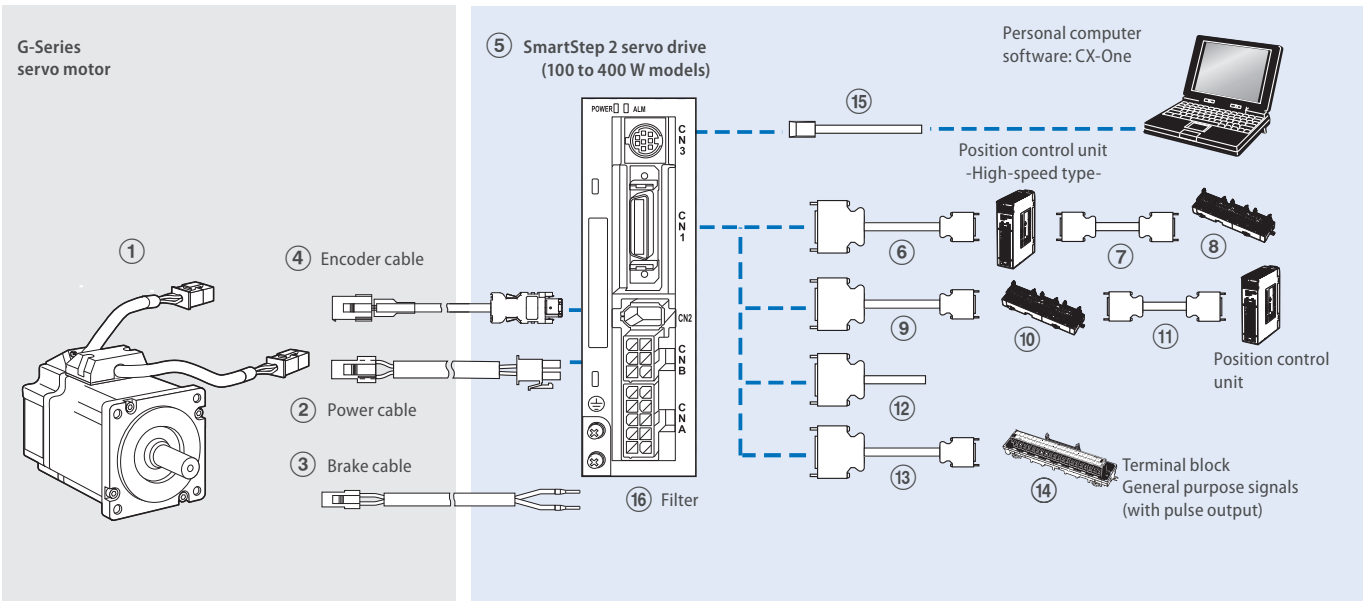
Another step forward in drive simplicity

The new SmartStep offers an ideal solution for point-to-point motion applications where simplicity is essential. SmartStep 2 keeps things simple whilst combining high performance and advanced features in a cost effective solution.

- On-line Auto-tuning and Easy set up
- Ultra-compact size. The footprint is only 48% compared to the previous SmartStep
- Two torque limits
- Electronic gear, four internal speed settings and wide range of pulse settings
- Adaptive resonance suppression filter
- Position control via pulse input 500 kpps
- Configuration and commissioning using CX Drive-software

Ordering information

SmartStep2 servo drive configuration (100-400 W)



Note: The symbols ①②③④⑤ ... show the recommended sequence to select the components in a SmartStep 2 servo system

Servo motor

Note: ①②③④ refer to G-Series motor section for detailed motor specifications and selection.

Servo drives

Symbol	Specifications		① Compatible servo motors		SmartStep 2 drive model
			Cylindrical type	Flat type	Order code
⑤	200 VAC	100 W	R88M-G05030H-__	—	R7D-BP01H
			R88M-G10030H-__	R88M-GP10030H-__	
		200 W	R88M-G20030H-__	R88M-GP20030H-__	R7D-BP02HH
		400 W	R88M-G40030H-__	R88M-GP40030H-__	R7D-BP04H

Power supply cables (for CNA)

Symbol	Specifications	Appearance	Order code
⑤	Power supply input cable for single-phase power (connectors attached)		R7A-CLB002S2

Control cables (for CN1)

Symbol	Description	Connect to	Length	Order code
⑥	Control cable (line-driver output for 1 axis)	Position control unit (high-speed type) CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G12
			5 m	XW2Z-500J-G12
			10 m	XW2Z-10MJ-G12
	Control cable (open-collector output for 1 axis)	Position control unit (high-speed type) CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G16
			3 m	XW2Z-300J-G16
	Control cable (line-driver output for 2 axis)	Position control unit (high-speed type) CJ1W-NC234 CJ1W-NC434	1 m	XW2Z-100J-G4
			5 m	XW2Z-500J-G4
			10 m	XW2Z-10MJ-G4
	Control cable (open-collector output for 2 axis)	Position control unit (high-speed type) CJ1W-NC214 CJ1W-NC414	1 m	XW2Z-100J-G8
			3 m	XW2Z-300J-G8

Symbol	Description	Connect to	Length	Order code
⑦	Terminal block cable for external signals (for input common, forward/reverse run prohibited inputs, emergency stop input, origin proximity input and interrupt input)	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434 CJ1W-NC214 CJ1W-NC414	0.5 m	XW2Z-C50X
			1 m	XW2Z-100X
			2 m	XW2Z-200X
			3 m	XW2Z-300X
			5 m	XW2Z-500X
			10 m	XW2Z-010X
⑧	Terminal block for external signals (with M3 screw and for pin terminals)		–	XW2B-20G4
	Terminal block ext. signals (with M3.5 screw and for fork/round terminals)		–	XW2B-20G5
	Terminal block ext. signals (with M3 screw and fork/round pin terminals)		–	XW2D-20G6
⑨	Cable from servo relay unit to servo drive	CS1W-NC1_3, CJ1W-NC1_3, C200HW-NC113, CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3, C200HW-NC213/413, CQM1H-PLB21 or CQM1-CPU43-V1	1 m	XW2Z-100J-B29
			2 m	XW2Z-200J-B29
		CJ1M-CPU21/22/23	1 m	XW2Z-100J-B32
			2 m	XW2Z-200J-B32
⑩	Servo relay unit	CS1W-NC1_3, CJ1W-NC1_3 or C200HW-NC113 position control unit	–	XW2B-20J6-1B (1 axis)
		CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3 or C200HW-NC213/413 position control unit	–	XW2B-40J6-2B (2 axes)
		CQM1H-PLB21 or CQM1-CPU43-V1	–	XW2B-20J6-3B (1 axis)
		CJ1M-CPU21/22/23	–	XW2B-20J6-8A (1 axis)
			–	XW2B-40J6-9A (2 axes)
⑪	Position control unit connecting cable	CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CS1W-NC113 C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CJ1M-CPU21/22/23	0.5 m	XW2Z-050J-A33
			1 m	XW2Z-100J-A33
CQM1H-PLB21 CQM1-CPU43-V1	0.5 m	XW2Z-050J-A3		
	1 m	XW2Z-100J-A3		
⑫	General purpose cable	For general purpose controllers	1 m	R7A-CPB001S
			2 m	R7A-CPB002S
⑬	Terminal block cable	For general purpose controllers	1 m	XW2Z-100J-B28
			2 m	XW2Z-200J-B28
⑭	Terminal block (with M3 screw and for pin terminals)		–	XW2B-34G4
	Terminal block (with M3.5 screw and for fork/round terminals)		–	XW2B-34G5
	Terminal block (with M3 screw and fork/round pin terminals)		–	XW2D-34G6
			–	

Cable for CN3

Symbol	Name	Length	Order code
⑮	Personal Computer Monitor Cable	2 m	R88A-CCG002P2

Filters

Symbol	Applicable servo drive	Rated current	Rated voltage	Order code
⑯	R7D-BP01H/ 02HH/ 04H	4 A	1 pH, 230 V	R7A-FIB104-RE

Connectors

Specifications	Order code
Main Circuit Connector (CNA)	R7A-CNB01P
Servomotor Connector (CNB)	R7A-CNB01A
Control I/O Connector (CN1)	R88A-CNW01C
Encoder Input Connector (CN2)	R88A-CNW01R
Servomotor Connector for Encoder Cable	R88A-CNG02R
Servomotor Connector for Servomotor Power Cable	R88A-CNG01A
Brake Cable Connector	R88A-CNG01B

External regeneration resistor

Specification	Order code
80 W, 50 Ω	R88A-RR08050S
80 W, 100 Ω	R88A-RR080100S
220 W, 47 Ω	R88A-RR22047S

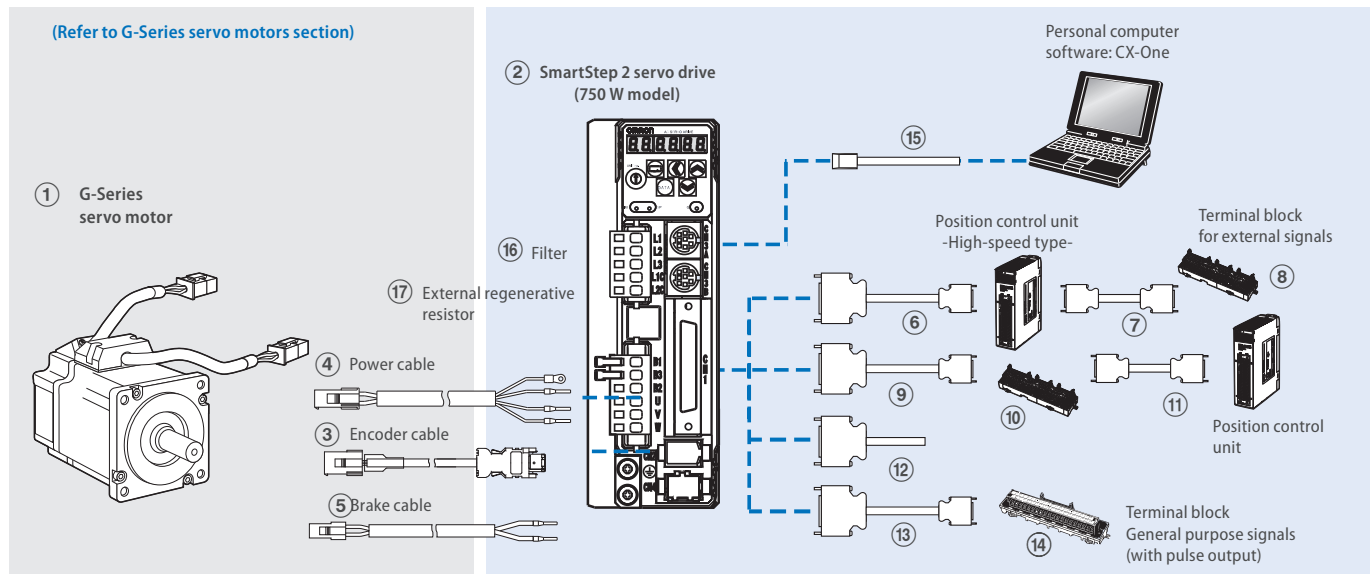
External regeneration resistor cable

Specifications	Order code
External Regenerative Resistor Connection Cable, 2 meters	R7A-CLB002RG

Parameter unit & computer software

Specifications	Order code
Parameter copy unit (with cable)	R88A-PR02G
Configuration and monitoring software tool for servo drives and inverters. (CX-Drive version 1.8 or higher)	CX-Drive

SmartStep2 servo drive configuration (750 W)



Note: The symbols ①②③④⑤ ... show the recommended sequence to select the components in a SmartStep 2 servo system.

Servo motor

Note: ①③④⑤ refer to G-Series motor section for detailed motor specifications and selection.

Servo drives

Symbol	Specifications	① Compatible rotary servo motors	Servo drive model
		Cylindrical type	Order code
②	1 phase 200 VAC 750 W	R88M-G75030H-__	R88D-GP08H

Control cables (for CN1)

Symbol	Description	Connect to	Length	Order code
⑥	Control cable (line-driver output for 1 axis)	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434	1 m 5 m 10 m	XW2Z-100J-G9 XW2Z-500J-G9 XW2Z-10MJ-G9
	Control cable (open-collector output for 1 axis)	Position control units (high-speed type) CJ1W-NC214 CJ1W-NC414	1 m 3 m	XW2Z-100J-G13 XW2Z-300J-G13
	Control cable (line-driver output for 2 axis)	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434	1 m 5 m 10 m	XW2Z-100J-G1 XW2Z-500J-G1 XW2Z-10MJ-G1
	Control cable (open-collector output for 2 axis)	Position control units (high-speed type) CJ1W-NC214 CJ1W-NC414	1 m 3 m	XW2Z-100J-G5 XW2Z-300J-G5
⑦	Terminal block cable for external signals (for input common, forward/reverse run prohibited inputs, emergency stop input, origin proximity input and interrupt input)	Position control units (high-speed type) CJ1W-NC234 CJ1W-NC434 CJ1W-NC214 CJ1W-NC414	0.5 m 1 m 2 m 3 m 5 m 10 m	XW2Z-C50X XW2Z-100X XW2Z-200X XW2Z-300X XW2Z-500X XW2Z-010X
			—	XW2B-20G4
			—	XW2B-20G5
			—	XW2D-20G6
			—	XW2Z-100J-B25
			—	XW2Z-200J-B25
⑧	Terminal block for external signals (M3 screw, pin terminals)	CS1W-NC1_3, CJ1W-NC1_3, C200HW-NC113/213/413, CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3 or CQM1H-PLB21	1 m 2 m	XW2Z-100J-B31 XW2Z-200J-B31
	Terminal block ext. signals (M3.5 screw, fork/round terminals)		1 m 2 m	XW2Z-100J-B31 XW2Z-200J-B31
⑨	Cable from servo relay unit to servo drive	CJ1M-CPU21/22/23	1 m 2 m	XW2Z-100J-B25 XW2Z-200J-B25
			1 m 2 m	XW2Z-100J-B31 XW2Z-200J-B31
⑩	Servo relay unit	CS1W-NC1_3, CJ1W-NC1_3 or C200HW-NC113 position control unit	—	XW2B-20J6-1B (1 axis)
		CS1W-NC2_3/4_3, CJ1W-NC2_3/4_3 or C200HW-NC213/413 position control unit	—	XW2B-40J6-2B (2 axes)
		CQM1H-PLB21	—	XW2B-20J6-3B (1 axis)
		CJ1M-CPU21/22/23	—	XW2B-20J6-8A (1 axis)
			—	XW2B-40J6-9A (2 axes)

Symbol	Description	Connect to	Length	Order code
⑪	Position control unit connecting cable	CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 or C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 or C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CJ1M-CPU21/22/23	0.5 m	XW2Z-050J-A33
			1 m	XW2Z-100J-A33
⑫	General purpose cable	For general purpose controllers	1 m	R88A-CPG001S
			2 m	R88A-CPG002S
⑬	Terminal block cable	For general purpose controllers	1 m	XW2Z-100J-B24
			2 m	XW2Z-200J-B24
⑭	Terminal block (M3 screw and for pin terminals)		–	XW2B-50G4
	Terminal block (M3.5 screw and for fork/round terminals)		–	XW2B-50G5
	Terminal block (M3 screw and for fork/round terminals)		–	XW2D-50G6
	Terminal block (M3 screw and for fork/round terminals)		–	XW2D-50G6

Computer cable (for CN3)

Symbol	Name	Length	Order code
⑮	Computer cable RS232	2 m	R88A-CCG002P2

Filter

Symbol	Rated current	Leakage current	Rated voltage	Applicable servodrive	Order code
⑯	6.6 A	3.5 mA	250 VAC single-phase	R88D-GP08H	R88A-FIK107-RE

External regenerative resistor

Symbol	Specifications	Order code
⑰	50 Ω, 80 W	R88A-RR08050S
	100 Ω, 80 W	R88A-RR080100S
	47 Ω, 220 W	R88A-RR22047S
	20 Ω, 500 W	R88A-RR50020S

Connectors

Specifications	Order code
I/O connector kit -50 pins- (for CN1)	R88A-CNU11C
Power cable connector (motor side)	R88A-CNG01A
Encoder connector (Servo drive side CN2)	R88A-CNW01R
Incremental encoder cable connector (motor side)	R88A-CNG02R

Computer software

Specifications	Order code
Configuration and monitoring software tool for servo drives and inverters (CX-Drive version 1.91 or higher).	CX-Drive

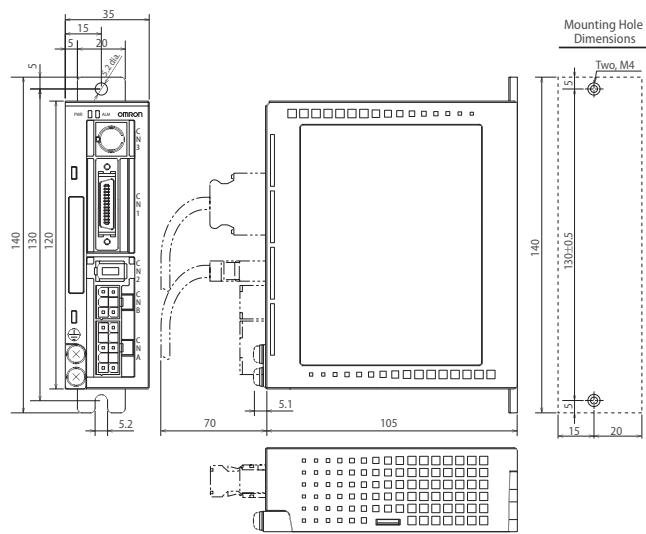
Specifications

Performance specifications

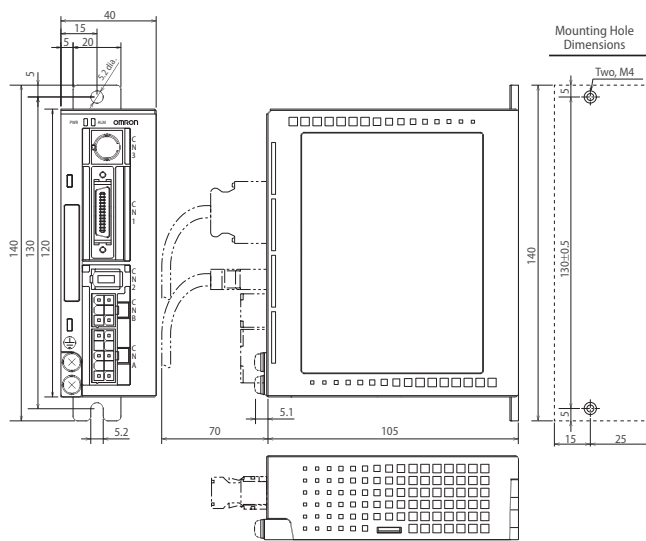
Item	200 VAC input type			
	100 W	200 W	400 W	750 W
	R7D-BP01H	R7D-BP02HH	R7D-BP04H	R88D-GP08H
Continuous output current (rms)	1.0 A	1.6 A	2.5 A	4 A
Momentary maximum output current (rms)	3.3 A	4.9 A	7.8 A	14.1 A
Main-circuit power supply	Single-phase 200 to 240 VAC (170 to 264 V), 50/60 Hz			Single-phase/three-phase 200 to 240 VAC (170 to 264 V), 50/60 Hz
Control circuit input power	–			Single-phase 200 to 240 VAC (170 to 264 V)
Control method	All-digital method			
Feedback	10,000 pulses/revolution incremental encoder			
Inverter method	PWM method based on IGBT			
PWM frequency	12 kHz		6 kHz	
Weight	0.35 kg	0.42 kg	0.42 kg	1.5 kg
Compatible motor voltage	200 V			
Command pulse response	Line drive: 500 kpps			
Compatible motor capacity	50 W 100 W	200 W	400 W	750 W
Applicable servo motor (R88M-)	G05030H G10030H GP10030H	G020030H GP20030H	G40030H GP40030H	G75030H

Dimensions

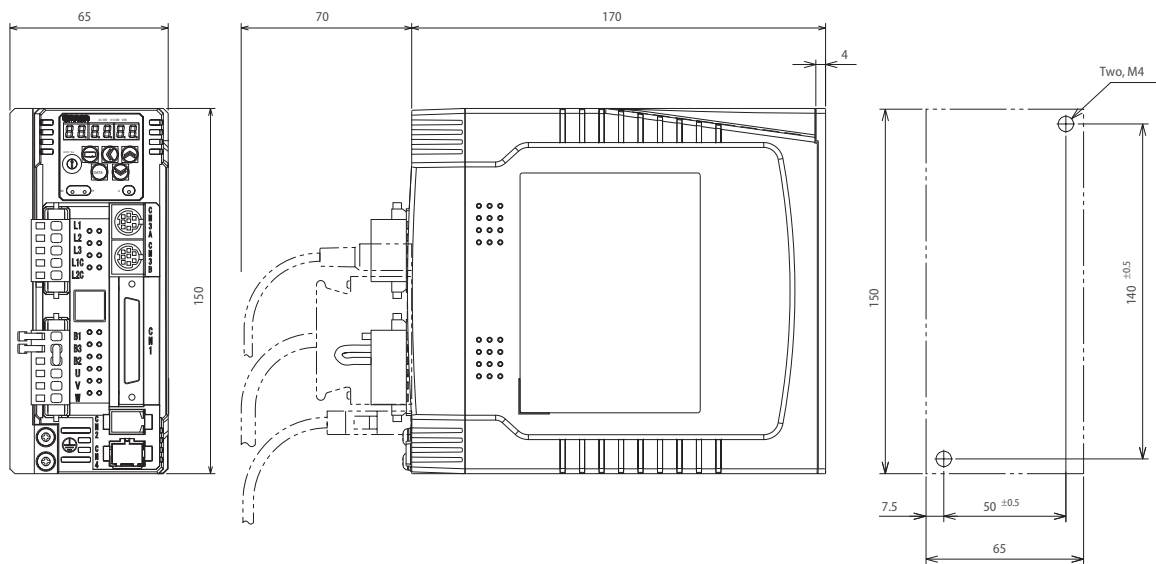
R7D-BP01H (230 V, 100 W)



R7D-BP02HH/04H (230 V, 200-400 W)



R88D-GP08H (230 V, 750 W)



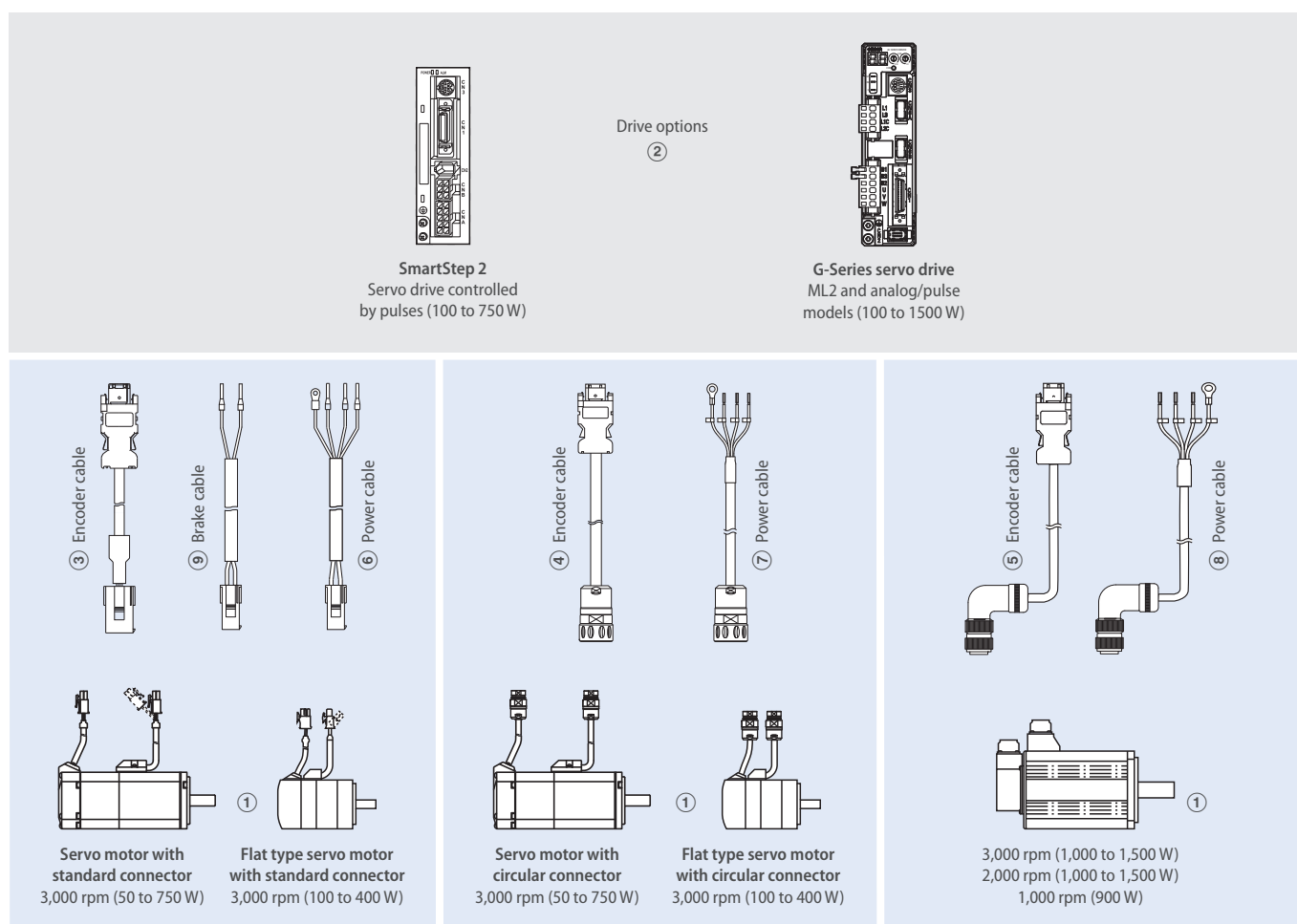


Compact in size, big in features

A wide range of compact servo motors to meet all application needs. When used with a SmartStep 2 drive, the G-Series servo motors offer the simplicity and cost-effectiveness of a stepper with the added advantages of a servo system.

- Peak torque 300% of continuous torque during 3 seconds or more depending on model
- Servo motors supported by SmartStep2, G-Series and Accurax G5 servo drives
- Cylindrical and Flat servo motors types are available
- Encoder accuracy of 10,000 step/rev as standard and 17-bit INC/ABS encoder as optional
- IP65 as standard and shaft oil seal available
- Motors with brake as option

Ordering information



Note: The symbols ①②③④⑤⑥ ... show the recommended sequence to select the servo motor and cables

Servo drive

② Refer to G-Series and SmartStep2 servo drive section for detailed drive specifications and selection of drive accessories.

Servo motor

① Select motor from cylindrical and flat types using motor tables in next pages.

Cylindrical servo motors 3,000/2,000/1,000 r/min (230 V, 50 to 1.5 kW)

Symbol	Specifications					② Compatible servo drives		Servo motor with standard connector	Servo motor with circular connector
	Encoder and design	Speed	Design	Rated torque	Capacity	SmartStep 2	G-Series	Order code	
①	 (50 to 750 W)  (900 to 1,500 W)	3,000 min ⁻¹	Without brake	0.16 Nm	50 W	R7D-BP01H	R88D-G_01H_	R88M-G05030H-S2	R88M-G05030H-S2-D
				0.32 Nm	100 W	R7D-BP01H	R88D-G_01H_	R88M-G10030H-S2	R88M-G10030H-S2-D
				0.64 Nm	200 W	R7D-BP02HH	R88D-G_02H_	R88M-G20030H-S2	R88M-G20030H-S2-D
				1.3 Nm	400 W	R7D-BP04H	R88D-G_04H_	R88M-G40030H-S2	R88M-G40030H-S2-D
				2.4 Nm	750 W	R88D-GP08H	R88D-G_08H_	R88M-G75030H-S2	R88M-G75030H-S2-D
			With brake	0.16 Nm	50 W	R7D-BP01H	R88D-G_01H_	R88M-G05030H-B52	R88M-G05030H-B52-D
				0.32 Nm	100 W	R7D-BP01H	R88D-G_01H_	R88M-G10030H-B52	R88M-G10030H-B52-D
				0.64 Nm	200 W	R7D-BP02HH	R88D-G_02H_	R88M-G20030H-B52	R88M-G20030H-B52-D
				1.3 Nm	400 W	R7D-BP04H	R88D-G_04H_	R88M-G40030H-B52	R88M-G40030H-B52-D
				2.4 Nm	750 W	R88D-GP08H	R88D-G_08H_	R88M-G75030H-B52	R88M-G75030H-B52-D
	Absolute/ incremental encoder (17 bits) Straight shaft with key and tap	3,000 min ⁻¹	Without brake	0.16 Nm	50 W	—	R88D-G_01H_	R88M-G05030T-S2	R88M-G05030T-S2-D
				0.32 Nm	100 W	—	R88D-G_01H_	R88M-G10030T-S2	R88M-G10030T-S2-D
				0.64 Nm	200 W	—	R88D-G_02H_	R88M-G20030T-S2	R88M-G20030T-S2-D
				1.3 Nm	400 W	—	R88D-G_04H_	R88M-G40030T-S2	R88M-G40030T-S2-D
				2.4 Nm	750 W	—	R88D-G_08H_	R88M-G75030T-S2	R88M-G75030T-S2-D
				3.18 Nm	1 kW	—	R88D-G_15H_	R88M-G1K030T-S2	—
				4.77 Nm	1.5 kW	—	R88D-G_15H_	R88M-G1K530T-S2	—
			With brake	0.16 Nm	50 W	—	R88D-G_01H_	R88M-G05030T-B52	R88M-G05030T-B52-D
				0.32 Nm	100 W	—	R88D-G_01H_	R88M-G10030T-B52	R88M-G10030T-B52-D
				0.64 Nm	200 W	—	R88D-G_02H_	R88M-G20030T-B52	R88M-G20030T-B52-D
				1.3 Nm	400 W	—	R88D-G_04H_	R88M-G40030T-B52	R88M-G40030T-B52-D
				2.4 Nm	750 W	—	R88D-G_08H_	R88M-G75030T-B52	R88M-G75030T-B52-D
				3.18 Nm	1 kW	—	R88D-G_15H_	R88M-G1K030T-B52	—
				4.77 Nm	1.5 kW	—	R88D-G_15H_	R88M-G1K530T-B52	—
		2,000 min ⁻¹	Without brake	4.8 Nm	1 kW	—	R88D-G_10H_	R88M-G1K020T-S2	—
				7.15 Nm	1.5 kW	—	R88D-G_15H_	R88M-G1K520T-S2	—
			With brake	4.8 Nm	1 kW	—	R88D-G_10H_	R88M-G1K020T-B52	—
				7.15 Nm	1.5 kW	—	R88D-G_15H_	R88M-G1K520T-B52	—
		1,000 min ⁻¹	Without brake	8.62 Nm	900 W	—	R88D-G_15H_	R88M-G90010T-S2	—
			With brake	8.62 Nm	900 W	—	R88D-G_15H_	R88M-G90010T-B52	—

Flat type servo motors 3,000 r/min (230 V, 100 to 400 W)

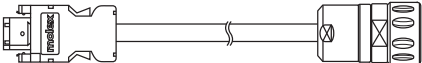
Symbol	Specifications				② Compatible servo drives		Servo motor with standard connector	Servo motor with circular connector
	Encoder and design		Rated torque	Capacity	SmartStep 2	G-Series	Order code	
①	Incremental encoder (10,000 pulses) Straight shaft with key and tap	Without brake	0.32 Nm	100 W	R7D-BP01H	R88D-G_01H_	R88M-GP10030H-S2	R88M-GP10030H-S2-D
			0.64 Nm	200 W	R7D-BP02HH	R88D-G_02H_	R88M-GP20030H-S2	R88M-GP20030H-S2-D
			1.3 Nm	400 W	R7D-BP04H	R88D-G_04H_	R88M-GP40030H-S2	R88M-GP40030H-S2-D
		With brake	0.32 Nm	100 W	R7D-BP01H	R88D-G_01H_	R88M-GP10030H-B52	R88M-GP10030H-B52-D
			0.64 Nm	200 W	R7D-BP02HH	R88D-G_02H_	R88M-GP20030H-B52	R88M-GP20030H-B52-D
			1.3 Nm	400 W	R7D-BP04H	R88D-G_04H_	R88M-GP40030H-B52	R88M-GP40030H-B52-D
	Absolute/ incremental encoder (17 bits) Straight shaft with key and tap	Without brake	0.32 Nm	100 W	—	R88D-G_01H_	R88M-GP10030T-S2	R88M-GP10030T-S2-D
			0.64 Nm	200 W	—	R88D-G_02H_	R88M-GP20030T-S2	R88M-GP20030T-S2-D
			1.3 Nm	400 W	—	R88D-G_04H_	R88M-GP40030T-S2	R88M-GP40030T-S2-D
		With brake	0.32 Nm	100 W	—	R88D-G_01H_	R88M-GP10030T-B52	R88M-GP10030T-B52-D
			0.64 Nm	200 W	—	R88D-G_02H_	R88M-GP20030T-B52	R88M-GP20030T-B52-D
			1.3 Nm	400 W	—	R88D-G_04H_	R88M-GP40030T-B52	R88M-GP40030T-B52-D

Encoder cables

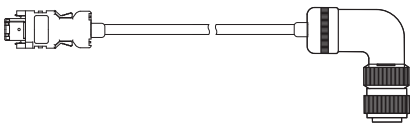
For 50 to 750 W servo motors with standard connectors

Symbol	Appearance	Specifications		Length	Order code
③		Encoder cable (50 to 750 W) R88M-G(50/100/200/400/750)30 R88M-GP(100/200/400)30	Absolute encoder T-__	1.5 m	R88A-CRGA001-5CR-E
				3 m	R88A-CRGA003CR-E
				5 m	R88A-CRGA005CR-E
				10 m	R88A-CRGA010CR-E
				15 m	R88A-CRGA015CR-E
				20 m	R88A-CRGA020CR-E
			Incremental encoder H-__	1.5 m	R88A-CRGB001-5CR-E
				3 m	R88A-CRGB003CR-E
				5 m	R88A-CRGB005CR-E
				10 m	R88A-CRGB010CR-E
				15 m	R88A-CRGB015CR-E
				20 m	R88A-CRGB020CR-E

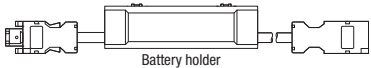
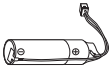
For 50 to 750 W servo motors with circular connector

Symbol	Appearance	Specifications	Length	Order code
④		Encoder cable (50 to 750 W) R88M-G(50/100/200/400/750)30_-_-_-D R88M-GP(100/200/400)30_-_-_-D	3 m	R88A-CRWA003C-DE
			5 m	R88A-CRWA005C-DE
			10 m	R88A-CRWA010C-DE
			15 m	R88A-CRWA015C-DE
			20 m	R88A-CRWA020C-DE

For 900 to 1,500 W servo motors

Symbol	Appearance	Specifications	Length	Order code
⑤		Encoder cable (900-1500 W) R88M-G(1K0/1K5)30T-__ R88M-G(1K0/1K5)20T-__ R88M-G90010T-__	1.5 m	R88A-CRGC001-5NR-E
			3 m	R88A-CRGC003NR-E
			5 m	R88A-CRGC005NR-E
			10 m	R88A-CRGC010NR-E
			15 m	R88A-CRGC015NR-E
			20 m	R88A-CRGC020NR-E

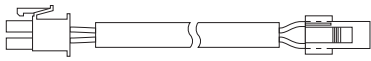
Battery cable for G-series servo drive models with absolute encoder

Symbol	Appearance	Specifications		Order code
④		Absolute encoder battery cable	Battery not included	0.3 m R88A-CRGDOR3C-E
			Battery included	0.3 m R88A-CRGDOR3C-BS-E
		Absolute encoder backup battery 2,000 mA.h 3.6 V	—	R88A-BAT01G

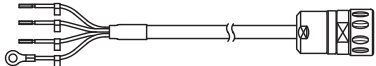
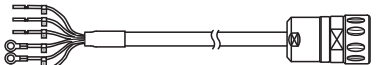
Note: The absolute encoder battery cable is only an extension and must be used with an absolute encoder cable.

Power cables

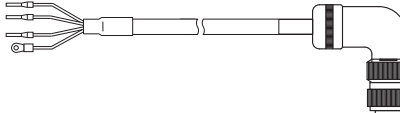
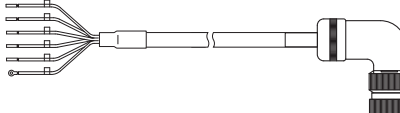
For 50 to 750 W servo motors with standard connectors

Symbol	Appearance	Specifications	Applicable servo drive	Length	Order code
⑥		For servomotors from 50 to 400 W R88M-G(050/100/200/400)30_ R88M-GP(100/200/400)30_ For servomotors with brake, a separate cable (R88A-CAGA_BR-E) is needed	SmartStep 2	1.5 m	R7A-CAB001-5SR-E
				3 m	R7A-CAB003SR-E
				5 m	R7A-CAB005SR-E
				10 m	R7A-CAB010SR-E
				15 m	R7A-CAB015SR-E
				20 m	R7A-CAB020SR-E
		For servomotors from 50 to 750 W R88M-G(050/100/200/400/750)30_ R88M-GP(100/200/400)30_ For servomotors with brake, a separate cable (R88A-CAGA_BR-E) is needed	SmartStep 2 (only 750 W) and G-Series	1.5 m	R88A-CAGA001-5SR-E
				3 m	R88A-CAGA003SR-E
				5 m	R88A-CAGA005SR-E
				10 m	R88A-CAGA010SR-E
				15 m	R88A-CAGA015SR-E
				20 m	R88A-CAGA020SR-E

For 50 to 750 W servo motors with circular connectors

Symbol	Appearance	Specifications		Applicable servo drive	Length	Order code
⑦		For servomotors from 50 to 400 W R88M-G(050/100/200/400)30_ R88M-GP(100/200/400)30_	Without brake -S2-D	SmartStep 2	1.5 m	R7A-CAB001-5SR-DE
	3 m		R7A-CAB003SR-DE			
	5 m		R7A-CAB005SR-DE			
	10 m		R7A-CAB010SR-DE			
	15 m		R7A-CAB015SR-DE			
	20 m		R7A-CAB020SR-DE			
	1.5 m		R7A-CAB001-5BR-DE			
	3 m		R7A-CAB003BR-DE			
	5 m		R7A-CAB005BR-DE			
	10 m		R7A-CAB010BR-DE			
	15 m		R7A-CAB015BR-DE			
	20 m		R7A-CAB020BR-DE			
		For servomotors from 50 to 750 W R88M-G(050/100/200/400/750)30_ R88M-GP(100/200/400)30_	With brake -BS2-D	SmartStep 2 (only 750 W) and G-Series	3 m	R88A-CAWA003S-DE
	5 m		R88A-CAWA005S-DE			
	10 m		R88A-CAWA010S-DE			
	15 m		R88A-CAWA015S-DE			
	20 m		R88A-CAWA020S-DE			
	3 m		R88A-CAWA003B-DE			
	5 m		R88A-CAWA005B-DE			
	10 m		R88A-CAWA010B-DE			
	15 m		R88A-CAWA015B-DE			
	20 m		R88A-CAWA020B-DE			
	For servomotors from 50 to 750 W R88M-G(050/100/200/400/750)30_ R88M-GP(100/200/400)30_	Without brake -S2-D	SmartStep 2 (only 750 W) and G-Series	3 m	R88A-CAWA003S-DE	
5 m		R88A-CAWA005S-DE				
10 m		R88A-CAWA010S-DE				
15 m		R88A-CAWA015S-DE				
20 m		R88A-CAWA020S-DE				
3 m		R88A-CAWA003B-DE				
5 m		R88A-CAWA005B-DE				
10 m		R88A-CAWA010B-DE				
	For servomotors from 50 to 750 W R88M-G(050/100/200/400/750)30_ R88M-GP(100/200/400)30_	With brake -BS2-D	SmartStep 2 (only 750 W) and G-Series	3 m	R88A-CAWA003B-DE	
5 m		R88A-CAWA005B-DE				
10 m		R88A-CAWA010B-DE				
15 m		R88A-CAWA015B-DE				
20 m		R88A-CAWA020B-DE				
3 m		R88A-CAWA003B-DE				
5 m		R88A-CAWA005B-DE				
10 m		R88A-CAWA010B-DE				

For 900 to 1,500 W servo motors

Symbol	Appearance	Specifications		Applicable servo drive	Length	Order code
⑧		For servomotors from 900 to 1.5 kW R88M-G(1K0/1K5)30T_ R88M-G(1K0/1K5)20T_ R88M-G90010T_	Without brake -S2	G-Series	1.5 m	R88A-CAGB001-5SR-E
	3 m				R88A-CAGB003SR-E	
	5 m				R88A-CAGB005SR-E	
	10 m				R88A-CAGB010SR-E	
	15 m				R88A-CAGB015SR-E	
	20 m				R88A-CAGB020SR-E	
			With brake -BS2		1.5 m	R88A-CAGB001-5BR-E
	3 m				R88A-CAGB003BR-E	
	5 m				R88A-CAGB005BR-E	
	10 m				R88A-CAGB010BR-E	
	15 m				R88A-CAGB015BR-E	
	20 m				R88A-CAGB020BR-E	

Brake cable with standard connector

Symbol	Appearance	Specifications	Order code	
⑥		Brake cable only. For servomotors from 50 to 750W with brake R88M-G(050/100/200/400/750)30_-BS2, R88M-GP(100/200/400)30_-BS2	1.5 m	R88A-CAGA001-5BR-E
			3 m	R88A-CAGA003BR-E
			5 m	R88A-CAGA005BR-E
			10 m	R88A-CAGA010BR-E
			15 m	R88A-CAGA015BR-E
			20 m	R88A-CAGA020BR-E

Connectors for power, encoder and brake cables

Specifications			Applicable servomotor	Order code
Connectors for power cable	Drive side (CNB)	-	R88M-G(050/100/200/400)30H_ R88M-GP(100/200/400)30H_	R7A-CNB01A
	Motor side	Standard connector	R88M-G(050/100/200/400/750)30_ R88M-GP(100/200/400)30_	R88A-CNG01A
			R88M-G(1K0/1K5)30_-S2 R88M-G(1K0/1K5)20_-S2 R88M-G90010_-S2	MS3108E20-4S
			R88M-G(1K0/1K5)30_-BS2 R88M-G(1K0/1K5)20_-BS2 R88M-G90010_-BS2	MS3108E20-18S
			R88M-G(50/100/200/400/750)30_-_-_-_-D R88M-GP(100/200/300)_-_-_-_-D	SPOC-06K-FSDN169
		Circular connector (Hypertac)		
Connectors for encoder cable	Drive side (CN2)	-	All models	R88A-CNW01R
	Motor side	Standard connector	R88M-G(050/100/200/400/750)30T-_ R88M-GP(100/200/400)30T-_ R88M-G(050/100/200/400/750)30H-_ R88M-GP(100/200/400)30H-_ R88M-G(1K0/1K5)30T-_ R88M-G(1K0/1K5)20T-_ R88M-G90010T-_ R88M-G(50/100/200/400/750)30_-_-_-_-D R88M-GP(100/200/300)_-_-_-_-D	R88A-CNG01R R88A-CNG02R MS3108E20-29S SPOC-17H-FRON169
		Circular connector (Hypertac)		
Connector for brake cable	Motor side	Standard connector	R88M-G(050/100/200/400/750)30_-BS2 R88M-GP(100/200/400)30_-BS2	R88A-CNG01B

Connectors included with the motor

Specifications		Applicable servomotor	Order code
Power and brake connector (MALE)	Circular connector (Hypertac)	R88M-G(50/100/200/400/750)30_-_-_-_-D R88M-GP(100/200/300)_-_-_-_-D	SRUC-06J-MSCN236
Encoder connector (MALE)		R88M-G(50/100/200/400/750)30_-_-_-_-D R88M-GP(100/200/300)_-_-_-_-D	SRUC-17G-MRWN087

Note: 1. All cables listed are flexible and shielded (except the R88A-CAGA ___ BR-E which is only a flexible cable).

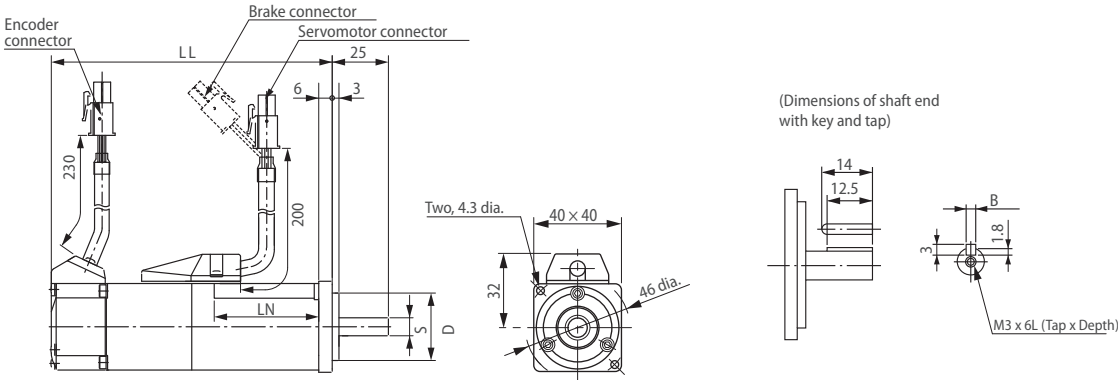
2. The R88A-CRGC ___ NR-E, R88A-CAGB ___ SR-E, R88A-CAGB ___ BR-E, R88A-CRWA ___ C-DE, R88A-CAWA ___ S-DE and R88A-CAWA ___ B-DE cables have IP67 class (including connector).

Dimensions

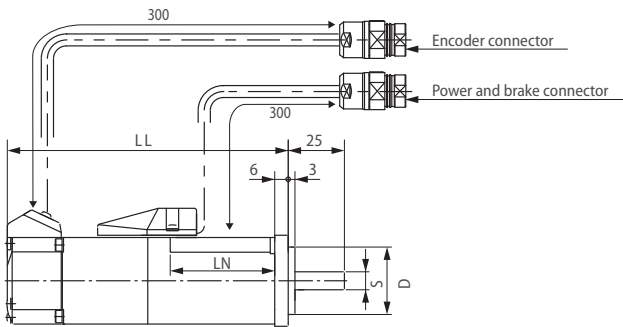
Cylindrical type 3,000 r/min (230 V, 50 to 100 W)

Dimensions (mm)	Without brake	With brake	LN	Flange surface	Shaft end		Aprox. mass (kg)	
Model	LL	LL		D	S	B	Without brake	With brake
R88M-G05030_-S2_-	72	102	26.5	30 ^{h7}	8 ^{h6}	3 ^{h9}	0.3	0.5
R88M-G10030_-S2_-	92	122	46.5				0.5	0.7

Servo motor with standard connector



Servo motor with circular connector



Encoder connector wiring



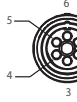
Cable length 300±30
Connector optional
Made by Hypertac
SRUC-17G-MRWN087 (MALE)

Encoder connector	
Pin No.	Signal
1	BAT - (0 V)
2	BAT +
3	S +
4	S -
5 to 7	Free
8	ESV (power supply)
9	E0V (power supply)
10 to 17	Free
Connector case	FG (Ground)

*Note: Pins 1 and 2 used only for motors with ABS encoder.

Mating connector:
Plug type: SPOC-17H-FRON169 (FEMALE)

Power and brake connector wiring



Cable length 300±30
Connector optional
Made by Hypertac
SRUC-06J-M5CN236 (MALE)

Power and brake connector	
Pin No.	Output
1	Phase U
2	Phase V
3	Phase W
4	*Brake terminal
5	*Brake terminal
6	FG (ground)

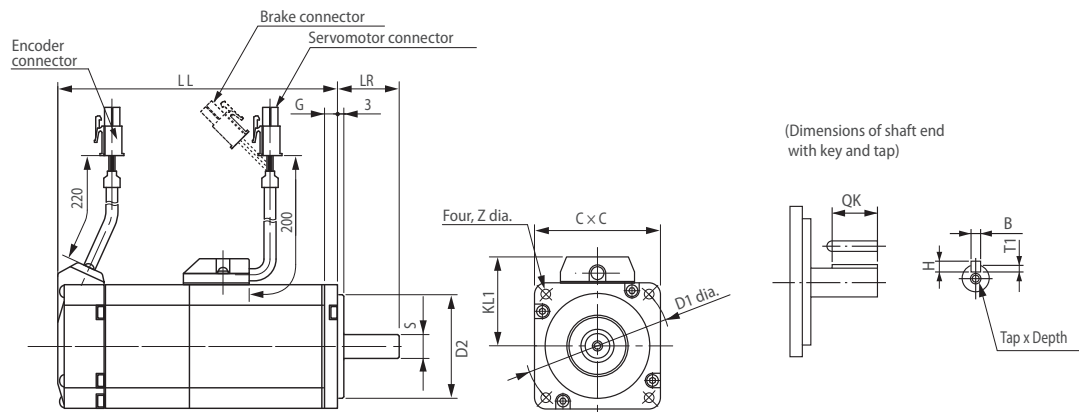
*Note: Pins 4 and 5 used only for motors with brake.

Mating connector:
Plug type: SPOC-06K-FSDN169 (FEMALE)

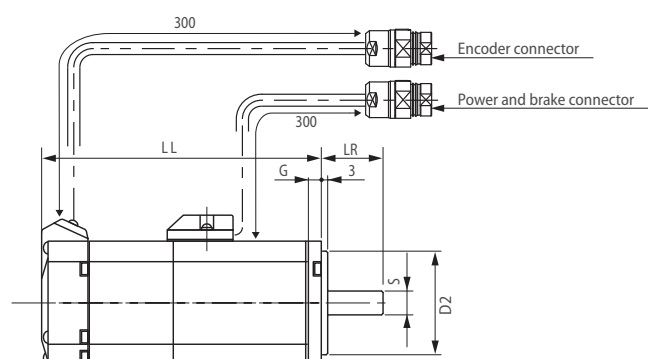
Cylindrical type 3,000 r/min (230 V, 200 to 750 W)

Dimensions (mm)	Without brake	With brake	LR	KL1	Flange surface					Shaft end						Approx. mass (kg)	
Model	LL	LL			D1	D2	C	G	Z	S	QK	B	H	T1	Tap x depth	Without brake	With brake
R88M-G20030_-S2_-	79.5	116	30	43	70	50 ^{h7}	60	6.5	4.5	11 ^{h6}	18	4 ^{h9}	4	2.5	M4 × 8L	0.8	1.3
R88M-G40030_-S2_-	99	135.5								14 ^{h6}	22.5	5 ^{h9}	5	3		1.2	1.7
R88M-G75030_-S2_-	112.2	149.2	35	53	90	70 ^{h7}	80	8	6	19 ^{h6}	22	6 ^{h9}	6	3.5		2.3	3.1

Servo motor with standard connector



Servo motor with circular connector



Encoder connector wiring



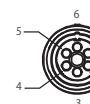
Cable length 300±30
Connector optional
Made by Hypertac
SRUC-17G-MRW087 (MALE)

Pin No.	Signal
1	BAT - (0 V)
2	BAT +
3	S +
4	S -
5 to 7	Free
8	E5V (power supply)
9	E0V (power supply)
10 to 17	Free
Connector case	FG (Ground)

*Note: Pins 1 and 2 used only for motors with ABS encoder.

Mating connector:
Plug type: SPOC-17H-FRON169 (FEMALE)

Power and brake connector wiring



Cable length 300±30
Connector optional
Made by Hypertac
SRUC-06J-M5CN236 (MALE)

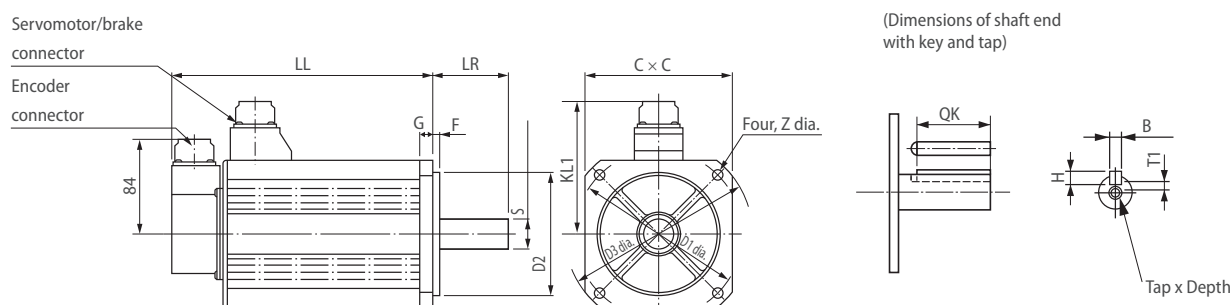
Pin No.	Output
1	Phase U
2	Phase V
3	Phase W
4	*Brake terminal
5	*Brake terminal
6	FG (ground)

*Note: Pins 4 and 5 used only for motors with brake.

Mating connector:
Plug type: SPOC-06K-FSDN169 (FEMALE)

Cylindrical type 3,000, 2,000 and 1,000 r/min (230 V, 900 W to 1.5 kW)

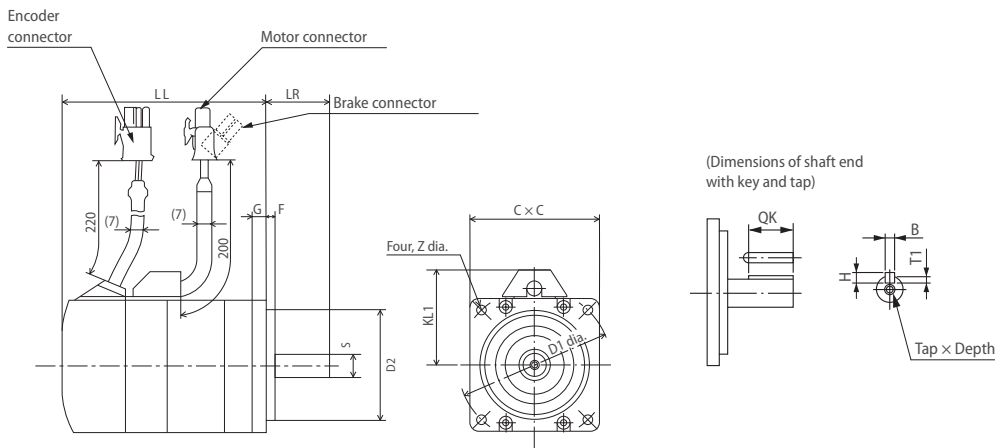
Dimensions (mm)	Without brake	With brake	LR	KL1	Flange surface							Shaft end						Approx. mass (kg)	
Model	LL	LL			D1	D2	D3	C	G	F	Z	S	QK	B	H	T1	Tap × depth	Without brake	With brake
R88M-G1K030T-_S2	175	200	55	98	100	80 ^{h7}	120	90	7	3	6.6	19 ^{h6}	42	6 ^{h9}	6	3.5	M5 × 12L	4.5	5.1
R88M-G1K530T-_S2	180	205		103	115	95 ^{h7}	135	100	10		9							5.1	6.5
R88M-G1K020T-_S2	150	175		118	145	110 ^{h7}	165	130	12	6		22 ^{h6}	41	8 ^{h9}	7	4		6.8	8.7
R88M-G1K520T-_S2	175	200																8.5	10.1
R88M-G90010T-_S2	175	200	70																10



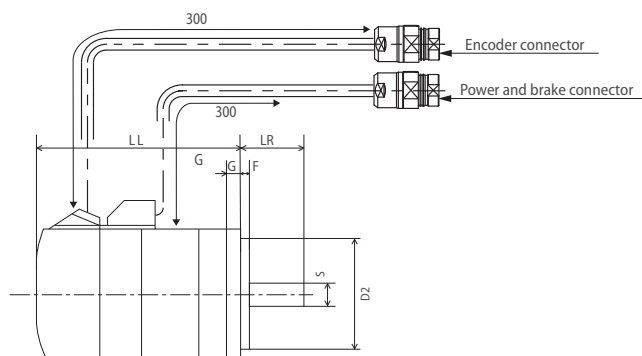
Flat type 3;000 r/min (230 V, 100 W to 400 W)

Dimensions (mm)	Without brake	With brake	LR	KL1	Flange surface						Shaft end						Aprox. mass (kg)							
Model	LL	LL			D1	D2	C	F	G	Z	S	QK	B	H	T1	Tap × depth	Without brake	With brake						
R88M-GP10030H-_-S2-_-	60.5	84.5	25	43	70	50 ^{h7}	60	3	7	4.5	8 ^{h6}	12.5	3 ^{h9}	3	1.8	M3 × 6L	0.7	0.9						
R88M-GP10030T-_-S2-_-	87.5	111.5																						
R88M-GP20030H-_-S2-_-	67.5	100	30	53	90	70 ^{h7}	80	5	8	5.5	11 ^{h6}	18	4 ^{h9}	4	2.5	M4 × 8L	1.3	2						
R88M-GP20030T-_-S2-_-	94.5	127																						
R88M-GP40030H-_-S2-_-	82.5	115																						
R88M-GP40030T-_-S2-_-	109.5	142																						

Servo motor with standard connector



Servo motor with circular connector



Encoder connector wiring



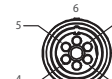
Cable length 300±30
Connector optional
Made by Hypertac
SRUC-17G-MIRWN087 (MALE)

Encoder connector	
Pin No.	Signal
1	BAT - (0 V)
2	BAT +
3	S +
4	S -
5 to 7	Free
8	E5V (power supply)
9	E0V (power supply)
10 to 17	Free
Connector case	FG (Ground)

*Note: Pins 1 and 2 used only for motors with ABS encoder.

Mating connector:
Plug type: SPOC-17H-FRON169 (FEMALE)

Power and brake connector wiring



Cable length 300±30
Connector optional
Made by Hypertac
SRUC-06J-MSCN236 (MALE)

Power and brake connector	
Pin No.	Output
1	Phase U
2	Phase V
3	Phase W
4	*Brake terminal
5	*Brake terminal
6	FG (ground)

*Note: Pins 4 and 5 used only for motors with brake.

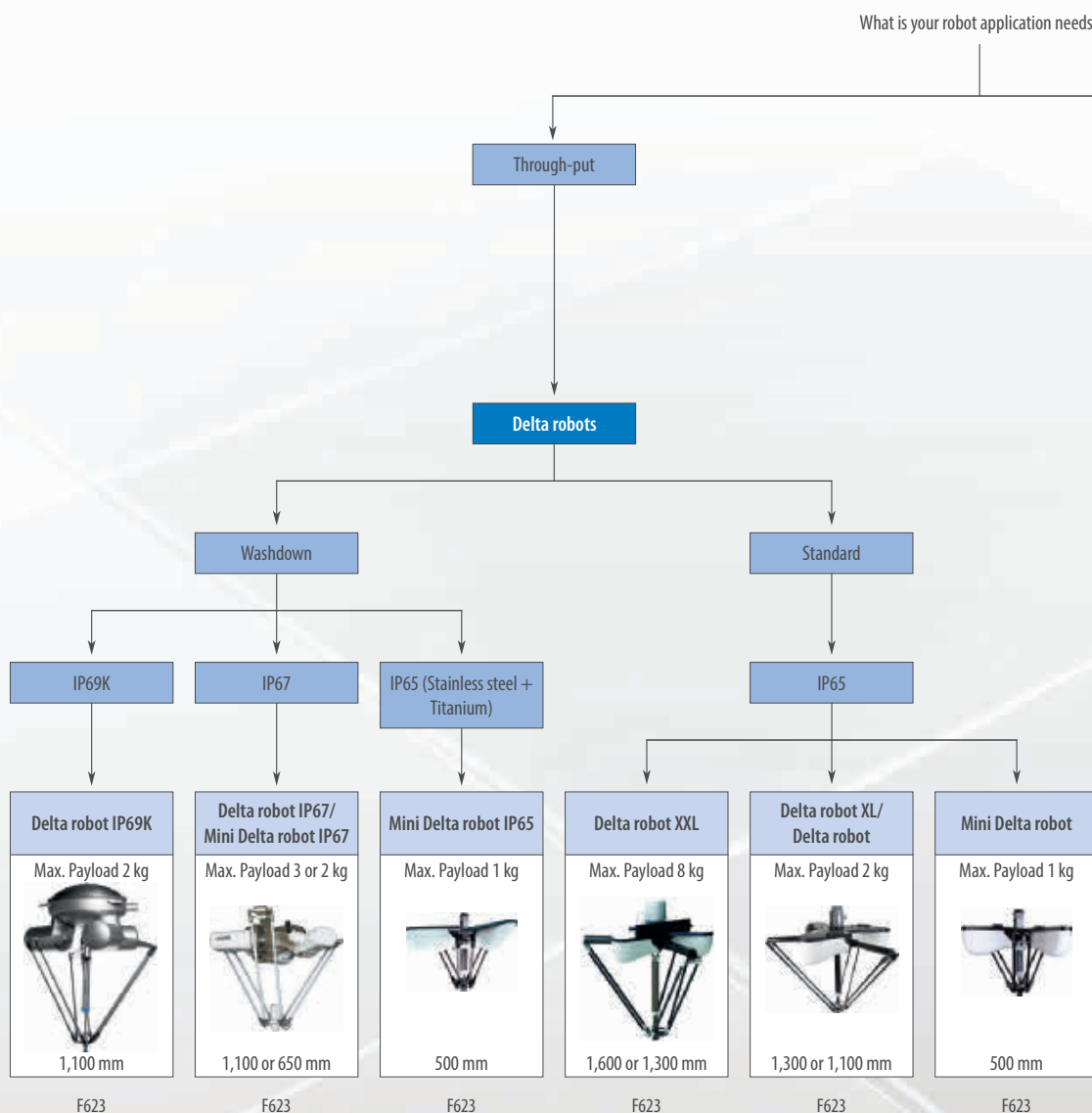
Mating connector:
Plug type: SPOC-06K-FSDN169 (FEMALE)

PICK & PLACE SOLUTIONS



Delta robots

The new solutions centred on Delta robots allow you to build very high through-put machines that can handle more than one hundred picking operations per minute.



SCARA robots

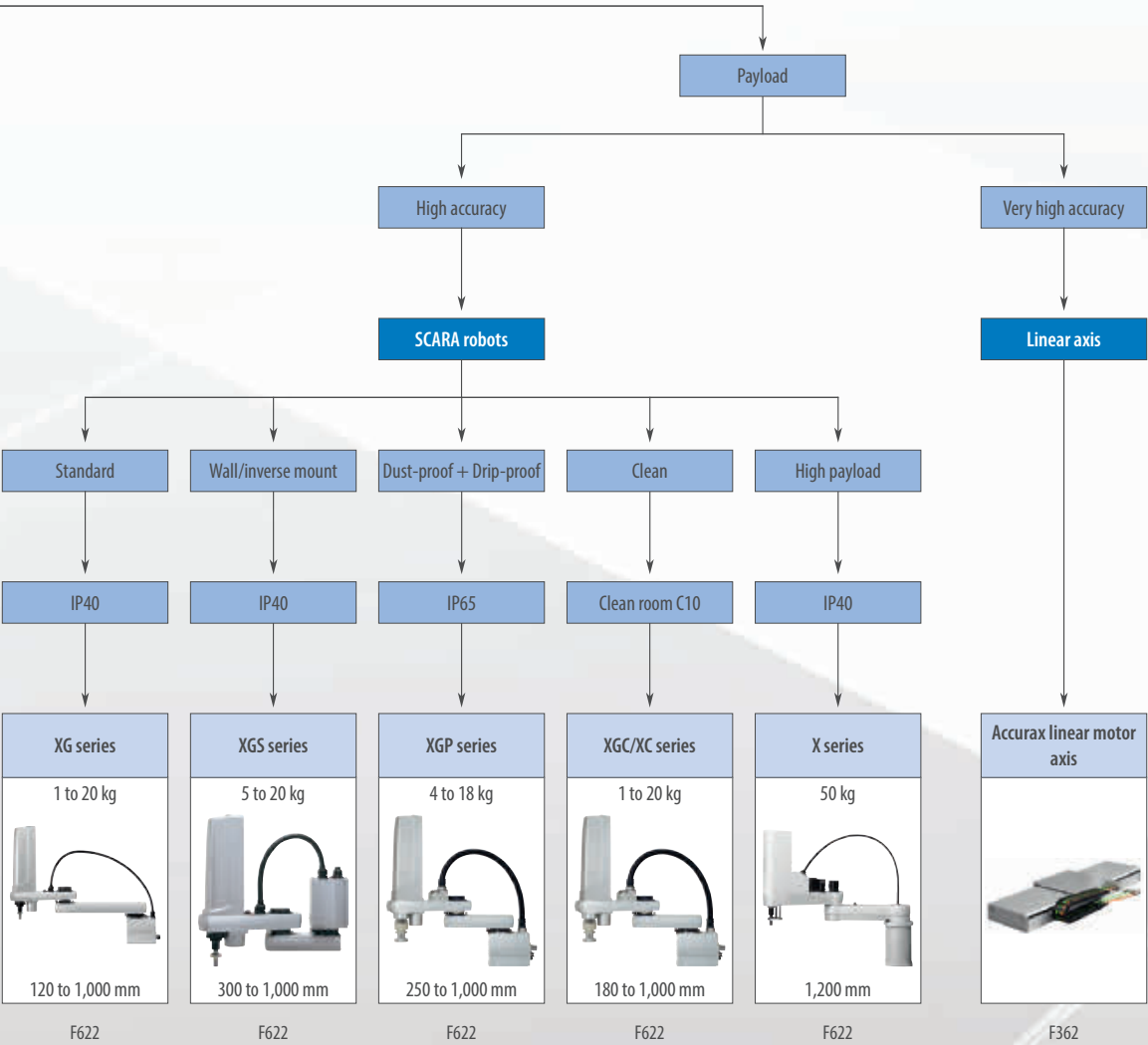
With more than 70 robot models, the SCARA based solutions are excellent when you face heavy part handling in combination with high speed cycles.



Robots

Linear axis

If precise positioning is requested then the Linear motor family provides repeatability down to the micrometer level which is achievable even while the machine performs high dynamic tasks.



Selection table

Delta robots				
				
Model	Delta robot IP69K	Delta robot IP67	Mini Delta robot IP67	Mini Delta robot IP65
Type	Washdown Delta robot series			
Max. Payload	2 kg	3 kg	2 kg	1 kg
Degrees of freedom	3 + 1 (rotation optional)			
Rated working range	Ø 1,100 × 250 mm (Max. 400)	Ø 1,100 × 300 mm (Max. 450)	Ø 650 × 150 mm (Max. 250)	Ø 500 × 155 mm/ Ø 500 × 130 mm (with rotational axis)
Cycle time	25/305/25 mm (0.1 kg): Up to 150 cycle/min		25/305/25 mm (0.1 kg): Up to 200 cycle/min	
Position repeatability	±0.2 mm (X, Y, Z)		±0.1 mm (X, Y, Z)	±0.2 mm (X, Y, Z)
Angular repeatability	±0.3° (q)		±0.1° (q)	
Protection class	IP69K	IP67	IP65 (Stainless steel + Titanium)	
Rotational axis type	Shaft mounting	Tool Center Point mounting - Low or High inertia -		Shaft mounting
Option	–	Anti-collision detection	–	
Machine controller	NJ5 Robotics			
Servo drive	Accurax G5 rotary servo drive - EtherCAT			
Page/Quick Link	F623			

Delta robots					
Model	Delta robot XXL (1,600)	Delta robot XXL (1,300)	Delta robot XL	Delta robot	Mini Delta robot
Type	Delta robot series				
Max. Payload	8 kg		2 kg		1 kg
Degrees of freedom	3 + 1 (rotation optional)				
Rated working range	Ø 1,600 × 350 mm (Max. 550)	Ø 1,300 × 300 mm (Max. 450)	Ø 1,300 x 250 mm (Max. 400)	Ø 1,100 x 250 mm (Max. 400)	Ø 500 × 155 mm/ Ø 500 × 130 mm (with rotational axis)
Cycle time	25/300/25 mm (8 kg): Up to 60 cycle/min 200/1000/200 mm (8 kg): Up to 35 cycle/min	25/300/25 mm (8 kg): Up to 65 cycle/min 200/1000/200 mm (8 kg): Up to 40 cycle/min	25/305/25 mm (0.1 kg): Up to 120 cycle/min	25/305/25 mm (0.1 kg): Up to 150 cycle/min	25/305/25 mm (0.1 kg): Up to 200 cycle/min
Position repeatability	±1 mm (X, Y, Z)		±0.2 mm (X, Y, Z)		±0.2 mm (X, Y, Z)
Angular repeatability	±0.3° (q)			±0.4° (q)	
Protection class	IP65				
Rotational axis type	Shaft mounting				
Machine controller	NJ5 Robotics				
Servo drive	Accurax G5 rotary servo drive - EtherCAT				
Page/Quick Link	F623				

SCARA robots



Model	XG series	XGS series	XGP series	XGC/XC series	X series
Type	SCARA robot series				
Typical environment	Normal conditions		Food	Pharmaceutical	Normal conditions
Max. Payload range	1 to 20 kg	5 to 20 kg	4 to 18 kg	4 kg (XGC series) 1 to 20 kg (XC series)	50 kg
Reach range	120 to 1,000 mm	300 to 1,000 mm	250 to 1,000 mm	250 to 600 mm (XGC series) 180 to 1,000 mm (XC series)	1,200 mm
Protection class	IP40		IP65	Clean room C10	IP40
Mounting options	Standard	Wall/inverse mount	Standard		
Page/Quick Link	F622				

Accurax linear motor axis



Model	Accurax linear motor axis
Type	Linear motor axis
Continuous force range	48 to 760 N
Peak force range	105 to 2,000 N
Maximum speed	5 m/s
Magnetic attraction force	300 to 4,440 N
Applicable servo drive	Accurax G5 linear drive
Page/Quick Link	F362

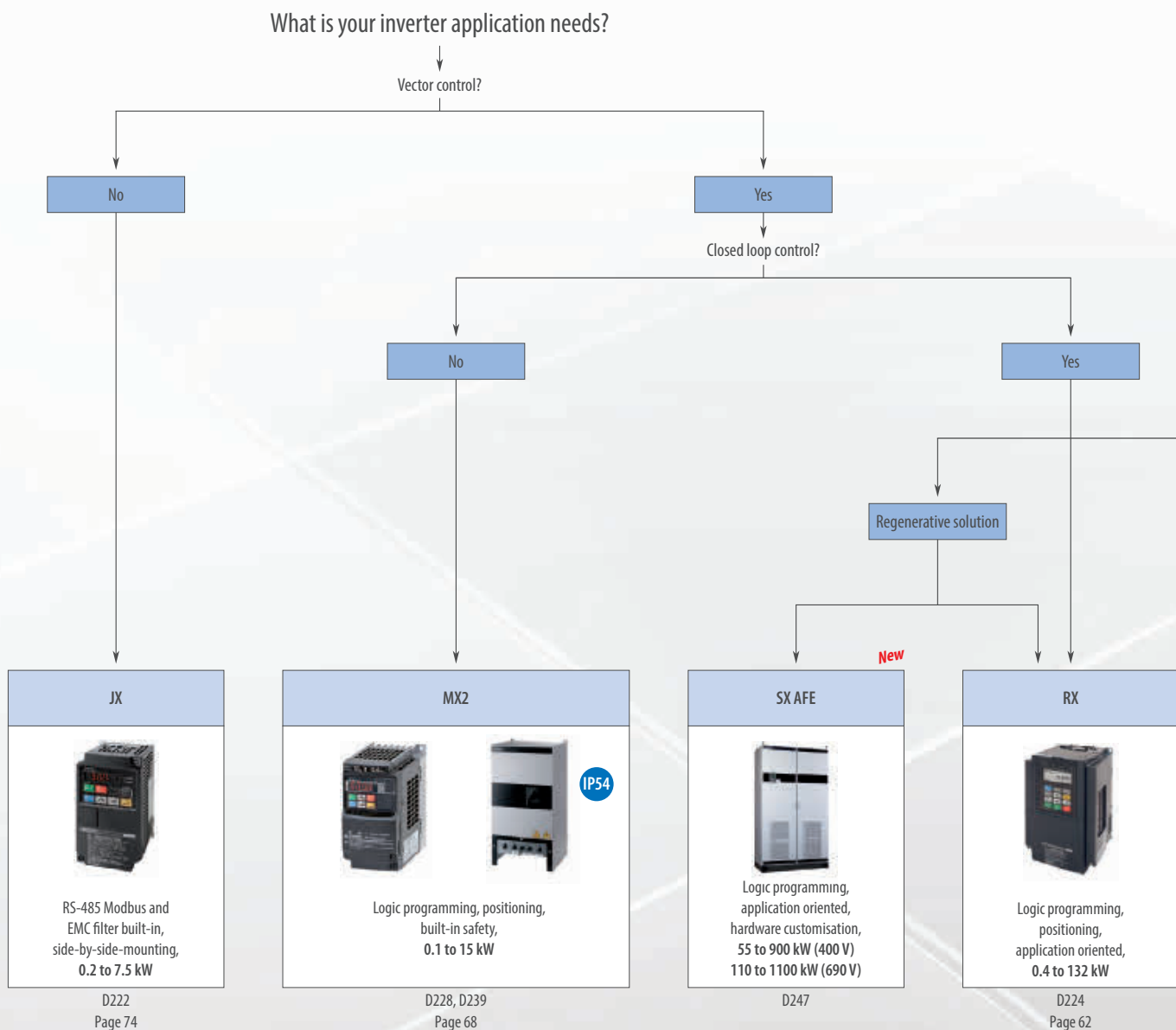
BORN TO DRIVE MACHINES

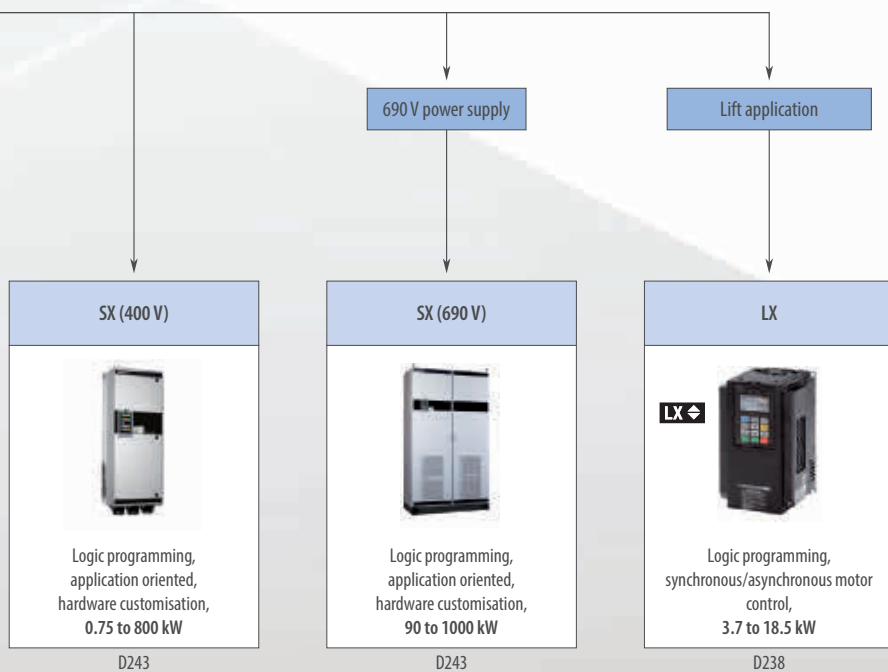
Harmonised motor and machine control

Specifically created for your application, the MX2 was developed to harmonise advanced motor and machine control. Thanks to its advanced design and algorithms the MX2 provides smooth control down to zero speed, plus precise operation for fast cyclic operations and torque control capability in open loop.

The MX2 also gives you comprehensive functionality for machine control such as positioning, speed synchronisation and logic programming. The MX2 is fully integrated within the Omron smart automation platform.

The MX2 is the child of a true leader in machine automation.





Model	RX	LX
		
	Customised to your machine	Lift applications
400 V three-phase	0.4 kW to 132 kW	3.7 kW to 18.5 kW
200 V three-phase	0.4 kW to 55 kW	–
Application	High performance, built-in know-how functionality	Lift control with asynchronous and synchronous motors
Control method	Open and closed loop for vector and V/F control	Open and closed loop vector control and V/F control
Torque features	200% at 0.0 Hz (CLV) 150% at 0.3 Hz (OLV)	150% at 0.0 Hz (CLV) 200% at 0.3 Hz (OLV)
Connectivity	Modbus, DeviceNet, PROFIBUS, MECHATROLINK-II, EtherCAT, CompoNet	Modbus
Logic programming	Standard firmware	Standard firmware
Page/Quick Link	62/D224	D238

Model	MX2	JX
	  IP54	
	Born to drive machines	Compact and complete
400 V three-phase	0.4 kW to 15 kW	0.4 kW to 7.5 kW
200 V three-phase	0.1 kW to 15 kW	0.2 kW to 7.5 kW
200 V single-phase	0.1 kW to 2.2 kW	0.2 kW to 2.2 kW
Application	Harmonized motor and machine control	General purpose built-in communications
Control method	Open loop speed and torque control for vector and speed for V/F control	V/F control
Torque features	200% at 0.5 Hz	150% at 3 Hz
Connectivity	Modbus, DeviceNet, PROFIBUS, MECHATROLINK-II, EtherCAT, CompoNet, EtherNet IP	Modbus
Logic programming	Standard firmware	N/A
Customisation options	IP54 enclosure	N/A
Page/Quick Link	68/D228, D239	74/D222

Model	SX (400 V)	SX (690 V)
		
	High performance vector control	
400 V three-phase	0.75 kW to 800 kW	–
690 V three-phase	–	90 kW to 1,000 kW
Application	High power flux vector and variable torque applications	High power flux vector and variable torque applications
Control method	Flux vector and V/F control	Flux vector and V/F control
Torque features	120% at 0.0 Hz (CLV) 120% at 0.5 Hz (OLV)	120% at 0.0 Hz (CLV) 120% at 0.5 Hz (OLV)
Connectivity	Modbus, DeviceNet, PROFIBUS, EtherCAT, Modbus TCP, CAN	Modbus, DeviceNet, PROFIBUS, EtherCAT, Modbus TCP, CAN
Logic programming	Standard firmware	Standard firmware
Customisation options	Hardware customisation (main switch, liquid cooling, 12-pulse rectifier, ...)	Hardware customisation (main switch, liquid cooling, 12-pulse rectifier, ...)
Protection class	IP54	IP54
Energy saving option	Low harmonic/Regenerative (D247)	
Page/Quick Link	D243	D243

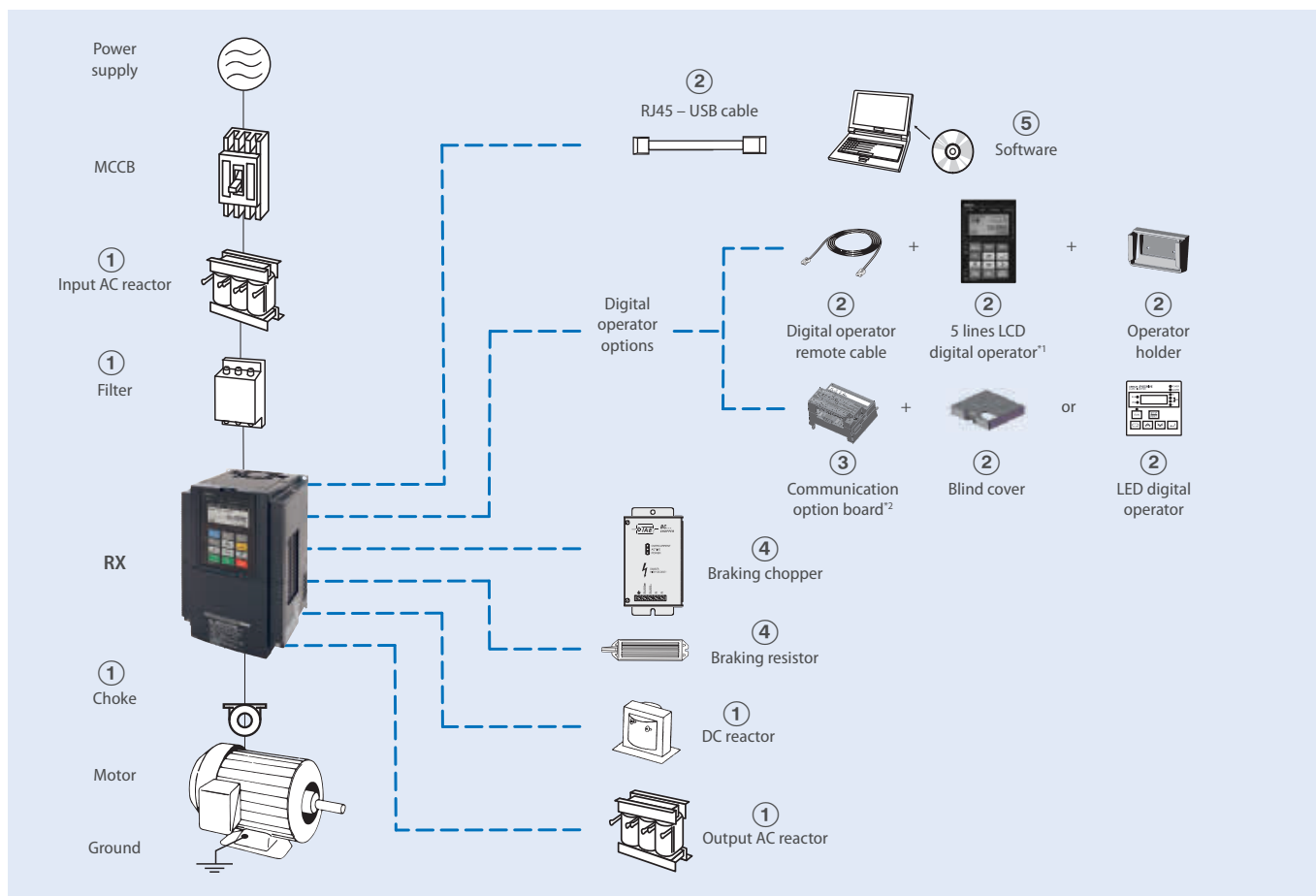


Customised to your machine

Omron realises that you need quality and reliability, plus the ability to easily and quickly customise your inverter to the application in hand. And with the RX, you have the perfect tool for the job. Naturally it combines the same high level of quality and performance for which Omron is renowned. It also has abundant application functionality on board and you can customise it yourself to match your precise requirements.

- Ratings up to 132 kW
- Full torque at 0 Hz in closed loop
- Sensor-less and vector closed-loop control
- Built-in EMC filter
- Built-in logic programmability
- Built-in application oriented functionality
- Fieldbus communications: Modbus, DeviceNet, PROFIBUS, MECHATROLINK-II, EtherCAT and CompoNet

Ordering information



¹ The 5 lines LCD digital operator is provided with the inverter from factory.

² When a communication option board is mounted, there are two options: mount a blind cover or a LED digital operator.

3G3RX

Specifications					Order code	Specifications					Order code
Voltage class	Constant torque		Variable torque		Standard	Voltage class	Constant torque		Variable torque		Standard
	Max. motor kW	Rated current A	Max. motor kW	Rated current A			Max. motor kW	Rated current A	Max. motor kW	Rated current A	
Three-phase 200 V	0.4	3.0	0.75	3.7	3G3RX-A2004-E1F	Three-phase 400 V	0.4	1.5	0.75	1.9	3G3RX-A4004-E1F
	0.75	5.0	1.5	6.3	3G3RX-A2007-E1F		0.75	2.5	1.5	3.1	3G3RX-A4007-E1F
	1.5	7.5	2.2	9.4	3G3RX-A2015-E1F		1.5	3.8	2.2	4.8	3G3RX-A4015-E1F
	2.2	10.5	4.0	12	3G3RX-A2022-E1F		2.2	5.3	4.0	6.7	3G3RX-A4022-E1F
	4.0	16.5	5.5	19.6	3G3RX-A2037-E1F		4.0	9.0	5.5	11.1	3G3RX-A4040-E1F
	5.5	24	7.5	30	3G3RX-A2055-E1F		5.5	14	7.5	16	3G3RX-A4055-E1F
	7.5	32	11	44	3G3RX-A2075-E1F		7.5	19	11	22	3G3RX-A4075-E1F
	11	46	15	58	3G3RX-A2110-E1F		11	25	15	29	3G3RX-A4110-E1F
	15	64	18.5	73	3G3RX-A2150-E1F		15	32	18.5	37	3G3RX-A4150-E1F
	18.5	76	22	85	3G3RX-A2185-E1F		18.5	38	22	43	3G3RX-A4185-E1F
	22	95	30	113	3G3RX-A2220-E1F		22	48	30	57	3G3RX-A4220-E1F
	30	121	37	140	3G3RX-A2300-E1F		30	58	37	70	3G3RX-A4300-E1F
	37	145	45	169	3G3RX-A2370-E1F		37	75	45	85	3G3RX-A4370-E1F
	45	182	55	210	3G3RX-A2450-E1F		45	91	55	105	3G3RX-A4450-E1F
	55	220	75	270	3G3RX-A2550-E1F		55	112	75	135	3G3RX-A4550-E1F
	-						75	149	90	160	3G3RX-B4750-E1F
							90	176	110	195	3G3RX-B4900-E1F
							110	217	132	230	3G3RX-B411K-E1F
							132	260	160	290	3G3RX-B413K-E1F

① Rasmi line filter

200 V					400 V				
Model 3G3RX-X-	Leakage Nom./Max.	Rated current A	Weight (kg)	Order code	Model 3G3RX-	Leakage Nom./Max.	Rated current A	Weight (kg)	Order code
A2004/A2007/A2015/A2022/A2037	0.7/40 mA	18	2.0	AX-FIR2018-RE	A4004/A4007/A4015/A4022/A4040	0.3/40 mA	10	1.9	AX-FIR3010-RE
A2055/A2075/A2110	0.7/40 mA	53	2.5	AX-FIR2053-RE	A4055/A4075/A4110	0.3/40 mA	30	2.2	AX-FIR3030-RE
A2150/A2185/A2220	1.2/70 mA	110	8.0	AX-FIR2110-RE	A4150/A4185/A4220	0.8/70 mA	53	4.5	AX-FIR3053-RE
A2300	1.2/70 mA	145	8.6	AX-FIR2145-RE	A4300	3/160 mA	64	7.0	AX-FIR3064-RE
A2370/A2450	6/300 mA	250	13.0	AX-FIR3250-RE	A4370	2/130 mA	100	8.0	AX-FIR3100-RE
A2550	6/300 mA	320	13.2	AX-FIR3320-RE	A4450/A4550	2/130 mA	130	8.6	AX-FIR3130-RE
-					A4750/A4900	10/500 mA	250	13.0	AX-FIR3250-RE
					A411K/A413K	10/500 mA	320	13.2	AX-FIR3320-RE

① Input AC reactors

3-phase 200 VAC		3-phase 400 VAC	
Inverter model 3G3RX-	Order code	Inverter model 3G3RX-	Order code
A2004/A2007/A2015	AX-RAI02800100-DE	A4004/A4007/A4015	AX-RAI07700050-DE
A2022/A2037	AX-RAI00880200-DE	A4022/A4040	AX-RAI03500100-DE
A2055/A2075	AX-RAI00350335-DE	A4055/A4075	AX-RAI01300170-DE
A2110/A2150	AX-RAI00180670-DE	A4110/A4150	AX-RAI00740335-DE
A2185/A2220	AX-RAI00091000-DE	A4185/A4220	AX-RAI00360500-DE
A2300/A2370	AX-RAI00071550-DE	A4300/A4370	AX-RAI00290780-DE
A2450/A2550	AX-RAI00042300-DE	A4450/A4550	AX-RAI00191150-DE
		A4750/A4900	AX-RAI00111850-DE
		A411K/A413K	AX-RAI00072700-DE

① DC reactors

3-phase 200 VAC		3-phase 400 VAC	
Inverter model 3G3RX-	Order code	Inverter model 3G3RX-	Order code
A2004	AX-RC10700032-DE	A4004	AX-RC43000020-DE
A2007	AX-RC06750061-DE	A4007	AX-RC27000030-DE
A2015	AX-RC03510093-DE	A4015	AX-RC14000047-DE
A2022	AX-RC02510138-DE	A4022	AX-RC10100069-DE
A2037	AX-RC01600223-DE	A4040	AX-RC06400116-DE
A2055	AX-RC01110309-DE	A4055	AX-RC04410167-DE
A2075	AX-RC00840437-DE	A4075	AX-RC03350219-DE
A2110	AX-RC00590614-DE	A4110	AX-RC02330307-DE
A2150	AX-RC00440859-DE	A4150	AX-RC01750430-DE
A2185/A2220	AX-RC00301275-DE	A4185/A4220	AX-RC01200644-DE
A2300	AX-RC00231662-DE	A4300	AX-RC00920797-DE
A2370	AX-RC00192015-DE	A4370	AX-RC00741042-DE
A2450	AX-RC00162500-DE	A4450	AX-RC00611236-DE
A2550	AX-RC00133057-DE	A4550	AX-RC00501529-DE

3-phase 200 VAC		3-phase 400 VAC	
Inverter model 3G3RX-__	Order code	Inverter model 3G3RX-__	Order code
		A4750	AX-RC00372094-DE
		A4900	AX-RC00312446-DE
		A411K	AX-RC00252981-DE
		A413K	AX-RC00213613-DE

① Chokes

Diameter	Description	Order code
21	For 2.2 kW motors or below	AX-FER2102-RE
25	For 15 kW motors or below	AX-FER2515-RE
50	For 45 kW motors or below	AX-FER5045-RE
60	For 55 kW motors or above	AX-FER6055-RE

① Output AC Reactor

200 V		400 V	
Model 3G3RX-__	Order code	Model 3G3RX-__	Order code
A2004	AX-RAO11500026-DE	A4004/A4007/A4015	AX-RAO16300038-DE
A2007	AX-RAO07600042-DE		
A2015	AX-RAO04100075-DE		
A2022	AX-RAO03000105-DE	A4022	AX-RAO11800053-DE
A2037	AX-RAO01830160-DE	A4040	AX-RAO07300080-DE
A2055	AX-RAO01150220-DE	A4055	AX-RAO04600110-DE
A2075	AX-RAO00950320-DE	A4075	AX-RAO03600160-DE
A2110	AX-RAO00630430-DE	A4110	AX-RAO02500220-DE
A2150	AX-RAO00490640-DE	A4150	AX-RAO02000320-DE
A2185	AX-RAO00390800-DE	A4185	AX-RAO01650400-DE
A2220	AX-RAO00330950-DE	A4220	AX-RAO01300480-DE
A2300	AX-RAO00251210-DE	A4300	AX-RAO01030580-DE
A2370	AX-RAO00191450-DE	A4370	AX-RAO00800750-DE
A2450	AX-RAO00161820-DE	A4450	AX-RAO00680900-DE
A2550	AX-RAO00132200-DE	A4550	AX-RAO00531100-DE
		A4750	AX-RAO00401490-DE
		A4900	AX-RAO00331760-DE
		A411K	AX-RAO00262170-DE
		A413K	AX-RAO00212600-DE

Note: This table corresponds with HD rating. When ND is used, please choose the reactor for the next size inverter.

② Accessories

Types	Appearance	Description	Order code
Remote digital operator		5 line LCD digital operator with copy function ^{*1}	3G3AX-OP05
		Operator holder (for inside cabinet mounting)	3G3AX-OP05-H-E
		LED remote digital operator	3G3AX-OP01
LED digital operator		Mounting kit	4X-KITmini
		To be used in combination with communication option boards	3G3AX-OP03
Blind cover			3G3AX-OP05-B-E
Cables		3 m remote digital operator cable	3G3AX-CAJOP300-EE
	—	RJ45 to USB connection cable	USB-CONVERTERCABLE 3G3AX-PCACN2

^{*1} This digital operator is provided with the RX inverter from factory.

③ Option boards

Types	Description	Functions	Order code
Encoder feedback	PG speed controller option card	Phase A,B and Z pulse (differential pulse) inputs (RS-422) Pulse train position command input (RS-422) Pulse monitor output (RS-422) PG frequency range: 100 kHz max	3G3AX-PG
Communication option board	DeviceNet option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current ... through communications with the host controller	3G3AX-RX-DRT
	Profibus option card		3G3AX-RX-PRT
	Ethercat option card		3G3AX-RX-ECT
	CompoNet option card		3G3AX-RX-CRT
	Mechatrolink-II option card		3G3AX-RX-MRT
I/O option	Extra input/output option card	8 digital inputs, 8 digital outputs, 4 analog inputs, 1 analog output	3G3AX-EIO21-ROE

④ Braking unit, braking resistor unit

Inverter					Braking resistor unit					
Voltage	Max. motor kW	Inverter 3G3RX_	Braking unit AX-BCR_	Connectable min. resistance Ω	Inverter mounted type (3% ED, 10 sec max.)		Braking torque %	External resistor 10% ED 10 sec max. for built-in 5 sec max. for braking unit		Braking torque %
		3-phase			Order code	Resist Ω		Order code	Resist Ω	
200 V (single-/three-phase)	0.55	2004	Built-in	50	AX-REM00K1200-IE	200	180	AX-REM00K1200-IE	200	180
	1.1	2007					100	AX-REM00K2070-IE	70	200
	1.5	2015		35	AX-REM00K2070-IE	70	140	AX-REM00K4075-IE	75	130
	2.2	2022					90	AX-REM00K4035-IE	35	180
	4.0	2037			AX-REM00K4075-IE	75	50	AX-REM00K6035-IE	35	100
	5.5	2055		16	AX-REM00K4035-IE	35	75	AX-REM00K9020-IE	20	150
	7.5	2075					55	AX-REM01K9017-IE	17	110
	11.0	2110		10	AX-REM00K6035-IE	35	40	AX-REM02K1017-IE	17	75
	15.0	2150			AX-REM00K9017-IE	17	55	AX-REM03K5010-IE	10	95
	18.5	2185		7.5	AX-REM03K5010-IE	10	75	AX-REM19K0008-IE	8	95
	22.0	2220					65			80
	30.0	2300	2035090-TE	4	—			AX-REM19K0006-IE	6	80
	37.0	2370							6	60
	45.0	2450	2070130-TE	2.8				2 x AX-REM19K0006-IE	3	105
	55.0	2550							3	85
400 V (three-phase)	0.55	4004	Built-in	100	AX-REM00K1400-IE	400	200	AX-REM00K1400-IE	400	200
	1.1	4007					200			200
	1.5	4015			AX-REM00K1200-IE	200	190	AX-REM00K2200-IE	200	190
	2.2	4022			AX-REM00K2200-IE	200	130	AX-REM00K5120-IE	120	200
	4.0	4040		70	AX-REM00K2120-IE	120	120	AX-REM00K6100-IE	100	140
	5.5	4055			AX-REM00K4075-IE	75	140	AX-REM00K9070-IE	70	150
	7.5	4075		35			100	AX-REM01K9070-IE	70	110
	11.0	4110			AX-REM00K6100-IE	100	50	AX-REM02K1070-IE	70	75
	15.0	4150		24	AX-REM00K9070-IE	70	55	AX-REM03K5035-IE	35	110
	18.5	4185			AX-REM03K5035-IE	35	90	AX-REM19K0030-IE	30	100
	22.0	4220		20			75			85
	30.0	4300	4015045-TE	16	—			AX-REM19K0020-IE	20	95
	37.0	4370						AX-REM38K0012-IE	15	125
	45.0	4450	4035090-TE	8.5						100
	55.0	4550						2 x AX-REM19K0020-IE	10	100
	75.0	4750	4070130-TE	5.5				3 x AX-REM19K0030-IE	10	75
	90.0	4900						2 x AX-REM38K0012-IE	6	105
	110.0	411K	4090240-TE	3.2				3 x AX-REM38K0012-IE	4	125
	132.0	413K								105

⑤ Computer software

Description	Installation	Order code
Computer software	Configuration and monitoring software tool	CX-Drive
Computer software	Configuration and monitoring software tool	CX-One
Computer software	Software tool for energy saving calculation	€Saver

Specifications

200 V class

Three-phase: 3G3RX-			A2004	A2007	A2015	A2022	A2037	A2055	A2075	A2110	A2150	A2185	A2220	A2300	A2370	A2450	A2550		
Max. applicable motor 4P kW ^{*1}			at CT	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	
			at VT	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	
Output characteristics	Inverter capacity kVA	200 V	at CT	1.0	1.7	2.5	3.6	5.7	8.3	11.0	15.9	22.1	26.3	32.9	41.9	50.2	63.0	76.2	
			at VT	1.3	2.1	3.2	4.1	6.7	10.4	15.2	20.0	26.3	29.4	39.1	49.5	59.2	72.7	93.5	
		240 V	at CT	1.2	2.0	3.1	4.3	6.8	9.9	13.3	19.1	26.6	31.5	39.4	50.2	60.2	75.6	91.4	
			at VT	1.5	2.6	3.9	5.0	8.1	12.4	18.2	24.1	31.5	35.3	46.9	59.4	71.0	87.2	112.2	
	Rated output current (A)	at CT	3.0	5.0	7.5	10.5	16.5	24	32	46	64	76	95	121	145	182	220		
		at VT	3.7	6.3	9.4	12	19.6	30	44	58	73	85	113	140	169	210	270		
	Max. output voltage			Proportional to input voltage: 0 to 240 V															
	Max. output frequency			400 Hz															
Power supply	Rated input voltage and frequency		3-phase 200 to 240 V 50/60 Hz																
	Allowable voltage fluctuation		-15% to 10%																
	Allowable frequency fluctuation		5%																
Braking	Regenerative braking		Internal BRD circuit (external discharge resistor)												External regenerative braking unit				
	Minimum connectable resistance		50	50	35	35	35	16	10	10	7.5	7.5	5						
Protective structure			IP20																
Cooling method			Forced air cooling																

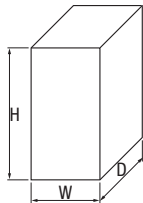
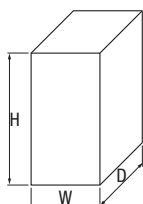
^{*1} Based on a standard 3-phase standard motor.

400 V class

Three-phase: 3G3RX-__			A4004	A4007	A4015	A4022	A4040	A4055	A4075	A4110	A4150	A4185	A4220	A4300	A4370	A4450	A4550	B4750	B4900	B411K	B413K		
Max. applicable motor 4P kW*1			at CT	0.4	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	
			at VT	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	
Output characteristics	Inverter capacity kVA	400 V	at CT	1.0	1.7	2.5	3.6	6.2	9.7	13.1	17.3	22.1	26.3	33.2	40.1	51.9	63.0	77.6	103.2	121.9	150.3	180.1	
			at VT	1.3	2.1	3.3	4.6	7.7	11.0	15.2	20.9	25.6	30.4	39.4	48.4	58.8	72.7	93.5	110.8	135	159.3	200.9	
		480 V	at CT	1.2	2.0	3.1	4.3	7.4	11.6	15.8	20.7	26.6	31.5	39.9	48.2	62.3	75.6	93.1	123.8	146.3	180.4	216.1	
			at VT	1.5	2.5	4.0	5.5	9.2	13.3	18.2	24.1	30.7	36.5	47.3	58.1	70.6	87.2	112.2	133	162.1	191.2	241.1	
	Rated output current (A)	at CT	1.5	2.5	3.8	5.3	9.0	14	19	25	32	38	48	58	75	91	112	149	176	217	260		
		at VT	1.9	3.1	4.8	6.7	11.1	16	22	29	37	43	57	70	85	105	135	160	195	230	290		
	Max. output voltage			Proportional to input voltage: 0 to 480 V																			
	Max. output frequency			400 Hz																			
Power supply	Rated input voltage and frequency		3-phase 380 to 480 V 50/60 Hz																				
	Allowable voltage fluctuation		-15% to 10%																				
	Allowable frequency fluctuation		5%																				
Braking	Regenerative braking		Internal BRD circuit (external discharge resistor)												External regenerative braking unit								
	Minimum connectable resistance		100	100	100	100	70	70	35	35	24	24	20										
Protective structure			IP20																	IP00			
Cooling method			Forced air cooling																				

^{*1} Based on a standard 3-phase standard motor.

Dimensions

Voltage class	Inverter model	Dimensions in mm				
		H	W	D	Weight (kg)	
Three-phase 200 V	3G3RX-A2004	255	150	140	3.5	
	3G3RX-A2007					
	3G3RX-A2015					
	3G3RX-A2022					
	3G3RX-A2037					
	3G3RX-A2055	260	210	170	6	
	3G3RX-A2075					
	3G3RX-A2110					
	3G3RX-A2150	390	250	190	14	
	3G3RX-A2185					
	3G3RX-A2220					
	3G3RX-A2300	540	310	195	20	
	3G3RX-A2370	550	390	250	30	
	3G3RX-A2450					
	3G3RX-A2550	700	480	250	43	
Three-phase 400 V	3G3RX-A4004	255	150	140	3.5	
	3G3RX-A4007					
	3G3RX-A4015					
	3G3RX-A4022					
	3G3RX-A4040					
	3G3RX-A4055	260	210	170	6	
	3G3RX-A4075					
	3G3RX-A4110					
	3G3RX-A4150	390	250	190	14	
	3G3RX-A4185					
	3G3RX-A4220					
	3G3RX-A4300	540	310	195	22	
	3G3RX-A4370	550	390	250	30	
	3G3RX-A4450					
	3G3RX-A4550					
	3G3RX-B4750	700	390	270	60	
	3G3RX-B4900					
	3G3RX-B411K	740	480	270	80	
	3G3RX-B413K					

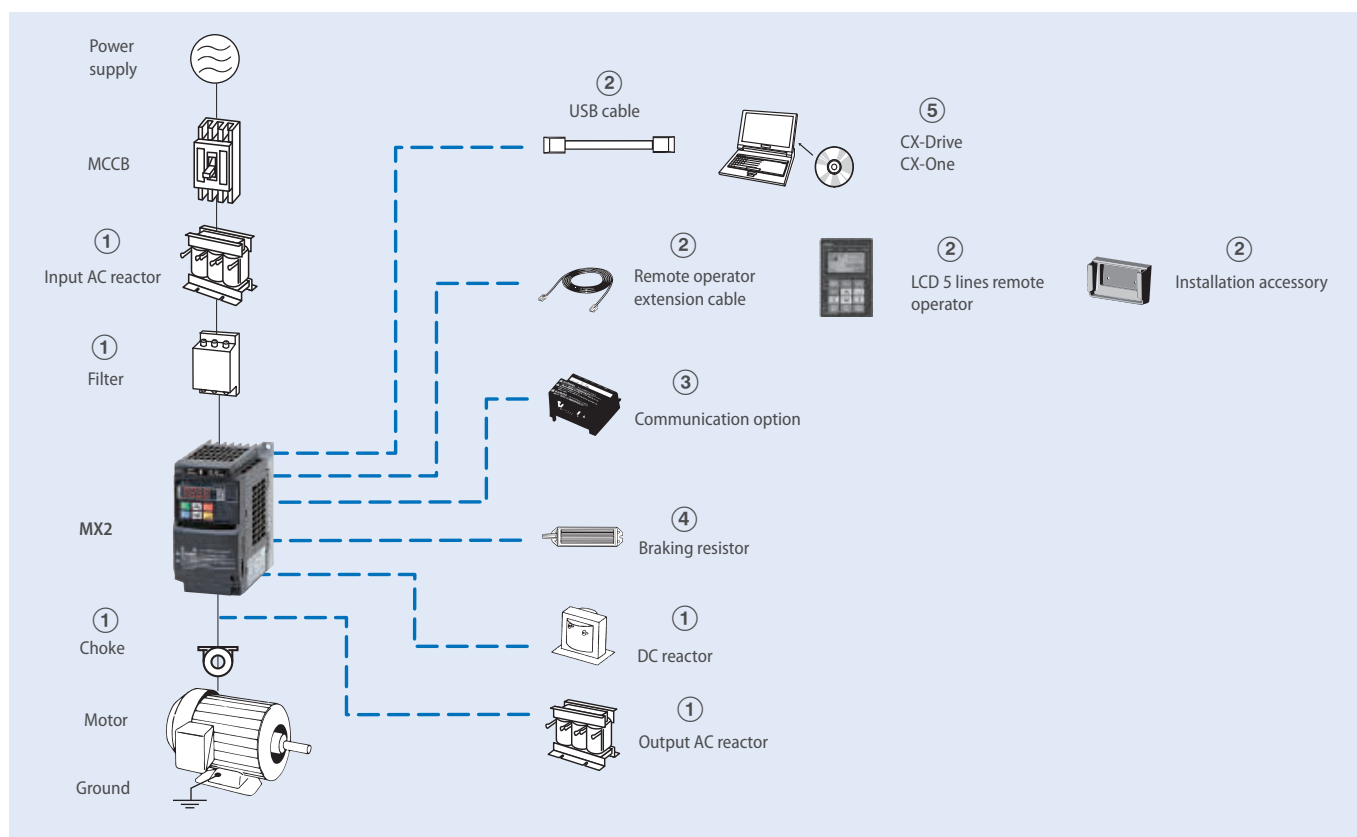


Born to drive machines

MX2 has been developed to harmonise advanced motor and machine control. Thanks to its advanced design algorithms the MX2 provides smooth control down to zero speed, plus precise operation for fast cyclic operations and torque control capability in open loop. The MX2 also gives you comprehensive functionality for machine control such as positioning, speed synchronisation and logic programming.

- Current vector control
- Double rating VT 120%/1 min and CT 150%/1 min
- IM & PM motor control
- Torque control in open loop vector
- Positioning functionality
- Built-in application functionality (i.e. Brake control)
- Fieldbus comms: Modbus, DeviceNet, Profibus, MECHATROLINK-II, EtherCAT, CompoNet and EtherNet/IP

Ordering information



3G3MX2

Specifications					Order code		
Voltage class	Constant torque		Variable torque		Standard (IP20)	Finless	IP54
	Max motor kW	Rated current A	Max motor kW	Rated current A			
Single-phase 200 V	0.1	1.0	0.2	1.2	3G3MX2-AB001-E	3G3MX2-AB001-P-E	3G3MX2-DB001-E/EC
	0.2	1.6	0.4	1.9	3G3MX2-AB002-E	3G3MX2-AB002-P-E	3G3MX2-DB002-E/EC
	0.4	3.0	0.55	3.5	3G3MX2-AB004-E	3G3MX2-AB004-P-E	3G3MX2-DB004-E/EC
	0.75	5.0	1.1	6.0	3G3MX2-AB007-E	3G3MX2-AB007-P-E	3G3MX2-DB007-E/EC
	1.5	8.0	2.2	9.6	3G3MX2-AB015-E	3G3MX2-AB015-P-E	3G3MX2-DB015-E/EC
	2.2	11.0	3.0	12.0	3G3MX2-AB022-E	3G3MX2-AB022-P-E	3G3MX2-DB022-E/EC
Three-phase 200 V	0.1	1.0	0.2	1.2	3G3MX2-A2001-E	3G3MX2-A2001-P-E	3G3MX2-D2001-E/EC
	0.2	1.6	0.4	1.9	3G3MX2-A2002-E	3G3MX2-A2002-P-E	3G3MX2-D2002-E/EC
	0.4	3.0	0.55	3.5	3G3MX2-A2004-E	3G3MX2-A2004-P-E	3G3MX2-D2004-E/EC
	0.75	5.0	1.1	6.0	3G3MX2-A2007-E	3G3MX2-A2007-P-E	3G3MX2-D2007-E/EC
	1.5	8.0	2.2	9.6	3G3MX2-A2015-E	3G3MX2-A2015-P-E	3G3MX2-D2015-E/EC
	2.2	11.0	3.0	12.0	3G3MX2-A2022-E	3G3MX2-A2022-P-E	3G3MX2-D2022-E/EC
	3.7	17.5	5.5	19.6	3G3MX2-A2037-E	3G3MX2-A2037-P-E	3G3MX2-D2037-E/EC
	5.5	25.0	7.5	30.0	3G3MX2-A2055-E	—	3G3MX2-D2055-E/EC
	7.5	33.0	11	40.0	3G3MX2-A2075-E	—	3G3MX2-D2075-E/EC
	11	47.0	15	56.0	3G3MX2-A2110-E	—	3G3MX2-D2110-E/EC
	15	60.0	18.5	69.0	3G3MX2-A2150-E	—	3G3MX2-D2150-E/EC

Specifications					Order code		
Voltage class	Constant torque		Variable torque		Standard (IP20)	Finless	IP54
	Max motor kW	Rated current A	Max motor kW	Rated current A			
Three-phase 400 V	0.4	1.8	0.75	2.1	3G3MX2-A4004-E	3G3MX2-A4004-P-E	3G3MX2-D4004-EC
	0.75	3.4	1.5	4.1	3G3MX2-A4007-E	3G3MX2-A4007-P-E	3G3MX2-D4007-EC
	1.5	4.8	2.2	5.4	3G3MX2-A4015-E	3G3MX2-A4015-P-E	3G3MX2-D4015-EC
	2.2	5.5	3.0	6.9	3G3MX2-A4022-E	3G3MX2-A4022-P-E	3G3MX2-D4022-EC
	3.0	7.2	4.0	8.8	3G3MX2-A4030-E	3G3MX2-A4030-P-E	3G3MX2-D4030-EC
	4.0	9.2	5.5	11.1	3G3MX2-A4040-E	3G3MX2-A4040-P-E	3G3MX2-D4040-EC
	5.5	14.8	7.5	17.5	3G3MX2-A4055-E	–	3G3MX2-D4055-EC
	7.5	18.0	11	23.0	3G3MX2-A4075-E	–	3G3MX2-D4075-EC
	11	24.0	15	31.0	3G3MX2-A4110-E	–	3G3MX2-D4110-EC
	15	31.0	18.5	38.0	3G3MX2-A4150-E	–	3G3MX2-D4150-EC

① Line filters

Inverter		Standard line filter				Low leakage line filter			
		Rasmi		Schaffner		Rasmi		Schaffner	
Voltage	Model 3G3MX2_	Order code AX-FIM	Current (A)	Order code AX-FIM	Current (A)	Order code AX-FIM	Current (A)	Order code AX-FIM	Current (A)
1Phase 200 VAC	AB001 / AB002 / AB004	1010-RE	10	1010-SE-V1	8	1010-RE-LL	10	1010-SE-LL	10
	AB007	1014-RE	14	1014-SE-V1	14	1014-RE-LL	14	1014-SE-LL	14
	AB015 / AB022	1024-RE	24	1024-SE-V1	27	1024-RE-LL	24	1024-SE-LL	24
3Phase 200 VAC	A2001 / A2002 / A2004 / A2007	2010-RE	10	2010-SE-V1	7.8	2010-RE-LL	10	–	–
	A2015 / A2022	2020-RE	20	2020-SE-V1	16	2020-RE-LL	20	2020-SE-LL	20
	A2037	2030-RE	30	2030-SE-V1	25	2030-RE-LL	30	2030-SE-LL	30
	A2055 / A2075	2060-RE	60	2060-SE-V1	50	2060-RE-LL	60	2060-SE-LL	50
	A2110	2080-RE	80	2080-SE-V1	70	2080-RE-LL	80	–	–
	A2150	2100-RE	100	2100-SE-V1	75	2100-RE-LL	100	–	–
3Phase 400 VAC	A4004 / A4007	3005-RE	5	3005-SE-V1	6	3005-RE-LL	5	3005-SE-LL	5
	A4015 / A4022 / A4030	3010-RE	10	3010-SE-V1	12	3010-RE-LL	10	3010-SE-LL	10
	A4040	3014-RE	14	3014-SE-V1	15	3014-RE-LL	14	3014-SE-LL	15
	A4055 / A4075	3030-RE	30	3030-SE-V1	29	3030-RE-LL	30	3030-SE-LL	30
	A4110 / A4150	3050-RE	50	3050-SE-V1	48	3050-RE-LL	50	3050-SE-LL	50

① Input AC reactors

Inverter		AC Reactor
Voltage	Model 3G3MX2_	Order code
1-Phase 200 VAC	AB002/AB004	AX-RAI02000070-DE
	AB007	AX-RAI01700140-DE
	AB015	AX-RAI01200200-DE
	AB022	AX-RAI00630240-DE
3-Phase 200 VAC	A2002/A2004/A2007	AX-RAI02800080-DE
	A2015/A2022/A2037	AX-RAI00880200-DE
	A2055/A2075	AX-RAI00350335-DE
	A2110/A2150	AX-RAI00180670-DE

Inverter		AC Reactor
Voltage	Model 3G3MX2_	Order code
3-Phase 400 VAC	A4004/A4007/A4015	AX-RAI07700050-DE
	A4022/A4030/A4040	AX-RAI03500100-DE
	A4055/A4075	AX-RAI01300170-DE
	A4110/A4150	AX-RAI00740335-DE

① DC reactors

200 V single-phase		200 V three-phase		400 V three-phase	
Inverter	Order code	Inverter	Order code	Inverter	Order code
3G3MX2-AB001	AX-RC10700032-DE	3G3MX2-A2001	AX-RC21400016-DE	3G3MX2-A4004	AX-RC43000020-DE
3G3MX2-AB002		3G3MX2-A2002		3G3MX2-A4007	AX-RC27000030-DE
3G3MX2-AB004	AX-RC06750061-DE	3G3MX2-A2004	AX-RC10700032-DE	3G3MX2-A4015	AX-RC14000047-DE
3G3MX2-AB007	AX-RC03510093-DE	3G3MX2-A2007	AX-RC06750061-DE	3G3MX2-A4022	AX-RC10100069-DE
3G3MX2-AB015	AX-RC02510138-DE	3G3MX2-A2015	AX-RC03510093-DE	3G3MX2-A4030	AX-RC08250093-DE
3G3MX2-AB022	AX-RC01600223-DE	3G3MX2-A2022	AX-RC02510138-DE	3G3MX2-A4040	AX-RC06400116-DE
–		3G3MX2-A2037	AX-RC01600223-DE	3G3MX2-A4055	AX-RC04410167-DE
		3G3MX2-A2055	AX-RC01110309-DE	3G3MX2-A4075	AX-RC03350219-DE
		3G3MX2-A2075	AX-RC00840437-DE	3G3MX2-A4011	AX-RC02330307-DE
		3G3MX2-A2011	AX-RC00590614-DE	3G3MX2-A4015	AX-RC01750430-DE
		3G3MX2-A2015	AX-RC00440859-DE	–	

① Chokes

Diameter	Description	Order code
21	For 2.2 KW motors or below	AX-FER2102-RE
25	For 15 KW motors or below	AX-FER2515-RE
50	For 45 KW motors or below	AX-FER5045-RE

① Output AC reactor

Inverter		AC Reactor
Voltage	Model 3G3MX2_—	Order code
200 VAC	AB001/AB002/AB004/A2001/A2002/A2004	AX-RAO11500026-DE
	AB007/A2007	AX-RAO07600042-DE
	AB015/A2015	AX-RAO04100075-DE
	AB022/A2022	AX-RAO03000105-DE
	A2037	AX-RAO01830160-DE
	A2055	AX-RAO01150220-DE
	A2075	AX-RAO00950320-DE
	A2110	AX-RAO00630430-DE
	A2150	AX-RAO00490640-DE

Inverter		AC Reactor
Voltage	Model 3G3MX2_	Order code
400 VAC	A4004/A4007/A4015	AX-RAO16300038-DE
	A4022	AX-RAO11800053-DE
	A4030/A4040	AX-RAO07300080-DE
	A4055	AX-RAO04600110-DE
	A4075	AX-RAO03600160-DE
	A4110	AX-RAO02500220-DE
	A4150	AX-RAO02000320-DE

② Accessories

Types	Description	Functions	Order code
Digital operator	LCD remote operator	5 Line LCD remote operator with copy function, cable length max. 3m.	AX-OP05-E
	Remote operator cable	3 meters cable for connecting remote operator	3G3AX-CAJOP300-EE
	LED remote operator	LED remote operator, cable length max. 3m	3G3AX-OP01
	Mounting kit for LED operator	Mounting kit for LED operator on panel	4X-KITMINI
	Operator holder	Holder to put the AX-OP05-E inside of the cabinet	3G3AX-OP05-H-E
Accessories	PC configuration cable	Mini USB to USB connector cable	AX-CUSBM002-E

③ Communication option boards

Description	Functions	Order code
Profibus option card	Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through communications with the host controller.	3G3AX-MX2-PRT
DeviceNet option card		3G3AX-MX2-DRT
EtherCAT option card		3G3AX-MX2-ECT
CompoNet option card		3G3AX-MX2-CRT
MECHATROLINK-II option card		3G3AX-MX2-MRT
EtherNet/IP option card		3G3AX-MX2-EIP
Extra input/output option board	1 analog voltage input, 1 analog current input, 1 analog voltage output, 8 discrete logic inputs, 4 discrete logic outputs	3G3AX-MX2-EIO15-E

④ Braking unit, braking resistor unit

Inverter				Braking resistor unit						
Voltage	Max. motor kW	Inverter 3G3MX2_		Connectable min. resistance Ω	Inverter mounted type (3 %ED, 10 sec max)		Braking torque %	Inverter mounted type (10 %ED, 10 sec max)		Braking torque %
		1-phase	3-phase		Order code	Resist Ω		Order code	Resist Ω	
200 V (Single-/Three-phase)	0.12	B001	2001	100	AX-REM00K1400-IE	400	200	AX-REM00K1400-IE	400	200
	0.25	B002	2002				180			180
	0.55	B004	2004		AX-REM00K1200-IE	200	180	AX-REM00K1200-IE	200	180
	1.1	B007	2007	50			100	AX-REM00K2070-IE	70	200
	1.5	B015	2015		AX-REM00K2070-IE	70	140	AX-REM00K4075-IE	75	130
	2.2	B022	2022	35			90	AX-REM00K4035-IE	35	180
	4.0	—	2040		AX-REM00K4075-IE	75	50	AX-REM00K6035-IE	35	100
	5.5	—	2055	20	AX-REM00K4035-IE	35	75	AX-REM00K9020-IE	20	150
	7.5	—	2075				55	AX-REM01K9017-IE	17	110
	11	—	2110	10	AX-REM00K6035-IE	35	40	AX-REM02K1017-IE	17	75
400 V (Three-phase)	15	—	2150		AX-REM00K9017-IE	17	55	AX-REM03K5010-IE	10	95
	0.55	—	4004	180	AX-REM00K1400-IE	400	200	AX-REM00K1400-IE	400	200
	1.1	—	4007				200			200
	1.5	—	4015		AX-REM00K1200-IE	200	190	AX-REM00K2200-IE	200	190
	2.2	—	4022	100	AX-REM00K2200-IE	200	130	AX-REM00K5120-IE	120	200
	3.0	—	4030		AX-REM00K2120-IE	120	160			160
	4.0	—	4040				120	AX-REM00K6100-IE	100	140
	5.5	—	4055	70	AX-REM00K4075-IE	75	140	AX-REM00K9070-IE	70	150
	7.5	—	4075				100	AX-REM01K9070-IE	70	110
	11	—	4110		AX-REM00K6100-IE	100	50	AX-REM02K1070-IE	70	75
	15	—	4150		AX-REM00K9070-IE	70	55	AX-REM03K5035-IE	35	110

⑤ Computer software

Description	Installation	Order code
Computer software	Configuration and monitoring software tool	CX-Drive
Computer software	Configuration and monitoring software tool	CX-One
Computer software	Software tool for Energy Saving calculation	€Saver

Specifications

200 V class

Single-phase: 3G3MX2-__			B001	B002	B004	B007* ¹	B015	B022	—	—	—	—	—
Three-phase: 3G3MX2-__			2001	2002	2004	2007	2015	2022	2037	2055	2075	2110	2150
Motor kW ^{*2}	For VT setting		0.2	0.4	0.55	1.1	2.2	3.0	5.5	7.5	11	15	18.5
	For CT setting		0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
Output characteristics	Inverter capacity kVA	200 VT	0.4	0.6	1.2	2.0	3.3	4.1	6.7	10.3	13.8	19.3	23.9
		200 CT	0.2	0.5	1.0	1.7	2.7	3.8	6.0	8.6	11.4	16.2	20.7
		240 VT	0.4	0.7	1.4	2.4	3.9	4.9	8.1	12.4	16.6	23.2	28.6
		240 CT	0.3	0.6	1.2	2.0	3.3	4.5	7.2	10.3	13.7	19.5	24.9
		Rated output current (A) at VT		1.2	1.9	3.5	6.0	9.6	12.0	19.6	30.0	40.0	56.0
	Rated output current (A) at CT		1.0	1.6	3.0	5.0	8.0	11.0	17.5	25.0	33.0	47.0	60.0
	Max. output voltage		Proportional to input voltage: 0 ... 240 V										
	Max. output frequency		400 Hz										
Power supply	Rated input voltage and frequency		Single-phase 200... 240 V 50/60 Hz 3-phase 200... 240 V 50/60 Hz										
	Allowable voltage fluctuation		−15% ... +10%										
	Allowable frequency fluctuation		5%										
Braking torque	At short-time deceleration		100%: <50Hz				70%: <50Hz	Approx 20%		—			
	At capacitor feedback		50%: <60Hz				50%: <60Hz						
Cooling method			Self cooling* ³				Forced-air-cooling						

^{*1} Three phase model use forced-air-cooling but single phase model is self cooling.

^{*2} Based on a standard 3-Phase standard motor.

^{*3} Forced air cooling for IP54 models

400 V class

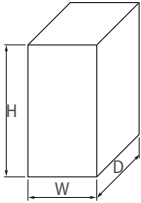
Three-phase: 3G3MX2-__			4004	4007	4015	4022	4030	4040	4055	4075	4110	4150
Motor kW ^{*1}	For VT setting		0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5
	For CT setting		0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15
Output characteristics	Inverter capacity kVA	380 VT	1.3	2.6	3.5	4.5	5.7	7.3	11.5	15.1	20.4	25.0
		380 CT	1.1	2.2	3.1	3.6	4.7	6.0	9.7	11.8	15.7	20.4
		480 VT	1.7	3.4	4.4	5.7	7.3	9.2	14.5	19.1	25.7	31.5
		480 CT	1.4	2.8	3.9	4.5	5.9	7.6	12.3	14.9	19.9	25.7
	Rated output current (A) at VT		2.1	4.1	5.4	6.9	8.8	11.1	17.5	23.0	31.0	38.0
	Rated output current (A) at CT		1.8	3.4	4.8	5.5	7.2	9.2	14.8	18.0	24.0	31.0
	Max. output voltage		Proportional to input voltage: 0 ... 480 V									
	Max. output frequency		400 Hz									
	Power supply	Rated input voltage and frequency		3-phase 380 ... 480 V 50/60 Hz								
Allowable voltage fluctuation		−15% ... +10%										
Allowable frequency fluctuation		5%										
Braking torque	At short-time deceleration ^{*2}		100%: <50Hz 50%: <60Hz				70%: <50Hz 50%: <60Hz	–				
	At capacitor feedback											
Cooling method			Self cooling ^{*2}			Forced-air-cooling						

^{*1} Based on a standard 3-Phase standard motor.

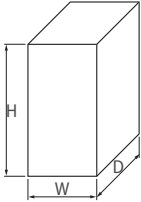
^{*2} Forced air cooling for IP54 models

Dimensions

Standard models (IP20)

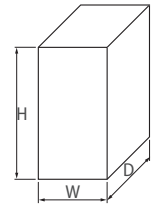
Voltage class	Inverter model	Dimensions in mm			Weight (kg)	
		H	W	D		
Single-phase 200 V	3G3MX2-AB001-E	128	68	109	1.0	
	3G3MX2-AB002-E				1.0	
	3G3MX2-AB004-E			122.5	1.1	
	3G3MX2-AB007-E	128	108	170.5	1.4	
	3G3MX2-AB015-E				1.8	
	3G3MX2-AB022-E				1.8	
Three-phase 200 V	3G3MX2-A2001-E	128	68	109	1.0	
	3G3MX2-A2002-E				1.0	
	3G3MX2-A2004-E			122.5	1.1	
	3G3MX2-A2007-E			145.5	1.2	
	3G3MX2-A2015-E	128	108	170.5	1.6	
	3G3MX2-A2022-E				1.8	
	3G3MX2-A2037-E	128	140	170.5	2.0	
	3G3MX2-A2055-E	260	140	155	3.0	
	3G3MX2-A2075-E				3.4	
	3G3MX2-A2110-E	296	180	175	5.1	
	3G3MX2-A2150-E	350	220	175	7.4	
Three-phase 400 V	3G3MX2-A4004-E	128	108	143.5	1.5	
	3G3MX2-A4007-E			170.5	1.6	
	3G3MX2-A4015-E				1.8	
	3G3MX2-A4022-E				1.9	
	3G3MX2-A4030-E				1.9	
	3G3MX2-A4040-E	128	140	170.5	2.1	
	3G3MX2-A4055-E	260		155	3.5	
	3G3MX2-A4075-E				3.5	
	3G3MX2-A4110-E	296	180	175	4.7	
	3G3MX2-A4150-E				5.2	

Finless models

Voltage class	Inverter model	Dimensions in mm			Weight (kg)	
		H	W	D		
Single-phase 200 V	3G3MX2-AB001-P-E	128	68	103	1.1	
	3G3MX2-AB002-P-E					
	3G3MX2-AB004-P-E					
	3G3MX2-AB007-P-E	128	108	123	1.8	
	3G3MX2-AB015-P-E					
	3G3MX2-AB022-P-E					
Three-phase 200 V	3G3MX2-A2001-P-E	128	68	103	1.1	
	3G3MX2-A2002-P-E					
	3G3MX2-A2004-P-E					
	3G3MX2-A2007-P-E					
	3G3MX2-A2015-P-E	128	108	123	1.8	
	3G3MX2-A2022-P-E					
Three-phase 400 V	3G3MX2-A2037-P-E	128	140	123	2.1	
	3G3MX2-A4004-P-E	128	108	123	1.8	
	3G3MX2-A4007-P-E					
	3G3MX2-A4015-P-E					
	3G3MX2-A4022-P-E					
	3G3MX2-A4030-P-E					
	3G3MX2-A4040-P-E	128	140	123	2.1	

IP54 models

Voltage class	Inverter model	Dimensions in mm			Weight (kg)
		H	W	D	
Single-phase 200 V	3G3MX2-DB001-E	464.74	179.5	292.7	8.0
	3G3MX2-DB001-EC	482.8	309.5	317.7	11.8
	3G3MX2-DB002-E	464.74	179.5	292.7	8.0
	3G3MX2-DB002-EC	482.8	309.5	317.7	11.8
	3G3MX2-DB004-E	464.74	179.5	292.7	8.4
	3G3MX2-DB004-EC	482.8	309.5	317.7	12.1
	3G3MX2-DB007-EC				12.4
	3G3MX2-DB015-EC				16.0
	3G3MX2-DB022-EC				16.0
Three-phase 200 V	3G3MX2-D2001-E	464.74	179.5	292.7	8.0
	3G3MX2-D2001-EC	482.8	309.5	317.7	11.8
	3G3MX2-D2002-E	464.74	179.5	292.7	8.0
	3G3MX2-D2002-EC	482.8	309.5	317.7	11.8
	3G3MX2-D2004-E	464.74	179.5	292.7	8.1
	3G3MX2-D2004-EC	482.8	309.5	317.7	11.9
	3G3MX2-D2007-E	464.74	179.5	292.7	8.2
	3G3MX2-D2007-EC	482.8	309.5	317.7	12.0
	3G3MX2-D2015-EC				15.4
	3G3MX2-D2022-EC				15.6
	3G3MX2-D2037-EC				16.2
	3G3MX2-D2055-EC	627.04	325	299.5	18.8
	3G3MX2-D2075-EC				19.2
	3G3MX2-D2110-EC	710.35	379	329.7	25.3
	3G3MX2-D2150-EC				28.0
Three-phase 400 V	3G3MX2-D4004-EC	482.8	309.5	317.7	12.0
	3G3MX2-D4007-EC				12.5
	3G3MX2-D4015-EC				12.4
	3G3MX2-D4022-EC				12.5
	3G3MX2-D4030-EC				12.5
	3G3MX2-D4040-EC				13.1
	3G3MX2-D4055-EC	627.04	325	299.5	18.7
	3G3MX2-D4075-EC				18.7
	3G3MX2-D4110-EC	710.35	379	329.7	23.8
	3G3MX2-D4150-EC				24.3



For more information, please enter "D228" in the search field on our website industrial.omron.eu.

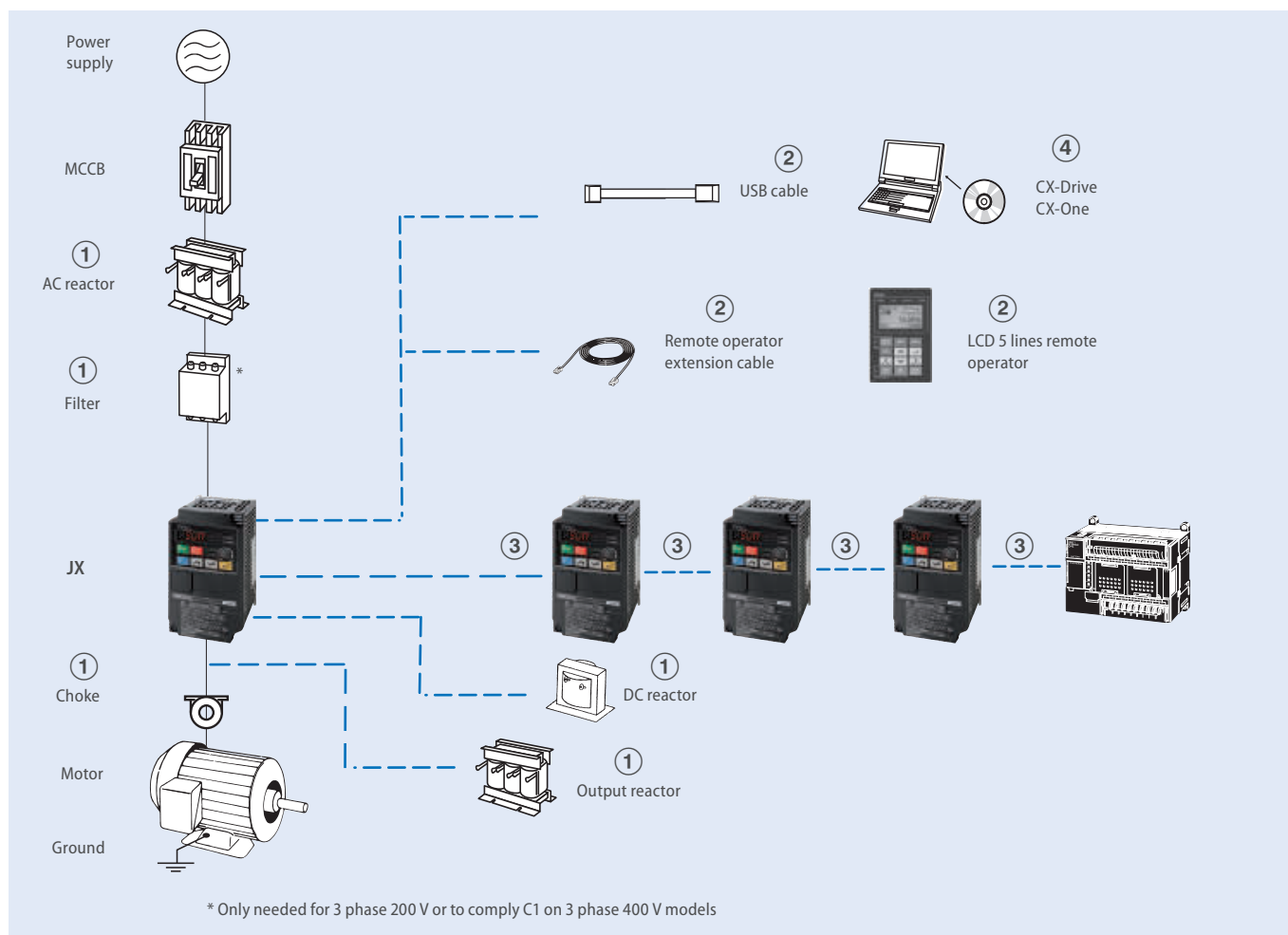


Compact and complete

With the RFI filter built-in, and the communications integrated as standard, the JX provides a compact and complete solution to a whole range of simple applications, such as conveyor control. The RS485 Modbus is built into the RJ45 port of the inverter front, making it very easy to add inverters into the network without any extra option boards. Therefore, saving costs and space.

- V/f controlled inverter
- Side by side mounting
- EMC filter built-in
- RS485 Modbus built-in
- Overload detection function (150% during 60 s)
- PID
- Micro-surge voltage suppression
- Automatic energy saving

Ordering information



3G3JX

Specifications			Order code
Voltage class	Max. applicable motor output kW	Rated output current (A)	Standard
Single-phase 200 V	0.2	1.4	3G3JX-AB002-EF
	0.4	2.6	3G3JX-AB004-EF
	0.75	4	3G3JX-AB007-EF
	1.5	7.1	3G3JX-AB015-EF
	2.2	10	3G3JX-AB022-EF
Three-phase 200 V	0.2	1.4	3G3JX-A2002-E
	0.4	2.6	3G3JX-A2004-E
	0.75	4	3G3JX-A2007-E
	1.5	7.1	3G3JX-A2015-E
	2.2	10	3G3JX-A2022-E
	3.7	15.9	3G3JX-A2037-E
	5.5	24	3G3JX-A2055-E
Three-phase 400 V	7.5	32	3G3JX-A2075-E
	0.4	1.5	3G3JX-A4004-EF
	0.75	2.5	3G3JX-A4007-EF
	1.5	3.8	3G3JX-A4015-EF
	2.2	5.5	3G3JX-A4022-EF
	4.0	8.6	3G3JX-A4040-EF
	5.5	13	3G3JXA4055-EF
	7.5	16	3G3JXA4075-EF

① Line filters

Inverter		Line filter Rasmi		
Voltage	Model 3G3JX-__	Rated current (A)	Weight (kg)	Order code
1-Phase 200 VAC	AB002/AB004	6	0.5	AX-FIJ1006-RE
	AB007	10	0.6	AX-FIJ1010-RE
	AB015/AB022	26	0.8	AX-FIJ1023-RE
3-Phase 200 VAC	A2002/A2004/A2007	6	1.0	AX-FIJ2006-RE
	A2015/A2022/A2037	20	1.3	AX-FIJ2020-RE
	A2055/A2075	40	2.3	AX-FIJ2040-RE
3-Phase 400 VAC	A4004/A4007 /A4015	5	0.9	AX-FIJ3005-RE
	A4022 /A4040	11	1.1	AX-FIJ3011-RE
	A4055/A4075	20	1.7	AX-FIJ3020-RE

① Input AC Reactors

Inverter		AC Reactor
Voltage	Model 3G3JX-__	Order code
3-Phase 200 VAC	A2002/A2004/A2007	AX-RAI02800080-DE
	A2015/A2022/A2037	AX-RAI00880175-DE
	A2055/A2075	AX-RAI00350335-DE
1-Phase 200 VAC	AB002/AB004	Under development
	AB007	
	AB015/AB022	
3-Phase 400 VAC	A4004/A4007/A4015	AX-RAI07700042-DE
	A4022/A4040	AX-RAI03500090-DE
	A4055/A4075	AX-RAI01300170-DE

① DC Reactors

200 V single-phase		200 V three-phase		400 V three-phase	
Inverter	Order code	Inverter	Order code	Inverter	Order code
3G3JX-AB002	AX-RC10700032-DE	3G3JX-A2002	AX-RC21400016-DE	—	
3G3JX-AB004	AX-RC06750061-DE	3G3JX-A2004	AX-RC10700032-DE	3G3JX-A4004	AX-RC43000020-DE
3G3JX-AB007	AX-RC03510093-DE	3G3JX-A2007	AX-RC06750061-DE	3G3JX-A4007	AX-RC27000030-DE
3G3JX-AB015	AX-RC02510138-DE	3G3JX-A2015	AX-RC03510093-DE	3G3JX-A4015	AX-RC14000047-DE
3G3JX-AB022	AX-RC01600223-DE	3G3JX-A2022	AX-RC02510138-DE	3G3JX-A4022	AX-RC10100069-DE
—		3G3JX-A2037	AX-RC01600223-DE	3G3JX-A4040	AX-RC06400116-DE
		3G3JX-A2055	AX-RC01110309-DE	3G3JX-A4055	AX-RC04410167-DE
		3G3JX-A2075	AX-RC00840437-DE	3G3JX-A4075	AX-RC03350219-DE

① Chokes

Diameter	Description	Order code
21	For 2.2 KW motors or below	AX-FER2102-RE
25	For 7.5 KW motors or below	AX-FER2515-RE

① Output AC Reactors

Inverter	Model 3G3JX-□	AC Reactor
Voltage		Order code
200 VAC	A2001/A2002/A2004 AB001/AB002/AB004	AX-RAO11500026-DE
	A2007/AB007	AX-RAO07600042-DE
	A2015/AB015	AX-RAO04100075-DE
	A2022/AB022	AX-RAO03000105-DE
	A2037	AX-RAO01830160-DE
	A2055	AX-RAO01150220-DE
	A2075	AX-RAO00950320-DE
400 VAC	A4004/A4007/A4015	AX-RAO16300038-DE
	A4022	AX-RAO11800053-DE
	A4040	AX-RAO07300080-DE
	A4055	AX-RAO04600110-DE
	A4075	AX-RAO03600160-DE

② Accessories

Types	Description	Functions	Order code
Digital operator	LCD remote operator	5 Line LCD remote operator with copy function, cable length max. 3 m.*1	AX-OP05-E
	Remote operator cable	3 meters cable for connecting remote operator	3G3AX-CAJOP300-EE
	LED remote operator	LED remote operator, cable length max. 3 m	3G3AX-OP01
	Mounting kit for LED operator	Mounting kit for LED operator on panel	4X-KITMINI
Accessories	USB converter / USB cable	RJ45 to USB connection cable	3G3AX-PCACN2 USB-convertercable
	RJ45 T-Branch cable	T cable for RS-422 connection	3G3AX-CTB020-EE
	RJ45 Terminator resistor	Terminator resistor for RS-422 connection	3G3AX-CTR150-EE

*1 Please note, for 3G3JX inverters models, the operator will only display 2 lines of text.

④ Computer software

Description	Installation	Order code
Computer software	Configuration and monitoring software tool	CX-Drive
Computer software	Configuration and monitoring software tool	CX-One
Computer software	Software tool for Energy Saving calculation	€Saver

Specifications

200 V class

Single-phase: 3G3JX_			AB002	AB004	AB007	AB015	AB022	-	-	-
Three-phase: 3G3JX_			A2002	A2004	A2007	A2015	A2022	A2037	A2055	A2075
Motor kW ^{*1}	Applicable motor capacity		0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5
Output characteristics	Inverter capacity kVA	200 V	0.4	0.9	1.3	2.4	3.4	5.5	8.3	11.0
		240 V	0.5	1.0	1.6	2.9	4.1	6.6	9.9	13.3
	Rated output current (A)		1.4	2.6	4.0	7.1	10.0	15.9	24.0	32.0
	Max. output voltage		Proportional to input voltage: 0 to 240 V							
	Max. output frequency		400 Hz							
Power supply	Rated input voltageand frequency		Single-phase 200 to 240 V 50/60 Hz Three-phase 200 to 240 V 50/60 Hz							
	Rated input current (A) Three-phase 200 V		1.8	3.4	5.2	9.3	13.0	20.0	30.0	40.0
	Rated input current (A) Single-phase 200 V		3.1	5.8	9.0	16.0	22.5	—	—	—
	Allowable voltage fluctuation		-15% to 10%							
	Allowable frequency fluctuation		5%							
Built-in filter			EMC filter (C1 single phase)							
Braking torque	At short-time deceleration		Approx. 50%			50% for 3-phase 20% to 40% for 1-phase	Approx 20% to 40%		Approx 20%	
	At capacitor feedback									
Cooling method			Self cooling			Forced-air-cooling				

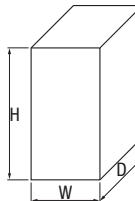
*1 Based on a standard 3-Phase standard motor.

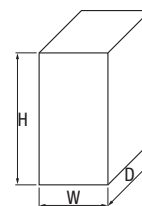
400 V class

Three-phase: 3G3JX_			A4004	A4007	A4015	A4022	A4040	A4055	A4075
Motor kW ^{*1}	Applicable motor capacity		0.4	0.75	1.5	2.2	4.0	5.5	7.5
Output characteristics	Inverter capacity kVA	380 V	0.9	1.6	2.5	3.6	5.6	8.5	10.5
		480 V	1.2	2.0	3.1	4.5	7.1	10.8	13.3
	Rated output current (A)		1.5	2.5	3.8	5.5	8.6	13.0	16.0
	Max. output voltage		Proportional to input voltage: 0 to 480 V						
	Max. output frequency		400 Hz						
Power supply	Rated input voltage and frequency		3-phase 380 to 480 V 50/60 Hz						
	Rated input current (A)		2.0	3.3	5.0	7.0	11.0	16.5	20.0
	Allowable voltage fluctuation		-15% to 10%						
	Allowable frequency fluctuation		5%						
Built-in filter			EMC filter C2 class						
Braking torque	At short-time deceleration		Approx. 50%			Approx. 20% to 40%		Approx. 20%	
	At capacitor feedback								
Cooling method			Self cooling		Forced-air-cooling				

*1 Based on a standard 3-Phase standard motor.

Dimensions

Voltage class	Max. applicable motor output kW	Inverter model	Dimensions in mm				
			H	W	D	Weight (kg)	
Single-phase 200 V	0.2	3G3JX-AB002	155	80	95.5	0.8	
	0.4	3G3JX-AB004			109.5	0.9	
	0.75	3G3JX-AB007	189	110	130.5	1.5	
	1.5	3G3JX-AB015			157.5	2.3	
	2.2	3G3JX-AB022				2.4	
Three-phase 200 V	0.2	3G3JX-A2002	155	80	95.5	0.8	
	0.4	3G3JX-A2004			109.5	0.9	
	0.75	3G3JX-A2007			132.5	1.1	
	1.5	3G3JX-A2015	189	110	157.5	2.2	
	2.2	3G3JX-A2022				2.4	
	3.7	3G3JX-A2037					
	5.5	3G3JX-A2055	250	180	167.5	4.2	
	7.5	3G3JX-A2075					
Three-phase 400 V	0.4	3G3JX-A4004	189	110	130.5	1.5	
	0.75	3G3JX-A4007			157.5	2.3	
	1.5	3G3JX-A4015				2.4	
	2.2	3G3JX-A4022					
	4.0	3G3JX-A4040					
	5.5	3G3JX-A4055	250	180	167.5	4.2	
	7.5	3G3JX-A4075					



Photoelectric sensors

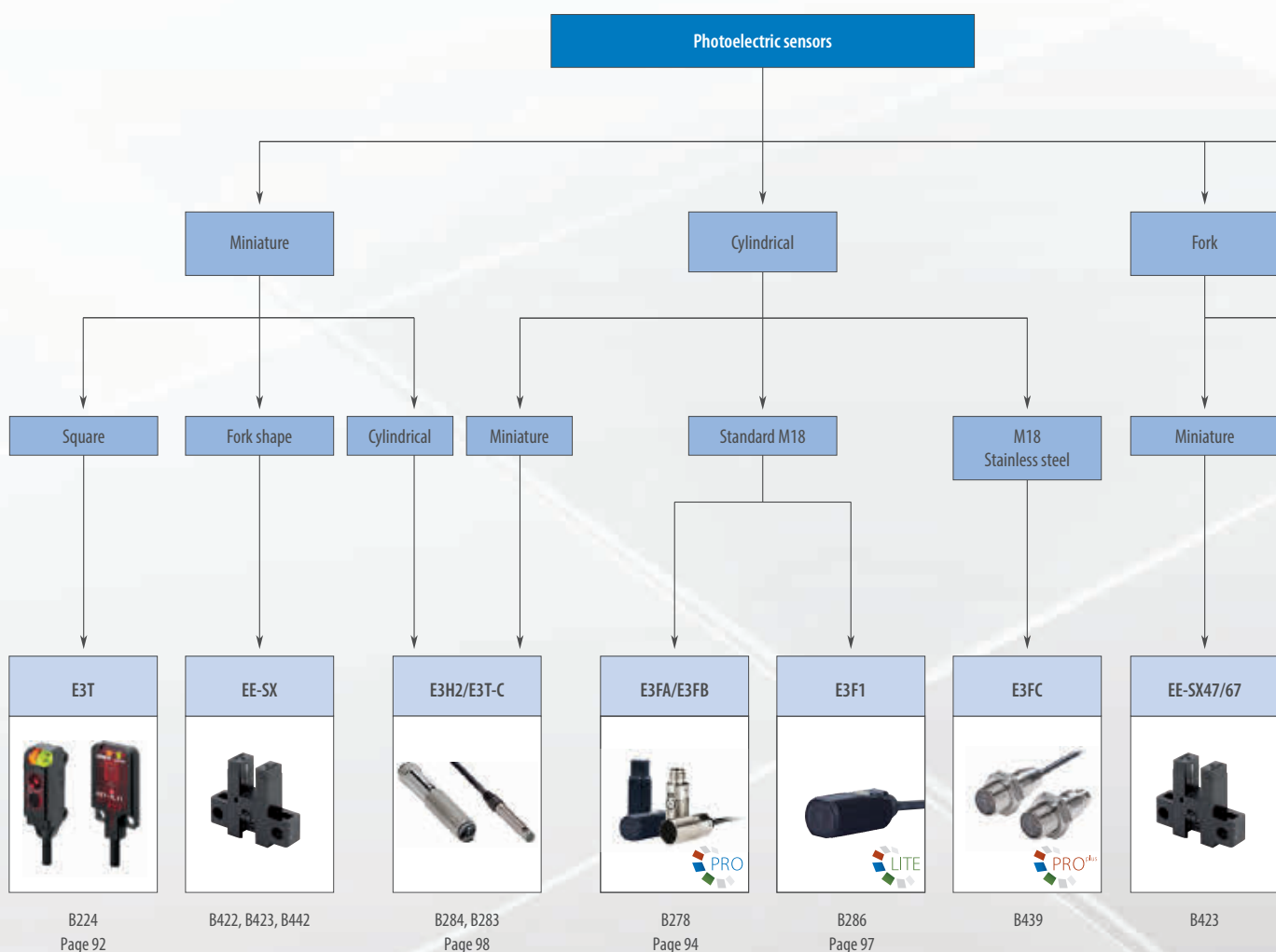
FOR MACHINES BUILT TO LAST

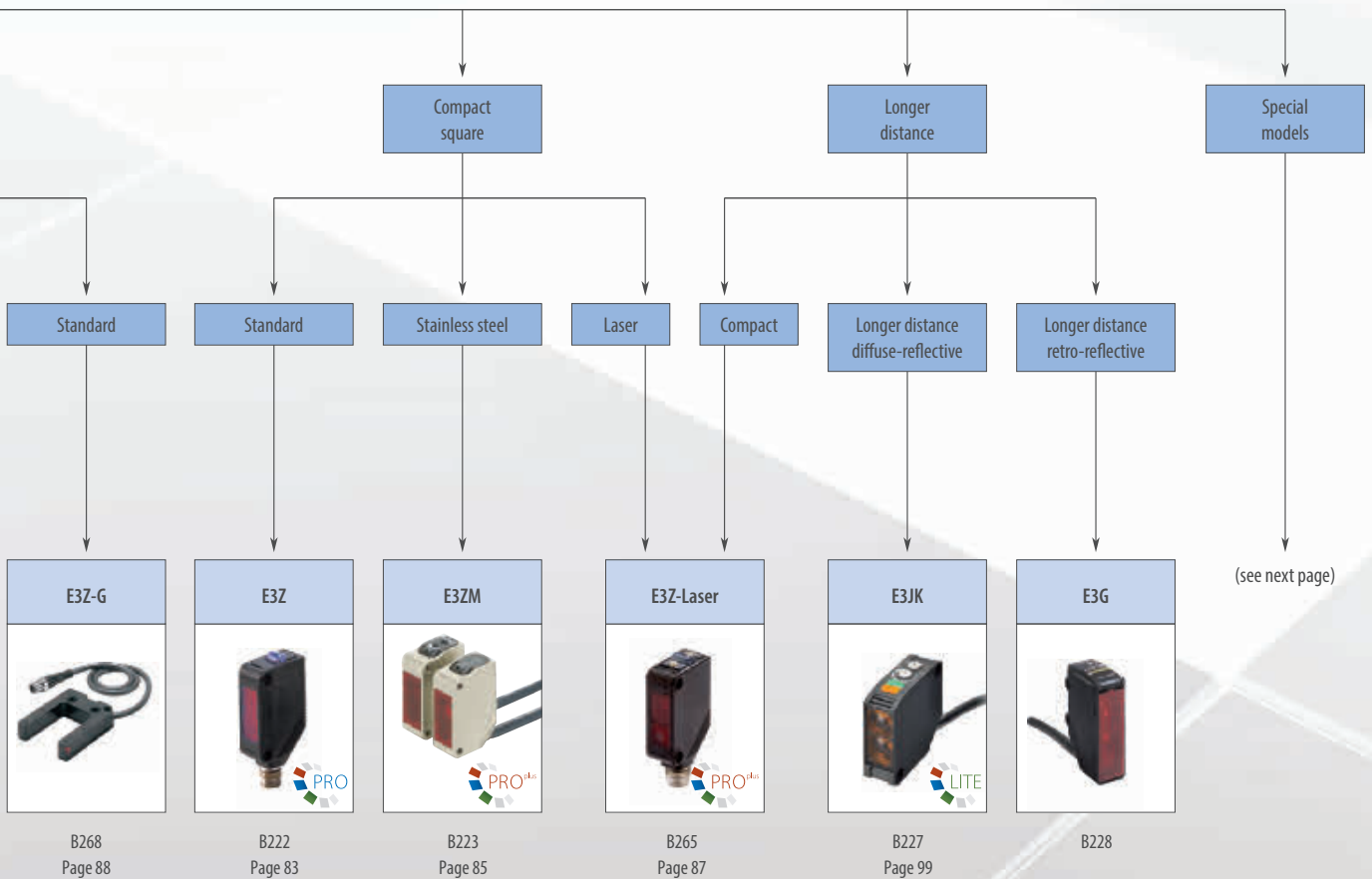
Reliability and accuracy confirmed by millions ... every day

With more than one million units sold, OMRON Photoelectric sensors are among the world's most popular and successful photoelectric sensors.

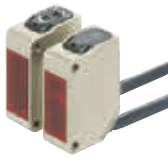
Manufactured to exceptionally high engineering standards, you can take the performance reliability for granted.

- Optimal sensing performance tuned to your application
- Various housing designs fitting your application concept
- Proven performance and unmatched reliability





Selection table

Type	Compact square			Longer distance	
					
Model	E3Z	E3ZM	E3Z Laser	E3S-CL	E3JK
361°	PRO	PRO ^{plus}	PRO ^{plus}	n.a.	LITE
Housing	PBT	Stainless steel	PBT	Zinc diecast	ABS
Through-beam	15 m, 30 m	15 m	60 m	–	40 m
Retro-reflective with M.S.R.	5 m	4 m	15 m	–	7 m
Diffuse-reflective (energetic)	1 m	1 m	–	–	2.5 m
Diffuse-reflective (background suppression)	200 mm	200 mm	300 mm	500 mm	–
Page/Quick Link	83/B222	85/B223	87/B265	91/B249	99/B227

Type	Cylindrical			
				
Model	E3FA/E3FB	E3F1	E3FC	E3H2
361°	PRO	LITE	PRO ^{plus}	n.a.
Housing	M18 PBT, metal	ABS	M18 stainless steel	M12 metal, M8 stainless steel
Through-beam	20 m	15 m	20 m	4 m, 2 m
Retro-reflective with M.S.R.	4 m	3 m	4 m	2 m
Diffuse-reflective (energetic)	1 m	300 mm	1 m	300 mm
Diffuse-reflective (background suppression)	200 mm	–	200 mm	–
Page/Quick Link	94/B278	97/B286	B439	98/B284

Type	Miniature			Fork
				
Model	E3T-C	E3T	EE-SX47/67	E3Z-G
361°	n.a.	n.a.	n.a.	n.a.
Housing	M5, M6 stainless steel	PBT	PBT	PBT
Through-beam	1 m	1 m, 2 m	5 mm (slot width)	25 mm
Retro-reflective with M.S.R.	–	200 mm	–	–
Diffuse-reflective (energetic)	50 mm	30 mm	–	–
Diffuse-reflective (background suppression)	–	30 mm	–	–
Page/Quick Link	B283	92/B224	B423	88/B268

Type	Oil resistant	Mark detection	Transparent detection			
						
Model	E3ZM-C	E3ZM-V	E3ZM-B	E3Z-B	E3F-B/-V	E3S-DB
361°	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}
Key features	Oil and lubricant resistant stainless steel housing	White LED for optimal contrast recognition	Optimised optical system for all transparent objects	Optical system for standard transparent objects	Optimised optical system for all transparent objects	Enhanced performance for all transparent objects, SmartTeach, Narrow spot
Housing	Stainless steel	Stainless steel	Stainless steel	PBT	M18 PBT/metal	PBT/ABS
Through-beam	20 m	–	–	–	–	–
Retro-reflective with M.S.R.	4 m	–	500 mm	500 mm, 2 m	2 m	4.5 m
Diffuse-reflective	1 m	12mm±2mm	–	–	–	–
Diffuse-reflective (background suppression)	200 mm	–	–	–	50 mm	–
Page/Quick Link	B267	113/B274	89/B266	90/B271	B285	B346

Type	High precision positioning	Structured object detection	Multi voltage power supply
			
Model	E3NC Laser Sensors	E3S-LS3	E3JK, E3JM, E3G-_M
361°	n.a.	n.a.	n.a.
Key features	0.1 mm Laser spot, line beam, CMOS BGS, EtherCAT connectivity	Wide beam	AC/DC power supply and relay output
Housing	PBT	PBT	ABS, ABS, PBT
Through-beam	–	–	40 m, 10 m, –
Retro-reflective with M.S.R.	8 m	–	9 m, 4 m, 10 m
Diffuse-reflective	1.2 m	60 mm	2.5 m, 700 mm, 2 m
Diffuse-reflective (background suppression)	250 mm	–	–, –, 1.2 m
Page/Quick Link	102/B289, B292	B259	99/B227, 101/B226, B282

General purpose sensor in compact plastic housing

The compact housing size and the high-power LED provide an excellent performance-size ratio and the high optical precision and long sensor lifetime make the sensor the first choice for standard and challenging applications.

- Minimal optical axis deviation for easy alignment
- IP67 and IP69K for highest water resistance
- Intensive shielding for highest noise immunity (EMC)
- Multiple molding housing for high mechanical resistance



Ordering information

Sensor type	Sensing distance	Connection method				Order code*1	
						NPN output	PNP output
Through-beam 	30 m (Infrared light)	—	—	2 m	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-T62 2M	E3Z-T82 2M
			—	—		E3Z-T67	E3Z-T87
	10 m (Red light)	—	—	2 m		E3Z-T61A 2M	E3Z-T81A 2M
			—	—		E3Z-T66A	E3Z-T86A
Retro-reflective with M.S.R. 	0.1 to 4 m*2 (Red light)	—	—	2 m		E3Z-R61 2M	E3Z-R81 2M
			—	—		E3Z-R66	E3Z-R86
Retro-reflective without M.S.R. 	0.1 to 5 m*2 (Infrared light)	—	—	2 m		E3Z-R61-4 2M	E3Z-R81-4 2M
			—	—		E3Z-R66-4	E3Z-R86-4
Diffuse-reflective 	1 m (adjustable) (Infrared light)	—	—	2 m		E3Z-D62 2M	E3Z-D82 2M
			—	—		E3Z-D67	E3Z-D87
Diffuse-reflective wide beam 	100 mm (adjustable) (Infrared light)	—	—	2 m		E3Z-D61 2M	E3Z-D81 2M
			—	—		E3Z-D66	E3Z-D86
Distance settable (background suppression) 	Small spot (Red light)		—	2 m		E3Z-LS63 2M	E3Z-LS83 2M
			—	—		E3Z-LS68	E3Z-LS88
	Standard (Red light)		—	2 m		E3Z-LS61 2M*3	E3Z-LS81 2M*3
			—	—		E3Z-LS66*3	E3Z-LS86*3

*1 Light-ON/Dark-ON switch selectable

*2 Measured with E39-R1S

*3 For infrared LED models contact your Omron representative

Specifications

Item	Through-beam			Retro-reflective with M.S.R	Retro-reflective without M.S.R	Diffuse-reflective	Diffuse-reflective (wide beam)	Distance-settable (background suppression)	
									Standard
		NPN	E3Z-T62/T67	E3Z-T61A/T66A	E3Z-R61/R66	E3Z-R6_-4	E3Z-D62/D67	E3Z-D61/D66	E3Z-LS61/66
	PNP	E3Z-T82/T87	E3Z-T81A/T86A	E3Z-R81/R86	E3Z-R8_-4	E3Z-D82/D87	E3Z-D81/D86	E3Z-LS81/86	E3Z-LS83/88
Directional angle		Both emitter and receiver: 3° to 15°		2° to 10°		—			
Black/white error		—						10% of set distance max.	5% of set distance max.
Light source (wave length)		Infrared LED (870 nm)	RED LED (700 nm)	Red LED (680 nm)	Infrared LED (870 nm)	Infrared LED (860 nm)		Red LED (680 nm)	Red LED (650 nm)
Power supply voltage		12 to 24 V±10%, ripple (p-p): 10% max.							
Protective circuits		Reverse polarity protection, short-circuit protection, output reverse polarity protection	Output short-circuit protection, power supply, reverse polarity protection	Reverse polarity protection, output short-circuit protection, mutual interference prevention, output reverse polarity protection				Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		2 ms max.	1 ms max.						
Ambient temperature	Operating	-25 to 55°C							
	Storage	-40 to 70°C (with no icing or condensation)							
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9							
Material	Case	PBT (polybutylene terephthalate)							
	Lens	Denatured polycarbonate resin		Methacrylate resin		Denatured polycarbonate resin			



High ambient light immunity



High electromagnetic noise immunity



Robust and tight housing construction

For more information, please enter "B222" in the search field on our website industrial.omron.eu.



Photoelectric sensor in compact stainless steel housing

Compact housing size and high power LED for excellent performance-size ratio in a rugged, detergent-resistant stainless steel housing for demanding environments.

- High grade stainless steel housing (SUS316L)
- IP67 and IP69k for highest water resistance
- ECOLAB tested and certified detergent resistance

Ordering information

Sensor type	Sensing distance	Connection method				Order code ^{*1}	
						NPN output	PNP output
Through-beam 	15 m	—	—	2 m	^{*2}	E3ZM-T61 2M	E3ZM-T81 2M
		■	—	—		E3ZM-T66	E3ZM-T86
	0.8 m with built-in slit	—	—	2 m		E3ZM-T63 2M	E3ZM-T83 2M
		■	—	—		E3ZM-T68	E3ZM-T88
Retro-reflective with M.S.R. 	0.1 to 4 m	—	—	2 m		E3ZM-R61 2M	E3ZM-R81 2M
		■	—	—		E3ZM-R66	E3ZM-R86
Diffuse-reflective 	1 m (adjustable)	—	—	2 m		E3ZM-D62 2M	E3ZM-D82 2M
		■	—	—		E3ZM-D67	E3ZM-D87
Diffuse-reflective (background suppression) 	10 to 100 mm (fixed)	—	—	2 m		E3ZM-LS61X 2M ^{*3}	E3ZM-LS81X 2M ^{*3}
		■	—	—		E3ZM-LS66X ^{*3}	E3ZM-LS86X ^{*3}
	10 to 200 mm (fixed)	—	—	2 m		E3ZM-LS64X 2M ^{*3}	E3ZM-LS84X 2M ^{*3}
		■	—	—		E3ZM-LS69X ^{*3}	E3ZM-LS89X ^{*3}

^{*1} Light-ON / Dark-ON switch selectable except for E3ZM-LS

^{*2} For ordering pigtail versions replace '2M' of the cable types with:

- S1J: for M12 stainless steel plug with 30 cm cable
- S3J: for M8 4-pin stainless steel plug with 30cm cable
- S5J: for M8 3-pin stainless steel plug with 30cm cable (except for background suppression types)
- M1J: for M12 brass plug with 30cm cable
- M3J: for M8 4-pin brass plug with 30cm cable
- M5J: for M8 3-pin brass plug with 30cm cable (except for background suppression types)

^{*3} E3ZM-LS_X are fixed LIGHT-ON models. For fixed DARK-ON models please order E3ZM-LS_Y and for L-ON/D-ON selectable by wire please order E3ZM-LS_H.

Specifications

Item	Through-beam		Retro-reflective with M.S.R.		Diffuse-reflective
	NPN	E3ZM-T61 E3ZM-T66	E3ZM-T63 E3ZM-T68	E3ZM-R61 E3ZM-R66	E3ZM-D62 E3ZM-D67
	PNP	E3ZM-T81 E3ZM-T86	E3ZM-T83 E3ZM-T88	E3ZM-R81 E3ZM-R86	E3ZM-D82 E3ZM-D87
Light source (wave length)		Infrared LED (870 nm)		Red LED (660 nm)	Infrared LED (860 nm)
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p)			
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection		Power supply reverse polarity protection, output short-circuit protection, mutual interference prevention, output reverse polarity protection	
Response time		1 ms max.			
Ambient temperature	Operating	-25 to 55°C			
	Storage	-40 to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9			
Material	Case	SUS316L			
	Lens	Methacrylic resin			
	Display	PES (polyether sulfone)			
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)			
	Seals	Fluoro rubber			

Item		Diffuse-reflective with background suppression (fixed distance)	
		NPN	PNP
		E3ZM-LS61X E3ZM-LS66X	E3ZM-LS64X E3ZM-LS69X
		E3ZM-LS81X E3ZM-LS86X	E3ZM-LS84X E3ZM-LS89X
Light source (adjustable)		Red LED (650 nm)	Red LED (660 nm)
Black/white error		5% of sensing distance max.	20% of sensing distance max.
Power supply voltage		10 to 30 VDC, $\pm 10\%$ ripple (p-p): 10% max.	
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection, mutual interference protection	
Response time		1 ms max.	
Ambient temperature range	Operating	-25 to 55°C	
	Storage	-40 to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	SUS316L	
	Lens	Methacrylic resin	
	Display	PES (polyether sulfone)	
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)	
	Seals	Fluoro rubber	



Robust construction



Tight housing



Detergent resistant



Pre-wired models with stainless steel plug connectors for best combination of highest water ingress protection with fast connect & disconnect..

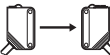
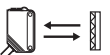


LASER sensor in compact plastic housing

The E3Z LASER sensor in compact plastic housing features visible LASER light for precision positioning and detection applications.

- Visible LASER light for precision positioning and small object detection
- High power LD for long range precision
- Class 1 LASER
- Precise background suppression and low black/white error for accurate detection

Ordering information

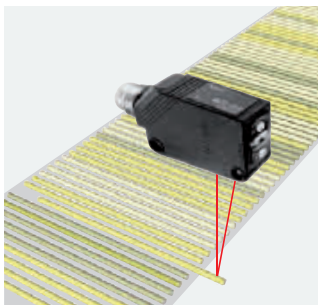
Sensor type	Sensing distance	Response time	Connection method				Order code*1	
							NPN output	PNP output
Through-beam 	60 m	1 ms	–	–	2 m	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-LT61 2M	E3Z-LT81 2M
Retro-reflective with M.S.R. 	0.3 to 15 m*2			–	–		E3Z-LT66	E3Z-LT86
			–	–	2 m		E3Z-LR61 2M	E3Z-LR81 2M
Distance-settable (background suppression) 	20 to 300 mm	0.5 ms		–	–		E3Z-LR66	E3Z-LR86
			–	–	2 m		E3Z-LL61 2M	E3Z-LL81 2M
			–	–	E3Z-LL66		E3Z-LL86	
	25 to 300 mm		–	–	2 m		E3Z-LL63 2M	E3Z-LL83 2M
				–	–		E3Z-LL68	E3Z-LL88

*1 Light-ON/Dark-ON switch selectable

*2 Measured with E39-R1

Specifications

Item		Through-beam	Retro-reflective with M.S.R.	Distance settable (background suppression)	
		Standard model			High-speed model
	NPN output	E3Z-LT61/-LT66	E3Z-LR61/-LR66	E3Z-LL61/-LL66	E3Z-LL63/-LL68
	PNP output	E3Z-LT81/-LT86	E3Z-LR81/-LR86	E3Z-LL81/-LL86	E3Z-LL83/-LL88
Black/white error		—		5% (at 160 mm)	5% (at 100 mm)
Light source (wave length)		Red LD (655 nm), JIS Class 1, IEC Class 1, FDA Class II			
Power supply voltage		12 to 24 VDC±10%, ripple (p-p): 10% max.			
Protective circuits		Power supply reverse polarity, protection, short circuit protection, output reverse polarity protection	Power supply reverse polarity protection, short circuit protection, output reverse polarity protection, mutual interference prevention		
Response time		1 ms max.			0.5 ms max.
Ambient temperature	Operating	−10 to 55°C			
	Storage	−25 to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9			
Material	Case	PBT (polybutylene terephthalate)			
	Lens	Modified polyacrylate resin	Methacrylate	Modified polyacrylate resin	



Low black/white error for precise detection



Visible laser light for precision positioning



Class 1 laser



Photoelectric sensor in 25 mm plastic fork shape housing

The forked shape optical through-beam sensors combine simple installation with reliable passage detection of object, machine parts or transportation elements like hanggliders.

- Fork shape for simple installation
- 1 or 2 axis models

Ordering information

Sensor type	Sensing distance	Number of optical axes	Connection method				Order code*1	
							NPN output	PNP output
Through-beam	25 mm (Infrared light)	1	–	–	2 m	–	E3Z-G61 2M	E3Z-G81 2M
			–	–	–	■ M8 4-pin	E3Z-G61-M3J	E3Z-G81-M3J
		2	–	–	2 m	–	E3Z-G62 2M	E3Z-G822M
			–	–	–	■ M8 4-pin	E3Z-G62-M3J	E3Z-G82-M3J

*1 Light-ON/Dark-ON switch selectable

Specifications

Item		Through-beam
		E3Z-G
Power supply voltage		12 to 24 VDC±10% max. ripple (p-p): 10%
Protective circuits		Output short-circuit protection, and mutual interference prevention, power supply, reverse polarity protection
Response time		1 ms max.
Ambient temperature	Operating	–25 to 55°C
	Storage	–40 to 70°C (with no icing or condensation)
Degree of protection		IEC60529 IP64
Material		ABS



Transparent object detection sensor in compact stainless steel housing

The E3ZM-B family provides models for the general transparent material detection and specialized models providing highest stability for the detection of PET bottles.

- Stable PET detection using double refraction and AC³ power control technology
- Detergent resistant compact SUS316L housing

Ordering information

Sensor type		Sensing distance	Special reflector	Connection method				Order code ^{*1}	
								NPN output	PNP output
Retro-reflective with M.S.R. 	Optimised for PET bottles and trays	100 to 500 mm (teachable)	Order separately ^{*2}	—	—	2 m	—	E3ZM-B61 2M	E3ZM-B81 2M
					—	—	—	E3ZM-B66	E3ZM-B86
			E39-RP1 included	—	—	2 m	—	E3ZM-B61-C 2M	E3ZM-B81-C 2M
					—	—	—	E3ZM-B66-C	E3ZM-B86-C
Retro-reflective with M.S.R. 	For all transparent media (glass, PET, foils)	100 to 500 mm (potentiometer adjustment) ^{*3}	Order separately ^{*4}	—	—	2 m	—	E3ZM-B61T 2M	E3ZM-B81T 2M
					—	—	—	E3ZM-B66T	E3ZM-B86T

^{*1} PET optimised models are Light-ON/Dark-ON selectable by wire. E3ZM-B_T all transparent media types are Light-ON/ Dark-ON switch selectable

^{*2} For higher signal stability using circular polarisation functionality for PET bottles, order special reflector E39-RP1 separately

^{*3} Teachable all-transparent-media types are available. Contact your OMRON representative

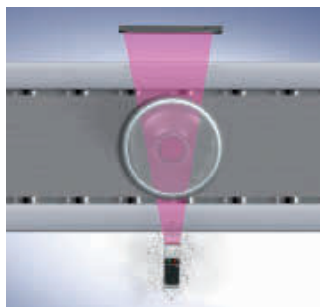
^{*4} Order reflector separately

Specifications

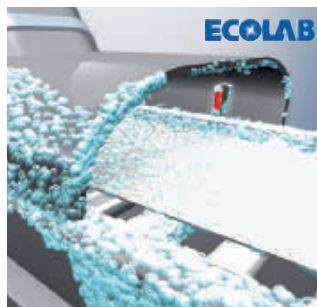
Item	PET optimised (teachable)		all-transparent-media (potentiometer adjustment)	
	NPN	E3ZM-B61(-C)/-B66(-C)	E3ZM-B6_T	
	PNP	E3ZM-B81(-C)/-B86(-C)	E3ZM-B8_T	
Light source (wave length)		Red LED (650 nm)		
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p): 10% max.		
Protective circuits		Reversed power supply polarity protection, output short-circuit protection, mutual interference prevention, and reversed output polarity protection		
Repsonse time		1 ms max.		
Ambient temperature	Operating	-40 to 60°C		-25 to 55°C
	Storage	-40 to 70°C (with no icing or condensation)		
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9		
Material	Case	SUS316L		
	Lens	PMMA (polymethylmethacrylate)		
	Display	PES (polyether sulfone)		
	Seals	Fluoro rubber		
	Cable	PVC (polyvinyl chloride)		



Utilisation of double reflection effect in PET for higher detection stability (PET optimised models)



Automatic LED power adjustment (AC³) to compensate for soiling and temperature fluctuations (PET optimised models)



Detergent resistant

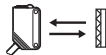
Transparent object detection photoelectric sensor in compact plastic housing

The E3Z-B provides easy adjustment for the detection of a large variety of standard transparent objects.

- Detects a wide range of bottles from single bottles to sets of stocked bottles
- IP67/IP69K tested for highest water resistance



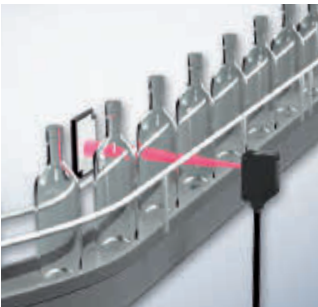
Ordering information

Sensor type	Sensing distance	Connection method				Order code*1	
						NPN output	PNP output
 Retro-reflective without M.S.R.	80 to 500 mm*2 (adjustable)	—	—	2 m	—	E3Z-B61 2M	E3Z-B81 2M
			—	—	—	E3Z-B66	E3Z-B86
	0.5 to 2 m*2 (adjustable)	—	—	2 m	—	E3Z-B62 2M	E3Z-B82 2M
			—	—	—	E3Z-B67	E3Z-B87

*1 Light-ON / Dark-ON switch selectable
*2 Measured with E39-R1S

Specifications

Item		Retro-reflective without M.S.R.	
	NPN output	E3Z-B61/E3Z-B66	E3Z-B62/E3Z-B67
	PNP output	E3Z-B81/E3Z-B86	E3Z-B82/E3Z-B87
Light source (wave length)		Red LED (680 nm)	
Power supply voltage		12 to 24 VDC±10%, ripple (p-p) : 10% max.	
Protective circuits		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		1 ms max.	
Ambient temperature	Operating	-25 to 55°C	
	Storage	-40 to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	PBT (polybutylene terephthalate)	
	Lens	Methacrylate resin	



Easy adjustment for the detection of a large variety of transparent objects



Distance-settable photoelectric sensor in metal housing

- Minimal black/white error for highest reliability detecting differently colored objects (E3S-CL1)
- Setting distance up to 500 mm with reliable background suppression

Ordering information

Sensortype	Sensing distance	Connection method				Order code ^{*1}
Distance-settable (background suppression) 		—	—	■	—	E3S-CL1 2M
		—	—	—	■ M12	E3S-CL1-M1J
		—	—	■	—	E3S-CL2 2M
		—	—	—	■ M12	E3S-CL2-M1J

^{*1} Light-ON/Dark-ON switch selectable. NPN/PNP switch selectable

Specifications

Item		Distance-settable (background suppression)	
		E3S-CL1	E3S-CL2
Light source (wave length)		Red LED (700 nm)	Infrared LED (860 nm)
Black/white error ^{*1}		2% max.	10% max.
Power supply voltage		10 to 30 VDC [ripple (p-p) 10% included]	
Protective circuits		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		1 ms max.	2 ms max.
Ambient temperature	Operating	-25 to 55°C (with no icing or condensation)	
	Storage		
Degree of protection		IEC 60529 IP67	
Material	Case	Zinc diecast	
	Operation panel cover	Polyethyl sulfon	
	Lens	Acrylics	

^{*1} Sensing distance difference between standard white paper (reflectivity 90%) and standard black paper (reflectivity 5%)

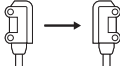
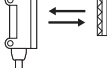


Photoelectric sensor in miniature plastic housing

Small sized photoelectric sensors in flat and side view shape for demanding mounting conditions.

- Small size with precision pinpoint LED where space is crucial
- 3.5 mm flat model with reliable background suppression and small black/white error
- Unique optical alignment technology ensuring minimal deviation of optical axis
- High EMC and ambient light immunity

Ordering information

Sensor type	Sensing distance	Connection method				Operation mode	Mounting screw size	Order code*1		
								NPN output	PNP output	
 Through-beam	2 m	-	-	2 m		Light-ON	M2	E3T-ST31 2M	E3T-ST33 2M	
	1 m					Dark-ON	M2	E3T-ST32 2M	E3T-ST34 2M	
						Light-ON	M2	E3T-ST11 2M	E3T-ST13 2M	
							M3	E3T-ST11M 2M	E3T-ST13M 2M	
						Dark-ON	M2	E3T-ST12 2M	E3T-ST14 2M	
	M3						E3T-ST12M 2M	E3T-ST14M 2M		
	300 mm					Light-ON	M2	E3T-ST21 2M	E3T-ST23 2M	
							M3	E3T-ST21M 2M	E3T-ST23M 2M	
						Dark-ON	M2	E3T-ST22 2M	E3T-ST24 2M	
							M3	E3T-ST22M 2M	E3T-ST24M 2M	
	 Through-beam					500 mm	Light-ON	M2	E3T-FT11 2M	E3T-FT13 2M
						300 mm	Dark-ON	M2	E3T-FT12 2M	E3T-FT14 2M
Light-ON							M2	E3T-FT21 2M	E3T-FT23 2M	
Dark-ON							M2	E3T-FT22 2M	E3T-FT24 2M	
 Retro-reflective	30 to 200 mm*2 on reflectors/ 10 to 100 mm*2 on reflective foils					Light-ON	M2	E3T-SR41-C 2M*3	E3T-SR43-C 2M*3	
	Dark-ON					M2	E3T-SR42-C 2M*3	E3T-SR44-C 2M*3		
 Diffuse-reflective	5 to 30 mm					Light-ON	M2	E3T-FD11 2M	E3T-FD13 2M	
							M3	E3T-FD11M 2M	E3T-FD13M 2M	
						Dark-ON	M2	E3T-FD12 2M	E3T-FD14 2M	
							M3	E3T-FD12M 2M	E3T-FD14M 2M	
 Limited-reflective	5 to 15 mm					Light-ON	M2	E3T-SL11 2M	E3T-SL13 2M	
							M3	E3T-SL11M 2M	E3T-SL13M 2M	
	Dark-ON					M2	E3T-SL12 2M	E3T-SL14 2M		
						M3	E3T-SL12M 2M	E3T-SL14M 2M		
	5 to 30 mm					Light-ON	M2	E3T-SL21 2M	E3T-SL23 2M	
							M3	E3T-SL21M 2M	E3T-SL23M 2M	
						Dark-ON	M2	E3T-SL22 2M	E3T-SL24 2M	
							M3	E3T-SL22M 2M	E3T-SL24M 2M	
	 Diffuse-reflective (background suppression)					1 to 15 mm	Light-ON	M2	E3T-FL11 2M	E3T-FL13 2M
							Dark-ON	M2	E3T-FL12 2M	E3T-FL14 2M
						1 to 30 mm	Light-ON	M2	E3T-FL21 2M	E3T-FL23 2M
							Dark-ON	M2	E3T-FL22 2M	E3T-FL24 2M

For ordering pigtail versions replace '2M' of cable types with:

- M1J: M12 with 30 cm cable
- M3J: M8 4-pin with 30 cm cable
- M5J: M8 3-pin with 30 cm cable

For ordering pigtail versions replace '2M' of cable types with:

- M1J: M12 with 30 cm cable
- M3J: M8 4-pin with 30 cm cable
- M5J: M8 3-pin with 30 cm cable

^{*1} For pre-wired models with robotic cables add '-R' to the order code (example: E3T-FT21R 2M)

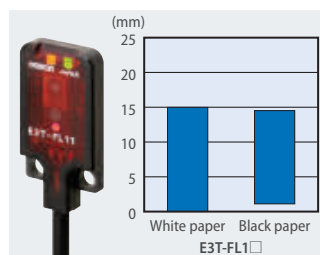
^{*2} The distances are measured with reflector E39-R4 and reflective foil E39-R37-CA. For applications with shorter distances between the sensor and the reflector contact your OMRON representative.

^{*3} Order reflector separately. Models with included reflectors are available.

Specifications

Item		Through-beam		Retro-reflective
		Side-view	Flat	Side-view
		E3T-ST1 E3T-ST2 E3T-ST3	E3T-FT1 E3T-FT2	E3T-SR4
Sensing distance		E3T-ST3_: 2 m E3T-ST1_: 1 m E3T-ST2_: 300 mm	E3T-FT1_: 500 mm E3T-FT2_: 300 mm	30 to 200 mm (with E39-R4) 10 to 100 mm (with E39-R37-CA)
Light source (wave length)		Red LED ("Pin-point" LED) λ = 650 nm		
Power supply voltage		12 to 24 VDC±10%, ripple (p-p) 10% max.		
Protective circuits		Power supply and control output reverse polarity protection Output short-circuit protection		Power supply and control output reverse polarity protection Output short-circuit protection, mutual interference prevention, surge suppressor
Response time		1 ms max.		
Ambient temperature	Operating	−25 to 55°C (with no icing or condensation)		
	Storage	−40 to 70°C (with no icing or condensation)		
Degree of protection		IEC60529 IP67		
Material	Case	PBT (polybutylene terephthalate)		
	Display window	Denatured polyarylate		
	Lens	Denatured polyarylate		Methacrylic resin

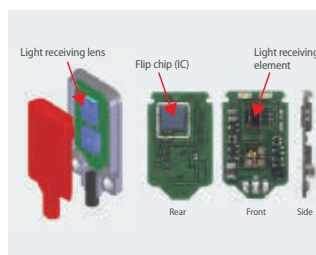
Item	Diffuse-reflective		Limited-reflective		Diffuse-reflective (background suppression)	
	Flat		Side-view		Flat	
	E3T-FD1		E3T-SL1	E3T-SL2	E3T-FL1	E3T-FL2
Sensing distance	5 to 30 mm		5 to 15 mm	5 to 30 mm	1 to 15 mm	1 to 30 mm
Black/white error	–				15% max.	
Light source (wave length)	Red LED (“Pin-point” LED) λ = 650 nm					
Power supply voltage	12 to 24 VDC±10%, ripple (p-p) 10% max.					
Protective circuits	Power supply and control output reverse polarity protection Output short-circuit protection, Mutual interference prevention					
Response time	1 ms max.					
Ambient temperature	Operating	–25 to 55°C				
	Storage	–40 to 70°C (with no icing or condensation)				
Degree of protection	IEC60529 IP67					
Material	Case	PBT (polybutylene terephthalate)				
	Display window	Denatured polyarylate				
	Lens	Denatured polyarylate				



Minimal black / white error



The coaxial optics and the small focal lens of the retro-reflective models allow the detection of small (dia 2 mm) objects or through small holes (dia 2 mm).



The unique light receiving lens shape and the chip mounting technology, provide appropriate sensing distances for very precise and reliable detection even through smallest slits and gaps with e.g. 0.5 mm dia.



Models with mounting holes for M2 or M3 screws



High performance photoelectric sensor in compact M18 housing

E3FA/E3FB series represents a new generation of OMRON photoelectric sensors with large varieties of reliable and easy-to use photoelectric sensors. Featuring many standard and special functions this line is addressing many kinds of industries such as packaging, ceramics and material handling.

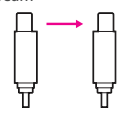
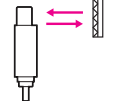
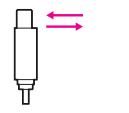
- Large variety of standard and special types
- High power and visible red LED enabling easy alignment and long sensing distance
- Compact and robust housing for easy integration into machines

Ordering information

Straight types

Sensor type	Sensing distance	Connection method				Order code			
						E3FA (plastic housing)		E3FB (metal housing)	
						NPN output	PNP output	NPN output	PNP output
Through-beam (Red LED) 	20 m	—	—	2 m	—	E3FA-TN11 2M	E3FA-TP11 2M	E3FB-TN11 2M	E3FB-TP11 2M
		—	■	—	—	E3FA-TN21	E3FA-TP21	E3FB-TN21	E3FB-TP21
Through-beam (Infrared LED) 	15 m	—	—	2 m	—	E3FA-TN12 2M	E3FA-TP12 2M	—	—
		—	■	—	—	E3FA-TN22	E3FA-TP22	—	—
Retro-reflective with MSR ^{*1} 	0.1 to 4 m (with E39-R1S)	—	—	2 m	—	E3FA-RN11 2M	E3FA-RP11 2M	E3FB-RN11 2M	E3FB-RP11 2M
		—	■	—	—	E3FA-RN21	E3FA-RP21	E3FB-RN21	E3FB-RP21
Coaxial Retro-reflective with MSR ^{*1} 	0 to 500 mm (with E39-R1S)	—	—	2 m	—	E3FA-RN12 2M	E3FA-RP12 2M	E3FB-RN12 2M	E3FB-RP12 2M
		—	■	—	—	E3FA-RN22	E3FA-RP22	E3FB-RN22	E3FB-RP22
Diffuse-reflective (Red LED) 	100 mm	—	—	2 m	—	E3FA-DN11 2M	E3FA-DP11 2M	E3FB-DN11 2M	E3FB-DP11 2M
		—	■	—	—	E3FA-DN21	E3FA-DP21	E3FB-DN21	E3FB-DP21
	300 mm	—	—	2 m	—	E3FA-DN12 2M	E3FA-DP12 2M	E3FB-DN12 2M	E3FB-DP12 2M
		—	■	—	—	E3FA-DN22	E3FA-DP22	E3FB-DN22	E3FB-DP22
	1 m	—	—	2 m	—	E3FA-DN13 2M	E3FA-DP13 2M	E3FB-DN13 2M	E3FB-DP13 2M
		—	■	—	—	E3FA-DN23	E3FA-DP23	E3FB-DN23	E3FB-DP23
Diffuse-reflective (Infrared LED) 	100 mm	—	—	2 m	—	E3FA-DN14 2M	E3FA-DP14 2M	—	—
		—	■	—	—	E3FA-DN24	E3FA-DP24	—	—
	300 mm	—	—	2 m	—	E3FA-DN15 2M	E3FA-DP15 2M	—	—
		—	■	—	—	E3FA-DN25	E3FA-DP25	—	—
	1 m	—	—	2 m	—	E3FA-DN16 2M	E3FA-DP16 2M	—	—
		—	■	—	—	E3FA-DN26	E3FA-DP26	—	—
BGS (background suppression) 	100 mm	—	—	2 m	—	E3FA-LN11 2M	E3FA-LP11 2M	E3FB-LN11 2M	E3FB-LP11 2M
		—	■	—	—	E3FA-LN21	E3FA-LP21	E3FB-LN21	E3FB-LP21
	200 mm	—	—	2 m	—	E3FA-LN12 2M	E3FA-LP12 2M	E3FB-LN12 2M	E3FB-LP12 2M
		—	■	—	—	E3FA-LN22	E3FA-LP22	E3FB-LN22	E3FB-LP22

Radial types

Sensor type	Sensing distance	Connection method				Order code			
						E3RA (plastic housing)		E3RB (metal housing)	
		NPN output	PNP output	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output
Through-beam 	15 m	—	—	2 m	—	E3RA-TN11 2M	E3RA-TP11 2M	E3RB-TN11 2M	E3RB-TP11 2M
		—	■	—	—	E3RA-TN21	E3RA-TP21	E3RB-TN21	E3RB-TP21
Retro-reflective with MSR ^{*1} 	0.1 to 3 m (with E39-R1S)	—	—	2 m	—	E3RA-RN11 2M	E3RA-RP11 2M	E3RB-RN11 2M	E3RB-RP11 2M
		—	■	—	—	E3RA-RN21	E3RA-RP21	E3RB-RN21	E3RB-RP21
Diffuse reflective 	100 mm	—	—	2 m	—	E3RA-DN11 2M	E3RA-DP11 2M	E3RB-DN11 2M	E3RB-DP11 2M
		—	■	—	—	E3RA-DN21	E3RA-DP21	E3RB-DN21	E3RB-DP21
	300 mm	—	—	2 m	—	E3RA-DN12 2M	E3RA-DP12 2M	E3RB-DN12 2M	E3RB-DP12 2M
		—	■	—	—	E3RA-DN22	E3RA-DP22	E3RB-DN22	E3RB-DP22
	700 mm	—	—	2 m	—	E3RA-DN13 2M	E3RA-DP13 2M	E3RB-DN13 2M	E3RB-DP13 2M
		—	■	—	—	E3RA-DN23	E3RA-DP23	E3RB-DN23	E3RB-DP23

^{*1} The Reflector is sold separately. Select the Reflector model most suited to the application.



Compact size and shape. Can be installed almost anywhere.



Visible LED light for easy alignment.

Specifications

Straight type

Model	Sensing method		Through-beam (Red LED)	Through-beam (Infrared LED)	Retro-reflective	Coaxial Retro-reflective	Diffuse-reflective		
	NPN output	Pre-wired	E3F_-TN11 2M	E3F_-TN12 2M	E3F_-RN11 2M	E3F_-RN12 2M	E3F_-DN11 2M	E3F_-DN12 2M	E3F_-DN13 2M
		M12 Connector	E3F_-TN21	E3F_-TN22	E3F_-RN21	E3F_-RN22	E3F_-DN21	E3F_-DN22	E3F_-DN23
	Item	PNP output	Pre-wired	E3F_-TP11 2M	E3F_-TP12 2M	E3F_-RP11 2M	E3F_-RP12 2M	E3F_-DP11 2M	E3F_-DP12 2M
M12 Connector			E3F_-TP21	E3F_-TP22	E3F_-RP21	E3F_-RP22	E3F_-DP21	E3F_-DP22	E3F_-DP23
Sensing distance			20 m	15 m	0.1 to 4 m	0 to 500 mm	100 mm	300 mm	1 m
Light source (wavelength)			Red LED (624 nm)	Infrared LED (850 nm)	Red LED (624 nm)				
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)						
Operation mode			Light-ON/Dark-ON selectable by wiring						
Sensitivity adjustment			One-turn adjuster						
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection						
Response time			0.5 ms						
Ambient temperature		Operating	-25 to 55°C						
		Storage	-30 to 70°C (with no icing or condensation)						
Degree of protection			IEC: IP67, DIN 40050-9: IP69K						
Material	Case and Nut		E3FA: ABS, E3FB: Nickel brass						
	Lens and Display		PMMA						
	Adjuster		POM						

Model	Sensing method		Diffuse-reflective			BGS (Background suppression)	
	NPN output	Pre-wired M12 Connector	E3F_-DN14 2M	E3F_-DN15 2M	E3F_-DN16 2M	E3F_-LN11 2M	E3F_-LN12 2M
Item	PNP output	Pre-wired M12 Connector	E3F_-DP14 2M	E3F_-DP15 2M	E3F_-DP16 2M	E3F_-LP11 2M	E3F_-LP12 2M
			E3F_-DP24	E3F_-DP25	E3F_-DP26	E3F_-LP21	E3F_-LP22
Sensing distance			100 mm	300 mm	1 m	100 mm	200 mm
Light source (wavelength)			Infrared LED (850 nm)			Red LED (624 nm)	
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)				
Operation mode			Light-ON/Dark-ON selectable by wiring				
Sensitivity adjustment			One-turn adjuster			Fixed	
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection				
Response time			0.5 ms				
Ambient temperature	Operating		-25 to 55°C				
	Storage		-30 to 70°C (with no icing or condensation)				
Degree of protection			IEC: IP67, DIN 40050-9: IP69K				
Material	Case and Nut		E3FA: ABS, E3FB: Nickel brass				
	Lens and Display		PMMA				
	Adjuster		POM				

Radial type

Model	Sensing method		Through-beam	Retro-reflective	Diffuse-reflective		
	NPN output	Pre-wired	E3R_-TN11 2M	E3R_-RN11 2M	E3R_-DN11 2M	E3R_-DN12 2M	E3R_-DN13 2M
		M12 Connector	E3R_-TN21	E3R_-RN21	E3R_-DN21	E3R_-DN22	E3R_-DN23
Item	PNP output	Pre-wired	E3R_-TP11 2M	E3R_-RP11 2M	E3R_-DP11 2M	E3R_-DP12 2M	E3R_-DP13 2M
		M12 Connector	E3R_-TP21	E3R_-RP21	E3R_-DP21	E3R_-DP22	E3R_-DP23
Sensing distance			15 m	0.1 to 3 m	100 mm	300 mm	700 mm
Light source (wavelength)			Red LED (624 nm)				
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)				
Operation mode			Light-ON/Dark-ON selectable by wiring				
Sensitivity adjustment			One-turn adjuster				
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection				
Response time			0.5 ms				
Ambient temperature	Operating		-25 to 55℃				
	Storage		-30 to 70℃ (with no icing or condensation)				
Degree of protection			IEC: IP67, DIN 40050-9: IP69K				
Material	Case and Nut		E3FA: ABS, E3FB: Nickel brass				
	Lens and Display		PMMA				
	Adjuster		POM				

Standard M18 Photosensor with best price-value ratio

OMRON E3F1 series represents an M18 size Photoelectric sensor with best value at competitive price. It features the same compact housing as E3FA and meets all requirements for standard industrial applications.

- Bright visible red LED enabling easy alignment
- Reliable operation in all industrial environments
- Compact and robust housing for easy integration into machines



Ordering information

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Through-beam 	15 m	—	—	2 m	—	E3F1-TN11 2M ^{*1}	E3F1-TP11 2M ^{*1}
		—	■	—	—	E3F1-TN21 ^{*1}	E3F1-TP21 ^{*1}
Retro-reflective ^{*2} 	0.1 to 3 m (with E39-R1S)	—	—	2 m	—	E3F1-RN11 2M	E3F1-RP11 2M
		—	■	—	—	E3F1-RN21	E3F1-RP21
Diffuse-reflective 	100 mm	—	—	2 m	—	E3F1-DN11 2M	E3F1-DP11 2M
		—	■	—	—	E3F1-DN21	E3F1-DP21
	300 mm	—	—	2 m	—	E3F1-DN12 2M	E3F1-DP12 2M
		—	■	—	—	E3F1-DN22	E3F1-DP22

^{*1} Includes the emitter and receiver.

^{*2} The Reflector is sold separately.

Specifications

Model	Sensing method		Through-beam	Retro-reflective	Diffuse-reflective	
	NPN output	Pre-wired	E3F1-TN11 2M	E3F1-RN11 2M	E3F1-DN11 2M	E3F1-DN12 2M
		M12 Connector	E3F1-TN21	E3F1-RN21	E3F1-DN21	E3F1-DN22
Item	PNP output	Pre-wired	E3F1-TP11 2M	E3F1-RP11 2M	E3F1-DP11 2M	E3F1-DP12 2M
		M12 Connector	E3F1-TP21	E3F1-RP21	E3F1-DP21	E3F1-DP22
Sensing distance			15 m	0.1 to 3 m	100 mm	300 mm
Light source (wavelength)			Red LED (624 nm)			
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)			
Operation mode			Light-ON/Dark-ON selectable by wiring			
Sensitivity adjustment			One-turn adjuster			
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection			
Response time			0.5 ms			
Ambient temperature		Operating	-25 to 55°C			
		Storage	-30 to 70°C (with no icing or condensation)			
Degree of protection			IEC: IP66			
Material	Case		ABS			
	Lens and Display		PMMA			



Compact size and shape. Can be installed almost anywhere.



Visible LED light for easy alignment.



Miniature photoelectric sensors in cylindrical M8 and M12 housing

- M8 or M12 sized cylindrical housings when mounting space is crucial
- Retro-reflective models with two teaching modes for standard and semi-transparent objects
- pre-wired and connector models

Ordering information

M12 cylindrical housing

Sensor type	Sensing distance	Connection method				Order code ^{*1}	
						NPN output	PNP output
Through-beam 	4 m (adjustable)	–	–	2 m	–	E3H2-T4C4M 2M	E3H2-T4B4M 2M
		–	■	–	–	E3H2-T4C4M-M1	E3H2-T4B4M-M1
Retro-reflective with M.S.R. 	2 m (teachable ^{*2})	–	–	2 m	–	E3H2-R2C4M 2M ^{*3}	E3H2-R2B4M 2M ^{*3}
		–	■	–	–	E3H2-R2C4M-M1 ^{*3}	E3H2-R2B4M-M1 ^{*3}
Diffuse-reflective 	300 mm (teachable)	–	–	2 m	–	E3H2-DS30C4M 2M	E3H2-DS30B4M 2M
		–	■	–	–	E3H2-DS30C4M-M1	E3H2-DS30B4M-M1
	100 mm (fixed)	–	–	2 m	–	E3H2-DS10C4M 2M	E3H2-DS10B4M 2M
		–	■	–	–	E3H2-DS10C4M-M1	E3H2-DS10B4M-M1

^{*1} Light-ON/Dark-ON selectable by wire

^{*2} Models without teach-button are available. Contact your OMRON representative.

^{*3} Without reflector; order reflector separately

M8 cylindrical housing

Sensor type	Sensing distance	Connection method				Operation mode	Order code	
							NPN output	PNP output
Through-beam 	2 m	–	–	2 m	–	dark on	E3H2-T2C2S 2M	E3H2-T2B2S 2M
		■	–	–	–		E3H2-T2C2S-M5	E3H2-T2B2S-M5
		–	–	2 m	–	light on	E3H2-T2C1S 2M	E3H2-T2B1S 2M
		■	–	–	–		E3H2-T2C1S-M5	E3H2-T2B1S-M5

Specifications

Item		Through-beam		Retro-reflective with M.S.R.	Diffuse-reflective	
		E3H2-T4	E3H2-T2	E3H2-R	E3H2-DS30	E3H2-DS10
Light source (wave length)		Infrared LED (880 nm)		Red LED (660 nm)	Infrared LED (880 nm)	
Power supply voltage		10 to 30 VDC, 10% ripple				
Protective circuits		Power supply reverse polarity protection, output short circuit protection				
Response time		2.5 ms max	1 ms max.	1.1 ms max		
Sensitivity adjustment		Potentiometer adjuster	–	Teach-in		–
Ambient temperature	Operating	–25 to 55°C	–25 to 50°C	–25 to 55°C		
Degree of protection		EN 60529: IP67				
Material	Case	nickel-plated brass	stainless steel	nickel-plated brass		
	Lens	plastic				



All voltage photoelectric sensor with long sensing distance

The new generation of square sized E3JK family provides significantly enhanced sensing performance and ease of operation. The family features 24 to 240 VAC power models as well as models with PNP/NPN transistor output.

- High power and visible red LED for all models enabling easy alignment and long sensing distance
- Bright indicator LEDs that are visible even at a large distance
- Best price-value ratio

Ordering information

Sensor type	Sensing distance	Connection method				Order code		
						Relay models (AC/DC)	NPN models	PNP models
Through-beam 	40 m (adjustable)	–	–	2 m	–	E3JK-TR11 2M	E3JK-TN11 2M	E3JK-TP11 2M
Retro-reflective without M.S.R. 	9 m ^{*1} (adjustable)					E3JK-RR11 2M	E3JK-RN11 2M	E3JK-RP11 2M
Retro-reflective with M.S.R. 	7 m ^{*1} (adjustable)					E3JK-RR12 2M	E3JK-RN12 2M	E3JK-RP12 2M
Diffuse-reflective 	2.5 m (adjustable)					E3JK-DR11 2M	E3JK-DN11 2M	E3JK-DP11 2M
	300 mm (adjustable)					E3JK-DR12 2M	E3JK-DN12 2M	E3JK-DP12 2M

^{*1} Measured with E39-R1S. Please order reflector separately.

Accessories

Appearance	Description	Order code
	Mounting bracket ^{*1} (A mounting bracket is not provided with the sensor. Order a mounting bracket separately if required.)	E39-L40

^{*1} When using a through-beam sensor, order one mounting bracket for the receiver and one for the emitter.

Specifications

AC models

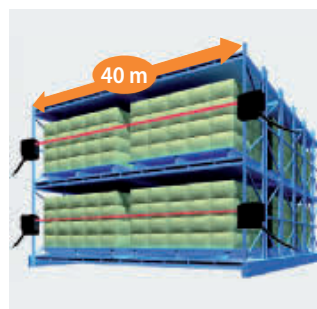
Item		Through-beam	Retro-reflective without M.S.R.	Retro-reflective with M.S.R.	Diffuse-reflective	
		E3JK-TR11	E3JK-RR11	E3JK-RR12	E3JK-DR11	E3JK-DR12
Sensing distance		40 m	9 m	7 m	2.5 m	300 mm
Light source (wave length)		Red LED (624 nm)				
Power supply voltage		24 to 240 VDC±10% ripple (p-p): 10% max. 24 to 240 VAC±10% 50/60 Hz				
Control output		Relay output SPDT, 250 VAC, 3 A max. (cosφ= 1), 5 VDC, 10 mA min., Light-ON/Dark-ON selectable				
Response time		20 ms max.				
Sensitivity adjustment		One-turn adjuster				
Ambient temperature	Operating	–25 to 55°C				
	Storage	–30 to 70°C (with no icing or condensation)				
Degree of protection		IEC60529 IP64				
Material	Case	ABS				
	Lens	Methacrylics (PMMA)				

DC models

Item		Through-beam	Retro-reflective without M.S.R.	Retro-reflective with M.S.R.	Diffuse-reflective	
	NPN output	E3JK-TN11	E3JK-RN11	E3JK-RN12	E3JK-DN11	E3JK-DN12
	PNP output	E3JK-TP11	E3JK-RP11	E3JK-RP12	E3JK-DP11	E3JK-DP12
Sensing distance		40 m	9 m	7 m	2.5 m	300 mm
Light source (wave length)		Red LED (624 nm)				
Power supply voltage		10 to 30 VDC, including ripple (p-p): 10%				
Control output		Open collector output (NPN/PNP), Load current: 100 mA max., Light-ON/Dark-ON selectable				
Response time		1 ms max.				
Sensitivity adjustment		One-turn adjuster				
Ambient temperature	Operating	-25 to 55°C				
	Storage	-30 to 70°C (with no icing or condensation)				
Degree of protection		IEC60529 IP64				
Material	Case	ABS				
	Lens	Methacrylics (PMMA)				



AC power-supply fits for building installations like industrial doors, elevators or car parks



Long sensing distance up to 40 m

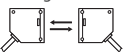


All voltage photoelectric sensor in plastic housing with timer function

The square sized E3JM family provides 12 to 240 VDC and 24 to 240 VAC power supply voltage, an enhanced sensing distance and a timer function.

- 12 to 240 VDC and 24 to 240 VAC supply voltage
- Relay or solid state relay output
- Models with timer function

Ordering information

Sensor type	Sensing distance	Connection method	Timer function	Order code ^{*1}		
				Relay output	DC SSR output	
					minus common	plus common
Through-beam 	10 m	Terminal block (with PG 13.5)	–	E3JM-10M4-G-N	E3JM-10S4-G-N	E3JM-10R4-G-N
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-10M4T-G-N	E3JM-10S4T-G-N	E3JM-10R4T-G-N
Retro-reflective with M.S.R. 	4 m		–	E3JM-R4M4-G	E3JM-R4S4-G	E3JM-R4R4-G
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-R4M4T-G	E3JM-R4S4T-G	E3JM-R4R4T-G
Diffuse-reflective 	700 mm (adjustable)		–	E3JM-DS70M4-G	E3JM-DS70S4-G	E3JM-DS70R4-G
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-DS70M4T-G	E3JM-DS70S4T-G	E3JM-DS70R4T-G

^{*1} Light-ON / Dark-ON switch selectable

Specifications

Item		Through-beam		Retro-reflective with M.S.R.		Diffuse-reflective	
		E3JM-10	E3JM-10_T	E3JM-R	E3JM-R_T	E3JM-D	E3JM-D_T
Light source (wave length)		Infrared LED (950 nm)		Red LED (660 nm)		Infrared LED (950 nm)	
Power supply voltage		12 to 240 VDC±10% ripple (p-p) : 10% max. 24 to 240 VAC±10% 50/60 Hz					
Control output	Relay output	250 VAC, 3 A max.; 5 VDC, 10 mA min.					
	DC SSR output	48 VDC, 100 mA max.; residual voltage 2V					
Response time	Relay output	30 ms max.					
	DC SSR output	5 ms max.					
Timer function	ON/OFF delay	–	0.1 s to 5 s	–	0.1 s to 5 s	–	0.1 s to 5 s
Ambient temperature	Operating	–25 to 55°C					
	Storage	–30 to 70°C (with no icing or condensation)					
Degree of protection		IEC60529 IP66					
Material	Case	ABS					
	Lens	Methacrylate resin					



High precision laser sensor with separate amplifier

The separate amplifier laser sensors feature a comprehensive range of sensing heads with variable spot and advanced CMOS sensing heads for high precision positioning and demanding applications.

- High detection stability independent from color or surface structure
- Lens attachments for line beam applications
- Easy installation due to adjustable focus and smart tune functions
- Sensor heads with up to 1.2 m sensing distance covering a wide range of applications
- High speed network connectivity to EtherCat fieldbus

Ordering information

Sensor heads E3NC-L Sensor Series

Sensor type	Sensing distance	Remarks	Order code
Diffuse-reflective 	1,200 mm	Variable spot (diffuse reflective)	E3NC-LH02 2M
	70±15 mm	Fixed spot (limited reflective)	E3NC-LH01 2M
Coaxial retro-reflective with M.S.R. 	8 m ^{*1}	Fixed spot	E3NC-LH03 2M

^{*1} A Reflector is not included. Purchase a Reflector separately.

Sensor heads E3NC-S CMOS Laser Sensor Series

Sensor type	Sensing distance	Laser class	Order code
Diffuse-reflective (distance-settable) 	35 to 100 mm	1	E3NC-SH100 2M
	35 to 250 mm	1	E3NC-SH250 2M
	35 to 250 mm	2	E3NC-SH250H 2M

Amplifier units E3NC-L Sensor Series

Item	Order code					
	pre-wired		with connector ^{*1}		M8 connector	
	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output
2 outputs + 1 input models	E3NC-LA21 2M	E3NC-LA51 2M	—	—	—	—
1 output + 1 input models	—	—	E3NC-LA7	E3NC-LA9	E3NC-LA24	E3NC-LA54
Networking model ^{*2}	E3NC-LA0					

^{*1} Order connector (E3X-CN21_) separately from accessories

^{*2} For network connection please order networking unit E3NW

Amplifier units E3NC-S CMOS Laser Sensor Series

Item	Order code					
	pre-wired		with connector ^{*1}		M8 connector	
	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output
2 outputs + 1 input models	E3NC-SA21 2M	E3NC-SA51 2M	—	—	—	—
1 output + 1 input models	—	—	E3NC-SA7	E3NC-SA9	E3NC-SA24	E3NC-SA54
Networking model ^{*2}	E3NC-SA0					

^{*1} Order connector (E3X-CN21_) separately from accessories

^{*2} For network connection please order networking unit E3NW

Amplifier connectors

Shape	Type	Comment	Order code
	Amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

Communication units

Shape	Communications method	Applicable Amplifier Units	Order code
	Sensor communication unit for EtherCAT	E3NX-FA0 E3NC-LA0 E3NC-SA0	E3NW-ECT
	Sensor dispersion (slave) unit		E3NW-DS

Reflectors

Appearance	Type	Size	Applicable sensor	Order code
	Micro-triple reflector	30 × 35 mm	E3NC-LH03	E39-R21
	Micro-triple reflector	55 × 40 mm		E39-R22
	Micro-triple reflector self-adhesive	25 × 25 mm		E39-RS10
	Micro-triple reflector self-adhesive	50 × 50 mm		E39-RS11

Lens Attachments for Sensor Heads

Appearance	Comment	Applicable sensor	Order code
	Lens attachment to a create line beam	E3NC-LH03	E39-P51
	Lens attachment to a create line beam	E3NC-LH02	E39-P52

Mounting Brackets for Sensor Heads

Appearance	Type	Applicable sensor	Order code
	L-shape mounting bracket	E3NC-LH03	E39-L190
	L-shape mounting bracket	E3NC-LH02	E39-L185
	L-shape mounting bracket	E3NC-LH01	E39-L186
	L-shape mounting bracket	E3NC-SH250 E3NC-SH250 E3NC-SH100	E39-L187
	L-shape mounting bracket		E39-L188

Specifications

Sensor heads E3NC-L Sensor Series

Item	Coaxial Retro-reflective (M.S.R.)	Diffuse-reflective	
	E3NC-LH03	E3NC-LH02	E3NC-LH01
Light source (emission wave length)	Red laser diode (660 nm), 315 μW max. (JIS Class 1, IEC/EN Class 1, and FDA Class 1)		
Sensing distance	Giga-power mode (GIGA): 8 m Standard mode (Std): 6 m High-speed mode (HS): 3.5 m Super-high-speed mode (SHS): 2 m	Giga-power mode (GIGA): 1,200 mm Standard mode (Std): 750 mm High-speed mode (HS): 250 mm Super-high-speed mode (SHS): 200 mm	70±15 mm
Beam size (typical)	2 mm dia. (at 1 m)	0.8 mm max. (at distances up to 300 mm)	0.1 mm (at 70 mm)
Degree of protection	IP67	IP65	

Amplifier units E3NC-L Sensor Series

Item	2 output/1 input models		1 output/1 input models	Networking models
	NPN output	E3NC-LA21	E3NC-LA7/E3NC-LA24	
	PNP output	E3NC-LA51	E3NC-LA9/E3NC-LA54	
Outputs		2 outputs	1 output	—*
Inputs		1 input		—*
Supply voltage		10 to 30 VDC±10%, ripple (p-p) 10% max.		
Response time	Super-high-speed mode	80 μs		
	High-speed mode	250 μs		
	Standard mode	1 ms		
	Giga-power mode	16 ms		
Functions	Smart tuning	2-point tuning, full auto tuning, position tuning, maximum sensitivity tuning, power tuning, or percentage tuning (–99% to 99%)		
	Timer function	Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer: 1 to 9,999 ms		
	Eco mode	Select from OFF (digital displays lit) or ECO (digital displays not lit)		
	Bank switching	Select from banks 1 to 4		
	Dynamic Power Control (DPC)	Provided (automatically controls light intensity and compensates incident level changes)		
Ambient temperature range	Operating	–10 to 55°C		
	Storage	–25 to 70°C (with no icing or condensation)		
Digital display		7-segment displays (sub digital display: green, main digital display: white) Display direction: switchable between normal and reversed		
Degree of protection		IP50 (IEC 60529)		

* Two sensor outputs are allocated in the programmable logic controller PLC I/O table. PLC operation via Communications Unit enables reading detected values and changing settings.

Sensor heads E3NC-SH CMOS Laser Sensor series

Item	Diffuse-reflective (distance-settable)		
	E3NC-SH250H	E3NC-SH250	E3NC-SH100
Light source (emission wave length)	Red laser diode (660 nm), 1 mW (average output: 220 μ W), (JIS Class 2, IEC/EN Class 2, and FDA Class 2)	Red laser diode (660 nm), 100 μ W max. (JIS Class 1, IEC/EN Class 1, and FDA Class 1)	
Measurement range	35 to 250 mm (display value: 350 to 2,500)		35 to 100 mm (display value: 350 to 1,000)
Spot diameter	1 mm (at 250 mm)		0.5 mm (at 100 mm)
Degree of protection	IEC60529 IP67		

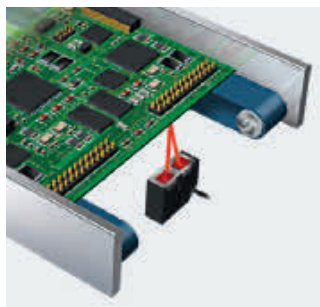
Amplifier units E3NC-SH CMOS Laser Sensor series

Item		2 output/1 input models	1 output/1 input models	Networking models
	NPN output	E3NC-SA21	E3NC-SA7/E3NC-SA24	E3NC-SA0
	PNP output	E3NC-SA51	E3NC-SA9/E3NC-SA54	
Outputs		2 outputs	1 output	—*
Inputs		1 input		—*
Supply voltage		10 to 30 VDC±10%, ripple (p-p) 10% max.		
Response time	Super-high-speed mode	1.5 ms		
	High-speed mode	5 ms		
	Standard mode	10 ms		
	Giga-power mode	50 ms		
Functions	Smart tuning	2-point tuning, full auto tuning, 1-point tuning, tuning without workpiece, 2-point area tuning, 1-point area tuning, or area tuning without workpiece		
	Timer function	Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer: 1 to 9,999 ms		
	Bank switching	Select from banks 1 to 4		
Ambient temperature range	Operating	−10 to 55°C		
	Storage	−25 to 70°C (with no icing or condensation)		
Digital display		7-segment displays (sub digital display: green, main digital display: white) Display direction: switchable between normal and reversed.		
Degree of protection		IP50 (IEC 60529)		

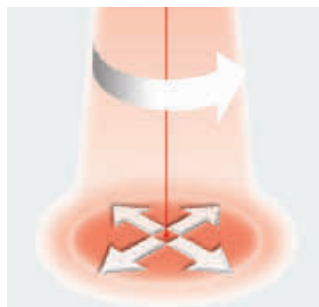
* Two sensor outputs are allocated in the programmable logic controller PLC I/O table. PLC operation via Communications Unit enables reading detected values and changing settings.



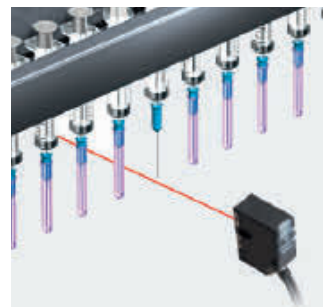
Integration into N-Smart platform



High precision positioning



Focal point adjustment

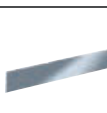
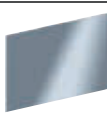
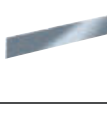
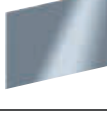


High precision detection over long range

Reflectors for retro-reflective photoelectric sensors

Shape	Type	Housing material	Features	Size in mm	Applicable Sensor	Order code
	General purpose reflectors	- ABS base - Acrylic surface	Surface screw mounting (diagonal holes)	40 × 60 × 7.5	Retro-reflective photoelectric sensors with and without M.S.R	E39-R1S
			Surface screw mounting (holes on one side only)	35.4 × 42.3 × 8		E39-R9
				51.4 × 60.3 × 8.5		E39-R42
	Small size		Side screw mounting or surface selfadhesive	41.8 × 22.5 × 11		E39-R3
			Surface screw mounting	23 × 13.7 × 4.9		E39-R4
	Large size			100 × 100 × 9		E39-R8
				84.5 × 84.5 × 8.7		E39-R40
	High precision		Microtripel for improved performance with fine beam sensors	52 × 40 × 4.8	Recommended for fine beam coaxial models (E3NC-LH03, E3S-DB, E3T-SR4)	E39-R6
				30 × 45		E39-R12
				14 × 23 × 1		E39-R37-CA
				12 × 24		E39-R13
	Simple mounting		Round shape with centered mounting hole for simple screw mounting	Diameter: 84 Depth: 7.4	Photoelectric sensors with and without M.S.R.	E39-R7

Note: the ambient operating temperature is -25°C to 55°C unless otherwise specified

Shape	Type	Housing material	Features	Size in mm	Applicable Sensor	Order code
	Enhanced detergent resistance	• PVC	• Surface screw mounting • IP69k after DIN 40050 part 9	40 × 60 × 7.5	Recommended for harsh environment sensors	E39-R50
				20 × 60 × 6		E39-R51
	Highest detergent resistance	• SUS316L • Borosilicat	• Surface screw mounting	43 × 30 × 5		E39-R16
	Heat resistant	• Borosilicat	• Surface screw mounting • 450°C heat resistance • Suitable for vacuum environment	95 × 51 × 8		E39-R47
	Non-fogging reflector	• ABS • Acrylic surface	Anti-fogging coating	40 × 60 × 7.5		E39-R1K
	Special polarizing	• ABS base • PMMA surface	Special polarizing filter to PET	44 × 80 × 8.5	E3ZM-B, E3FA-B, E3FB-B, E3S-DB	E39-RP1
	General purpose tape reflectors	• Acrylic	• Self adhesive • Pre cut	35 × 10 × 0.6	Photoelectric sensors with and without M.S.R.	E39-RS1
				40 × 35 × 0.6		E39-RS2
				80 × 70 × 0.6		E39-RS3
				25 mm × 5 m		E39-RS25 5 m
				25 mm × 22.8 m		E39-RS25 22.8 m
				50 mm × 5 m		E39-RS50 5 m
				50 mm × 22.8 m		E39-RS50 22.8 m
			• Self adhesive • Pre cut	195 × 22		E39-RS4
				108 × 46		E39-RS5

Note: Note: the ambient operating temperature is -25°C to 55°C unless otherwise specified

Mounting brackets

Shape	Type	Material	Features	Order code
	M8 nuts	brass	100 pcs	ASMM0800
		stainless steel		ASMM0801
	M12 nuts	brass		ASMM1200
	M18 nuts			ASMM1800
		stainless steel		ASMM1802
		plastic		1 pc
			100 pcs	ASMK1801 (4 mm thickness)
	M30 nuts	brass	100 pcs	ASMM3000
		M8 Washer	brass	1,000 pcs
M12 Washer			ASZA1200	
		stainless steel	500pcs	ASZA1201
M18 Washer		brass	100 pcs	ASZA1801
		stainless steel	200 pcs	ASZA1802
M30 Washer		brass	100 pcs	ASZA3001

Mounting brackets

Shape	Type	Order code
	Quick access – snap fix for cylindrical sensors; sizes M8, M12, M18, M30	Y92E-BC08 Y92E-BC12 Y92E-BC18 Y92E-BC30
	Surface mounting for M18 cylindrical sensors (dia 18mm)	E39-L183
	Standard-surface mounting (for pre-wired or pigtail models)	E39-L104 ^{*1}
	Standard-backwall mounting	E39-L44 ^{*1}
	Protection-wall mounting (for pre-wired or pigtail models)	E39-L142 ^{*1}
	Protection-surface mounting	E39-L98 ^{*1}
	Telescope mounting	E39-L93FH
	3D rotation mounting	E39-EL4

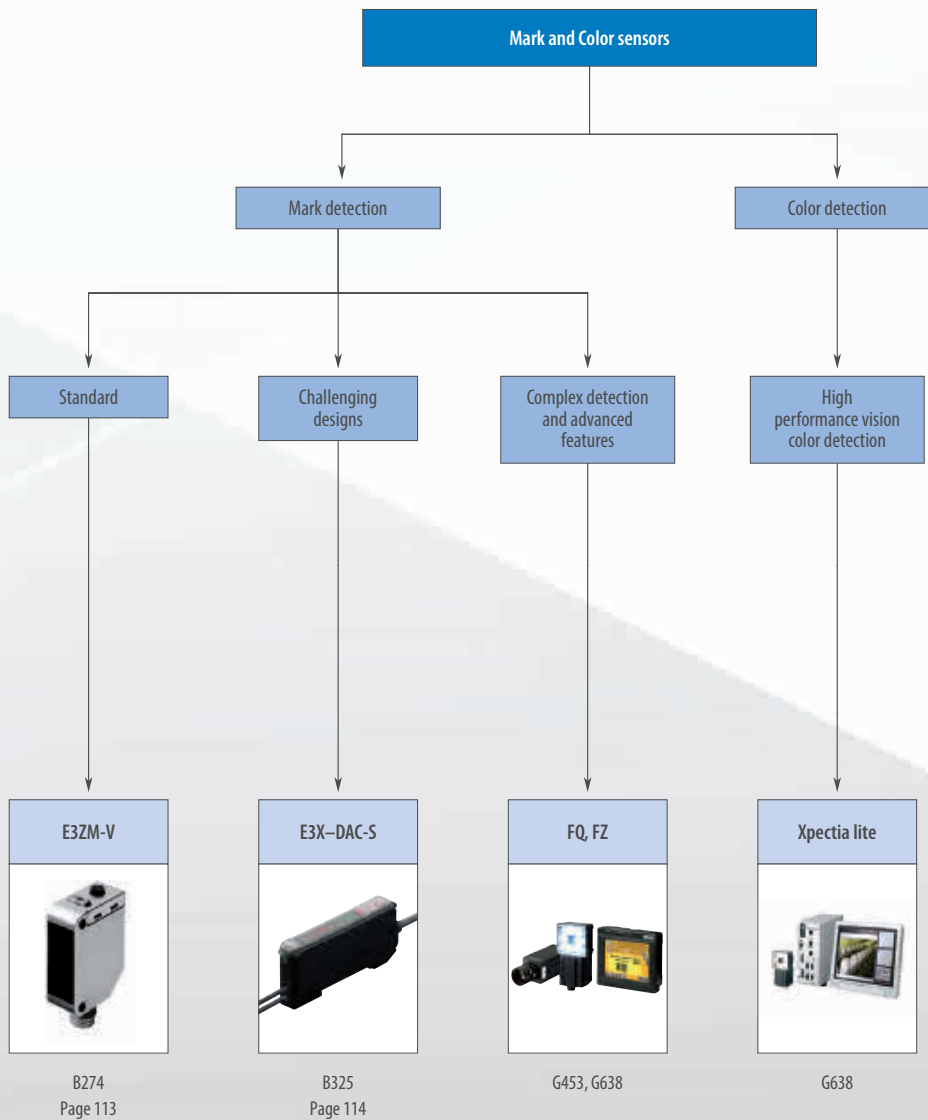
^{*1} The order references are examples for the E3Z sensor family. Refer to the sensor accessory datasheet E26E for the complete list of mounting brackets.

FAST ADAPTION TO CHANGING PACKAGINGS

Choose the performance you need

Packaging machines have to adapt quickly to a large variety of different packaging designs with minimal change-over time and no quality loss. For sensors detecting registration marks or colors this requires flexibility and simplicity in handling while keeping the precision and operational stability. At OMRON we closely work together with leading packaging machine makers to evaluate the requirements for sensors from commonly used packaging material as well as most critical designs or materials. Our portfolio is set up to balance the performance and budget requirements in these situations ... simply choose the performance you need.

- Reliable mark detection even in changing environmental conditions during machine operation
- Fast and easy setup up after packaging material exchange
- Performance levels fitting the machine value concept



Type	Standard print mark detection	Challenging designs	Complex detection and advanced features
			
Model	E3ZM-V	E3X-DAC-S	FQ, FZ
Key feature	White LED, stainless steel housing	White LED, RGB ratio comparison and extended functionality	High performance vision inspection functionality
Detection distance	12±2 mm	5–50 mm	See QUALITY CONTROL AND INSPECTION GUIDE
Response time	50 µs	60 µs	
Page/Quick Link	113/B274	114/B325	G453, G638

Type	High performance vision color detection	
		
Model	Xpectia lite	
No of simultaneous color inspections	1 to 128	
Output	Color detected – digital out	■
	RGB value out (via ethernet)	■
	HSI value out (via ethernet)	■
Tolerance adjustment	Teachable	■
	Manually adjustable	■
	Advanced	■
Page/Quick Link	G638	



Registration mark sensor in compact stainless steel housing

- The registration mark detection sensor in a compact stainless steel housing provides reliable detection of all common registration marks in food packaging applications.
- White LED for stable detection of differently colored or black print marks
 - SUS 316L stainless steel housing
 - Easy-to-use teach-in button or remote teach
 - Fast response time of 50 μ s

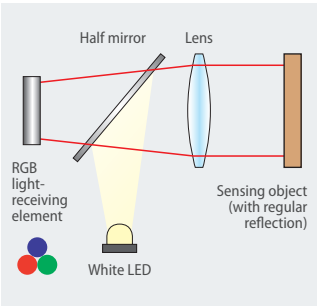
Ordering information

Sensor type	Sensing distance	Connection method				Order code*1	
						NPN output	PNP output
Mark sensor	12±2 mm	—	—	2 m	—	E3ZM-V61 2M	E3ZM-V81 2M
			—	—	—	E3ZM-V66	E3ZM-V86

*1 The output configuration (ON or OFF when mark is detected) is teachable. Common operation is output is ON when mark is detected.

Specifications

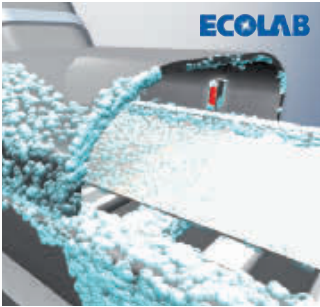
Item	NPN	E3ZM-V6_
	PNP	E3ZM-V8_
Light source (wave length)	White LED (450 to 700 nm)	
Power supply voltage	10 to 30 VDC±10%, ripple (p-p) 10% max.	
Protective circuits	Reversed power supply polarity protection, output short-circuit protection, Reversed output polarity protection, and mutual interference prevention	
Ambient temperature	Operating	–25 to 55°C
	Storage	–40 to 70°C (with no icing or condensation)
Response time	50 μ s	
Degree of protection	IEC: IP67, DIN 40050-9: IP69K	
Material	Case	SUS316L
	Lens	PMMA (polymethylmethacrylate)
	Display	PES (polyether sulfone)
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)
	Seals	Fluoro rubber



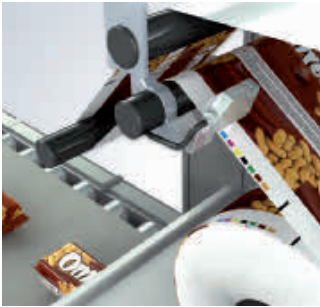
Coaxial optical system with white LED



Remote teaching



Detergent resistant



Reliable detection of standard or semi-transparent marks at normal or high speed



E3X-DAC-S high functionality mark detection sensor

The E3X-DAC-S provides reliable mark detection for standard as well as challenging applications. The separate sensing head setup allows the easy adaption to the mounting requirements even when space is crucial. The remote amplifier provides easy teaching for standard applications but also on demand full control over the detection performance for most challenging applications.

Ordering information

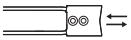
Pre-wired

Item	Functions	Order code (for pre-wired types with 2 m cable length)	
		NPN output	PNP output
Standard models	Timer, response speed change	E3X-DAC11-S	E3X-DAC41-S
Advanced models	Same as standard models + simultaneous determination (2 colors) AND/OR output, remote setting	E3X-DAC21-S	E3X-DAC51-S

Specifications

Item		Standard models E3X-DAC1, E3X-DAC4 E3X-DAC6, E3X-DAC8	Advanced models E3X-DAC2, E3X-DAC5
Light source (wave length)		White LED (420 to 700 nm)	
Number of registered marks		1	2 (simultaneous determination)
Power supply voltage		12 to 24 VDC $\pm$ 10%, ripple (p-p) 10% max.	
Protective circuits		Power supply reverse polarity protection, output short circuit protection, output reverse polarity protection, mutual interference prevention	
Ambient temperature	Operating	-25 to 55°C	
	Storage	-30 to 70°C (with no icing or condensation)	
Response time	Super-high-speed mode	Operation or reset: 60 μ s	Operation or reset: 120 μ s
	Standard mode	Operation or reset: 1 ms	Operation or reset: 2 ms
Sensitivity setting		Teaching (one-point teaching or teaching with/without workpiece) or manual adjustment	
Functions	Detection mode	Automode (automatic selection of C-mode or I-mode) C-mode (RGB ratio) I-mode (light intensity) Mark mode (Intensity and ratio of RGB values)	
	Operating mode	ON for match (ON for same color as registered color) or ON for mismatch (ON for different color from registered color)	
	Timer function	Timer type: OFF delay, ON delay, or one-short Timer time: 1 ms to 5 s (variable)	
	Control outputs	–	Output for each channel, AND output, and OR output
	Remote control	–	One-point teaching, teaching with/without workpiece, zero reset, and light emission OFF
Degree of protection		IEC60529 IP50 (with protective cover attached)	

Recommended fiber heads

Sensor type	Size	Recommended operating distance (mm)	Comment	Order code
	M6	5	Standard mark detection	E32-CC200 2M
	29x25.5x11.2 mm	40 to 50	Long distance – plastic	E32-L15 2M
	23x20x9 mm	25 to 30	Long distance – metal	E32-A09 2M
	M3	10	High precision mark detection (dia 1mm spot)	E32-EC31 2M + E39-EF51

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M



Easy to operate detection of challenging or colored registration marks.



Detection of challenging registration marks e.g. with texts or graphics.

Lightcurtains and area sensors

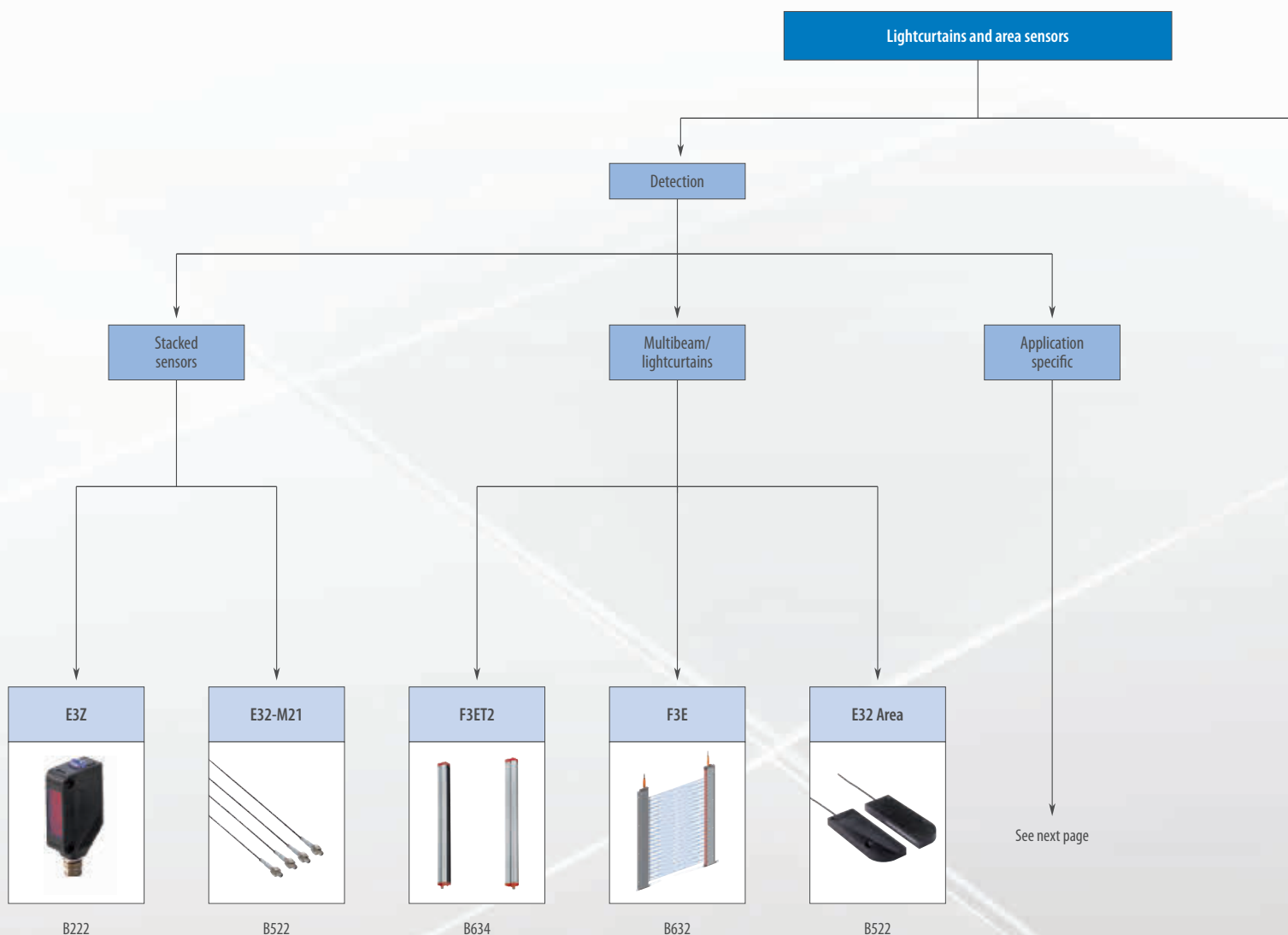
PRESENCE, HEIGHT OR PROFILE ...

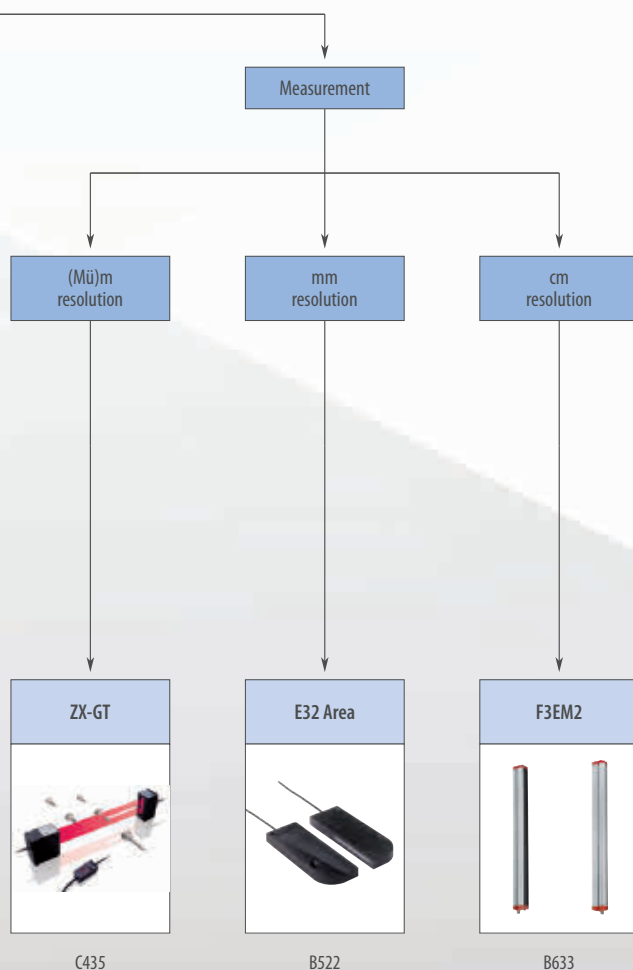
... choose the accuracy you need

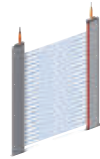
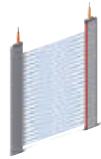
Objects with varying positions or heights or objects with holes can create multiple signals or stay undetected when using single beam sensors. These objects (e.g. parcels, bikes or natural products like ham or fish) are then wrongly classified as multiple smaller items or are not detected correctly.

Detecting these objects over their whole length or acquiring the more detailed object profile can be realized using multiple sensors or light curtains.

Omron offers a wide range of models with varying max detection heights, different resolutions and with digital, analog or serial outputs to provide the best performance match fitting your application.





Type	Stacked sensors		Multibeam sensors/lightcurtains			Application specific lightcurtains	
							
Model	E3Z	E32-M21	F3ET2	F3E	E32 area	Safety lightcurtains	F3E Elevator lightcurtains
Key features	Mutual interference prevention	4 × M3 heads combined in one fiber	Models with 5 and 18 mm pitch	Thin aluminum housing	Teachable sensitivity	Type 2, type 4 or application specific	Fulfills EN81-70
Max. sensing distance	60 m	1.3 m	15 m	5 m	4 m	50 m	5 m
Max. detection height	n. a.	4 m	2.1 m	1.8 m	70 mm	2.4 m	1.8 m
Page/Quick Link	B222	B522	B634	B632	B522	226	B632

Type	Measuring lightcurtains		
			
Model	F3EM2	E32 area	ZX-GT
Key features	cm accuracy	mm accuracy	µm accuracy
Max. sensing distance	15 m	4 m	0.5 m
Max. measurement height	2.1 m	70 mm	28 mm
Page/Quick Link	B633	B522	C435

Fiber optic sensors and amplifiers

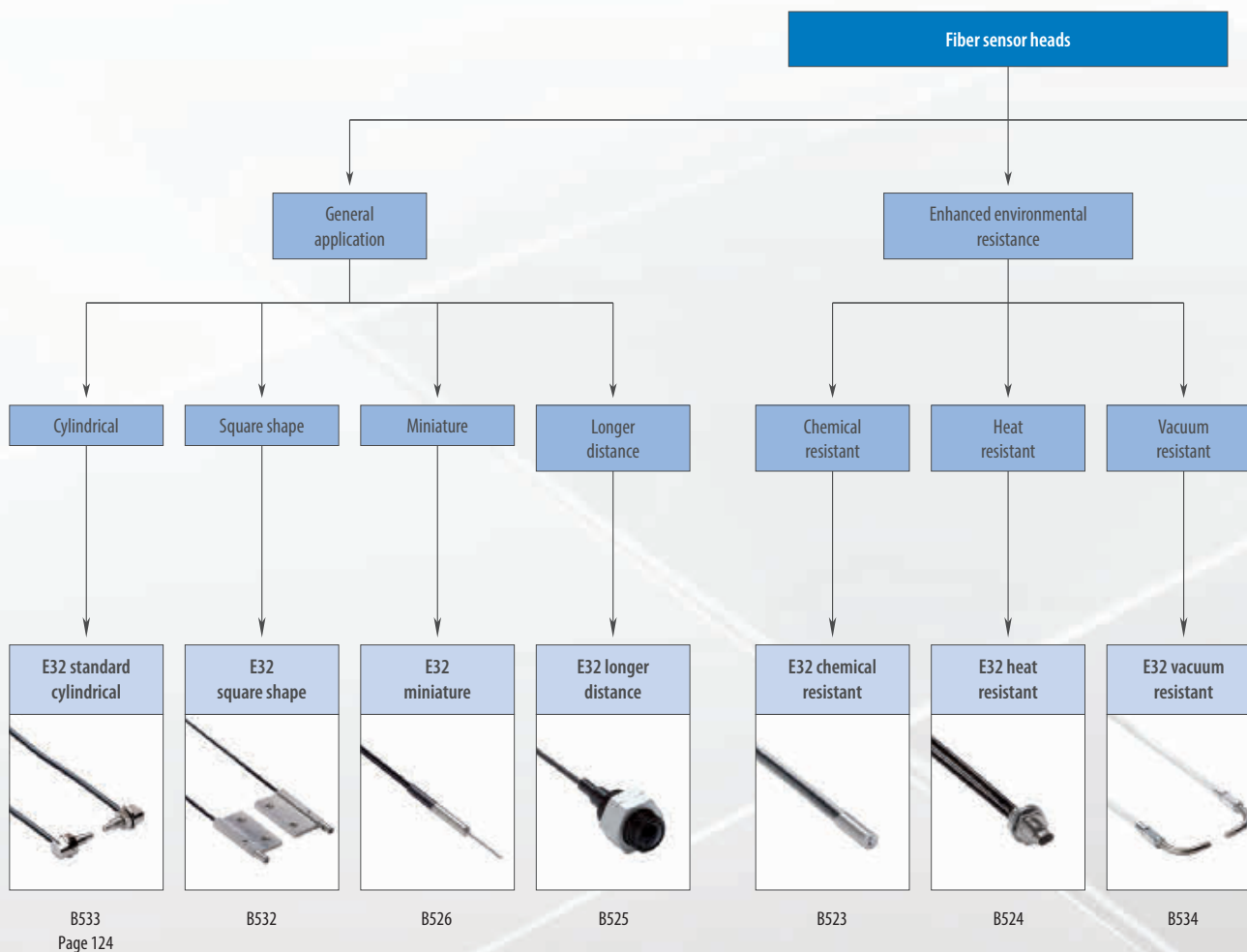
HIGH PRECISION IN SMALL SPACES

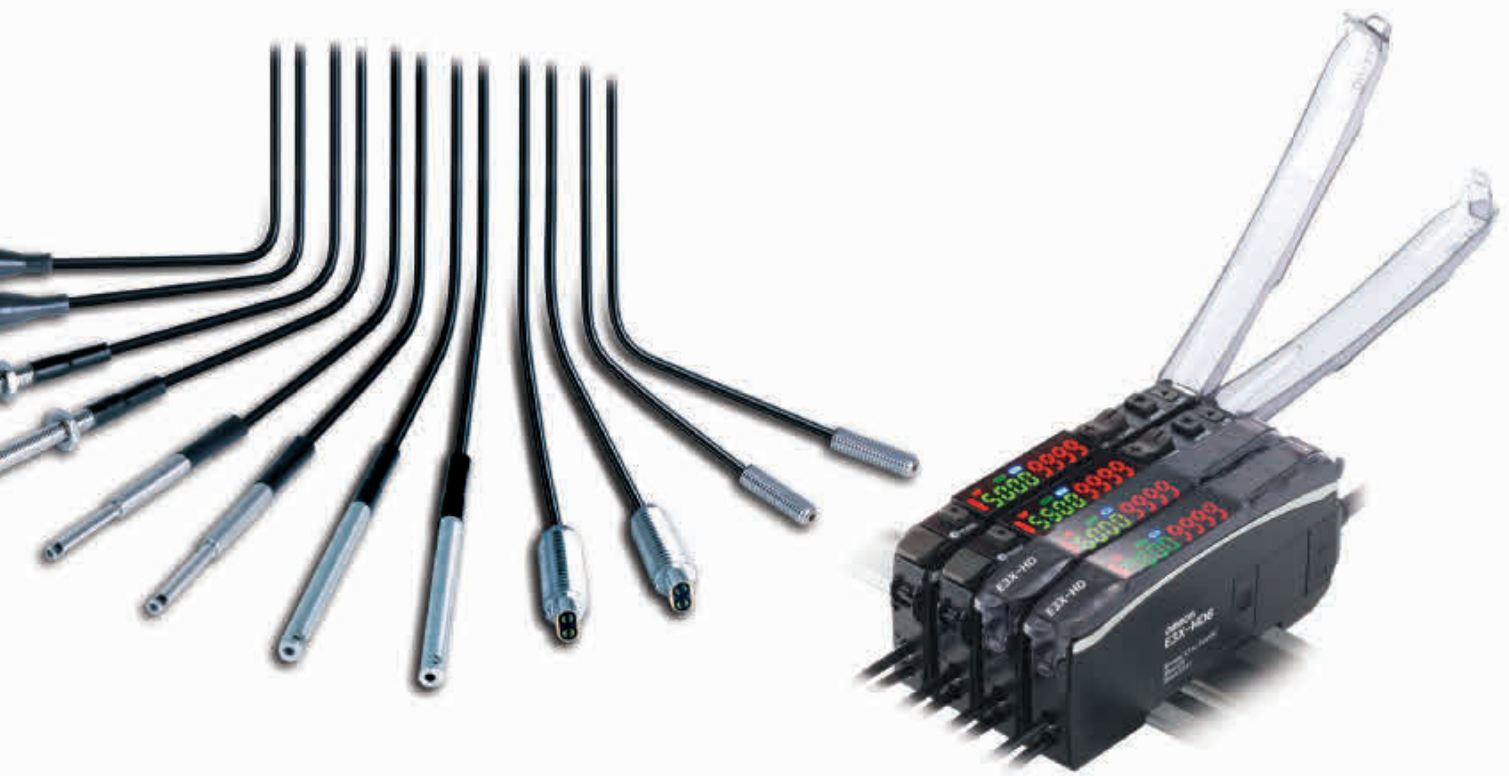
Precision and performance you can rely on

The requirements for fiber optic solutions can be very demanding particularly for applications with extreme temperatures and aggressive chemicals or for applications requiring highest precision with limited mounting space.

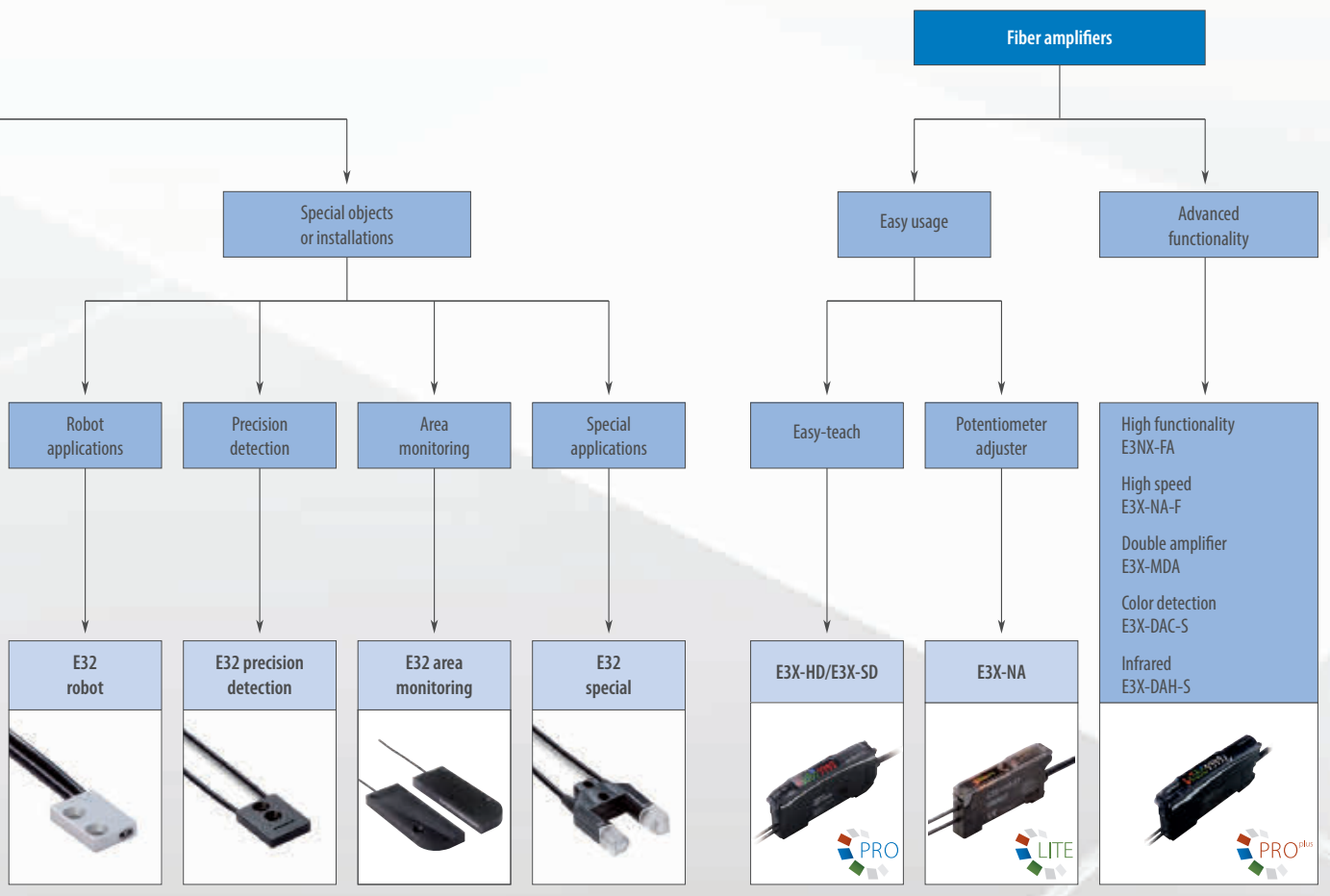
With the wide range of E32 fiber heads and the easy-usage amplifiers, the best performance fit for your application can be provided. The highest quality control procedures in design and manufacturing ensure that you get the precision and long service life that you can rely on.

- Long operational life
- Easy to install and adjust
- Wide portfolio range for best performance fit





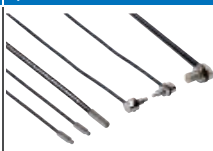
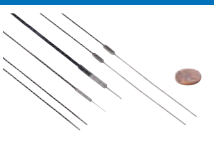
Explanation of 361° concept see page 4



E3NX-FA B345 Page 132
 E3X-NA_F B339
 E3X-MDA B326
 E3X-DAC-S B325 Page 114
 E3X-DAH-S B338

Selection table

Fiber sensor heads

Type	Cylindrical	Square shape	Miniature	Longer distance	Chemical resistant
					
Model	E32 standard cylindrical	E32 square shape	E32 miniature	E32 longer distance	E32 chemical resistant
Key features	- Standard and high-flex fibers - Sizes M3 to M6	3 or 4 mm thin housing - Models in X,Y or Z-axis - Direct mounting without bracket	- Sizes from dia 500 µm to 3 mm - Bendable sleeves	Built in focal lenses	Fluoroplastic cover or coating
Through-beam	1,550 mm	1,550 mm	1,550 mm	20 m	4 m
Retro-reflective	250 mm	—	—	1.5 m	—
Diffuse-reflective	650 mm	600 mm	600 mm	1.4 m	350 mm
Page/Quick Link	124/B533	B532	B526	B525	B523

Note: All sensing distances measured with E3X-DA-SE-S. Longer sensing distances up to 80% can be achieved with E3X-DA-S.

Fiber amplifiers

Type	Easy teach/double display	Easy teach/single display	Potentiometer adjuster	High performance	Double amplifier
					
Model	E3X-HD	E3X-SD	E3X-NA	E3NX-FA	E3X-MDA
361°	PRO	LITE	LITE	PRO ^{plus}	n.a.
Key features	- Easy operation by smart tuning - Dynamic power control - Fieldbus connectivity	1 button object teaching - Auto teach during operation	Easy adjustment by potentiometer	- High functionality signal processing (timer, counter, dynamic power control, etc.) - High signal resolution - Increased sensing distance - Double output/external input - Fieldbus connectivity	2 inputs and AND, OR signal comparison
Response time (min.)	1 ms (50 µs in super-high-speed mode)	1 ms	200 µs	1 ms (30 µs in super-high-speed mode)	1 ms (130 µs in high speed mode)
Page/Quick Link	126/B342	129/B334	130/B328	132/B345	B326

Heat resistant	Vacuum resistant	Robot applications	Precision detection	Area monitoring	Special application
					
E32 heat resistant	E32 vacuum resistant	E32 robot	E32 precision detection	E32 area monitoring	E32 special
Heat resistant up to 400°C	Leakage rate of 1×10^{-10} Pa·m³/s max	Free moving multicore fibers for >1 Mio bending cycles	- Detection accuracy up to 100 µm - Coaxial fibers - Adjustable focal points	Area monitoring up to 70 mm	Detection of special objects (wafer, liquid level, flat glass, print mark ...)
3 m	950 mm	1,350 mm	3.8 m	4 m	3.8 m
–	–	–	–	–	–
500 mm	–	350 mm	600 mm	300 mm	20 mm
B524	B534	B528	B527	B522	B529

High speed	Color/print mark detection	Infrared LED
		
E3X-NA-F	E3X-DAC-S	E3X-DAH-S
n.a.	n.a.	n.a.
Short turn on time of 20 µs	White LED and RGB ratio comparison	Infrared LED
20 µs	1 ms (60 µs in super high speed mode)	1 ms (55 µs in super high speed mode)
B339	114/B325	B338

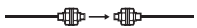


Standard cylindrical fiber sensor heads

The standard cylindrical fiber optic sensor heads provide reliable object detection, easy installation and long sensor lifetime for all general applications.

- High-flex fibers and 90° cable exit for fiber breakage prevention
- Models with hexagonal head for simplified one-nut mounting
- Sizes M3 to M6

Ordering information

Sensor type	Size	Sensing distance (in mm) ^{*1}				Order code	
		Standard fiber		High-flex fiber		Standard fiber	High-flex fiber
		E3X-HD	E3NX-FA	E3X-HD	E3NX-FA		
	M4	1550	2300	1400	1400	E32-TC200 2M	E32-T11R 2M
	M3	450	670	130	190	E32-TC200E 2M	E32-T21R 2M
	dia 4 mm	1500	2300	—	—	E32-ETC220 2M	—
 easy mount	M4	—	—	1000	1500	—	E32-T11N 2M
 easy mount	M6	—	—	1200	1800	—	E32-LR11NP 2M
	M6	250	370	—	—	E32-R21	—
	M6	600	900	550	820	E32-DC200 2M	E32-D11R 2M
	M4	160	240	60	90	E32-D211 2M	E32-D211R 2M
	M3	160	240	150	220	E32-DC200E 2M	E32-D21R 2M
 easy mount	M6	—	—	350	520	—	E32-D11N 2M
	M4	—	—	350	520	—	E32-D21N 2M
	dia 6 mm	220	300	100	150	E32-D14L 2M	E32-D14LR 2M

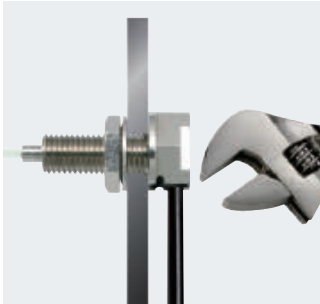
^{*1} Sensing distance measured with Standard Mode

Specifications

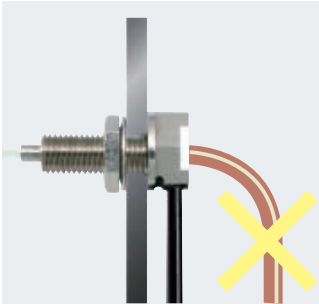
Item		Standard					High Flex				
		E32-_C200 E32-_C220	E32-D14L	E32-_C200E	E32-D211	E32-R21	E32-_R E32-T11N E32-D11N	E32-D14LR E32-D211R	E32-D21N	E32-LR11NP	
Permissible bending radius		R25		R10			R1		R2		
Cut to length		Yes									
Ambient temperature		-40°C to 70°C									
Material	Head	Brass-nickel plated	Stainless steel	Brass-nickel plated	Stainless steel	Plastic (ABS)	Brass-nickel plated	Stainless steel	Brass-nickel plated		
	Fiber	PMMA									
	Sheath	Polyethylene coating					PVC coating				
Degree of protection		IEC 60529 IP67								IP50	



Hi-flex multicore fibers for flexibility in installation without fiber breakage



Models with hexagonal back for simple one-nut mounting



Cable exit shifted by 90° for preventing fiber breakage



Easy-teach digital fiber amplifier

The E3X-HD with 1-button Smart tune set-up provides fast and simple teaching. Dual digital display and advanced features make the E3X-HD ideal even for demanding applications.

- Easy teaching by Smart tuning within a few seconds
- Dynamic Power Control (DPC) for highest operational stability for changing environmental conditions or challenging objects
- M8 connector models
- EtherCAT and CompoNet Communication units for high-speed field bus connectivity

Ordering information

Item	Order code		
	Transistor output models		Communication unit model ^{*1}
	NPN output	PNP output	
Pre-wired	E3X-HD11 2M	E3X-HD41 2M	–
Fiber amplifier connector	E3X-HD6	E3X-HD8	E3X-HD0
M8 connector (4pin)	E3X-HD14	E3X-HD44	–

^{*1} For field bus connection please chose Communication unit E3X-ECT for EtherCAT or E3X-CRT for CompoNet.

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN11
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

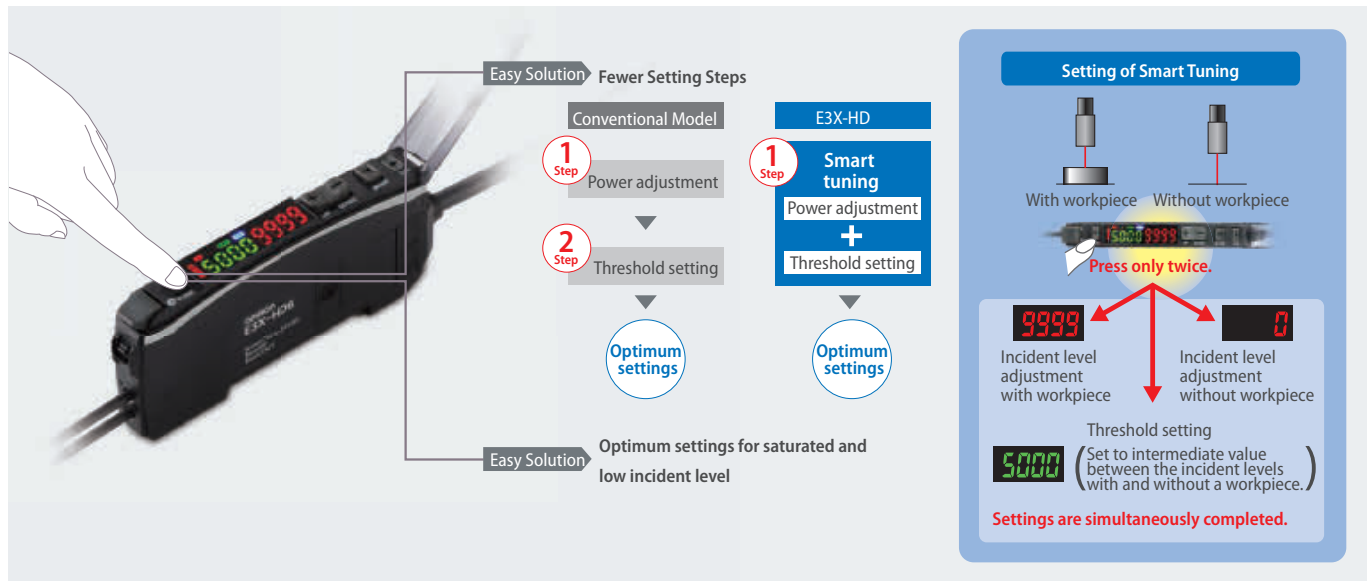
Communication units

Shape	Communications method	Applicable Fiber Amplifier Units	Order code
	CompoNet	E3X-HD0 E3X-MDA0 E3X-DA0-S	E3X-CRT
	EtherCAT		E3X-ECT

Specifications

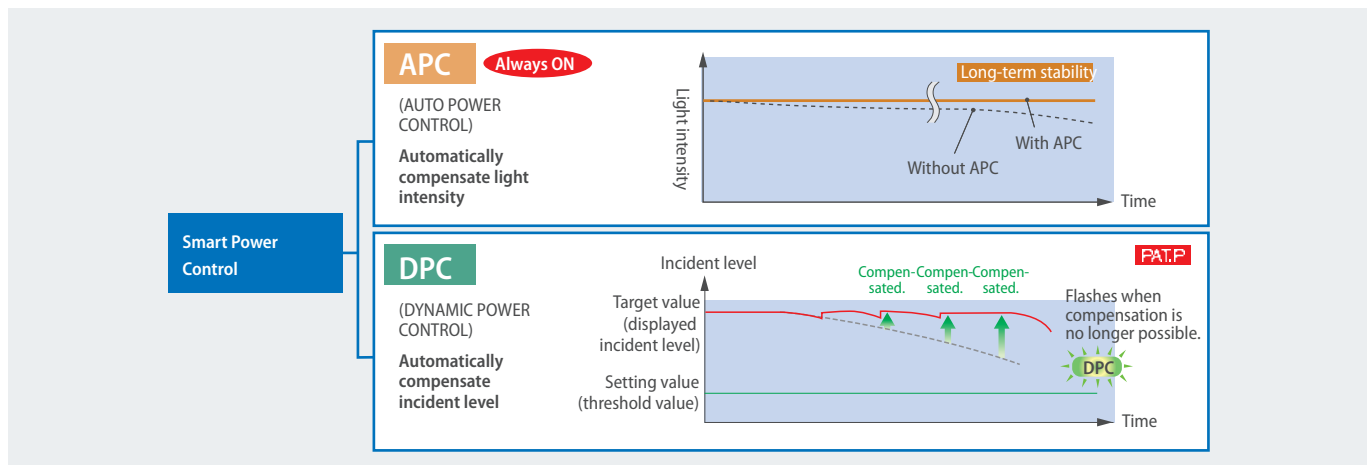
Item	Type	Standard models						For Communications Unit
	Model	E3X-HD11	E3X-HD41	E3X-HD6	E3X-HD8	E3X-HD14	E3X-HD44	E3X-HD0
	Connection method	Pre-wired		Wire-saving connector		M8-4pin connector		Communications unit connector
	Control output	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output	–
Light source (wavelength)		Red, 4-element LED (625 nm)						
Power supply voltage		12 to 24 VDC±10%, ripple (p-p) 10% max.						
Power consumption		Normal Mode: 720 mW max. (Current consumption: 30 mA max. at 24 VDC, 60 mA max. at 12 VDC.) Power Saving Eco Mode: 530 mW max. (Current consumption: 22 mA max. at 24 VDC, 44 mA max. at 12 VDC.)						
Control output		Load power supply voltage: 26.4 VDC max., open-collector output (Varies with the model depending on output is PNP or NPN.)Load current: 50 mA max. (residual voltage: 2 V max.), OFF current: 0.5 mA max.						–
Response time	Super-high-speed Mode (SHS)	Operate or reset: 50 μs (NPN models) or 55 μs (PNP models)						
	High-speed Mode (HS)	Operate or reset: 250 μs						
	Standard Mode (STND)	Operate or reset: 1 ms						
	Giga-power Mode (GIGA)	Operate or reset: 1 ms						
Mutual interference prevention		Possible for up to 10 units						
Maximum connectable Units		16 units						with E3X-CRT: 16 units with E3X-ECT: 30 units

Easy One-Button-Teaching/Smart Tuning



Easy setting of optimum power and threshold by pushing tune button twice.

Smart power control



Enhanced signal stability control for compensating power reductions caused by temperature drift, dust or aging of LED.

Field bus connectivity



Field bus communication allows control by an external device to simplify setup and reduce wiring effort.



Single display digital fiber amplifier

E3X-SD allows easy one button setting and provide the best value performance ratio for standard applications.

- Auto-teaching during machine operation
- 2-point teaching within a few seconds
- Simple threshold adjustment with up/down keys

Ordering information

Item	Order code	
	NPN output	PNP output
Pre-wired	E3X-SD21 2M	E3X-SD51 2M
Fiber amplifier connector*1	E3X-SD7	E3X-SD9

*1 Order connector separately. For M8 connector models see E3X-HD.

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN11
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

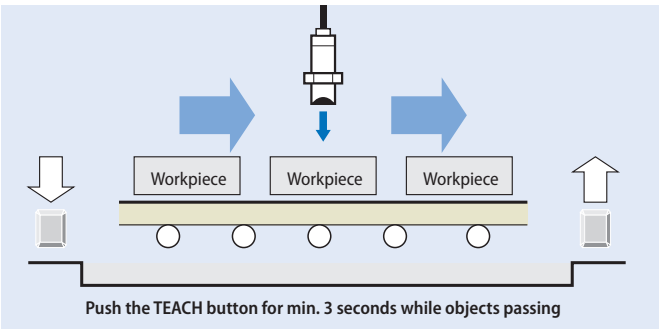
Specifications

Item		E3X-SD
Light source (wave length)		Red, 4-element LED (625 nm)
Power supply voltage		12 to 24 VDC $\pm$ 10%, ripple (p-p): 10% max.
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, mutual interference prevention
Response time		Operation or reset: 200 μ s max
Sensitivity setting		Teaching and digital up/down keys
Functions	Auto power control	High-speed control method for emission current
	Mutual interference prevention	Optical communication sync. possible for up to 5 units
Digital displays		Incident level or threshold
Degree of protection		IEC 60529 IP50 (with protective cover attached)

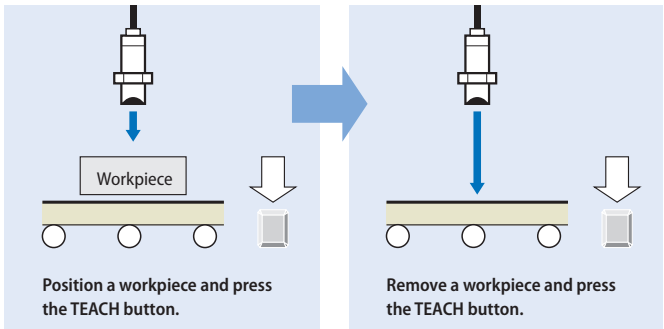
Easy operation by ergonomic buttons



Auto-teaching



2-point teaching





Digital fiber amplifier with potentiometer adjustment

The E3X-NA is the ideal amplifier for standard fiber applications providing quick & easy potentiometer adjustment and bargraph display.

- Easy adjustment with potentiometer
- Mutual interference prevention
- Enhanced water resistance types

Ordering information

Pre-wired

Item	Order code (for pre-wired types with 2 m cable length)	
	NPN output	PNP output
Standard	E3X-NA11 2M	E3X-NA41 2M
Enhanced water resistance	E3X-NA11V 2M	E3X-NA41V 2M

Connector version

Item	Order code	
	NPN output	PNP output
Standard (fiber amplifier connector)*1	E3X-NA6	E3X-NA8
Enhanced water resistance (M8 4-pin connector)	E3X-NA14V	E3X-NA44V

*1 Order connector separately.

Fiber amplifier connectors

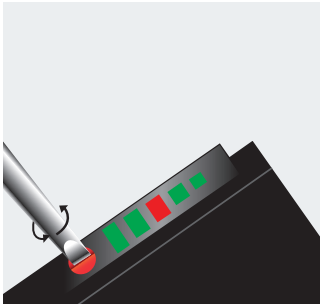
Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

Specifications

Item		Standard	Enhanced water resistance
Output	NPN output	E3X-NA11, E3X-NA6	E3X-NA11V, E3X-NA14V
	PNP output	E3X-NA41, E3X-NA8	E3X-NA41V, E3X-NA44V
Light source (wave length)		Red LED (625 nm)	
Power supply voltage		12 to 24 VDC±10%, ripple (p-p): 10% max.	
Protective circuit		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation or reset: 200 μs max.	
Sensitivity setting		8-turn endless adjuster (potentiometer)	
Functions		OFF-delay timer: 40 ms (fixed)	
Degree of protection		IEC 60529 IP50 (with protective cover attached)	IEC 60529 IP66 (with protective cover attached)



Bargraph display with light level, switching status and threshold indicators



Simple sensitivity adjustment by potentiometer



High-performance digital fiber amplifier

The E3NX-FA amplifier is best choice for most challenging fiber applications in terms of long sensing distance, minute object detection or high speed processes.

- Easy teaching by Smart tuning within a few seconds
- New N-Smart technology provides significant improvement for sensing distance, minimum object detection and speed
- Easy and transparent information about sensor status by Solution Viewer and Change Finder function
- EtherCAT Communication unit for high-speed field bus connectivity

Ordering information

Item	Connection	Inputs/Outputs	Order code	
			NPN output	PNP output
Standard models	Pre-wired	1 output	E3NX-FA11 2M	E3NX-FA41 2M
	Fiber amplifier connector		E3NX-FA6	E3NX-FA8
Advanced models	Pre-wired	2 outputs + 1 input	E3NX-FA21 2M	E3NX-FA51 2M
	Fiber amplifier connector	1 output + 1 input	E3NX-FA7	E3NX-FA9
		2 outputs	E3NX-FA7TW	E3NX-FA9TW
	M8 connector	1 output + 1 input	E3NX-FA24	E3NX-FA54
		2 output	–	E3NX-FA54TW
Networking model ^{*1}	Connector for communication unit	via com. protocol	E3NX-FA0	

^{*1} For field bus connection please chose communication unit E3NW-ECT for EtherCAT.

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable (4 pin)	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

Communication units

Shape	Communications method	Applicable Amplifier Units	Order code
	Sensor communication unit for EtherCAT	E3NX-FA0 E3NC-LA0 E3NC-SA0	E3NW-ECT
	Sensor dispersion (slave) unit		E3NW-DS

Specifications

Item	Type	Standard models		Advanced models					Model for sensor communications unit
	NPN output	E3NX-FA11	E3NX-FA6	E3NX-FA21	E3NX-FA7	E3NX-FA7TW	E3NX-FA24	–	E3NX-FA0
	PNP output	E3NX-FA41	E3NX-FA8	E3NX-FA51	E3NX-FA9	E3NX-FA9TW	E3NX-FA54	E3NX-FA54TW	
	Connection method	Pre-wired	Wire-saving connector	Pre-wired	Wire-saving connector		M8 connector		Connector for sensor communications unit
Inputs/outputs	Outputs	1 output		2 outputs	1 output	2 outputs	1 output	2 outputs	via com. protocol
	External inputs	–		1 input	1 input	–	1 input	–	–
Light source (wavelength)		Red, 4-element LED (625 nm)							
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)							
Power consumption		At power supply voltage of 24 VDC Standard model or model for sensor communications unit: Normal mode: 960 mW max. (current consumption: 40 mA max.), Power saving eco mode: 840 mW max. (current consumption: 35 mA max.) Advanced model: Normal mode: 1,080 mW max. (current consumption: 45 mA max.), Power saving eco mode: 930 mW max. (current consumption: 40 mA max.)							
Control output		Load power supply voltage: 30 VDC max., open-collector output Load current: groups of 1 to 3 amplifiers: 100 mA max., groups of 4 to 30 amplifiers: 20 mA max. Residual voltage: at load current of less than 10 mA: 1 V max. at load current of 10 to 100 mA: 2 V max. OFF current: 0.1 mA max.							–
Response time	Super-high-speed Mode (SHS)*1	Operate or reset for model with 1 output: 30 µs, with 2 outputs: 32 µs							
	High-speed Mode (HS)	Operate or reset: 250 µs							
	Standard Mode (Stnd)	Operate or reset: 1 ms							
	Giga-power Mode (GIGA)	Operate or reset: 16 ms							
No. of units for mutual interference prevention	Super-high-speed Mode (SHS)*1	0							
	High-speed Mode (HS)	10							
	Standard Mode (Stnd)	10							
	Giga-power Mode (GIGA)	10							
Functions		Auto power control (APC), dynamic power control (DPC), timer, zero reset, resetting settings, eco mode, bank switching, power tuning, and hysteresis width							
Maximum connectable units		30							

*1 The mutual interference prevention function is disabled if the detection mode is set to super-high-speed mode.

Easy One-Button-Teaching/Smart Tuning



Automatic setting of optimum values

Threshold + Incident level

5000 **9999**

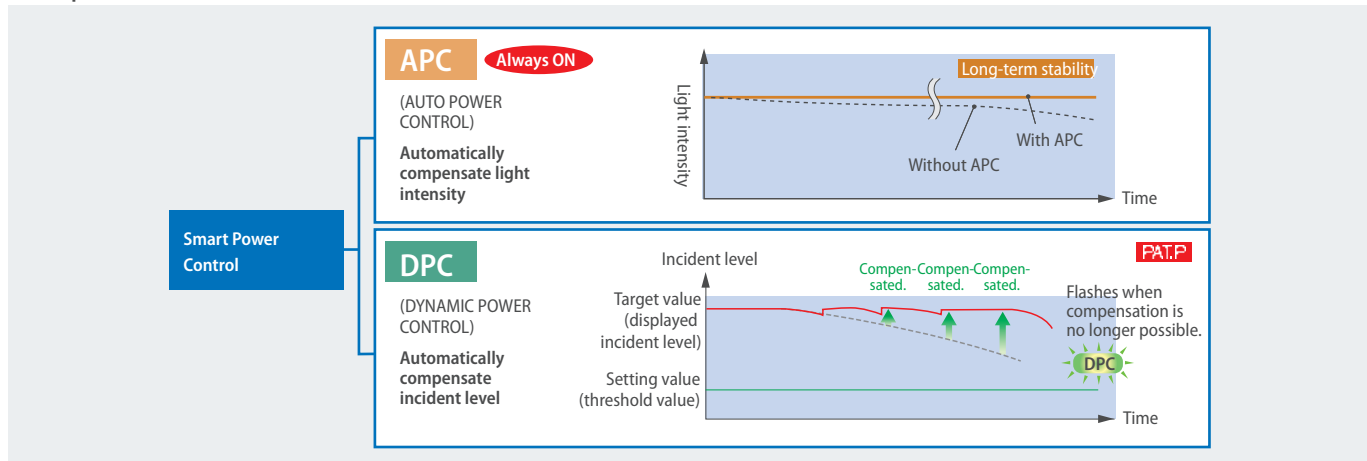
Set to the intermediate value between the incident levels with and without a workpiece.

Incident level adjustment with and without a workpiece

Dynamic range increased by a factor of 40,000

Easy setting of optimum power and threshold by pushing tune button twice.

Smart power control



Enhanced signal stability control for compensating power reductions caused by temperature drift, dust or aging of LED. Alarm output added for predictive maintenance.

N-Smart platform



The N-Smart platform provides wide portfolio of advanced sensors – all with the same intuitive operation concept and field bus connectivity.

Accessories

Shape	Type	Comment	Order code
	Focal lens	- Extends sensing distance by more than 500% - For M4 Through beam fibers E32-TC200, E32-ET11R, E32-T11 (fits M2.6 thread) 2 pcs per set	E39-F1
	Focal lens (side view)	- For M4 through beam fibers E32-TC200, E32-ET11R, E32-T11, E32-T61-S, E32-T81R-S (fits M2.6 thread) - Temperature range -40 to 200°C 2 pcs per set	E39-F2
	Focal lens (variable)	For precision detection with E32-D32	E39-F3A
	Focal lens	For precision detection with E32-EC41	E39-F3A-5
		For precision detection with E32-EC41	E39-F3B
		For precision detection with M6 coaxial diffuse reflective fibers (e.g. E32-CC200)	E39-F18
	Focal lens (side view, variable)	For precision detection with E32-EC31	E39-EF51
	Focal lens (heat resistant)	- Extends sensing distance by more than 500% - For M4 through beam fibers E32-ET51, E32-T61, E32-T61-S, E32-T81R, E32-T81R-S (fits M4 thread) - Temperature range -60 to 350°C 2 pcs per set	E39-EF1-37-2
			E39-F16
	Focal lens (vacuum resistant, heat resistant)	- Fits E32-T51V and E32-T54V (fits M2.6 thread) 2 units per set - Heat resistant up to 120°C	E39-F1V
	Fiber cutter	Included in applicable fiber	E39-F4
	Thin fiber attachment	- Amplifier adapter for thin fibers - Included in applicable fiber (2 sets)	E39-F9
	Sleeve bender	- For E32-TC200B(4) - For E32-TC200F(4) - For E32-DC200F(4)	E39-F11
	Single fiber extension connector	- Fiber extension connector for 2.2 mm dia standard fibers - One unit	E39-F10
	Dual fiber extension connector	For fibers with dia 2.2	E39-F13
		For fiber with dia 1.0	E39-F14
		For fibers with dia between 1.0 and 2.2	E39-F15
	Protective spiral tube ^{*1}	- For M3 diffuse type sensors - Length 1 m	E39-F32A
		- For M3 through beam type sensors - Length 1 m	E39-F32B
		- For M4 through beam type sensors - Length 1 m	E39-F32C
		- For M6 diffuse type sensors - Length 1 m	E39-F32D
	Fiber on roll ^{*2}	- Dia 2.2 mm - Standard moncore, 10 mm bending radius -40 to 80°C	E32-E01 100M
		- Dia 1.1 mm - Standard moncore, 15 mm bending radius -40 to 80°C	E32-E02 100M
		- Dia 2.2 mm - High flex multicore, 1 mm bending radius -40 to 80°C	E32-E01R 100M
		- Dia 1.1 mm - High flex multicore, 1 mm bending radius -40 to 80°C	E32-E02R 100M
		- Dia 2.2 mm - High temperature moncore, 20 mm bending radius -60 to 150°C	E32-E05 100M

^{*1} Protective spiral tubes with 0.5 m length are available. Add 'S' to order code ... e.g. E39-F32A5

^{*2} Fiber length 100 m on a roll – cut to length

ZERO TOLERANCE ON FAILURE

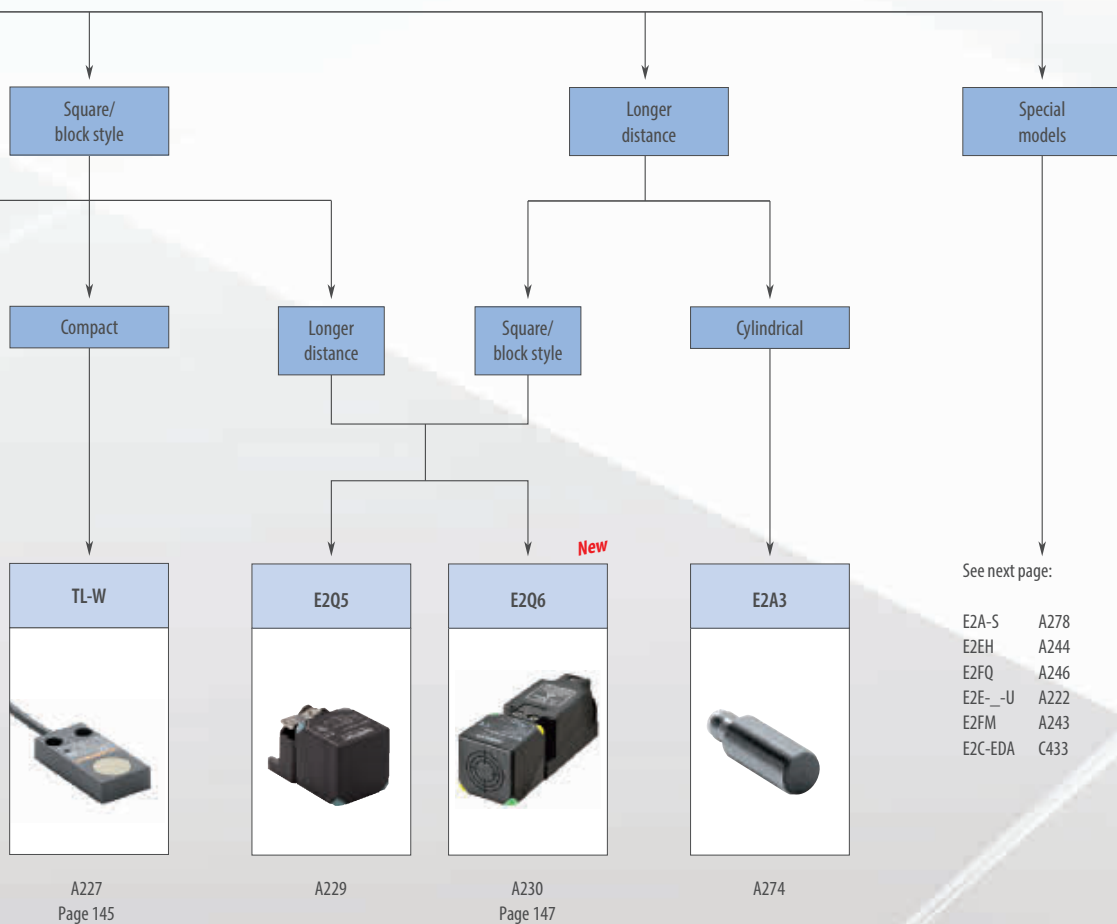
Tested reliability for demanding conditions

Our inductive sensors are designed and tested to ensure a long service life and to achieve maximum machine availability even in the harshest environments.

This trusted reliability makes the E2A one of the world's most popular and successful inductive proximity sensors with more than one million units sold every year.

- Wide portfolio and application range
- Highest reliability even in demanding environments
- Designed for flexibility - modular housing design for best performance fit





Selection table

Format		Cylindrical			
					
Model		E2A	E2A3	E2A-S	E2B
361° product line		PRO	PRO ^{plus}	PRO	LITE
Type		Compact	Long distance	Compact	Compact
Material		Brass, SUS	Brass	Stainless steel	Stainless steel
Max. sensing distance	dia. 3	–	–	–	–
	dia. 4	–	–	–	–
	M5	–	–	–	–
	dia. 6.5	–	–	–	–
	M8	2/4 mm	3 mm	2/4 mm	2/4 mm
	M12	4/8 mm	6 mm	4/8 mm	4/8 mm
	M18	8/16 mm	11 mm	8/16 mm	8/16 mm
	M30	15/30 mm	20 mm	15/20 mm	15/30 mm
	19 × 6 × 6	–	–	–	–
	22 × 8 × 6	–	–	–	–
	31 × 18 × 10	–	–	–	–
	53 × 40 × 23	–	–	–	–
	67 × 40 × 40	–	–	–	–
Mount.	Shielded	■	■	■	■
	Non-shielded	■	–	■	■
Oper. mode	NO	■	■	■	■
	NC	■	■	■	■
	NO + NC	■	–	■	–
Wiring	DC 2-wire	■	–	–	–
	DC 3-wire	■	■	■	■
	DC 4-wire	■	–	■	–
	AC 2-wire	–	–	–	–
Voltage	10 to 30 VDC	■	■	■	■
	12 to 240 VAC	–	–	–	–
IP rating	IP67	■	■	■	■
	IP69K	■	■	■	–
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Special models

Type	Detergent and heat resistant	Chemical resistant	Small diameter	Full metal face
				
Model	E2EH	E2FQ	μPROX E2E	E2FM
361° product line	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}
Key features	- Stainless steel housing 120°C heat resistance	PTFE housing	- High frequency of 5 kHz: suitable for high-speed counting - All sizes are also available as non-shielded types	- Immune to aluminum and cast iron chips on sensing surface - Oil resistant
dia. 3	–	–	■	–
dia. 4	–	–	■	–
dia. 6.5	–	–	■	–
M5	–	–	■	–
M8	–	–	–	■
M12	■	■	–	■
M18	■	■	–	■
M30	■	■	–	■
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Format		Square			
					
Model		TL-W	E2S	E2Q5	E2Q6
Type		Compact	Miniature	Long distance	Long distance
Material		ABS	Polyarylate	PBT	PBT
Max. sensing distance	dia. 3	—	—	—	—
	dia. 4	—	—	—	—
	M5	—	—	—	—
	dia. 5.4	—	—	—	—
	M8	—	—	—	—
	M12	—	—	—	—
	M18	—	—	—	—
	M30	—	—	—	—
	19 × 6 × 6	—	1.6 mm	—	—
	22 × 8 × 6	3 mm	2.5 mm	—	—
	31 × 18 × 10	5 mm	—	—	—
	53 × 40 × 23	20 mm	—	—	—
	67 × 40 × 40	—	—	40 mm	30 mm
Mount.	Shielded	■	—	■	■
	Non-shielded	■	■	■	■
Oper. mode	NO	■	■	■	—
	NC	■	■	—	—
	NO + NC	—	—	■	■
Wiring	DC 2-wire	■	■	—	—
	DC 3-wire	■	■	■	■
	DC 4-wire	—	—	■	■
	AC 2-wire	—	—	—	—
Voltage	10 to 30 VDC	■	■	■	■
	12 to 240 VAC	—	—	—	—
IP rating	IP67	■	■	■	■
	IP69K	—	—	■	—
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Special models

Type	Oil resistant	High precision positioning
		
Model	E2E- U	E2C-EDA
361° product line	PRO ^{plus}	PRO ^{plus}
Key features	• Tested oil resistance on commonly used lubricants	• Distance teaching up to μm accuracy
dia. 3	—	■
dia. 4	—	—
dia. 6.5	—	—
M5	—	—
M8	■	—
M12	■	■
M18	■	■
M30	■	—
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Extended sensing range inductive sensor in cylindrical brass housing

The high quality and the long-life design of the E2A extended sensing distance provide high operational reliability, accurate performance and long sensor lifetime for a wide range of applications.

- Extended (double) sensing distance
- IP67 and IP69k for highest water protection
- DC 3-wire (NO, NC)
- Wide temperature range –40 to 70°C
- 200 mA max load current
- Wide installation and connectivity range through modular concept

Ordering information

Pre-wired

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for pre-wired types with 2 m PVC cable)		
						Operation mode NO	Operation mode NC	DC 4-wire (NO+NC-PNP models)
M8	■	–	2.0 mm	27 (40) mm	PNP ^{*1}	E2A-S08KS02-WP-B1 2M ^{*2}	E2A-S08KS02-WP-B2 2M ^{*2}	E2A-S08LS02-WP-B3 2M ^{*3}
	–	■	4.0 mm	21 (40) mm	PNP ^{*1}	E2A-S08KN04-WP-B1 2M ^{*2}	E2A-S08KN04-WP-B2 2M ^{*2}	E2A-S08LN04-WP-B3 2M ^{*3}
M12	■	–	4.0 mm	34 (50) mm	PNP ^{*1}	E2A-M12KS04-WP-B1 2M	E2A-M12KS04-WP-B2 2M	E2A-M12KS04-WP-B3 2M
	–	■	8.0 mm	27 (50) mm	PNP ^{*1}	E2A-M12KN08-WP-B1 2M	E2A-M12KN08-WP-B2 2M	E2A-M12KN08-WP-B3 2M
M18	■	–	8.0 mm	39 (59) mm	PNP ^{*1}	E2A-M18KS08-WP-B1 2M	E2A-M18KS08-WP-B2 2M	E2A-M18KS08-WP-B3 2M
	–	■	16.0 mm	29 (59) mm	PNP ^{*1}	E2A-M18KN16-WP-B1 2M	E2A-M18KN16-WP-B2 2M	E2A-M18KN16-WP-B3 2M
M30	■	–	15.0 mm	44 (64) mm	PNP ^{*1}	E2A-M30KS15-WP-B1 2M	E2A-M30KS15-WP-B2 2M	E2A-M30KS15-WP-B3 2M
	–	■	20.0 mm ^{*4}	29 (64) mm	PNP ^{*1}	E2A-M30KN20-WP-B1 2M	E2A-M30KN20-WP-B2 2M	E2A-M30KN20-WP-B3 2M

Connector types (M12)

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for M12 connector types)		
						Operation mode NO	Operation mode NC	DC 4-wire (NO+NC-PNP models)
M8	■	–	2.0 mm	27 (43) mm	PNP ^{*1}	E2A-S08KS02-M1-B1 ^{*2}	E2A-S08KS02-M1-B2 ^{*2}	E2A-S08LS02-M3-B3 ^{*5}
	–	■	4.0 mm	21 (43) mm	PNP ^{*1}	E2A-S08KN04-M1-B1 ^{*2}	E2A-S08KN04-M1-B2 ^{*2}	E2A-S08LN04-M3-B3 ^{*5}
M12	■	–	4.0 mm	24 (48) mm	PNP ^{*1}	E2A-M12KS04-M1-B1	E2A-M12KS04-M1-B2	E2A-M12KS04-M1-B3
	–	■	8.0 mm	27 (48) mm	PNP ^{*1}	E2A-M12KN08-M1-B1	E2A-M12KN08-M1-B2	E2A-M12KN08-M1-B3
M18	■	–	8.0 mm	39 (53) mm	PNP ^{*1}	E2A-M18KS08-M1-B1	E2A-M18KS08-M1-B2	E2A-M18KS08-M1-B3
	–	■	16.0 mm	29 (53) mm	PNP ^{*1}	E2A-M18KN16-M1-B1	E2A-M18KN16-M1-B2	E2A-M18KN16-M1-B3
M30	■	–	15.0 mm	44 (58) mm	PNP ^{*1}	E2A-M30KS15-M1-B1	E2A-M30KS15-M1-B2	E2A-M30KS15-M1-B3
	–	■	20.0 mm ^{*4}	29 (58) mm	PNP ^{*1}	E2A-M30KN20-M1-B1	E2A-M30KN20-M1-B2	E2A-M30KN20-M1-B3

DC 2-Wire models

Size			Sensing distance	Thread length (overall length)	Body material	Operation mode	Order code (for pre-wired types with 2 m PVC cable)	
							DC 2-wire (NO)	
M8	■	–	2.0 mm	27 (40) mm	Stainless steel	NO	E2A-S08KS02-WP-D1 2M	
	–	■	4.0 mm	21 (40) mm			E2A-S08KN04-WP-D1 2M	
M12	■	–	4.0 mm	34 (50) mm	Brass-nickel plated		E2A-M12KS04-WP-D1 2M	
	–	■	8.0 mm	27 (50) mm			E2A-M12KN08-WP-D1 2M	
M18	■	–	8.0 mm	39 (59) mm			E2A-M18KS08-WP-D1 2M	
	–	■	16.0 mm	29 (59) mm			E2A-M18KN16-WP-D1 2M	
M30	■	–	15.0 mm	44 (64) mm			E2A-M30KS15-WP-D1 2M	
	–	■	20.0 mm	29 (64) mm			E2A-M30KN20-WP-D1 2M	

Gold-plated pins models

Size			Sensing distance	Thread length (overall length)	Output configuration	Connection	Body material	Operation mode	Order code
M8	■	—	2 mm	27 (40) mm	NPN	Connector M8 3 pin: gold-plated	Stainless steel	NO	E2A-S08KS02-M5-C1-4
	■	—		49 (62) mm					E2A-S08LS02-M5-C1-4
M12	■	—	4 mm	34 (48) mm	PNP	Connector M12 4 pin: gold-plated	Brass-nickel plated		E2A-M12KS04-M1-B1-4
	—	■	8 mm	E2A-M12KN08-M1-B1-4					

^{*1} NPN models are available. For ordering replace "B1", "B2", "B3" or "D1" by "C1", "C2" or "C3".

^{*2} M8 sized housings are only available in stainless steel (SUS 303).

^{*3} Longer housing with thread length 49 mm and overall length 62 mm.

^{*4} Models with longer sensing distances of 30 mm and 35 mm are available.

^{*5} Models with M8 4-pin connector and thread length 49 mm and overall length 61 mm.

Specifications

(Exemplary for shielded versions.)

Item		M8	M12	M18	M30
		E2A-S08KS	E2A-M12KS	E2A-M18KS	E2A-M30KS
Sensing distance		2 mm±10%	4 mm±10%	8 mm±10%	15 mm±10%
Response frequency		1,500 Hz	1,000 Hz	500 Hz	250 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)			
Protective circuits		Power supply reverse polarity protection, surge suppressor, short-circuit protection			
		Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection			
Ambient temperature	Operating	-40 to 70°C			
	Storage	-40 to 85°C (with no icing or condensation)			
Degree of protection		IP67 after IEC 60529; IP69K after DIN 40050 part 9			
Material	Case	Stainless steel	Brass-nickel plated		
	Sensing surface	PBT			

Optional features

Refer to complete datasheet or contact your OMRON representative for the below optional features

Sensing module and body

- single sensing distance (ideal for compatibility with previous machine generations)
- Long body (ideal for mounting through thicker constructions)

Connection

- M8 4-pin (for ordering replace -M1 by -M3 e.g. E2A-S08KS02-M3-B1)
- M8 3-pin (for ordering replace -M1 by -M5 e.g. E2A-S08KS02-M5-B1)
- PUR cable
- Pigtails with M8 or M12 plugs

Output

- 400 mA max. load current (ideal for switching higher load currents directly)
- DC 2-wire (ideal for reduced wiring; leakage current can be used to detect cable breakage)
- DC 4-wire (NO+NC output – ideal for reduced stock for spare parts; antivalent signal can be used to detect cable breakage)



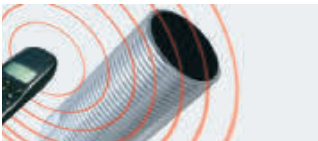
High water resistance



Cable breakage protection



High mechanical resistance



High electro-magnetic noise immunity



High resistance against temperature change



High vibration resistance



The ideal solution for standard industrial conditions

Thanks to the simple construction and Omron's innovative "hot melt" production process, the E2B sensors embody two characteristics: value-for-money and high reliability.

- All-round-visible indicator
- The laser printed part number
- Vibration shock resistance: IEC 60947-5-2 (10 to 55 Hz)
- Operating temperature: –25 to 70°C
- Water resistance: IP67

Ordering information

Pre-wired

Size			Sensing distance	Output configuration	Order code (for pre-wired types with 2 m PVC cable)	
					Operation mode NO	Operation mode NC
M8		–	2.0 mm	PNP ^{*1}	E2B-S08KS02-WP-B1 2M ^{*2}	E2B-S08KS02-WP-B2 2M ^{*2}
	–		4.0 mm	PNP ^{*1}	E2B-S08KN04-WP-B1 2M ^{*2}	E2B-S08KN04-WP-B2 2M ^{*2}
M12		–	4.0 mm	PNP ^{*1}	E2B-M12KS04-WP-B1 2M	E2B-M12KS04-WP-B2 2M
	–		8.0 mm	PNP ^{*1}	E2B-M12KN08-WP-B1 2M	E2B-M12KN08-WP-B2 2M
M18		–	8.0 mm	PNP ^{*1}	E2B-M18KS08-WP-B1 2M	E2B-M18KS08-WP-B2 2M
	–		16.0 mm	PNP ^{*1}	E2B-M18KN16-WP-B1 2M	E2B-M18KN16-WP-B2 2M
M30		–	15.0 mm	PNP ^{*1}	E2B-M30KS15-WP-B1 2M	E2B-M30KS15-WP-B2 2M
	–		30.0 mm	PNP ^{*1}	E2B-M30LN30-WP-B1 2M	E2B-M30LN30-WP-B2 2M

Connector types

Size			Sensing distance	Output configuration	Order code	
					Operation mode NO	Operation mode NC
M8		–	2.0 mm	PNP ^{*1}	E2B-S08KS02-MC-B1 ^{*2}	E2B-S08KS02-MC-B2 ^{*2}
	–		4.0 mm	PNP ^{*1}	E2B-S08KN04-MC-B1 ^{*2}	E2B-S08KN04-MC-B2 ^{*2}
M12		–	4.0 mm	PNP ^{*1}	E2B-M12KS04-M1-B1	E2B-M12KS04-M1-B2
	–		8.0 mm	PNP ^{*1}	E2B-M12KN08-M1-B1	E2B-M12KN08-M1-B2
M18		–	8.0 mm	PNP ^{*1}	E2B-M18KS08-M1-B1	E2B-M18KS08-M1-B2
	–		16.0 mm	PNP ^{*1}	E2B-M18KN16-M1-B1	E2B-M18KN16-M1-B2
M30		–	15.0 mm	PNP ^{*1}	E2B-M30KS15-M1-B1	E2B-M30KS15-M1-B2
	–		30.0 mm	PNP ^{*1}	E2A-M30LN30-M1-B1	E2B-M30LN30-M1-B2

^{*1} NPN models are available. For ordering replace "–B1" or "–B2" by "–C1" or "–C2".

^{*2} M8 sized housings are only available in stainless steel (SUS 303).

Optional features

Refer to complete datasheet or contact your OMRON representative for the below optional features

Sensing module and body

- Single sensing distance (ideal for compatibility with previous machine generations)
- Long body (ideal for mounting through thicker constructions)

Connection

- M8 3-pin –MC e.g. E2B-S08KS02-MC-B1

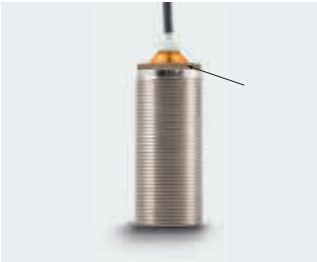
Output

- 200 mA max. load current

Specifications

(Exemplary for shielded versions.)

Item		M8	M12	M18	M30
		E2B-S08KS	E2B-M12KS	E2B-M18KS	E2B-M30KS
Sensing distance		2 mm±10%	4 mm±10%	8 mm±10%	15 mm±10%
Response frequency		1,500 Hz	1,000 Hz	500 Hz	250 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)			
Protective circuits		Output reverse polarity protection, Power source circuit reverse polarity protection			
Ambient temperature	Operating and storage	-25 to 70°C			
Degree of protection		IP67 after IEC 60529			
Material	Case	Stainless steel	Brass-nickel plated		
	Sensing surface	PBT			



High-visibility ring LED indicator



Laser printing part number



Small diameter proximity sensors for high precision detection

Omron's latest inductive technology has now been applied to a new range of small diameter inductive sensors. The new μPROX E2E provides precision detection and allows installation in even the most confined spaces. The portfolio has been extended to include non-shielded types and versions with pig-tail connector leads.

- Miniature size: 3, 4, 6.5 mm and M4, M5 diameters
- High frequency of 5 kHz: suitable for high-speed counting
- All sizes are also available as non-shielded types
- IP67 water ingress protection
- Highly visible indicators for easy operation confirmation

Ordering information

Size			Sensing distance	Connection	Output configuration	Order code	
						Operation mode NO	Operation mode NC
dia 3 mm			0.8 mm	PW	PNP	E2E-C03SR8-WC-B1 2M OMS	E2E-C03SR8-WC-B2 2M OMS
					NPN	E2E-C03SR8-WC-C1 2M OMS	E2E-C03SR8-WC-C2 2M OMS
			2 mm	PW	PNP	E2E-C03N02-WC-B1 2M OMS	E2E-C03N02-WC-B2 2M OMS
					NPN	E2E-C03N02-WC-C1 2M OMS	E2E-C03N02-WC-C2 2M OMS
M4			0.8 mm	PW	PNP	E2E-S04SR8-WC-B1 2M OMS	E2E-S04SR8-WC-B2 2M OMS
					NPN	E2E-S04SR8-WC-C1 2M OMS	E2E-S04SR8-WC-C2 2M OMS
			2 mm	PW	PNP	E2E-S04N02-WC-B1 2M OMS	E2E-S04N02-WC-B2 2M OMS
					NPN	E2E-S04N02-WC-C1 2M OMS	E2E-S04N02-WC-C2 2M OMS
dia 4 mm			1.2 mm	PW	PNP	E2E-C04S12-WC-B1 2M OMS	E2E-C04S12-WC-B2 2M OMS
					NPN	E2E-C04S12-WC-C1 2M OMS	E2E-C04S12-WC-C2 2M OMS
			3 mm	PW	PNP	E2E-C04N03-WC-B1 2M OMS	E2E-C04N03-WC-B2 2M OMS
					NPN	E2E-C04N03-WC-C1 2M OMS	E2E-C04N03-WC-C2 2M OMS
M5			1.2 mm	PW	PNP	E2E-S05S12-WC-B1 2M OMS	E2E-S05S12-WC-B2 2M OMS
					NPN	E2E-S05S12-WC-C1 2M OMS	E2E-S05S12-WC-C2 2M OMS
			3 mm	PW	PNP	E2E-S05N03-WC-B1 2M OMS	E2E-S05N03-WC-B2 2M OMS
					NPN	E2E-S05N03-WC-C1 2M OMS	E2E-S05N03-WC-C2 2M OMS
dia 6.5 mm			2 mm	PW	PNP	E2E-C06S02-WC-B1 2M OMS	E2E-C06S02-WC-B2 2M OMS
					NPN	E2E-C06S02-WC-C1 2M OMS	E2E-C06S02-WC-C2 2M OMS
				M8(3P)	PNP	E2E-C06S02-MC-B1 OMS	E2E-C06S02-MC-B2 OMS
					NPN	E2E-C06S02-MC-C1 OMS	E2E-C06S02-MC-C2 OMS
			4 mm	PW	PNP	E2E-C06N04-WC-B1 2M OMS	E2E-C06N04-WC-B2 2M OMS
					NPN	E2E-C06N04-WC-C1 2M OMS	E2E-C06N04-WC-C2 2M OMS
				M8(3P)	PNP	E2E-C06N04-MC-B1 OMS	E2E-C06N04-MC-B2 OMS
					NPN	E2E-C06N04-MC-C1 OMS	E2E-C06N04-MC-C2 OMS

Specifications

Item	dia. 3/M4		dia. 4/M5		dia. 6.5	
	E2E-C03S/-S04S	E2E-C03N/-S04N	E2E-C04S/-S05S	E2E-C04N/-S05N	E2E-C06S	E2E-C06N
Sensing distance	0.8 mm±10%	2.0 mm±10%	1.2 mm±10%	3.0 mm±10%	2.0 mm±10%	4 mm±10.0%
Setting distance	0 to 0.56 mm	0 to 1.4 mm	0 to 0.84 mm	0 to 2.1 mm	0 to 1.4 mm	0 to 2.8 mm
Response frequency	5 kHz	3 kHz	4 kHz	2 kHz	3 kHz	4 kHz
Supply voltage	10 to 30 VDC					
Current consumption	≤10 mA					
Max. control output	≤50 mA		≤100 mA		≤200 mA	
Residual output voltage	≤2 V					
Ambient temperature range	-25 to 70°C					
Ambient temperature fluctuation	≤15%					
Degree of protection	IEC 60529 IP67					
Material	Case	Stainless steel (SUS303)				
	Sensing surface	Heat-resistant ABS				



Flat shape inductive sensor in compact plastic housing

The TL-W family offers a wide range of block style inductive sensors for simple mounting on flat surfaces. With sensing distances from 1.5 mm to 20 mm the TL-W is the ideal solution for all standard applications.

- IP67
- DC 2-wire and DC 3-wire models
- Sensing distances from 1.5 mm to 20 mm
- Side facing sensing face

Ordering information

DC 2-wire

Size in mm (H × W × D)			Sensing distance	Order code (for pre-wired types with 2 m PVC cable)	
				Operation mode normally open (NO)	Operation mode normally closed (NC)
31 × 18 × 10	—	■	5 mm	TL-W5MD1	TL-W5MD2

DC 3-wire

Size in mm (H × W × D)			Sensing distance	Order code (for pre-wired types with 2 m PVC cable)			
				PNP-NO	PNP-NC	NPN-NO	NPN-NC
25 × 8 × 5	—	■	1.5 mm	TL-W1R5MB1	—	TL-W1R5MC1	—
22 × 8 × 6			3 mm	TL-W3MB1	TL-W3MB2	TL-W3MC1	TL-W3MC2
31 × 18 × 10			5 mm	TL-W5MB1	TL-W5MB2	TL-W5MC1	TL-W5MC2
53 × 40 × 23			20 mm	—	—	TL-W20ME1	TL-W20ME2
31 × 18 × 10	■	—	5 mm	TL-W5F1	TL-W5F2	TL-W5E1	TL-W5E2

Specifications

Item	TL-W5MD_	TL-W1R5M_1	TL-W3M_ _	TL-W5M_ _	TL-W5E_/_F_	TL-W20ME_
Sensing distance	5 mm±10%	1.5 mm±10%	3 mm±10%	5 mm±10%		20 mm±10%
Response frequency	500 Hz	1 kHz min.	600 Hz min.	500 Hz min.	300 Hz min.	40 Hz min.
Power supply voltage (operating voltage)	12 to 24 VDC (10 to 30 VDC) ripple (p-p): 10% max.				10 to 30 VDC with a ripple (p-p) of 20% max.	12 to 24 VDC (10 to 30 VDC) ripple (p-p): 10% max.
Protective circuits	Surge absorber; short-circuit protection	Surge suppressor; power supply reverse polarity protection				
Ambient temperature	Operating	-25 to 70°C (with no icing or condensation)				
	Storage					
Degree of protection	IEC60529 IP67					
Material	Case	Heat-resistant ABS resin			Diecast aluminum	Heat-resistant ABS resin
	Sensing surface	Heat-resistant ABS resin				



Oil resistant inductive sensor in cylindrical brass housing

The E2E-_-U offers tested oil resistance on commonly used oils in the automotive industry for reliable long-life operation in automotive assembly lines.

- Oil resistant PUR cable
- M8, M12, M18 and M30 standard sizes
- IP67g (water and oil resistance)



Ordering information

DC 2-wire (pre-wired)

Size			Sensing distance	Order code (for pre-wired types with 2 m PUR cable)	
				Operation mode NO	Operation mode NC
M8	■	—	2 mm	E2E-X2D1-U	E2E-X2D2-U
M12			3 mm	E2E-X3D1-U	E2E-X3D2-U
M18			7 mm	E2E-X7D1-U	E2E-X7D2-U
M30			10 mm	E2E-X10D1-U	E2E-X10D2-U

DC 2-wire (pre-wired with M12)

Size			Sensing distance	Order code (for pre-wired types with 30 cm PUR cable and M12 plug)	
				Operation mode NO	Operation mode NC
M8	■	—	2 mm	E2E-X2D1-M1TGJ-U 0.3M	E2E-X2D2-M1TGJ-U 0.3M
M12			3 mm	E2E-X3D1-M1TGJ-U 0.3M	E2E-X3D2-M1TGJ-U 0.3M
M18			7 mm	E2E-X7D1-M1TGJ-U 0.3M	E2E-X7D2-M1TGJ-U 0.3M
M30			10 mm	E2E-X10D1-M1TGJ-U 0.3M	E2E-X10D2-M1TGJ-U 0.3M

Specifications

Item		M8	M12	M18	M30
		E2E-X2D_	E2E-X3D_	E2E-X7D_	E2E-X10D_
Sensing distance		2 mm±10%	3 mm±10%	7 mm±10%	10 mm±10%
Response frequency		1.5 kHz	1.0 kHz	0.5 kHz	0.4 kHz
Power supply voltage (operating voltage)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.			
Protective circuits		Surge suppressor, output short-circuit protection (for control and diagnostic output)			
Ambient temperature	Operating	-25 to 70°C			
	Storage	-40 to 85°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67 (JEM standard IP67g (waterproof and oil-proof))			
Material	Case	Stainless steel (SUS303)	Brass-nickel plated		
	Sensing surface	PBT (polybutylene terephthalate)			
	Cable	PUR for jacket, PE			



Rectangular proximity sensor with free wire connection terminal

The E2Q6 family of rectangular inductive proximity sensors provides longer sensing distances and includes an innovative modified connected terminal for free wire connection.

- Conduit M20 with terminal block for free wire connection
- Change between any of five sensing directions: front or 90° up, down, left, or right
- Four indicators show the operating status of the sensor from all directions

Ordering information

Shielded/Unshielded	Sensing distance	Connection method	Operation mode	Order code	
				NPN output	PNP output
Shielded 	 20 mm	Terminal block	NO + NC	E2Q6-N20E3-H	E2Q6-N20F3-H
Unshielded 	 30 mm			E2Q6-N30ME3-H	E2Q6-N30MF3-H

Specifications

Item		E2Q6-N20_3-H	E2Q6-N30M_3-H
Shielding		Shielded	Unshielded
Sensing distance		20 mm ±10%	30 mm ±10%
Response frequency ^{*1}		150 Hz	100 Hz
Power supply voltage (operating voltage range)		10 to 30 VDC, including 10% ripple (p-p)	
Current consumption		20 mA max.	
Control output	Load current	200 mA max.	
	Residual voltage	2 V max. (at 200 mA load current)	
Operation mode		NO + NC	
Ambient temperature range		Operating and storage: -25 to 70°C (with no icing or condensation)	
Ambient humidity range		Operating and storage: 35% to 95% (with no condensation)	
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case	
Degree of protection		IEC IP67 ^{*2}	
Connection method		Terminal block	
Materials	Case	Polyamide (PA)	
	Sensing surface	Polyamide (PA)	
	Terminal base	Polyamide (PA)	
Accessories		Instruction manual	

^{*1} The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.

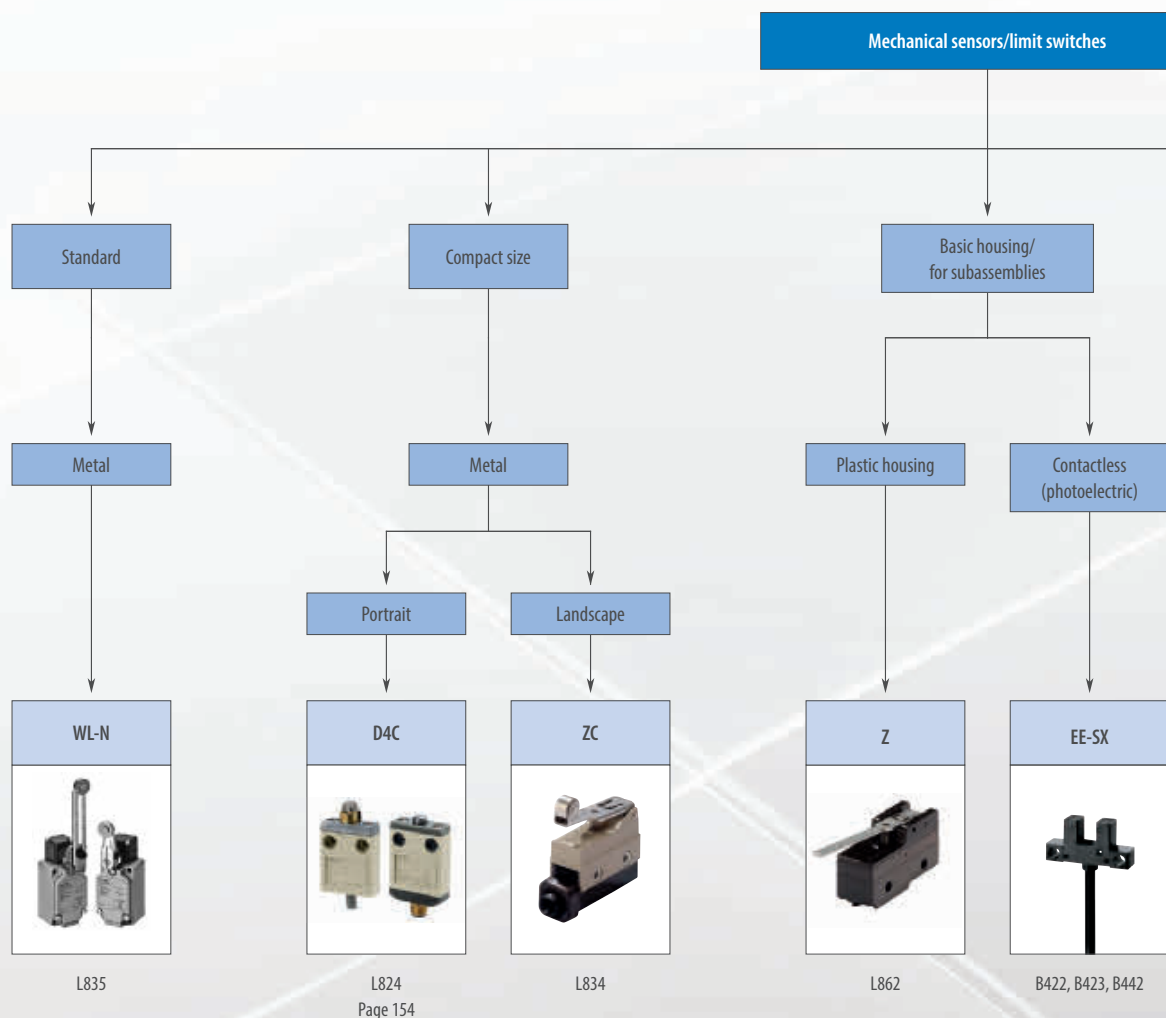
^{*2} When the recommended cable gland is used.

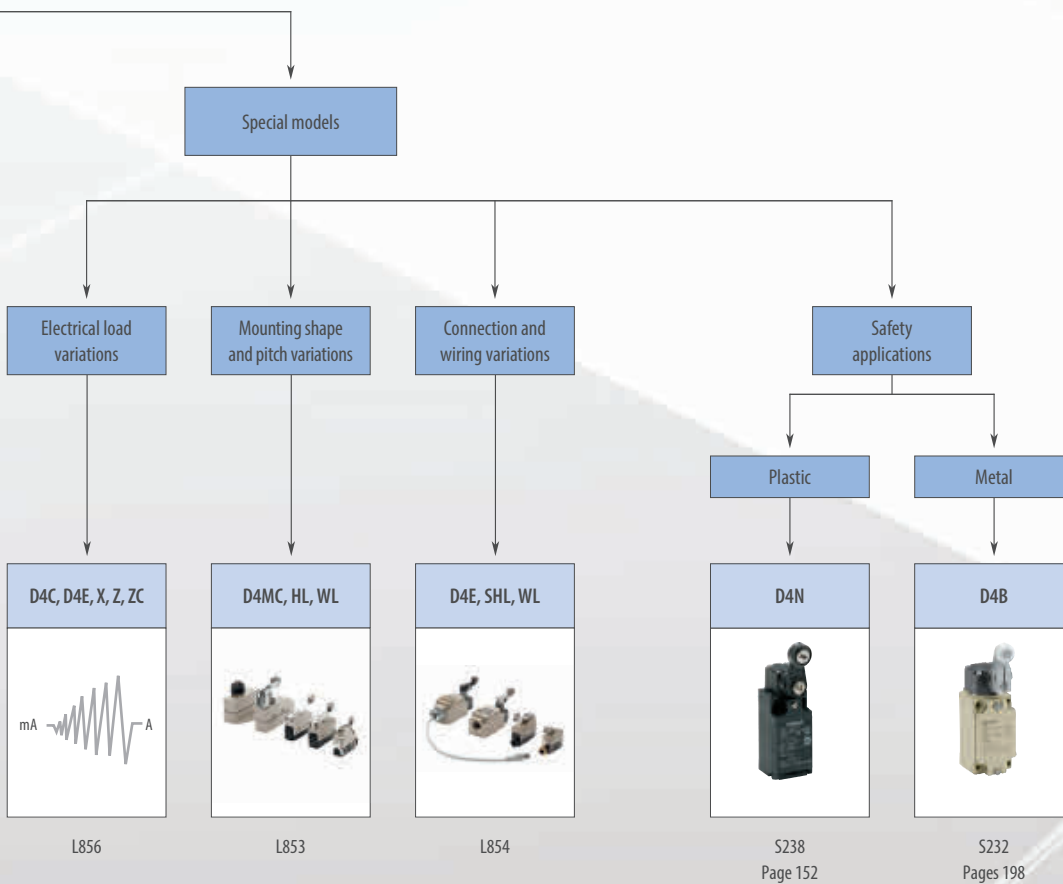
Mechanical sensors/Limit switches

THE RELIABLE AND FLEXIBLE WAY ...

... to stop your machines

For the detection of machine part movement especially for the detection of end positions, the mechanical and optical limit switches provide accurate and reliable operation with a large variety of actuation possibilities optimized for a widest range of application and usage requirements. The easy positioning and intuitive installation, the high immunity to changing environmental influences (electromagnetic fields, sunlight, temperatures, etc.) as well as the possibility to directly switch loads with up to 15 A make these sensors ideal for a wide range of conveying and handling applications.

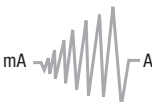




Type		Standard			Compact	Basic housing
						
Model		D4N	D4B	WL-N	D4C	Z
Material		Plastic	Metal	Metal	Metal	Plastic
Screw terminal	No conduit	–	–	–	–	■
	Cable dia. 8.5 to 10.5	–	–	–	–	–
	M20	■	■	■	–	–
	PG13.5	□	–	■	–	–
	G1/2	□	□	■	–	–
	1/2-14NPT	□	□	■	–	–
Cable connector	M12	■	–	■	■	–
	Prewired	–	–	–	■	–
Degree of protection		IP67				
Page/Quick Link		152/S238	198/S232	L835	154/L824	L862

Special models

Type		High precision multi direction	Compact
			
Model		D5B	ZC
Material		Metal	Metal
Key Features		– X, Y, Z action – several μm switching accuracy – M5, M8, M10 sizes	– Small housing size – Screw terminals – IP67
Page/Quick Link		L833	L834

Type	Highest precision tactile measurement	Electrical load variations	Mounting shape and pitch variations	Connection and wiring variations	Safety limit switches
					
Model	ZX-T	D4C, D4E, X, Z, ZC	D4MC, HL, WL	D4E, SHL, WL	D4 Safety
Material	Plastic	Plastic and Metal	Metal	Metal	Plastic and Metal
Key Features	Measurement resolution up to 0.1 μ m	– Microloads (1 mA to 100 mA) – High current at high voltage switching (10 A at 125 VDC) – Double circuit switching	– Mounting shapes and pitches popular in different countries in the world – Mounting pitch variations (base mounting, diagonal pitches, ...) – Alternative actuator positions	– Screw conduit variations (PG13.5, G1/2, 1/2"14NPT) – Cable exit variations (pigtails, rubber snap on covers, screw on covers, with or without cable breakage protection for different cable diameters)	– Mechanical form lock – Manual reset – Door hinge switches
Page/Quick Link	C428	Contact your OMRON representative/L856, L853, L854			194



Limit switch with plastic housing

The D4N series of limit switches in plastic housing is the ideal switch for all standard mechanical position detection applications both for safety and non-safety applications.

- Direct opening mechanism and approval by notified body
- Rugged plastic housing with double insulation
- Wide range of actuators
- M12 connectors or terminal block with M20 conduit

Ordering information

Actuator type		Connection method	Order code*1			
			1NC/1NO (snap-action)	1NC/1NO (slow-action)	2NC (slow-action)	2NC/1NO (slow-action)
			Order code	Order code	Order code	Order code
	Roller lever (resin lever, resin roller)	M20	D4N-4120	D4N-4A20	D4N-4B20	D4N-4C20
		M12 connector	D4N-9120	D4N-9A20	D4N-9B20	—
	Plunger	M20	D4N-4131	D4N-4A31	D4N-4B31	—
		M12 connector	D4N-9131	D4N-9A31	D4N-9B31	—
	Roller plunger	M20	D4N-4132	D4N-4A32	D4N-4B32	D4N-4C32
		M12 connector	D4N-9132	D4N-9A32	D4N-9B32	—
	One-way roller arm lever (horizontal)	M20	D4N-4162	D4N-4A62	D4N-4B62	D4N-4C62
		M12 connector	D4N-9162	D4N-9A62	D4N-9B62	—
	One-way roller arm lever (vertical)	M20	D4N-4172	D4N-4A72	D4N-4B72	—
	Adjustable roller lever, form lock (metal lever, resin roller)	M20	D4N-412G	D4N-4A2G	D4N-4B2G	—
		M12 connector	D4N-912G	D4N-9A2G	D4N-9B2G	—
	Adjustable roller lever, form lock (metal lever, rubber roller)	M20	D4N-412H	D4N-4A2H	D4N-4B2H	—
		M12 connector	D4N-912H	D4N-9A2H	D4N-9B2H	—

Switches with MBB contacts

MBB (Make Before Break) contacts have an overlapping structure, so that before the normally closed (NC) contact opens the normally open (NO) contact closes.

Actuator type		Connection method	Order code*1	
			1NC/1NO (slow-action)	2NC/1NO (slow-action)
	Roller lever (resin lever, resin roller)	M20	D4N-4E20	D4N-4F20
		M12 connector	D4N-9E20	—
	Roller plunger	M20	D4N-4E32	D4N-4F32
		M12 connector	D4N-9E32	—
	One-way roller arm lever (horizontal)	M20	D4N-4E62	D4N-4F62
		M12 connector	D4N-9E62	—

*1 The NC contacts provide the approved direct opening mechanism. 

Specifications

Durability*1	Mechanical	15,000,000 operations min.*2
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC 300,000 operations min. for a resistive load of 10 A at 250 VAC
Operating speed	Roller lever	1 mm/s to 0.5 m/s
Operating frequency		30 operations/minute max.
Minimum applicable load		Resistive load of 1 mA at 5 VDC (N-level reference value)
Protection against electric shock		Class II (double insulation)
Pollution degree (operating environment)		3 (EN60947-5-1)
Contact gap		Snap-action: 2x0.5 mm min Slow-action: 2x2 mm min
Conditional short-circuit current		100 A (EN60947-5-1)
Rated open thermal current (I _{th})		10 A (EN60947-5-1)
Ambient temperature	Operating	−30 to 70°C with no icing
Degree of protection		IP67 (EN60947-5-1)

*1 The durability is acquired for an ambient temperature of 5 to 35°C and an ambient humidity of 40% to 70%.

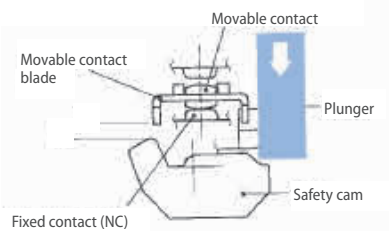
*2 10,000,000 operations min. for fork lever actuator.

1NO/1NC Contact (Snap-action)

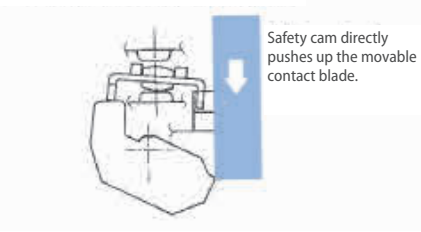
If metal deposition between mating contacts occurs on the NC contact side, they can be pulled apart by the shearing force and tensile force generated when part B of the

safety cam or plunger engages part A of the movable contact blade. When the safety cam or plunger is moved in the direction of the arrow, the Limit Switch releases.

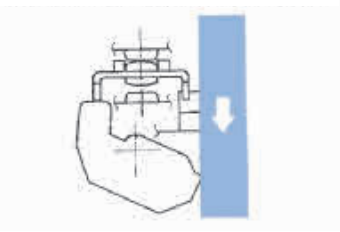
1. When metal deposition occurs.



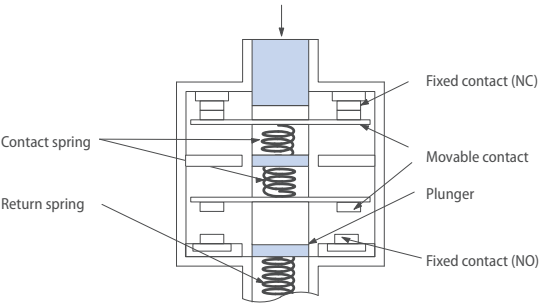
2. When contacts are being pulled apart.



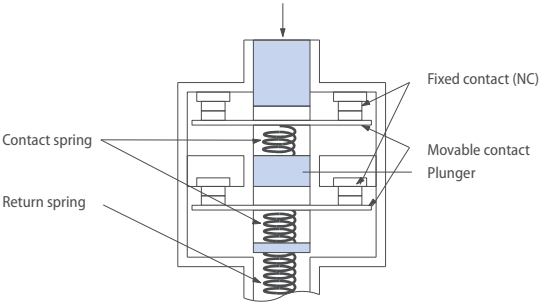
3. When contacts are completely pulled apart.



1NC/1NO Contact (Slow-action)



2NC Contact (Slow-action)



NC contacts conform to EN60947-5-1 Direct Opening

When metal deposition occurs, the contacts are separated from each other by the plunger being pushed in.

→ is marked on the product to indicate approval of direct opening.



Compact limit switch in metal housing

The 16 mm flat and compact size make the D4C range of limit switches very popular for all standard applications but especially where mounting space is limited or protruding housings may interfere with machine operation. The triple sealed construction, the rugged metal housing and the precisely manufactured movable parts ensure long operational life in standard or oily environments (special models).

- 16 mm flat compact size
- Rugged metal housing
- Models with M12 connector or oil resistant VCTF cable

Ordering Information

Actuator type	Load range (VDC) ^{*1} 0.8 W to 60 W max	Operation LED indicator		Connection method				Order code
		No	Yes					
Plunger	n	■	—		■		*2	D4CC-3001
		—	■		■	3 m		D4C-1201
Sealed plunger		■	—		■	3 m		D4CC-4001
		—	■		■	3 m		D4C-3201
Plunger with M14 mounting		■	—		■	3 m		D4CC-3031
		—	■		■	3 m		D4C-1231
Roller plunger		■	—		■	3 m		D4CC-4031
		—	■		■	3 m		D4C-3231
Sealed roller plunger		■	—		■	3 m		D4CC-3041
		—	■		■	3 m		D4C-1241
Roller plunger with M14 mounting		■	—		■	3 m		D4CC-4041
		—	■		■	3 m		D4C-3241
Crossroller plunger		■	—		■	3 m		D4CC-3002
		—	■		■	3 m		D4C-1202
Sealed crossroller plunger		■	—		■	3 m		D4CC-4002
		—	■		■	3 m		D4C-3202
Roller plunger with M14 mounting		■	—		■	3 m		D4CC-3032
		—	■		■	3 m		D4C-1232
Crossroller plunger		■	—		■	3 m		D4CC-4032
		—	■		■	3 m		D4C-3232
Sealed crossroller plunger		■	—		■	3 m		D4CC-3042
		—	■		■	3 m		D4C-1242
Roller lever		■	—		■	3 m		D4CC-4042
		—	■		■	3 m		D4C-3242
Coil spring		■	—		■	3 m		D4CC-3003
		—	■		■	3 m		D4C-1203
						3 m		D4CC-4003
						3 m		D4C-3203
						3 m		D4CC-3033
						3 m		D4C-1233
						3 m		D4CC-4033
						3 m		D4C-3233
						3 m		D4CC-3043
						3 m		D4C-1243
						3 m		D4CC-4043
						3 m		D4C-3243
						3 m		D4CC-3024
						3 m		D4C-1220
						3 m		D4CC-4024
						3 m		D4C-3220
						3 m		D4CC-3050
						3 m		D4C-1250
						3 m		D4CC-4050
						3 m		D4C-3250

^{*1} See specifications for details on max. current per rated voltage and load type. Micro load models with 5mW to 0.8W are available. For ordering refer to complete datasheet.

^{*2} Pre-wired models with 30 cm PVC cable and M12 plug (pigtail) are available. Contact your OMRON representative.

Specifications

Voltage and current rating

Model	Rated voltage	Rated current*1	Non-inductive load				Inductive load				Inrush current		Applicable load range (5 to 30 VDC)
			Resistive load		Lamp load		Inductive load		Motor load				
			NC	NO	NC	NO	NC	NO	NC	NO	NC	NO	
D4C-1□□□	125 VAC		5 A	5 A	1.5 A	0.7 A	3 A	3 A	2.5 A	1.3 A	20 A max.	10 A max.	–
	250 VAC	2 A	5 A	5 A	1 A	0.5 A	2 A	2 A	1.5 A	0.8 A			
	8 VDC		5 A	5 A	2 A	2 A	5 A	4 A	3 A	3 A			
	14 VDC		5 A	5 A	2 A	2 A	4 A	4 A	3 A	3 A			
	30 VDC	2 A	4 A	4 A	2 A	2 A	3 A	3 A	3 A	3 A			
	125 VDC		0.4 A	0.4 A	0.05 A	0.05 A	0.4 A	0.4 A	0.05 A	0.05 A			–
	250 VDC		0.2 A	0.2 A	0.03 A	0.03 A	0.2 A	0.2 A	0.03 A	0.03 A			
D4C-3□□□	30 VDC	2 A	4 A	4 A	2 A	2 A	3 A	3 A	3 A	3 A	5 A max.	2.5 A max.	0.8 W to 60 W
D4CC-3□□□	30 VDC	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A			0.8 W to 30 W
D4CC-4□□□	30 VDC	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A			0.8 W to 30 W
D4C-6□□□	30 VDC	0.1 A	0.1 A	0.1 A	–		–			20 A max.	10 A max.	5 mW to 0.8 W	

^{*1} For D4C- cable types these ratings are certified by TÜV Rheinland according to EN60947-5-1 (file no R9451333).

General specifications

Item		D4C- (cable types)	D4CC- (connector types)
Durability ^{*1}	Mechanical	10,000,000 operations min	
	Electrical	200,000 operations min	
Operating frequency	Mechanical	120 operations/min	
	Electrical	30 operations/min	
LED indicator		D4C-3_, D4C-6_, D4CC-4_: Operation indicator (red) Operation indicator turns OFF when the switch operates. ^{*2}	
Ambient temperature	Operating	–10 to 70°C (with no icing)	
Degree of protection		IEC 60529: IP67	

^{*1} Values are acquired at 5 to 35°C operating temperature, 40% to 70% operating humidity.

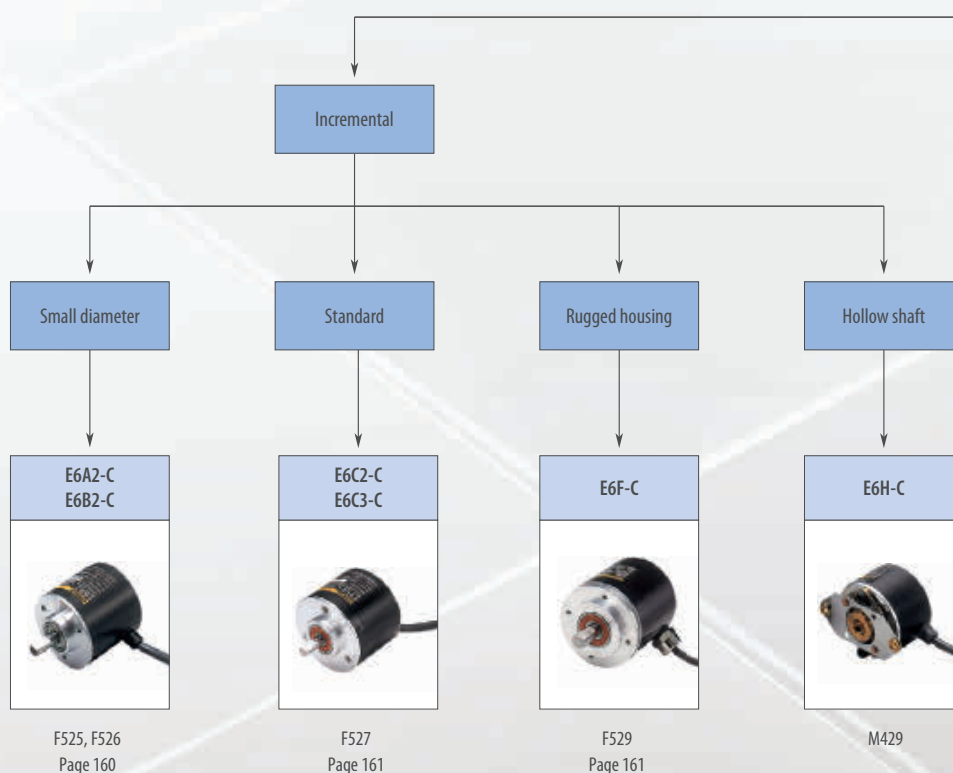
^{*2} Models where operation indicator turns ON when the switch operates are available by adding “-B” to the order code. Contact your OMRON representative for availability.

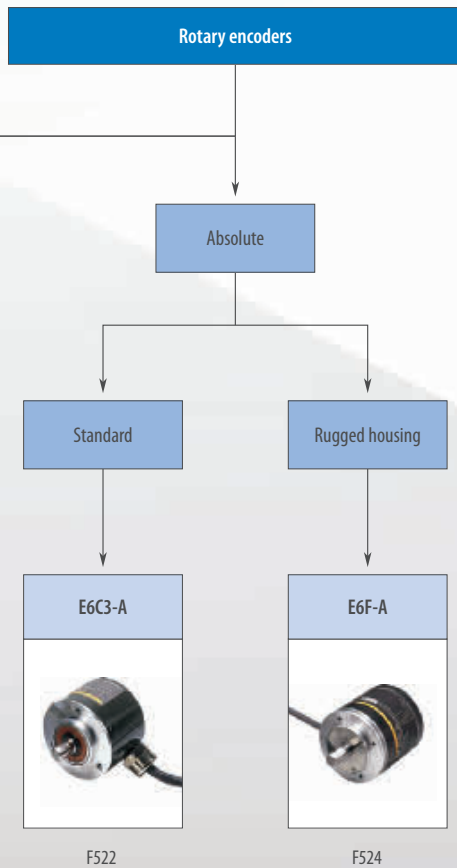
ACCURACY AND ROBUSTNESS MADE RELIABLE

Close the loop – angle, position and velocity on hand

Rotary encoders create information which represent the movement of your application. To meet challenging demands, Omron offers a wide range of absolute and incremental encoders.

- Wide resolution variety
- Models with rugged housing
- Models for multi- turn applications





Output		Incremental				
						
Model		E6A2-C	E6B2-C	E6C2-C	E6C3-C	E6F-C
Type		Small diameter shaft			Standard	
Resolution range	Min.	10			100	
	Max.	500	2,000		3,600	1,000
Output	NPN	■	■	■	■	■
	PNP	–	■	■	–	–
Size dia. in mm		25	40	50	50	60
Max. force	Radial	10	30	50	80	120
	Axial	5	20	30	50	50
IP rating	IP50	■	■	–	–	–
	IP64	–	–	■	–	–
	IP65	–	–	–	■	■
Max. rotation frequency		5,000	6,000	5,000		
Page/Quick Link		160/F525	160/F526	161/F527	161/F529	

Output		Incremental	Absolute		
					
Model		E6H-C	E6C3-A	E6F-A	
Type		Hollow shaft	Standard	Rugged housing	
Resolution Range	Min.	300	6	256	
	Max.	3,600	1,024		
Output	NPN	■	■	■	
	PNP	–	■	■	
Size dia. in mm		40 (hollow)	50	60	
Max. force	Radial	29.4	80	120	
	Axial	4.9	50	50	
IP rating	IP50	■	–	–	
	IP64	–	–	–	
	IP65	–	■	■	
Max. rotation frequency		10,000	5,000	5,000	
Page/Quick Link		M429	F522	F524	



Incremental rotary encoder in miniature housing

The E6A family of rotary encoders features a small sized dia. 25 mm housing.

- Small sized dia. 25 mm housing

Ordering information

Size dia. in mm	Output phase	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
25	A	5 to 12 VDC	NPN voltage output	10, 20, 60, 100, 200, 300, 360, 500	E6A2-CS3E
		12 to 24VDC	NPN open collector	10, 20, 60, 100, 200, 300, 360, 500	E6A2-CS3C
	A, B	5 to 12 VDC	NPN voltage output	100, 200, 360, 500	E6A2-CW3E
		12 to 24VDC	NPN open collector	100, 200, 360, 500	E6A2-CW3C
	A, B, Z	5 to 12 VDC	NPN voltage output	100, 200, 360, 500	E6A2-CWZ3E
		12 to 24VDC	NPN open collector	100, 200, 360, 500	E6A2-CWZ3C
					E6A2-CWZ5C

E6B2-C



Incremental rotary encoder in compact housing

The E6B family of incremental rotary encoders features a housing size dia. 40 mm.

- Line driver output models available

Ordering information

Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
40	5 to 24 VDC	NPN open collector output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6B2-CWZ6C
	12 to 24VDC	PNP open collector output	100, 200, 360, 500, 600, 1,000, 2,000	E6B2-CWZ5B
	5 to 12 VDC	NPN voltage output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 1,000, 1,200, 1,500, 1,800, 2,000	E6B2-CWZ3E
	5 VDC	Line driver output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6B2-CWZ1X



Incremental rotary encoder with enhanced water resistant

The E6C family of dia. 50 mm incremental rotary encoders features an improved water resistance compared to standard models.

- IP64f or IP65f drip-proof, oil-proof construction

Ordering information

	Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
Standard models	50	5 to 24 VDC	NPN open collector output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6C2-CWZ6C
		12 to 24VDC	PNP open collector output	100, 200, 360, 500, 600, 1,000, 2,000	E6C2-CWZ5B
		5 to 12 VDC	NPN voltage output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6C2-CWZ3E
		5 VDC	Line driver output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6C2-CWZ1X
8 dia. tough model	50	12 to 24VDC	Complimentary output	100, 200, 300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6C3-CWZ5GH
		5 to 12 VDC	NPN voltage output	100, 200, 300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6C3-CWZ3EH
		5 to 12 VDC	Line driver output	100, 200, 300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6C3-CWZ3XH

E6F-C



Incremental rotary encoder in rugged housing

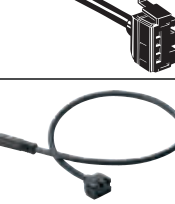
The E6F family of dia. 60 mm rotary encoders features a rugged housing.

- Strong shaft for max 120 N in radial direction and max 50 N in thrust direction)
- Water- and oil-proof structure (IP65f)

Ordering information

Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
60	12 to 24VDC	Complimentary output	100, 200, 360, 500, 600, 1000	E6F-CWZ5G

Cable connectors

Size	Shape	Type	Features	Material		Order code	
				Nut	Cable		
M8		PRO	3 pin	Brass (CuZn)	PVC 2 m	XS3F-M8PVC3S2M-EU	XS3F-M8PVC3A2M-EU
			4pin		PUR 2 m	XS3F-M8PUR3S2M-EU	XS3F-M8PUR3A2M-EU
					PVC 2 m	XS3F-M8PVC4S2M-EU	XS3F-M8PVC4A2M-EU
					PUR 2 m	XS3F-M8PUR4S2M-EU	XS3F-M8PUR4A2M-EU
		LITE	3 pin	Brass (CuZn)	PVC 2 m	XS3F-LM8PVC3S2M	XS3F-LM8PVC3A2M
			4 pin			XS3F-LM8PVC4S2M	XS3F-LM8PVC4A2M
		PRO ^{plus} Detergent resistant Wash-down	4 pin	Stainless steel (SUS316L)	PP* ¹ 2 m	Y92E-S08PP4S 2M	Y92E-S08PP4A 2M
		PRO ^{plus} Robotic (drag chain)	4 pin	Brass (CuZn)	Robotic PVC 2 m	XS3F-M421-402-R	XS3F-M422-402-R
					Robotic PUR 2 m	Y92E-M08PUR4S2M-L	Y92E-M08PUR4A2M-L
					High robotic PUR 2 m	Y92E-M08PUR4S2M-R	Y92E-M08PUR4A2M-R
M12		PRO	3 wire	Brass (CuZn)	PVC 2 m	XS2F-M12PVC3S2M-EU	XS2F-M12PVC3A2M-EU
			4 wire		PUR 2 m	XS2F-M12PUR3S2M-EU	XS2F-M12PUR3A2M-EU
			5 wire		PVC 2 m	XS2F-M12PVC4S2M-EU	XS2F-M12PVC4A2M-EU
					PUR 2 m	XS2F-M12PUR4S2M-EU	XS2F-M12PUR4A2M-EU
					PVC 2 m	XS2F-M12PVC5S2M-EU	XS2F-M12PVC5A2M-EU
					PUR 2 m	XS2F-M12PUR5S2M-EU	XS2F-M12PUR5A2M-EU
		LITE	3 wire	Brass (CuZn)	PVC 2 m	XS2F-LM12PVC3S2M	XS2F-LM12PVC3A2M
			4 wire			XS2F-LM12PVC4S2M	XS2F-LM12PVC4A2M
		PRO ^{plus} LED (power and output LED, PNP)	3 wire	Nickel plated brass	PVC 2 m	—	XS2F-M12PVC3A2MPLD
			4 wire			—	XS2F-M12PVC4A2MPLD
			3 wire		PUR 2 m	—	XS2F-M12PUR3A2MPLD
			4 wire			—	XS2F-M12PUR4A2MPLD
		PRO ^{plus} Detergent resistant Wash-down	4 wire	Stainless steel (SUS316L)	PP* ¹ 2 m	Y92E-S12PP4S 2M	Y92E-S12PP4A 2M
		PRO ^{plus} 105°C Heat resistant	4 wire	Stainless steel (SUS316L)	Heat resistant PVC 2 m	XS2F-E421-D80-E	XS2F-E422-D80-E
		Twist & click	4 wire	Nickel plated Zinc	PVC 2 m	XS5F-D421-D80-F	XS5F-D422-D80-F
					PUR 2 m	XS5F-D421-D80-P	XS5F-D422-D80-P
		PRO ^{plus} Robotic (drag chain)	4 wire	Brass (CuZn)	Robotic PVC 2 m	XS2F-D421-D80-F	XS2F-D422-D80-F
					Robotic PUR 2 m	Y92E-M12PUR4S2M-L	Y92E-M12PUR4A2M-L
					High grade robotic PUR 2 m	Y92E-M12PUR4S2M-R	Y92E-M12PUR4A2M-R
		High robotic (drag chain & torsion)	4 wire	Brass (CuZn)	High grade robotic PUR 2 m	Y92E-M12PUR4S2M-R	Y92E-M12PUR4A2M-R
Fiber amplifier (E3X) connector		Fiber amplifier connectors	Special fiber connector - 4 wire	PBT	PVC 2 m	E3X-CN21	
			Special fiber connector + M8 plug	Plug: Zinc diecast	PVC 30 cm with M8 4-pin plug	E3X-CN21-M3J-2 0.3M	
			Special fiber connector + M12 plug		PVC 30 cm with M12 4-pin plug	E3X-CN21-M1J 0.3M	

*1 PP - polypropylene

Cable connectors

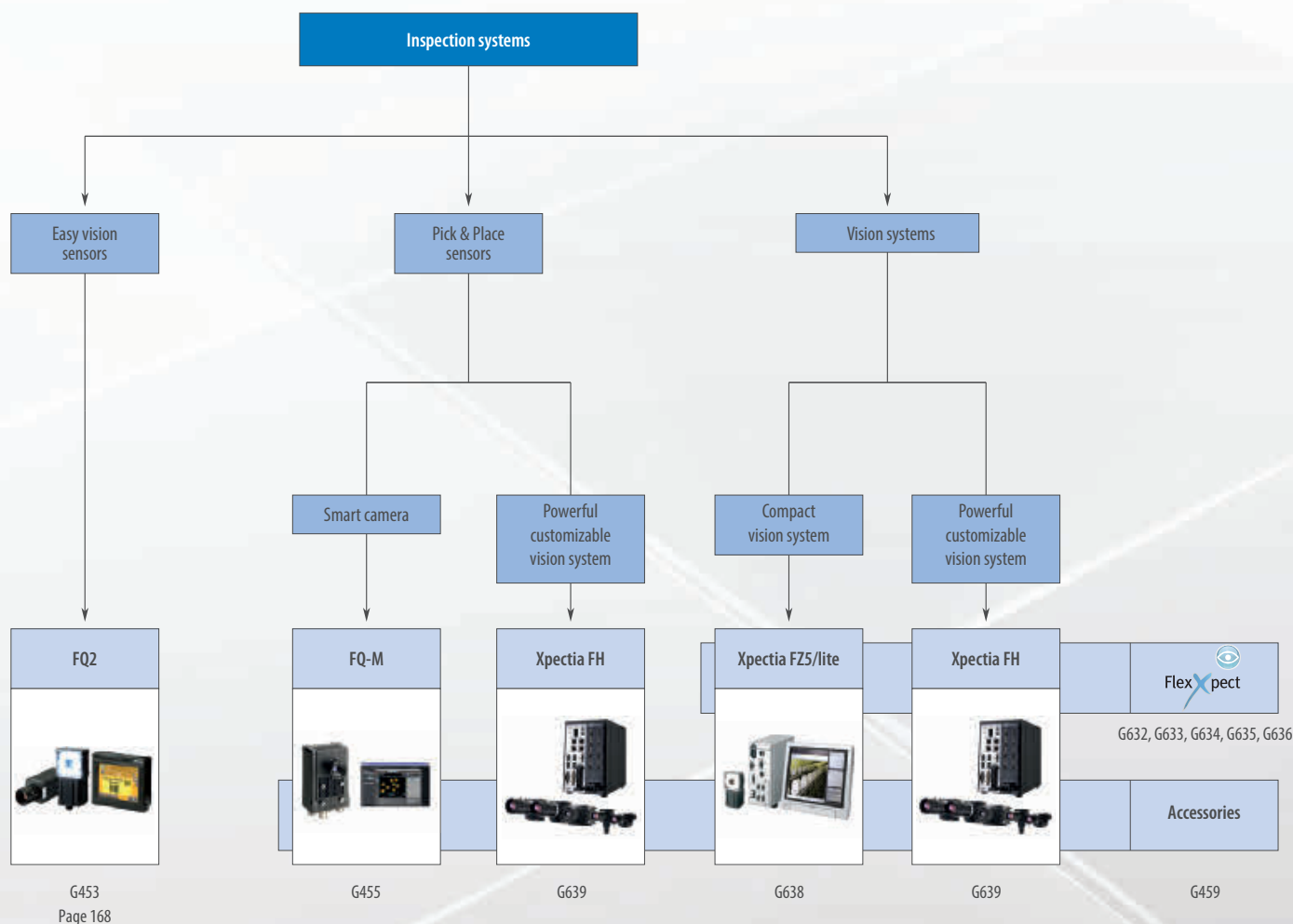
Size	Shape	Type	Features	Material		Order code	
				Nut	Cable		
M12		IDC (Insulation Displacement Contact)	Fast and easy IDC pressure-welded assembly One connector for cable diameters of 3 mm to 8 mm IP 67 for waterproof connection Smartclick connection	Brass	n.a.	XS5G-D418 XS5C-D418	
M8/M12		Confection-able	Plugs and connectors for self assembly	Brass	n.a.	XS2G, XS2C Y92E_conf	
M12		Field I/O boxes	Direct wiring or DeviceNet communication	–		XW3B, DRT2	
M8/M12		T-connectors, covers, accessories and extended wiring portfolio	n.a.	–		XS2R, XS3R, XY2F, ...	

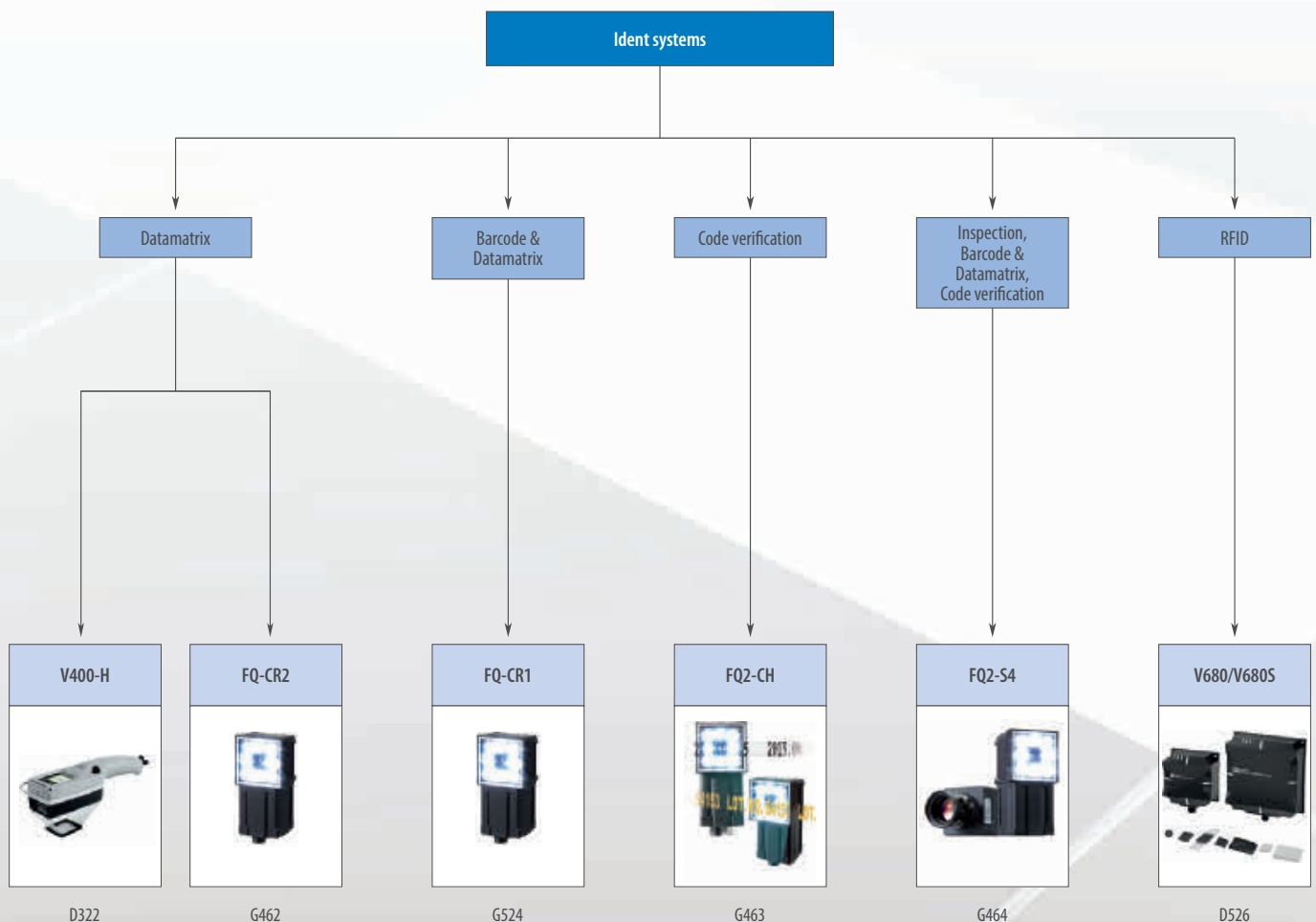
EASY VISION: TOUCH, COMMUNICATE AND GO

Built-in LCD monitor for setup and immediate image visualization

The easy vision sensor FQ2 solves the applications by an intuitive teach & go procedure. For advanced applications features such as multiple inspections, position correction, intelligent image filtering and ethernet communication are offered by the Xpectia lite. The high end is addressed by the Xpectia FJ.

- Easy vision – intuitive user interfaces
- Communication – centralized set-up & inspection via Ethernet
- High-end vision – PC-based system for challenging applications
- True color – close to human eye identification and image processing





D322

G462

G524

G463

G464

D526

Selection table

		Vision sensor	Pick & Place	Vision systems		
						
Model		FQ2	FQ-M	Xpectia FH	Xpectia FZ5/Lite	Xpectia FH
Selection criteria	Number of connectable cameras	Smart camera	Smart camera	8	4	8
	Camera type	Monochrome/Color	Color	Digital color or black & white	Digital color or black & white	Digital color or black & white
	Resolution (usable)	752 × 480	752 × 480	from 640 × 480 to 2,040 × 2,048	from 640 × 480 to 2,488 × 2,044	from 640 × 480 to 2,040 × 2,048
	Display dots	928 × 828 1,280 × 1,024				
	Working distance mm	Min.	8	Depends on selected lens	Depends on selected lens	Depends on selected lens
		Max.	970	–	–	–
	Field of view	Min.	7.5 × 4.7	Depends on selected lens	Depends on selected lens	Depends on selected lens
		Max.	300 × 268	–	–	–
	Number of storable configurations	32	32	–	–	–
	Number of tools/configuration	32	32	limited only by memory space	limited only by memory space	limited only by memory space
Features	IP-Rating camera head	IP67	IP40	Depends on setup & tools, IP20	Depends on setup & tools, IP20	Depends on setup & tools, IP20
	Supply voltage	24 VDC	24 VDC	–	–	–
	Image processing tools	Search, shape search II, sensitive search, area, color data, edge position, edge pitch, edge width, labeling, FQ2-S4 has additional: OCR, Bar code, 2D-code, 2D-code (DMP) and Model dictionary The types of characters and codes to be read are the same as those of FQ2-CH and FQ-CR1 & FQ-CR2	Contour based search, labelling, edge position	App. 70 processing tools for object or defect recognition, measurements, calculations, input/output, display and more. Includes also character recognition and high precision edge code inspection tools	App. 70 processing tools for object or defect recognition, measurements, calculations, input/output, display and more. Includes also character recognition and high precision edge code inspection tools	App. 70 processing tools for object or defect recognition, measurements, calculations, input/output, display and more. Includes also character recognition and high precision edge code inspection tools
	Image preprocessing	High dynamic range (HDR), polarizing filter (attachment), and white balance	High dynamic range (HDR), white balance	Smoothing, edge enhancement, edge extraction, erosion, dilation, median, background suppression - multiple passes, configurable	Smoothing, edge enhancement, edge extraction, erosion, dilation, median, background suppression - multiple passes, configurable	Smoothing, edge enhancement, edge extraction, erosion, dilation, median, background suppression - multiple passes, configurable
	Flow programming	–	–	■	■	■
	User interface	PC-Tool or Touch Display	PC-Tool or Touch Display	■	■	■
	Optional PC configuration software	Yes	Yes	■	■	■
	Security tools	–	■	–	–	–
	RS-232C	Optional via FQ-SDU2	–	■	■	■
	USB	–	–	■	■	■
Communication	Ethernet	Yes	■	■	■	■
	EtherCAT	–	Yes	Yes	–	Yes
	Number of digital I/O	7 in/3 out	9 in/5 out	19 in/34 out	11 in/26 out	19 in/34 out
	Page/Quick Link	168/G453	G455	G639	G638	G639

		Code reader				
						
Model		FQ-CR1	FQ-CR2	FQ2-CH	FQ2-S4	V400-H
Selection criteria	Number of connectable cameras	Smart camera	Smart camera	Smart camera	Smart camera	1
	Camera type	Monochrome	Monochrome	Monochrome	Monochrome/Color	Digital black & white
	Resolution (usable)	752 × 480	752 × 480	752 × 480	752 × 480 928 × 828 1,280 × 1,024	–
	Display dots	–	–	–	–	–
		–	–	–	–	–
	Working distance mm	Min. 8	8	8	8	40 mm
		Max. 970	970	970	970	40 mm
	Field of view	Min. 7.5 × 4.7	7.5 × 4.7	7.5 × 4.7	7.5 × 4.7	5 × 5 mm
		Max. 300 × 191	300 × 191	300 × 191	300 × 268	30 × 30 mm
	Number of storable configurations	32	32	32	32	limited by SD card
Features	Number of tools/configuration	32	32	32	32	–
	IP-Rating camera head	IP67	IP67	IP67	IP67	IP64
	Supply voltage	24 VDC	24 VDC	24 VDC	24 VDC	5 VDC
	Image processing tools	2D-codes: Data Matrix, QR Code, Micro QR Code, PDF417, Micro PDF417, GS1-Data Matrix Bar codes: JAN/EAN/UPC, Code39, Codabar (NW-7), IFT (interleaved2 of 5), Code93, Code128/GS1-128, GS1-DataBar, GS1-128 Composite Code, Pharmacode	2D-codes: Data Matrix, QR Code	OCR - Alphabet A to Z - Number 0 to 9 - Symbol '·' : / Model dictionary	Search, shape search II, sensitive search, area, color data, edge position, edge pitch, edge width, labeling, OCR, Bar code, 2D-code, 2D-code (DMP) and Model dictionary The types of characters and codes to be read are the same as those of FQ2-CH and FQ-CR1 & FQ-CR2	Data Matrix, ECC200, 10×10 to 64×64, 8×18 to 16×48, QR Code (Models 1, 2), 21×21 to 57×57 (Versions 1 to 10).
	Image preprocessing	High dynamic range (HDR), polarizing filter (attach- ment), and white balance	High dynamic range (HDR), polarizing filter (attach- ment), and white balance	High dynamic range (HDR), polarizing filter (attach- ment), and white balance	High dynamic range (HDR), polarizing filter (attach- ment), and white balance	–
	Flow programming	–	–	–	–	–
	User interface	PC-Tool or Touch Display	PC-Tool or Touch Display	PC-Tool or Touch Display	PC-Tool or Touch Display	–
	Optional PC configuration software	Yes	Yes	Yes	Yes	–
	Security tools	–	–	–	–	–
Communication	RS-232C	–	–	Optional via FQ-SDU2	Optional via FQ-SDU2	–
	USB	–	–	–	–	–
	Ethernet	Yes	Yes	Yes	Yes	–
	EtherCAT	–	–	–	–	–
	Number of digital I/O	7 in/3 out	7 in/3 out	7 in/3 out	7 in/3 out	–
Page/Quick Link		G524	G462	G463	G464	D322



The new standard in image inspection and code verification

The FQ2 vision sensor family is set to redefine the vision sensor market, providing advanced inspection, code reading and verification only previously available in higher end vision systems. With over 100 camera options, the FQ2 provides users with the ultimate flexibility to solve applications, whether you need high resolution, code reading, integrated lighting, or a cost effective solution to solve a simple application, there is an FQ2 which fits your needs.

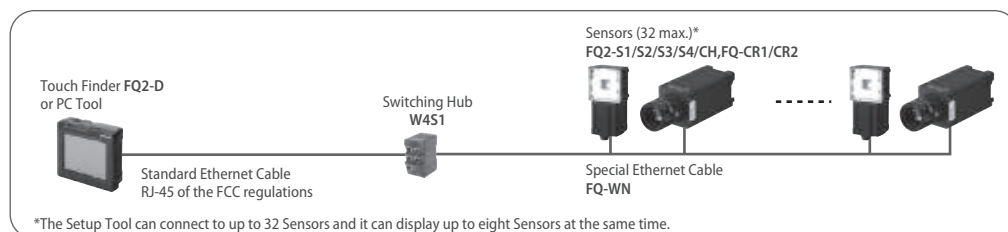
- Powerful functionality with versatile line-up
- All-in-one-housing
- Easy searching with Shape Search II
- Direct Part Marked (DPM)
- Unique OCR technology
- Code verification

System Configuration

Up to 32 Sensors can be set up and monitored from a single Touch Finder or PC Tool.

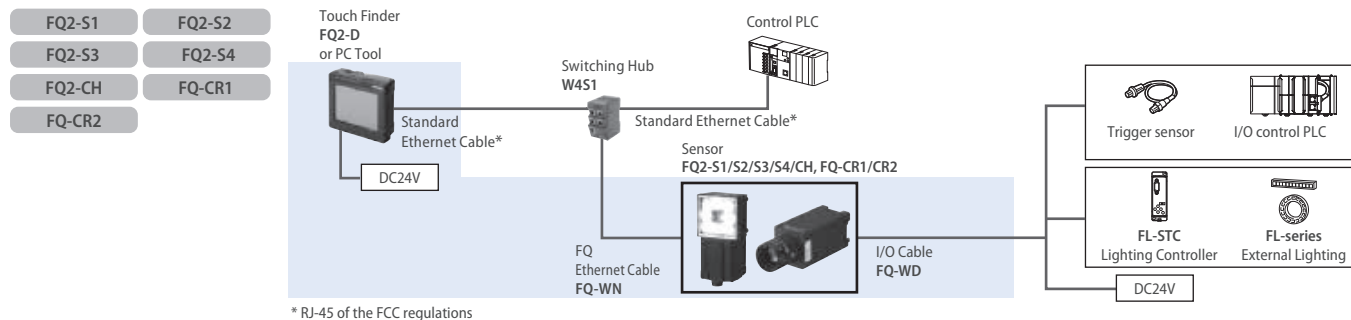
Various types of Sensors can be used at the same time.

However, I/O type and wiring method vary depending on the Sensor, so select the necessary devices.



Note: If you register as a member after purchasing a Sensor, you can download free setup software that runs on a PC and can be used in place of Touch Finder. Refer to the member registration sheet for details.

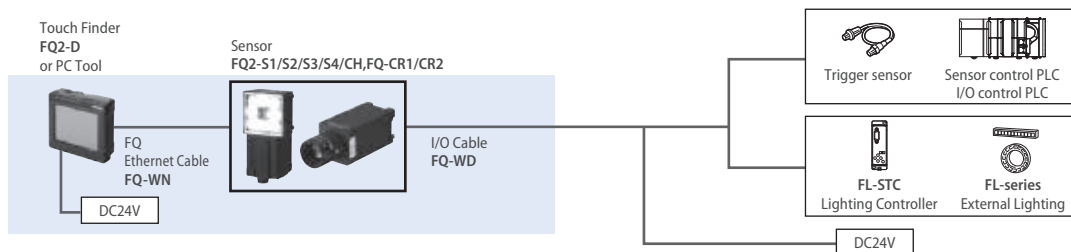
Ethernet (EtherNet/IP, No-protocol, or PLC Link) Connection



Parallel Interface Connection

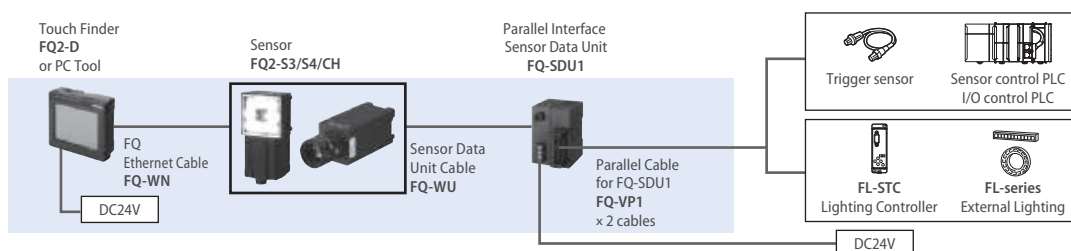
Connection with Standard Parallel Interface of the Sensor

- FQ2-S1
- FQ2-S2
- FQ2-S3
- FQ2-S4
- FQ2-CH
- FQ-CR1
- FQ-CR2

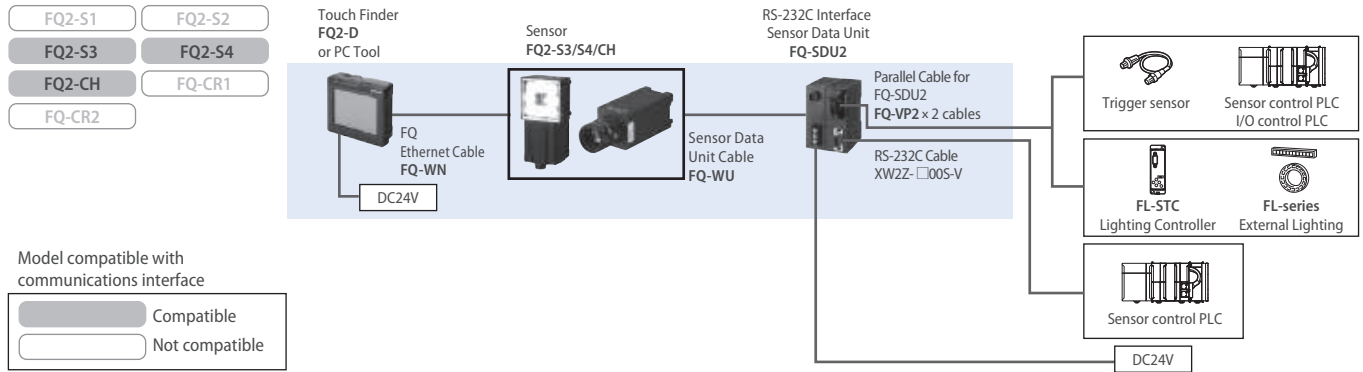


Connection through a Parallel Interface Sensor Data Unit

- FQ2-S1
- FQ2-S2
- FQ2-S3
- FQ2-S4
- FQ2-CH
- FQ-CR1
- FQ-CR2



RS-232C Serial Connection



Ordering Information

Sensor

Inspection model

FQ2-S1 Series [Single-function Type]

Field of vision		Narrow View	Standard View	Wide View (Long-distance)	Wide View (Short-distance)
Number of pixels		350,000 pixels			
Color	NPN	FQ2-S10010F	FQ2-S10050F	FQ2-S10100F	FQ2-S10100N
	PNP	FQ2-S15010F	FQ2-S15050F	FQ2-S15100F	FQ2-S15100N
Field of vision/Installation distance		Refer to Figure 1 on page 170.	Refer to Figure 2 on page 170.	Refer to Figure 3 on page 170.	Refer to Figure 4 on page 170.

FQ2-S2 Series [Standard Type]

Field of vision		Narrow View	Standard View	Wide View (Long-distance)	Wide View (Short-distance)
Number of pixels		350,000 pixels			
Color	NPN	FQ2-S20010F	FQ2-S20050F	FQ2-S20100F	FQ2-S20100N
	PNP	FQ2-S25010F	FQ2-S25050F	FQ2-S25100F	FQ2-S25100N
Field of vision/Installation distance		Refer to Figure 1 on page 170.	Refer to Figure 2 on page 170.	Refer to Figure 3 on page 170.	Refer to Figure 4 on page 170.

FQ2-S3 Series [High-resolution Type]

Field of vision		Narrow View	Standard View	Wide View (Long-distance)	Wide View (Short-distance)	C-mount
Number of pixels		760,000 pixels				1.3 million pixels
Color	NPN	FQ2-S30010F-08	FQ2-S30050F-08	FQ2-S30100F-08	FQ2-S30100N-08	FQ2-S30-13
	PNP	FQ2-S35010F-08	FQ2-S35050F-08	FQ2-S350100F-08	FQ2-S35100N-08	FQ2-S35-13
Monochrome	NPN	FQ2-S30010F-08M	FQ2-S30050F-08M	FQ2-S30100F-08M	FQ2-S30100N-08M	FQ2-S30-13M
	PNP	FQ2-S35010F-08M	FQ2-S35050F-08M	FQ2-S35100F-08M	FQ2-S35100N-08M	FQ2-S35-13M
Field of vision/Installation distance		Refer to Figure 5 on page 170.	Refer to Figure 6 on page 170.	Refer to Figure 7 on page 170.	Refer to Figure 8 on page 170.	Refer to optical chart on p. 171

Inspection/ID model

FQ2-S4 Series [Standard Type]

Field of vision		Narrow View	Standard View	Wide View (Long-distance)	Wide View (Short-distance)
Number of pixels		350,000 pixels			
Color	NPN	FQ2-S40010F	FQ2-S40050F	FQ2-S40100F	FQ2-S40100N
	PNP	FQ2-S45010F	FQ2-S45050F	FQ2-S45100F	FQ2-S45100N
Monochrome	NPN	FQ2-S40010F-M	FQ2-S40050F-M	FQ2-S40100F-M	FQ2-S40100N-M
	PNP	FQ2-S45010F-M	FQ2-S45050F-M	FQ2-S45100F-M	FQ2-S45100N-M
Field of vision/Installation distance		Refer to Figure 1 on page 170.	Refer to Figure 2 on page 170.	Refer to Figure 3 on page 170.	Refer to Figure 4 on page 170.

[High-resolution Type]

Field of vision		Narrow View	Standard View	Wide View (Long-distance)	Wide View (Short-distance)	C-mount
Number of pixels		760,000 pixels				1.3 million pixels
Color	NPN	FQ2-S40010F-08	FQ2-S40050F-08	FQ2-S40100F-08	FQ2-S40100N-08	FQ2-S40-13
	PNP	FQ2-S45010F-08	FQ2-S45050F-08	FQ2-S45100F-08	FQ2-S45100N-08	FQ2-S45-13
Monochrome	NPN	FQ2-S40010F-08M	FQ2-S40050F-08M	FQ2-S40100F-08M	FQ2-S40100N-08M	FQ2-S40-13M
	PNP	FQ2-S45010F-08M	FQ2-S45050F-08M	FQ2-S45100F-08M	FQ2-S45100N-08M	FQ2-S45-13M
Field of vision/Installation distance		Refer to Figure 5 on page 170.	Refer to Figure 6 on page 170.	Refer to Figure 7 on page 170.	Refer to Figure 8 on page 170.	Refer to optical chart on p. 171

ID Model

FQ2-CH Series [Optical Character Recognition Sensor]

Field of vision		Narrow View	Standard View	Wide View (Long-distance)	Wide View (Short-distance)
Number of pixels		350,000 pixels			
Monochrome	NPN	FQ2-CH10010F-M	FQ2-CH10050F-M	FQ2-CH10100F-M	FQ2-CH10100N-M
	PNP	FQ2-CH15010F-M	FQ2-CH15050F-M	FQ2-CH15100F-M	FQ2-CH15100N-M
Field of vision/Installation distance		Refer to Figure 1 on page 170.	Refer to Figure 2 on page 170.	Refer to Figure 3 on page 170.	Refer to Figure 4 on page 170.

FQ-CR1 Series [Multi Code Reader]

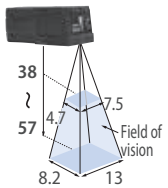
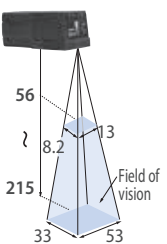
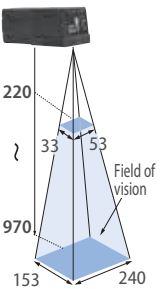
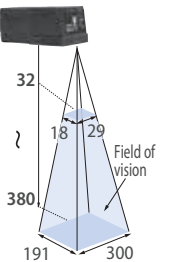
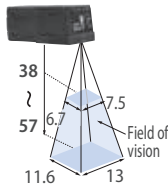
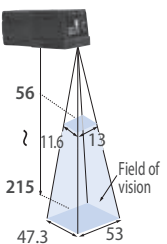
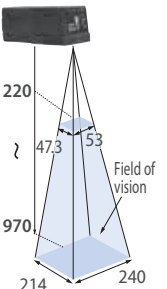
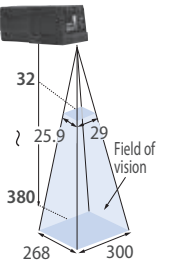
Field of vision		Narrow View	Standard View	Wide View (Long-distance)	Wide View (Short-distance)
Number of pixels		350,000 pixels			
Monochrome	NPN	FQ-CR10010F-M	FQ-CR10050F-M	FQ-CR10100F-M	FQ-CR10100N-M
	PNP	FQ-CR15010F-M	FQ-CR15050F-M	FQ-CR15100F-M	FQ-CR15100N-M
Field of vision/Installation distance		Refer to Figure 1 on page 170.	Refer to Figure 2 on page 170.	Refer to Figure 3 on page 170.	Refer to Figure 4 on page 170.

FQ-CR2 Series [2D Code Reader]

Field of vision		Narrow View	Standard View	Wide View (Long-distance)	Wide View (Short-distance)
Number of pixels		350,000 pixels			
Monochrome	NPN	FQ-CR20010F-M	FQ-CR20050F-M	FQ-CR20100F-M	FQ-CR20100N-M
	PNP	FQ-CR25010F-M	FQ-CR25050F-M	FQ-CR25100F-M	FQ-CR25100N-M
Field of vision/Installation distance		Refer to Figure 1 on page 170.	Refer to Figure 2 on page 170.	Refer to Figure 3 on page 170.	Refer to Figure 4 on page 170.

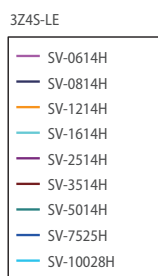
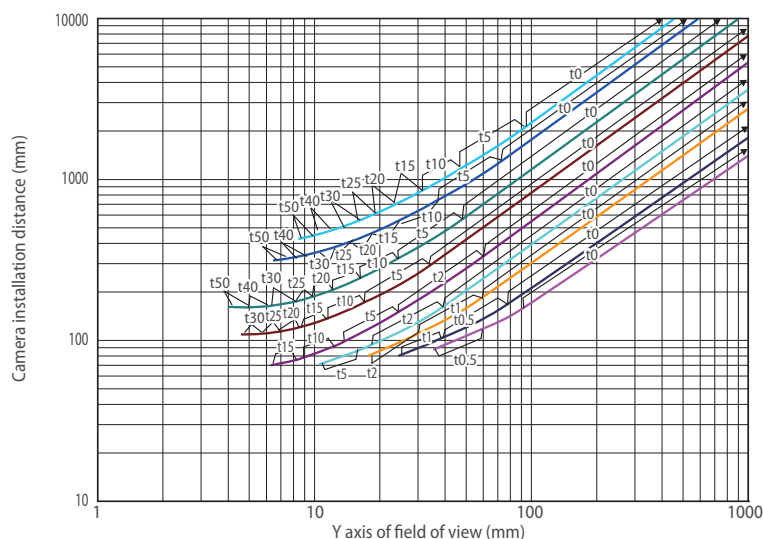
Field of vision/Installation distance

(Unit: mm)

Field of vision	Narrow View	Standard View	Wide View (Long-distance)	Wide View (Short-distance)
Appearance				
350,000 pixels type	Figure 1 	Figure 2 	Figure 3 	Figure 4 
760,000 pixels type	Figure 5 	Figure 6 	Figure 7 	Figure 8 

Optical Chart for C-mount Camera FQ2-S3□-13□/-S4□-13□

High-resolution, Low-distortion Lenses 3Z4S-LE SV-□□□□H



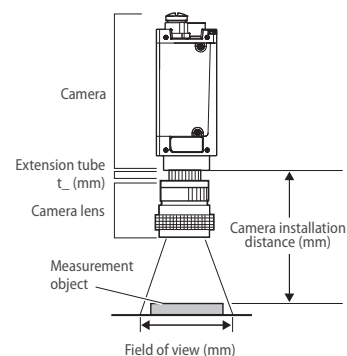
Extension tube

Examples
 t0: Extension tube is not required.
 t5: A 5-mm extension tube is required.

Meaning of Optical Chart

The X axis of the optical chart shows the field of vision (mm) (See Note.), and the Y axis of the optical chart shows the camera installation distance (mm).

Note: The lengths of the fields of vision given in the optical charts are the lengths of the Y axis.



Touch Finder

Type	Appearance	Order code
DC power supply		FQ2-D30
AC/DC/battery		FQ2-D31

Cables

Type	Appearance	Cable length	Order code
FQ Ethernet Cables (connect Sensor to Touch Finder, Sensor to PC)		2m	FQ-WN002
		5m	FQ-WN005
		10m	FQ-WN010
		20m	FQ-WN020
I/O Cables		2m	FQ-WD002
		5m	FQ-WD005
		10m	FQ-WD010
		20m	FQ-WD020

Sensor Data Unit (FQ2-S3/S4/CH only)

Type	Appearance	Output type	Order code
Parallel Interface		NPN	FQ-SDU10
		PNP	FQ-SDU15
RS-232C Interface		NPN	FQ-SDU20
		PNP	FQ-SDU25

Cables for Sensor Data Unit

Type	Appearance	Cable length	Order code
Sensor Data Unit Cable		2m	FQ-WU002
		5m	FQ-WU005
		10m	FQ-WU010
		20m	FQ-WU020
Parallel Cable for FQ-SDU1 ^{*1}		2m	FQ-VP1002
		5m	FQ-VP1005
		10m	FQ-VP1010
Parallel Cable for FQ-SDU2 ^{*1}		2m	FQ-VP2002
		5m	FQ-VP2005
		10m	FQ-VP2010
RS-232C Cable for FQ-SDU2 ^{*1}		2m	XW2Z-200S-V
		5m	XW2Z-500S-V

^{*1} When using FQ-SDU□□, 2 cables are required for all I/O signals.

External Lighting

Type	Model
FLV series	Refer to FLV series catalog Q198

Accessories

Application	Appearance	Name	Order code
For Sensor		Mounting Bracket ^{*1}	FQ-XL
		Mounting Bracket	FQ-XL2
		Mounting Base for C-mount type ^{*2}	FQ-XLC
		Polarizing Filter Attachment ^{*1}	FQ-XF1
For Touch Finder		Panel Mounting Adapter	FQ-XPM
		AC Adapter (for AC/DC/battery model) ^{*3}	FQ-A□
		Battery (for AC/DC/battery model)	FQ-BAT1
		Touch Pen ^{*4}	FQ-XT
		Strap	FQ-XH
		SD CARD (4 GB)	HMC-SD491

^{*1} Included with Integrated Sensor.

^{*2} Included with Sensor with C-mount.

^{*3} AC Adapters for Touch Finder with DC/AC/Battery Power Supply. Select the model for the country in which the Touch Finder will be used.

Plug Type	Voltage	Certified standards	Order code
A	125 V max.	PSE	FQ-AC1
		UL/CSA	FQ-AC2
	250 V max.	CCC mark	FQ-AC3
C	250 V max.	—	FQ-AC4
BF	250 V max.	—	FQ-AC5
C	250 V max.	—	FQ-AC6

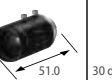
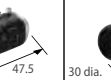
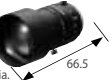
^{*4} Enclosed with Touch Finder.

Industrial Switching Hubs (Recommended)

Appearance	Number of ports	Failure detection	Current consumption	Order code
	3	None	0.22 A	W4S1-03B
	5	None	0.22 A	W4S1-05B
		Supported		W4S1-05C

Lenses for C-mount Camera. Refer to optical chart on p. 171 for selection of a lens.

High-resolution, Low-distortion Lenses

Model	3Z4S-LE SV-0614H	3Z4S-LE SV-0814H	3Z4S-LE SV-1214H	3Z4S-LE SV-1614H	3Z4S-LE SV-2514H	3Z4S-LE SV-3514H	3Z4S-LE SV-5014H	3Z4S-LE SV-7525H	3Z4S-LE SV-10028H
Appearance									
Focal length	6 mm	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm	100 mm
Brightness	F1.4	F1.4	F1.4	F1.4	F1.4	F1.4	F1.4	F2.5	F2.8
Filter size	M40.5 P0.5	M35.5 P0.5	M27 P0.5	M27 P0.5	M27 P0.5	M35.5 P0.5	M40.5 P0.5	M34.0 P0.5	M37.5 P0.5

Extension Tubes

Model	3Z4S-LE SV-EXR
Contents	Set of 7 tubes (40 mm, 20 mm, 10 mm, 5 mm, 2.0 mm, 1.0 mm, and 0.5 mm) Maximum outer diameter: 30 mm dia.

Note: Do not use the 0.5-mm, 1.0-mm, and 2.0-mm Extension Tubes attached to each other. Since these Extension Tubes are placed over the threaded section of the Lens or other Extension Tube, the connection may loosen when more than one 0.5-mm, 1.0-mm or 2.0-mm Extension Tube are used together.

Note: Reinforcement is required to protect against vibration when Extension Tubes exceeding 30 mm are used.

Ratings and Performance

Sensor

Inspection Model FQ2-S1/S2/S3 Series

Item		Single-function type	Standard type	High-resolution type				
Model	NPN	FQ2-S10□□□□	FQ2-S20□□□□	FQ2-S30□□□□-08	FQ2-S30□□□□-08M	FQ2-S30-13	FQ2-S30-13M	
	PNP	FQ2-S15□□□□	FQ2-S25□□□□	FQ2-S35□□□□-08	FQ2-S35□□□□-08M	FQ2-S35-13	FQ2-S35-13M	
Field of view		Refer to Ordering Information on p.19. (Tolerance (field of vision): ±10% max.)					Select a lens according to the field of vision and installation distance. Refer to optical chart on p. 171.	
Installation distance								
Main functions	Inspection items	Search, shape search II, sensitive search, area, color data, edge position, edge pitch, edge width, and labeling						
	Number of simultaneous measurements	1	32					
	Position compensation	Supported (360° Model position compensation, Edge position compensation)						
	Number of registered scenes	8	32					
	Calibration	Supported						
Image input	Image processing method	Real color				Monochrome	Real color	Monochrome
	Image filter	High dynamic range (HDR), image adjustment (Color Gray Filter, Weak smoothing, Strong smoothing, Dilate, Erosion, Median, Extract edges, Extract horizontal edges, Extract vertical edges, Enhance edges, Background suppression), polarizing filter (attachment), and white balance (Sensors with Color Cameras only)						
	Image elements	1/3-inch color CMOS		1/2-inch color CMOS	1/2-inch Monochrome CMOS	1/2-inch color CMOS	1/2-inch Monochrome CMOS	
	Shutter	Built-in lighting ON: 1/250 to 1/50,000 Built-in lighting OFF: 1/1 to 1/50,000		Built-in lighting ON: 1/250 to 1/60,000 Built-in lighting OFF: 1/1 to 1/60,000		1/1 to 1/60,000		
	Processing resolution	752 × 480		928 × 828		1,280 × 1,024		
	Partial input function	Supported horizontally only.		Supported horizontally and vertically				
	Lens mounts	–					C-mount	
Lighting	Lighting method	Pulse					–	
	Lighting color	White					–	
Data logging	Measurement data	In Sensor: 1,000 items (If a Touch Finder is used, results can be saved up to the capacity of an SD card.)						
	Images	In Sensor: 20 images (If a Touch Finder is used, images can be saved up to the capacity of an SD card.)						
Auxiliary function		Math (arithmetic, calculation functions, trigonometric functions, and logic functions)						
Measurement trigger		External trigger (single or continuous) Communications trigger (Ethernet TCP no-protocol, Ethernet UDP no-protocol, Ethernet FINS/TCP no-protocol, EtherNet/IP, PLC Link, or PROFINET)						

Item		Single-function type	Standard type	High-resolution type			
Model	NPN	FQ2-S10□□□□	FQ2-S20□□□□	FQ2-S30□□□□-08	FQ2-S30□□□□-08M	FQ2-S30-13	FQ2-S30-13M
	PNP	FQ2-S15□□□□	FQ2-S25□□□□	FQ2-S35□□□□-08	FQ2-S35□□□□-08M	FQ2-S35-13	FQ2-S35-13M
I/O specifications	Input signals	7 signals Single measurement input (TRIG) Control command input (IN0 to IN5)					
	Output signals	3 signals Control output (BUSY) Overall judgement output (OR) Error output (ERROR) The assignments of the three output signals (OUT0 to OUT2) can be changed to the individual judgements of the inspection items, the image input ready output (READY), or the external lighting timing output (STGOUT).					
	Ethernet specifications	100Base-TX/10Base-T					
	Communications	Ethernet TCP no-protocol, Ethernet UDP no-protocol, Ethernet FINS/TCP no-protocol, EtherNet/IP, PLC Link, or PROFINET					
	I/O expansion	–	–	Possible by connecting FQ-SDU1_ Sensor Data Unit. 11 inputs and 24 outputs			
	RS-232C	–	–	Possible by connecting FQ-SDU2_ Sensor Data Unit. 8 inputs and 7 outputs			
Ratings	Power supply voltage	21.6 to 26.4 VDC (including ripple)					
	Current consumption	2.4 A max.					0.3 A max.
Environmental immunity	Ambient temperature range	Operating: 0 to 50°C Storage: –25 to 65°C (with no icing or condensation)			Operating: 0 to 40°C Storage: –25 to 65°C (with no icing or condensation)		
	Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)					
	Ambient atmosphere	No corrosive gas					
	Vibration resistance (destruction)	10 to 150 Hz, single amplitude: 0.35 mm, X/Y/Z directions 8 min each, 10 times					
	Shock resistance (destruction)	150 m/s ² 3 times each in 6 direction (up, down, right, left, forward, and backward)					
	Degree of protection	IEC 60529 IP67 (Except when Polarizing Filter Attachment is mounted or connector cap is removed.)					IEC 60529 IP40
Materials		Sensor: PBT, PC, SUS Mounting Bracket: PBT Polarizing Filter Attachment: PBT, PC Ethernet connector: Oil-resistance vinyl compound I/O connector: Lead-free heat-resistant PVC				Cover: Zinc-plated steel, Thickness: 0.6 mm Case: Aluminum diecast alloy (ADC-12) Mounting base: Polycarbonate ABS	
Weight		Narrow View/Standard View: Approx.160 g Wide View: Approx.150 g				Approx. 160 g without base, Approx. 185 g with base	
Accessories included with sensor		Mounting Bracket (FQ-XL) (1) Polarizing Filter Attachment (FQ-XF1) (1) Instruction Manual, Quick Startup Guide Member Registration Sheet, Warning Label				Mounting Base (FQ-XLC) (1) Mounting Screw (M3 × 8mm) (4) Instruction Manual, Quick Startup Guide Member Registration Sheet	
LED class		Class 2(Applicable standards: IEC 60825-1:1993 +A1:1997 +A2:2001, EN 60825-1:1994 +A1:2002 +A2:2001, and JIS C 6802:2005)				–	
Applicable standards		EN standard EN 61326 and EC Directive No.2004/104/EC			EN 61326-1:2006 and IEC 61010-1		

Inspection/ID Model FQ2-S4 Series

Item		Inspection/ID Model					
Model	NPN	FQ2-S40□□□□	FQ2-S40□□□□-M	FQ2-S40□□□□-08	FQ2-S40□□□□-08M	FQ2-S40□□□□-13	FQ2-S40□□□□-13M
	PNP	FQ2-S45□□□□	FQ2-S45□□□□-M	FQ2-S45□□□□-08	FQ2-S45□□□□-08M	FQ2-S45□□□□-13	FQ2-S45□□□□-13M
Field of view		Refer to Ordering Information on p.19. (Tolerance (field of vision): ±10% max.)				Select a lens according to the field of vision and installation distance. Refer to optical chart on p. 171.	
Installation distance							
Main functions	Inspection items	Search, shape search II, sensitive search, area, color data, edge position, edge pitch, edge width, labeling, OCR ^{*1} , Bar code ^{*2} , 2D-code ^{*2} , 2D-code (DMP) ^{*3} , and Model dictionary					
	Number of simultaneous measurements	32					
	Position compensation	Supported (360° Model position compensation, Edge position compensation)					
	Number of registered scenes	32					
	Calibration	Supported					
	Retry function	Normal retry, Exposure retry, Scene retry, Trigger retry					
Image input	Image processing method	Real color	Monochrome	Real color	Monochrome	Real color	Monochrome
	Image filter	High dynamic range (HDR), image adjustment (Color Gray Filter, Weak smoothing, Strong smoothing, Dilate, Erosion, Median, Extract edges, Extract horizontal edges, Extract vertical edges, Enhance edges, Background suppression), polarizing filter (attachment), and white balance (Sensors with Color Cameras only)					
	Image elements	1/3-inch color CMOS	1/3-inch Monochrome CMOS	1/2-inch color CMOS	1/2-inch Monochrome CMOS	1/2-inch color CMOS	1/2-inch Monochrome CMOS
	Shutter	Built-in lighting ON: 1/250 to 1/50,000 Built-in lighting OFF: 1/1 to 1/50,000		Built-in lighting ON: 1/250 to 1/60,000 Built-in lighting OFF: 1/1 to 1/60,000		1/1 to 1/60,000	
	Processing resolution	752 × 480		928 × 828		1,280 × 1,024	
	Partial input function	Supported horizontally only.		Supported horizontally and vertically			
	Lens mounts	—				C-mount	
Lighting	Lighting method	Pulse				—	
	Lighting color	White				—	

Item		Inspection/ID Model					
Model	NPN	FQ2-S40□□□□	FQ2-S40□□□□-M	FQ2-S40□□□□-08	FQ2-S40□□□□-08M	FQ2-S40□□□□-13	FQ2-S40□□□□-13M
	PNP	FQ2-S45□□□□	FQ2-S45□□□□-M	FQ2-S45□□□□-08	FQ2-S45□□□□-08M	FQ2-S45□□□□-13	FQ2-S45□□□□-13M
Data logging	Measurement data	In Sensor: 1,000 items (If a Touch Finder is used, results can be saved up to the capacity of an SD card.)					
	Images	In Sensor: 20 images (If a Touch Finder is used, images can be saved up to the capacity of an SD card.)					
Auxiliary function		Math (arithmetic, calculation functions, trigonometric functions, and logic functions)					
Measurement trigger		External trigger (single or continuous) Communications trigger (Ethernet TCP no-protocol, Ethernet UDP no-protocol, Ethernet FINS/TCP no-protocol, EtherNet/IP, PLC Link , or PROFINET)					
I/O specifica- tions	Input signals	7 signals Single measurement input (TRIG) Control command input (IN0 to IN5)					
	Output signals	3 signals Control output (BUSY) Overall judgement output (OR) Error output (ERROR) The assignments of the three output signals (OUT0 to OUT2) can be changed to the individual judgements of the inspection items, the image input ready output (READY), or the external lighting timing output (STGOUT).					
	Ethernet specifications	100Base-TX/10Base-T					
	Communications	Ethernet TCP no-protocol, Ethernet UDP no-protocol, Ethernet FINS/TCP no-protocol, EtherNet/IP, PLC Link, or PROFINET					
	I/O expansion	Possible by connecting FQ-SDU1_ Sensor Data Unit. 11 inputs and 24 outputs					
	RS-232C	Possible by connecting FQ-SDU2_ Sensor Data Unit. 8 inputs and 7 outputs					
Ratings	Power supply voltage	21.6 to 26.4 VDC (including ripple)					
	Current consumption	2.4 A max.					0.3 A max.
Environment al immunity	Ambient temperature range	Operating: 0 to 40°C Storage: -25 to 65°C (with no icing or condensation)					
	Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)					
	Ambient atmosphere	No corrosive gas					
	Vibration resistance (destruction)	10 to 150 Hz, single amplitude: 0.35 mm, X/Y/Z directions 8 min each, 10 times					
	Shock resistance (destruction)	150 m/s ² 3 times each in 6 direction (up, down, right, left, forward, and backward)					
	Degree of protection	IEC 60529 IP67 (Except when Polarizing Filter Attachment is mounted or connector cap is removed.)					IEC 60529 IP40
Materials		Sensor: PBT, PC, SUS Mounting Bracket: PBT Polarizing Filter Attachment: PBT, PC Ethernet connector: Oil-resistance vinyl compound I/O connector: Lead-free heat-resistant PVC					Cover: Zinc-plated steel, Thickness: 0.6 mm Case: Aluminum diecast alloy (ADC-12) Mounting base: Polycarbonate ABS
Weight		Narrow View/Standard View:Approx.160 g Wide View:Approx.150 g					Approx. 160 g without base, Approx. 185 g with base
Accessories included with sensor		Mounting Bracket (FQ-XL)(1) Polarizing Filter Attachment (FQ-XF1) (1) Instruction Manual, Quick Startup Guide Member Registration Sheet, Warning Label					Mounting Base (FQ-XLC) (1) Mounting Screw (M3 × 8mm)(4) Instruction Manual, Quick Startup Guide Member Registration Sheet
LED class		Class 2(Applicable standards: IEC 60825-1:1993 +A1:1997 +A2:2001, EN 60825-1:1994 +A1:2002 +A2:2001, and JIS C 6802:2005)					—
Applicable standards		EN 61326-1:2006 and IEC 61010-1					

*1 The types of characters to be read are the same as those of FQ2-CH Optical Character Recognition Sensor.

*2 The types of codes to be read are the same as those of FQ-CR1 Multi Code Reader.

*3 The types of codes to be read are the same as those of FQ-CR2 2D Code Reader.

ID Model FQ2-CH, FQ-CR1/CR2 Series

Item		Optical Character Recognition Sensor		Multi Code Reader	2D Code Reader
Model	NPN	FQ2-CH10□□□□-M		FQ-CR10□□□□-M	FQ-CR20□□□□-M
	PNP	FQ2-CH15□□□□-M		FQ-CR15□□□□-M	FQ-CR25□□□□-M
Field of view		Refer to Ordering Information on page 169. (Tolerance (field of vision): ±10% max.)			
Installation distance					
Main functions	Inspection items	OCR · Alphabet A to Z · Number 0 to 9 · Symbol ' - . : / Model dictionary	2D Code (Data Matrix(EC200), QR Code, MicroQR Code, PDF417, MicroPDF417, GS1-Data Matrix) Bar Code (JAN/EAN/UPC, Code39, Codabar (NW-7), ITF (Interleaved 2 of 5), Code 93, Code128/ GS1-128, GS1 DataBar* (Truncated, Stacked, Omnidirectional, Stacked Omnidirectional, Limited, Expanded, Expanded Stacked), Pharmacode, GS1-128 Composite Code (CC-A, CC-B, CC-C)	2D Code (Data Matrix(EC200), QR Code)	
	Image filter	Weak smoothing, Strong smoothing, Dilate, Erosion, Median, Extract edges, Extract horizontal edges, Extract vertical edges, Enhance edges, Background suppression	None	Filter function (Smooth, Dilate, Erosion, Median), Code Error Correction Position Display	
	Verification function	Supported	Supported	None	
	Retry function	Normal retry, Exposure retry, Scene retry, Trigger retry			
	Number of simultaneous measurements	32			
	Position compensation	Supported (360° Model position compensation, Edge position compensation)	None		
	Number of registered scenes	32			
Image input	Image processing method	Monochrome			
	Image filter	High dynamic range (HDR) and polarizing filter (attachment)			
	Image elements	1/3-inch Monochrome CMOS			
	Shutter	Built-in lighting ON: 1/250 to 1/50,000 Built-in lighting OFF: 1/1 to 1/50,000	1/250 to 1/30,000	1/250 to 1/32,258	
	Processing resolution	752 × 480			
	Partial input function	Supported horizontally only.			
Lighting	Lighting method	Pulse			
	Lighting color	White			
Data logging	Measurement data	In Sensor: 1,000 items (If a Touch Finder is used, results can be saved up to the capacity of an SD card.)			
	Images	In Sensor: 20 images (If a Touch Finder is used, images can be saved up to the capacity of an SD card.)			
Auxiliary function		Math (arithmetic, calculation functions, trigonometric functions, and logic functions)			
Measurement trigger		External trigger (single or continuous) Communications trigger (Ethernet TCP no-protocol, Ethernet UDP no-protocol, Ethernet FINS/TCP no-protocol, EtherNet/IP, PLC Link, or PROFINET)	External trigger (single or continuous)		
I/O specifications	Input signals	7 signals Single measurement input (TRIG) Control command input (IN0 to IN5)			
	Output signals	3 signals Control output (BUSY) Overall judgement output (OR) Error output (ERROR) The assignments of the three output signals (OUT0 to OUT2) can be changed to the individual judgements of the inspection items, the image input ready output (READY), or the external lighting timing output (STGOUT).	3 signals Control output (BUSY) Overall judgement output (OR) Error output (ERROR) Note: The three output signals can be allocated for the judgements of individual inspection items		
	Ethernet specifications	100Base-TX/10Base-T			
	Communications	Ethernet TCP no-protocol, Ethernet UDP no-protocol, Ethernet FINS/TCP no-protocol, EtherNet/IP, PLC Link, or PROFINET	Ethernet TCP no-protocol		
	I/O expansion	Possible by connecting FQ-SDU1_ Sensor Data Unit. 11 inputs and 24 outputs	-		
	RS-232C	Possible by connecting FQ-SDU2_ Sensor Data Unit. 8 inputs and 7 outputs	-		
Ratings	Power supply voltage	21.6 to 26.4 VDC (including ripple)			
	Current consumption	2.4 A max.			
Environmental immunity	Ambient temperature range	Operating: 0 to 40°C, Storage: -25 to 65°C (with no icing or condensation)	Operating: 0 to 50°C, Storage: -25 to 65°C (with no icing or condensation)		
	Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)			
	Ambient atmosphere	No corrosive gas			
	Vibration resistance (destruction)	10 to 150 Hz, single amplitude: 0.35 mm, X/Y/Z directions 8 min each, 10 times			
	Shock resistance (destruction)	150 m/s ² 3 times each in 6 direction (up, down, right, left, forward, and backward)			
	Degree of protection	IEC 60529 IP67 (Except when Polarizing Filter Attachment is mounted or connector cap is removed.)			

Item		Optical Character Recognition Sensor	Multi Code Reader	2D Code Reader
Model	NPN	FQ2-CH10□□□□-M	FQ-CR10□□□□-M	FQ-CR20□□□□-M
	PNP	FQ2-CH15□□□□-M	FQ-CR15□□□□-M	FQ-CR25□□□□-M
Materials		Sensor: PBT, PC, SUS, Mounting Bracket: PBT, Polarizing Filter Attachment: PBT, PC Ethernet connector: Oil-resistance vinyl compound, I/O connector: Lead-free heat-resistant PVC		
Weight		Narrow View/Standard View: Approx.160 g Wide View: Approx. 150 g		
Accessories included with sensor		Mounting Bracket (FQ-XL)(1), Polarizing Filter Attachment (FQ-XF1) (1), Instruction Manual, Quick Startup Guide, Member Registration Sheet, Warning Label		
LED class		Class 2(Applicable standards: IEC 60825-1:1993 +A1:1997 +A2:2001,EN 60825-1:1994 +A1:2002 +A2:2001, and JIS C 6802:2005)		
Applicable standards		EN 61326-1:2006 and IEC61010-1		

Touch Finder

Item		Type	Model with DC power supply	Model with AC/DC/battery power supply
		Model	FQ2-D30	FQ2-D31
Number of connectable Sensor			Number of sensors that can be recognized (switched): 32 max. number or sensor that can displayed on monitor: 8 max.	
Main functions	Types of measurement displays		Last result display, Last NG display, trend monitor, histograms	
	Types of display images		Through, frozen, zoom-in, and zoom-out images	
	Data logging		Measurement results, measured images	
	Menu language		English, German, French, Italian, Spanish, Traditional Chinese, Simplified Chinese, Korean, Japanese	
Indications	LCD	Display device	3.5-inch TFT color LCD	
		Pixels	320 × 240	
		Display colors	16.7 million	
	Backlight	Life expectancy ^{*1}	50,000 hours at 25°C	
		Brightness adjustment	Provided	
		Screen saver	Provided	
Operation interface	Touch screen	Method	Resistance film	
		Life expectancy ^{*2}	1,000,000 touch operations	
External interface	Ethernet		100BASE-TX/10BASE-T	
	SD card		SDHC-compliant, Class 4 or higher recommended	
Ratings	Power supply voltage		DC power connection: 21.6 to 26.4 VDC (including ripple)	DC power connection: 21.6 to 26.4 VDC (including ripple) AC adapter (manufactured by Sino-American Japan Co., Ltd) connection: 100 to 240 VAC, 50/60 Hz Battery connection: FQ-BAT1 Battery (1 cell, 3.7 V)
	Continuous operation on Battery ^{*3}		–	1.5 h
	Power consumption		DC power connection: 0.2 A max.	DC power connection: 0.2 A max. Charging battery: 0.4 A max.
Environmental immunity	Ambient temperature range		Operating: 0 to 50°C Storage: –25 to 65°C (with no icing or condensation)	Operating: 0 to 50°C when mounted to DIN Track or panel Operation on Battery: 0 to 40°C: –25 to 65°C (with no icing or condensation)
	Ambient humidity range		Operating and storage: 35% to 85% (with no condensation)	
	Ambient atmosphere		No corrosive gas	
	Vibration resistance (destruction)		10 to 150 Hz, single amplitude: 0.35 mm, X/Y/Z directions 8 min each, 10 times	
	Shock resistance (destruction)		150 m/s ² 3 times each in 6 direction (up, down, right, left, forward, and backward)	
	Degree of protection		IEC 60529 IP20 (when SD card cover, connector cap, or harness is attached)	
Weight			Approx. 270 g (without Battery and hand strap attached)	
Materials			Case: ABS	
Accessories included with Touch Finder			Touch Pen (FQ-XT), Instruction Manual	

^{*1} This is a guideline for the time required for the brightness to diminish to half the initial brightness at room temperature and humidity. The life of the backlight is greatly affected by the ambient temperature and humidity and will be shorter at lower or higher temperatures.

^{*2} This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions.

^{*3} This value is only a guideline. No guarantee is implied. The value will be affected by the operating environment and operating conditions.

Sensor Data Units (FQ2-S3/S4/CH only)

Item			Parallel Interface	RS-232C Interface
Model	NPN		FQ-SDU10	FQ-SDU20
	PNP		FQ-SDU15	FQ-SDU25
I/O specifications	Parallel I/O	Connector 1	16 outputs (D0 to D15)	6 inputs (IN0 to IN5)
		Connector 2	11 inputs (TRIG, RESET, IN0 to IN7, and DSA) 8 outputs (GATE, ACK, RUN, BUSY, OR, ERROR, STGOUT, and SHTOUT)	2 inputs (TRIG and RESET) 7 outputs (ACK, RUN, BUSY, OR, ERROR, STGOUT, and SHTOUT)
	RS-232C		–	1 channel, 115,200 bps max.
	Sensor interface		FQ2-S3 connected with FQ-WU□□□: OMRON interface *Number of connected Sensors: 1	
Ratings	Power supply voltage		21.6 to 26.4 VDC (including ripple)	
	Insulation resistance		Between all DC external terminals and case: 0.5 MΩ min (at 250 VDC)	
	Current consumption		2.5 A max.: FQ2-S□□□□□□□-□□□ and FQ-SDU□□ 0.4 A max.: FQ2-S3□-□□□□ and FQ-SDU□□ 0.1 A max.: FQ-SDU□□□ only	
Environmental immunity	Ambient temperature range		Operating: 0 to 50°C, Storage: –20 to 65°C (with no icing or condensation)	
	Ambient humidity range		Operating and storage: 35% to 85% (with no condensation)	
	Ambient atmosphere		No corrosive gas	
	Vibration resistance (destruction)		10 to 150 Hz, single amplitude: 0.35 mm, X/Y/Z directions, 8 min each, 10 times	
	Shock resistance (destruction)		150 m/s ² 3 times each in 6 directions (up, down, right, left, forward, and backward)	
		Degree of protection	IEC 60529 IP20	
Materials			Case: PC + ABS, PC	
Weight			Approx. 150 g	
Accessories included with Sensor Data Unit			Instruction Manual	

Battery

Item/Model	FQ-BAT1
Battery type	Secondary lithium ion battery
Nominal capacity	1,800 mAh
Rated voltage	3.7 V
Ambient temperature range	Operating: 0 to 40°C Storage: –25 to 65°C (with no icing or condensation)
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)
Charging method	Charged in Touch Finder (FQ2-D31). AC adapter (FQ-AC□) is required.
Charging time ^{*1}	2 h
Usage time ^{*1}	1.5 h
Battery backup life ^{*2}	300 charging cycles
Weight	50 g max.

^{*1} This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions

^{*2} This is a guideline for the time required for the capacity of the Battery to be reduced to 60% of the initial capacity. No guarantee is implied. The value will be affected by the operating environment and operating conditions.

System Requirements for PC tool for FQ

The following Personal Computer system is required to use the software.

OS	Microsoft Windows XP Home Edition/Professional SP2 or higher (32-bit version) Microsoft Windows 7 Home Premium or higher (32-bit/64-bit version)
CPU	Core 2 Duo 1.06 GHz or the equivalent or higher
RAM	1GB min.
HDD	500 MB min. available space ^{*1}
Monitor	1,024 × 768 dots min.

^{*1} Available space is also required separately for data logging.

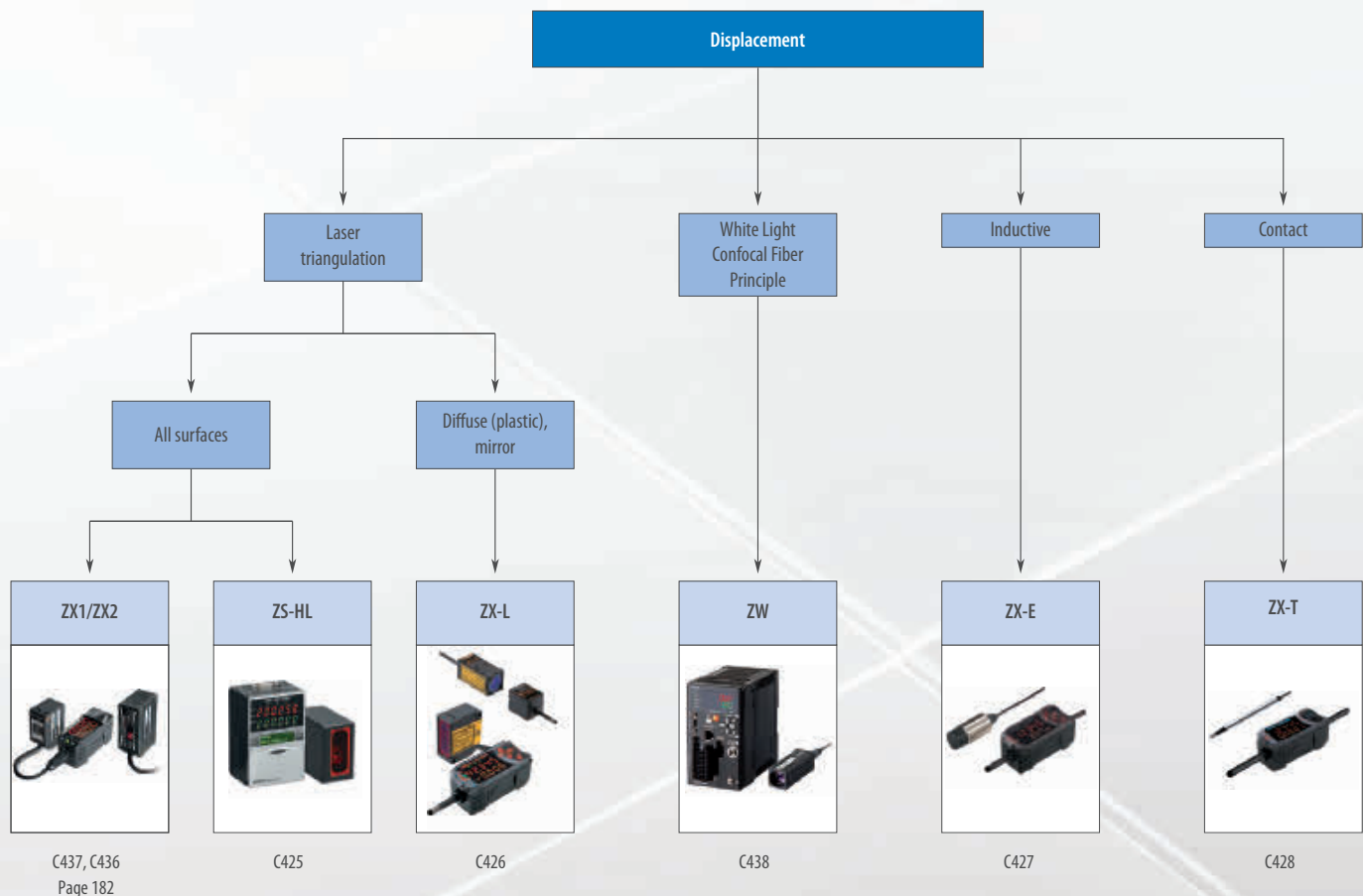
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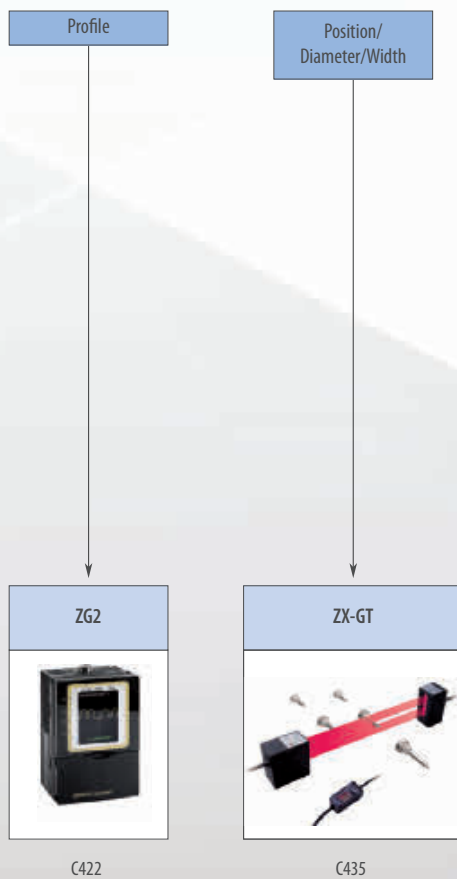
HIGH PRECISION QUALITY INSPECTION

Zero defect becomes reality – scalable accuracy in inspection

The Smart displacement sensor family offers a modular and scalable approach to solve the most challenging measurement tasks. The powerful portfolio enables you to measure profiles, thickness, distance, evenness/warpage, as well as width, edge, etc. Several measurement profiles can be performed simultaneously, using a single- or multi-controller unit. Aided by Omron's advanced technologies, the highest accuracy over long distances, speed and reliability will be achieved.

- Accurate and fast – 0.25 μm at less than 110 μs sampling time
- Scalable – multi-controller unit to coordinate and calculate up to 9 units
- Smart – data storage and remote control via networking capabilities





Selection table

		Laser displacement sensor			Confocal fiber sensor
					
Selection criteria	Model	ZX1/ZX2	ZS-HL	ZX-L	ZW
	Measurement range Z Min.	50±10 mm	10±0.5 mm	30±2 mm	7 mm
	Max.	600±400 mm	1500±500 mm	300±200 mm	40 mm
	Measurement range X Min.	—	—	—	—
	Max.	—	—	—	—
	Resolution Z	1.5 µm	0.25 µm	0.25 µm	0.01 µm
	Resolution X	—	—	—	—
	Linearity (±% of full scale)	0.05%	0.05%	0.2%	0.1%
	Response time	60 µs	110 µs	150 µs	500 µs
	Spot beam	■	■	■	■
	Line beam	■	■	■	—
	IP-rating head	IP67	IP64/IP67	IP50	IP40
	IP-rating controller	IP40	IP40	IP40	IP20
	Ambient oper. temperature	0 to 50°C	0 to 50°C	0 to 50°C	0 to 40°C
	Number of connectable sensors	5	9	5	4
Features	Thickness measurement	■	■	■	■
	Eccentricity	■	■	■	—
	Height	■	■	■	■
	Step	■	■	■	—
	Profile	—	—	—	—
	Distance	—	—	—	—
	Evenness	—	—	—	—
	Warpage	—	—	—	—
	Edge	—	—	—	—
	Width	—	—	—	—
	Peak	■	■	■	—
	Peak to peak	■	■	■	—
	Bottom	■	■	■	—
	Self-trigger	■	■	■	—
	Calibration	■	■	■	■
	Signal scaling	■	—	—	■
	PC-software	—	■	■	■
Application	Mirror	■	■	—	■
	Glass	■	■	—	■
	Metal	■	■	□	■
	Plastic	■	■	■	■
	Black rubber	■	■	—	■
	Paper	■	■	□	■
Supply voltage	12 to 24 VDC	■	—	■	■
	21.6 to 26.4 VDC	—	■	—	■
Control I/O	4 to 20 mA	■	■	■	■
	1 to 5 VDC	■	—	■	—
	Judgement output High/Pass/Low	■	■	■	■
	Trigger	■	■	■	■
Commu- nication	RS-232C	■	■	■	—
	USB2.0	■	■	—	—
Page/Quick Link		182, C437, C436	C425	C426	C438

		Inductive displacement sensor	Contact displacement sensor	Profile sensor	Laser micrometer
					
Selection criteria	Model	ZX-E	ZX-T	ZG2	ZX-GT
	Measurement range Z Min.	0.5 mm	1 mm	20 ±0.5 mm	–
	Max.	7 mm	10 mm	210 ±30 mm	28 mm
	Measurement range X Min.	–	–	3 mm	–
	Max.	–	–	70 mm	–
	Resolution Z	1 µm	0.1 µm	0.2 µm	10 µm
	Resolution X	–	–	3 mm/631 pixels	–
	Linearity (±% of full scale)	0.5%	0.3%	0.5%	0.1%
	Response time	150 µs	1 ms	5 ms	150 µs
	Spot beam	–	–	–	–
	Line beam	–	–	□	–
	IP-rating head	IP67	IP67	IP64/66	IP40
	IP-rating controller	IP40	IP40	IP20	IP40
	Ambient oper. temperature	0 to 50°C	0 to 50°C	0 to 50°C	0 to 50°C
	Number of connectable sensors	5	7	1	5
Features	Thickness measurement	■	■	■	■
	Eccentricity	■	■	■	■
	Height	■	■	■	■
	Step	■	■	■	■
	Profile	–	–	□	–
	Distance	■	■	–	–
	Evenness	■	■	–	–
	Warpage	■	■	–	–
	Edge	–	–	–	■
	Width	–	–	□	■
	Peak	■	■	■	■
	Peak to peak	■	■	■	■
	Bottom	■	■	■	■
	Self-trigger	■	■	■	■
	Calibration	–	–	■	–
	Signal scaling	■	■	–	■
	PC-software	■	■	■	■
Application	Mirror	–	■	■	■
	Glass	–	■	■	■
	Metal	■	■	■	■
	Plastic	–	■	■	■
	Black rubber	–	■	■	■
	Paper	–	–	■	■
Supply voltage	12 to 24 VDC	■	■	–	■
	21.6 to 26.4 VDC	–	–	■	■
Control I/O	4 to 20 mA	■	■	■	■
	1 to 5 VDC	■	■	–	■
	Judgement output High/Pass/Low	■	■	■	■
	Trigger	■	■	■	■
Communication	RS-232C	■	■	■	■
	USB2.0	■	–	■	–
	Page/Quick Link	C427	C428	C422	C435

■ Standard

□ Available

– No/not available



Highest performance for optimized productivity

Highest performance is now available in matchbox size. We are defining a new class of measurement sensors using an advanced HSDR-CMOS (High Speed and Dynamic Range) camera chip.

- Stable measurement for objects with any surface
- Best in class performance for accuracy and speed
- Compact size for quick mounting
- Increased measurement range
- Simple configuration by one-button, Smart Tuning
- Reliable measurement in harsh environments
- Integrated display

Ordering information

Sensors

Appearance	Connection method	Cable length	Sensing distance	Order code	
				NPN output	PNP output
	Pre-wired	2 m		ZX1-LD50A61 2M	ZX1-LD50A81 2M
		5 m		ZX1-LD50A61 5M	ZX1-LD50A81 5M
	Pre-wired connector	0.5 m		ZX1-LD50A66 0.5M	ZX1-LD50A86 0.5M
	Pre-wired	2 m		ZX1-LD100A61 2M	ZX1-LD100A81 2M
		5 m		ZX1-LD100A61 5M	ZX1-LD100A81 5M
	Pre-wired connector	0.5 m		ZX1-LD100A66 0.5M	ZX1-LD100A86 0.5M
	Pre-wired	2 m		ZX1-LD300A61 2M	ZX1-LD300A81 2M
		5 m		ZX1-LD300A61 5M	ZX1-LD300A81 5M
	Pre-wired connector	0.5 m		ZX1-LD300A66 0.5M	ZX1-LD300A86 0.5M
	Pre-wired	2 m		ZX1-LD600A61 2M	ZX1-LD600A81 2M
		5 m		ZX1-LD600A61 5M	ZX1-LD600A81 5M
	Pre-wired connector	0.5 m		ZX1-LD600A66 0.5M	ZX1-LD600A86 0.5M

Accessories (sold separately)

Extension cables for pre-wired connector models

An Extension cable is not provided with the sensor. Order an extension cable separately.

Cable length	Order code
10 m	ZX0-XC10R
20 m	ZX0-XC20R

Specifications

Model	NPN output	ZX1-LD50A61 ZX1-LD50A66	ZX1-LD100A61 ZX1-LD100A66	ZX1-LD300A61 ZX1-LD300A66	ZX1-LD600A61 ZX1-LD600A66
Item	PNP output	ZX1-LD50A81 ZX1-LD50A86	ZX1-LD100A81 ZX1-LD100A86	ZX1-LD300A81 ZX1-LD300A86	ZX1-LD600A81 ZX1-LD600A86
Measurement range		50±10 mm	100±35 mm	300±150 mm	600±400 mm
Light source (wave length)		Visible-light semiconductor laser (wavelength: 660 nm, 1 mW max., IEC/EN Class 2, FDA Class II*1)			
Spot diameter (typical) (Defined at the measurement center distance)*2		0.17 mm dia.	0.33 mm dia.	0.52 mm dia.	0.56 mm dia.
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)			
Current consumption		250 mA max. (at power supply voltage 10 VDC)			
Control output		Load power supply voltage: 30 VDC max., Load current: 100 mA max. (Residual voltage: 1 V max. (load current 10 mA or less), 2 V max. (load current of 10 to 100 mA))			
Analog output		Current output: 4 to 20 mA, maximum load resistance: 300 Ω			
Indicators		Digital display (red), output indicator (OUT1, OUT2) (orange), zero reset indicator (orange), menu indicator (orange), laser ON indicator (green), and smart tuning indicator (blue)			
Response time	Judgment output	Super-high-speed (SHS) Mode: 1 ms High-speed (HS) Mode: 10 ms Standard (Std) Mode: 100 ms			
	Laser OFF input	200 ms max.			
	Zero reset input	200 ms max.			
Temperature characteristic*3		0.03% F.S./°C			0.04% F.S./°C
Linearity*4		±0.15% F.S.		±0.25% F.S.	±0.25% F.S. (200 to 600 mm) ±0.5% F.S. (entire range)
Resolution *5		2 μm	7 μm	30 μm	80 μm
Ambient illumination		Illumination on received light surface: 7,500 lx or less (incandescent light)		Illumination on received light surface: 5,000 lx or less (incandescent light)	
Ambient temperature		Operating: -10 to 55°C, Storage: -15 to 70°C (with no icing or condensation)			
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)			
Dielectric strength		1,000 VAC, 50/60 Hz, 1 minute3			
Vibration resistance (destruction)		10 to 55 Hz, 1.5-mm double amplitude, 2 hours each in X, Y, and Z directions			
Shock resistance (destruction)		500 m/s ² 3 times each in X, Y, and Z directions			
Degree of protection *6		IEC 60529, IP67			
Connection method		Pre-wired model (Standard cable length: 2 m, 5 m) Pre-wired connector model (Standard cable length: 0.5 m)			
Weight (packed state/ sensor only)	Pre-wired models (2 m)	Approx. 240 g / Approx. 180 g		Approx. 270 g / Approx. 210 g	
	Pre-wired models (5 m)	Approx. 450 g / Approx. 330 g		Approx. 480 g / Approx. 360 g	
	Pre-wired connector models (0.5 m)	Approx. 170 g / Approx. 110 g		Approx. 200 g / Approx. 140 g	
Materials		Case and cover: PBT (polybutylene terephthalate), Optical window: Glass, Cable: PVC, Mounting hole part: SUS303			
Accessories		Instruction sheet and Laser warning label (English)			

^{*1} Classified as Class 2 by EN60825-1 criteria in accordance with the FDA standard provisions of Laser Notice No. 50. Notification to CDRH planned. (Center for Devices and Radiological Health)

^{*2} Spot diameter: Defined as 1/e² (13.5%) of the central intensity at the measurement center distance.

False detections can occur in the case there is light leakage outside the defined region and the surroundings of the target object have a high reflectance in comparison to the target object. Accurate measurements may not be possible for workpieces that are smaller than the spot diameter.

^{*3} Temperature characteristic: Value for the case the space between the sensor and Omron's standard target object is secured by an aluminum jig. (Measured at the measurement center distance)

^{*4} Linearity: Indicates the error with respect to the ideal straight line of the displacement output in the case of measuring Omron's standard target object (white ceramic) at a temperature of 25°C. Linearity and measured value may vary depending on target object.

^{*5} Resolution: Defined in Standard Mode for Omron's standard target object (white ceramic) after executing Smart Tuning.

The resolution indicates the repetition accuracy for a still workpiece. Not an indication of the distance accuracy.

Resolution performance may not be satisfied in a strong electromagnetic field.

^{*6} IP67 protection applies to the connector on pre-wired connector models if an extension cable is connected.

Note: False detection outside the measurement range can occur in the case of an object with high reflectance.

Emergency stop and control devices

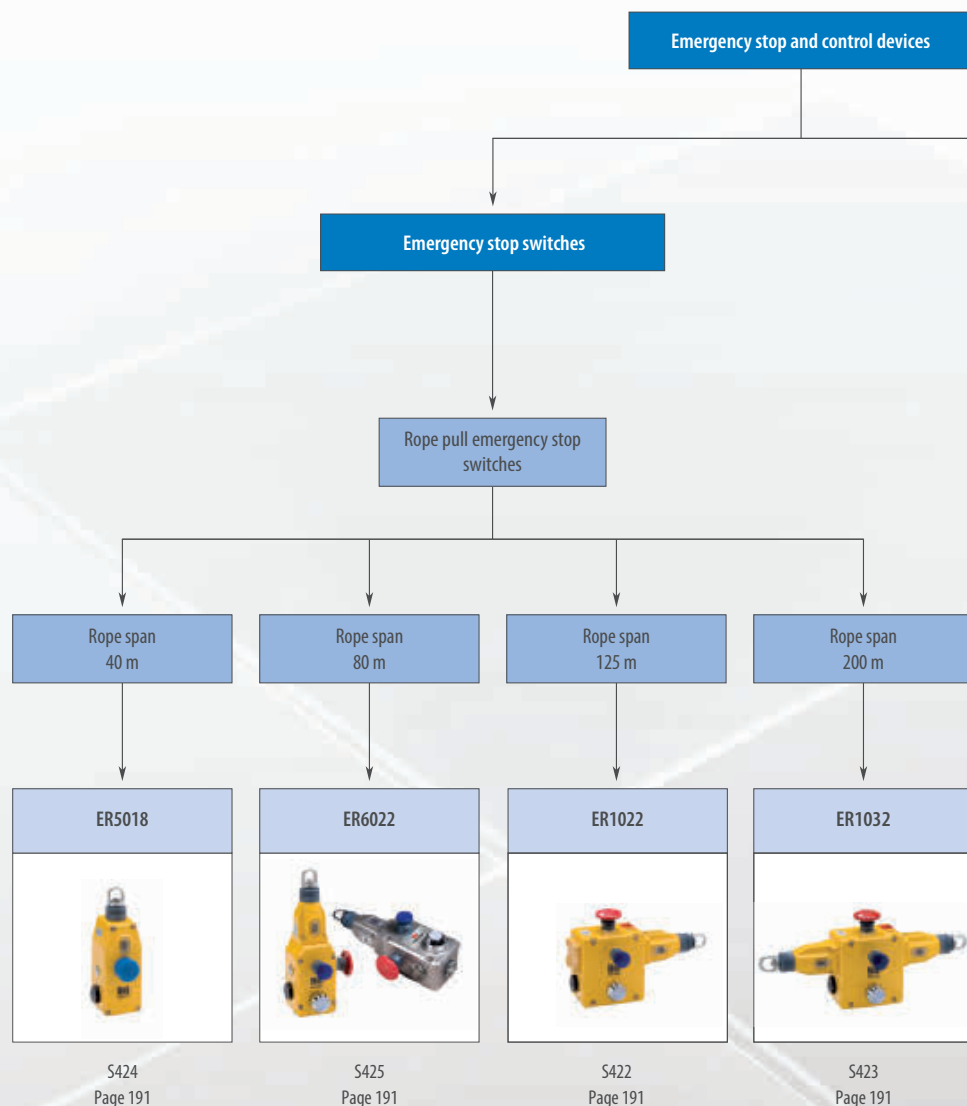
INTERACT WITH YOUR MACHINE

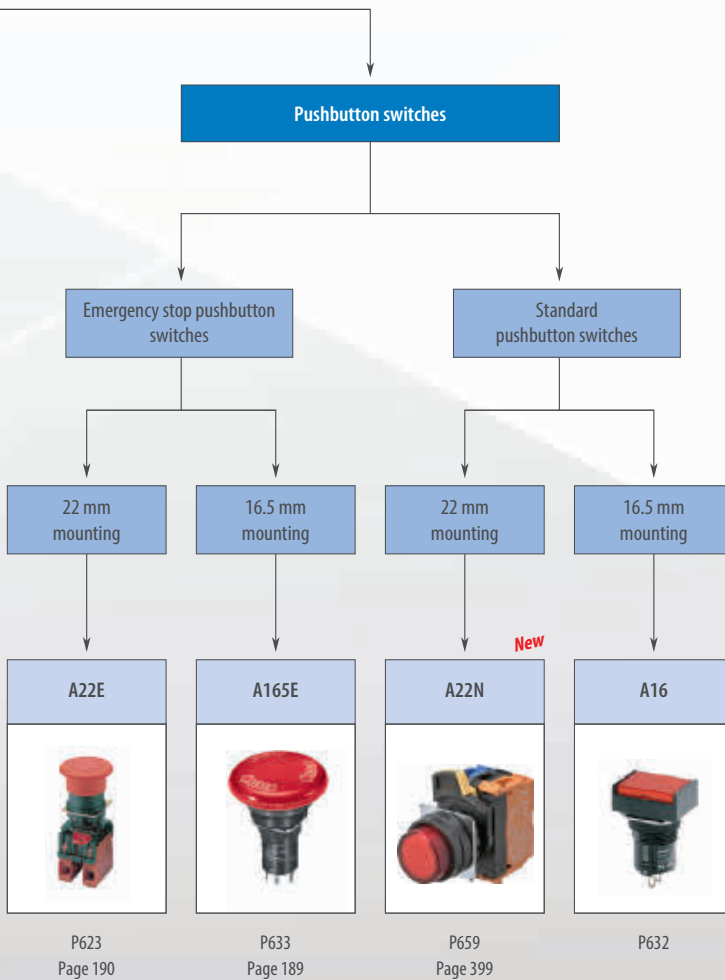
Emergency stop rope pull switches

Conveyor systems require Emergency stop function along the whole length of the machine. Rope pull emergency stop switches provide this function along the whole line with minimal wiring effort. Long rope spans, simple tensioning of the rope and a range of accessories in stainless steel support fast installation and enhanced durability.

Emergency stop pushbutton switches

Emergency stop switches are used to prevent movements that would endanger workers' hands. They are used in industrial applications such as switchboards, two-hand-operation consoles and all other kinds of machines.





Selection table

Category		Pushbutton switch	
			
Model		A16	A22N
Selection criteria	Mounting	Nut-mounting	
	Size	16 mm	22 mm
	Shape		
Pushbutton color	Incandescent lamp-lighted	Red	■
		Yellow	■
		Green	■
		White	■
		Blue	■
	LED-lighted	Red	■
		Yellow	■
		Green	■
		White	■
		Blue	■
	Non-lighted	Red	■
		Yellow	■
		Green	■
		White	■
		Blue	■
Features	Momentary operation	■	■
	Self-holding	■	■
	Number of contacts	2	6
	IP rating	IP65	IP66
	Legend plate	■	■
Switch ratings [A]	125 VAC	5	10
	250 VAC	3	6
	30 VDC	3	10
	Rated resistive load	5 A at 125 VAC, 3 A at 250 VAC, 3 A at 30 VDC	10 A at 120 VAC 6 A at 240 VAC
Terminals	Solder	■	—
	PCB	—	—
	Screw-less Clamp	—	—
Operating voltage	5 VAC/VDC	■	—
	12 VAC/VDC	■	—
	24 VAC/VDC	■	■
	120/240 VAC	—	■
Form	SPDT	■	—
	DPDT	■	—
	SPST-NO	—	■
	SPST-NC	—	■
	SPST-NO + SPST-NC	—	■
	DPST-NO	—	■
	DPST-NC	—	■
Page/Quick Link		P632	399/P659

Category		Emergency stop pushbutton switches	
			
Model		A165E	A22E
Selection criteria Features	Housing	Plastic	
	Protection class	IP65	
	Operating temperature range	–10 to 55°C	–20 to 70°C
	Head size	30 mm, 40 mm	30 mm, 40 mm, 60 mm
	Conformity	EN 60947-5-1	
	Max. rope span	—	
	Conduit size M20	—	
	Additional E-Stop button	—	
	LED indicator beacon	—	
	Stainless steel housing	—	
	Explosion proof housing	—	
	Lighted head	■	—
	Push lock – pull reset	—	■
Application	E-Stop application	■	—
	General safety application	■	—
Contact configuration	SPST (NC)	■	—
	DPST (NC)	■	—
	SPST (NO) + SPST (NC)	—	■
	TPST (NC)	■	—
Page/Quick Link		189/P633	190/P623

Category		Rope pull switches			
					
Model		ER 5018	ER 6022	ER 1022	ER 1032
Selection criteria	Housing	Metal			
	Protection class	IP67			
	Operating temperature range	-25 to 80°C			
	Head size	-			
Conformity		EN60947-5-1:2004, EN60947-5-5:1997+A1:2005; EN60204-1; EN ISO 13850:2006			
Features	Max. rope span	40 m	80 m	125 m	200 m
	Conduit size M20	■			
	Additional E-Stop button	■			
	LED indicator beacon	-	■	■	■
	Stainless steel housing	-	Available	-	-
	Explosion proof housing	-	■	■	■
	Lighted head	-			
	Push lock – pull reset	-			
	Push lock, turn reset	-			
	Push lock, lock key reset	-			
Application	E-Stop application	■			
	General safety application	■			
Contact configuration	2NC+1NO	■	■	-	-
	3NC	■	■	-	-
	4NC+2NO	-	-	■	■
Page/Quick Link		191/S424	191/S425	191/S422	191/S423

■ Standard

□ Available

- No/not available



Emergency stop switch

The A165E line-up offers E-Stop switches with various head types. For flexible application, a wide range of accessories is provided. To set up easy installation and maintenance, various contact combinations are available.

- Direct opening mechanism with minimum contact separation of 3 mm
- Safety lock mechanism prevents misuse
- Short mounting depth
- Modular construction; easy installation using snap-in switch

Ordering information

Switches	Rated voltage	Pushbutton color	Pushbutton size	Terminal	Contact	Order code
						Standard load (125 VAC at 5 A, 250 VAC at 3 A, 30 VDC at 3 A)
LED	24 VDC	Red	30 dia.	Solder terminal	SPST-NC	A165E-LS-24D-01
None	—				DPST-NC	A165E-LS-24D-02
					SPST-NC	A165E-S-01
					DPST-NC	A165E-S-02
					TPST-NC	A165E-S-03U
LED	24 VDC		40 dia.		SPST-NC	A165E-LM-24D-01
None	—				DPST-NC	A165E-LM-24D-02
					SPST-NC	A165E-M-01
					DPST-NC	A165E-M-02
					TPST-NC	A165E-M-03U

Note: The above models have a surface indication of "RESET." Models with "STOP" indication are also available. For further information, contact your Omron representative.

Accessories (order separately)

Item	Type	Precautions	Order code
Yellow plate	Yellow, 45 dia.	Use this as an emergency stop nameplate.	A16Z-5070
Panel plug	Round	Used for covering the panel cutouts for future panel expansion.	A16ZT-3003
Tightening tool	—	Useful for repetitive mounting. Be careful not to tighten excessively.	A16Z-3004
Extractor	—	Convenient for extracting the switch and lamp.	A16Z-5080

Specifications

Rated voltage	Resistive load		Features	Characteristics
	A165E series	A165E_U series		
125 VAC	5 A	1 A	Operating force (OF) max.	14.7 N
250 VAC	3 A	0.5 A	Releasing force (RF) min.	0.1 N·m
30 VDC	3 A	1 A	Pretravel (PT)	3.5±0.5 mm (3±0.5 mm in case of A165E_U series)
Minimum applicable load	150 mA at 5 VDC	1 mA at 5 VDC		

Emergency stop switch		
Allowable operating frequency	Mechanical	20 operations/minute max.
	Electrical	10 operations/minute max.
Insulation resistance		100 MΩ min. (at 500 VDC)
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity 2,000 VAC, 50/60 Hz for 1 min between terminals of different polarity and also between each terminal and ground 1,000 VAC, 50/60 Hz for 1 min between lamp terminals ^{*1}
Durability	Mechanical	100,000 operations min.
	Electrical	100,000 operations min.
Ambient temperature		Operating: -10 to 55°C (with no icing or condensation) Storage: -25 to 65°C (with no icing or condensation)
Protection against electric shock		Class II

^{*1} LED not mounted. Test them with the LED removed.



Emergency stop switch

The A22E line-up of E-Stop switches offers various head types as well as lighted models. E-stop shrouds and control boxes as accessories provide flexibility in application.

- Direct opening mechanism with minimum contact separation of 3 mm
- Safety lock mechanism prevents misuse
- Easy mounting of switch block
- Lighted models for easy diagnosis and maintenance
- Modular design for flexibility in application

Ordering information

Non-lighted models

Description	Output	Color of cap	Order code
30-dia. head Push-lock Turn-reset	SPST-NC	Red	A22E-S-01
	SPST-NO/SPST-NC		A22E-S-11
	DPST-NC		A22E-S-02
40-dia. head Push-lock Turn-reset	SPST-NC		A22E-M-01
	SPST-NO/SPST-NC		A22E-M-11
	DPST-NC		A22E-M-02
60-dia. head Push-lock Turn-reset	SPST-NC		A22E-L-01
	SPST-NO/SPST-NC		A22E-L-11
	DPST-NC		A22E-L-02

Lighted models

Description	Output	Lighting	Rated voltage	Color of cap	Order code
40-dia. head Push-lock Turn-reset	SPST-NC	LED	24 VAC/VDC	Red	A22EL-M-24A-01
	SPST-NO/SPST-NC		24 VAC/VDC		A22EL-M-24A-11
	DPST-NC		24 VAC/VDC		A22EL-M-24A-02
40-dia. head Push-lock Turn-reset	SPST-NC		220 VAC		A22EL-M-T2-01
	SPST-NO/SPST-NC		220 VAC		A22EL-M-T2-11
	DPST-NC		220 VAC		A22EL-M-T2-02

Accessories (Order separately)

Item	Classification	Remarks	Order code
Control boxes (enclosures)	One hole	Material: Polycarbonate resin	A22Z-B101
	One hole, yellow box (for emergency stop)		A22Z-B101Y
	Two holes		A22Z-B102
	Three holes		A22Z-B103
Legend plates for emergency stop	60-dia. black letters on yellow back-ground	"EMERGENCY STOP" is indicated on the plate.	A22Z-3466-1
	90-dia. black letters on yellow back-ground		A22Z-3476-1
Lock plate	Locks the mounting latch of the switch assembly	–	A22Z-3380

Specifications

Contacts (standard load)

Rated carry current	Rated voltage	Rated current (A)			
		AC15	AC12	DC13	DC12
10	24 VAC	10	10	–	–
	220 VAC	3	6	–	–
	24 VDC	–	–	1.5	10
	220 VDC	–	–	0.2	0.6

- Note**
1. Rated current values are determined according to the testing conditions. The above ratings were obtained by conducting tests under the following conditions.
 - (1) Ambient temperature: $20 \pm 2^\circ\text{C}$
 - (2) Ambient humidity: $65\% \pm 5\%$
 - (3) Operating frequency: 20 operations/minute
 2. Minimum applicable load: 10 mA at 5 VDC

Contacts (microload)

Rated applicable load	Minimum applicable load
50 mA at 5 VDC (resistive load)	1 mA at 5 VDC

Characteristics

Item	Emergency stop switches	
	Non-lighted model: A22E	Lighted model: A22EL
Dielectric strength	2,500 VAC, 50/60 Hz for 1 min between terminals of same polarity	
	2,500 VAC, 50/60 Hz for 1 min between terminals of different polarity and also between each terminal and ground	
Durability	Mechanical	Momentary operation: 300,000 operations min.
	Electrical	300,000 operations min.
Degree of protection	IP65 (oil-resistant)	IP65



Emergency stop switch

- Tension indicator – the tension indicator makes the system easy to set up and to maintain the proper rope tension
- Heavy-duty housing – the die-cast housing and stainless steel eye nut makes the ER-series rope pull switches suitable for demanding industrial applications
- Vibration tolerant – the snap-acting switch contacts protect against nuisance tripping due to vibration
- Integral E-stop – the E-stop button provides emergency stopping capability at the extreme end of the installation and is field serviceable
- ER6022 available in stainless steel housing
- ER6022, ER1022 and ER1032 available in explosion proof housing

Ordering information

Standard models

Aluminum die-cast housing

E-Stop	Indicator beacon	Contacts	Wiring entry	Order code
Not included	–	2 N/C + 1 N/O	3 × M20	44506-4010 ER5018-021M
Not included	–	3 N/C	3 × M20	44506-4030 ER5018-030M
Included	–	2 N/C + 1 N/O	3 × M20	44506-4110 ER5018-021ME
Included	–	3 N/C	3 × M20	44506-4130 ER5018-030ME
Not included	Not included	2 N/C + 1 N/O	3 × M20	44506-5010 ER6022-021M
Not included	Not included	3 N/C + 1 N/O	3 × M20	44506-5050 ER6022-031M
Not included	Included (24 VDC)	2 N/C + 1 N/O	3 × M20	44506-5110 ER6022-021ML
Not included	Included (24 VDC)	3 N/C + 1 N/O	3 × M20	44506-5150 ER6022-031ML
Included	Not included	2 N/C + 1 N/O	3 × M20	44506-5210 ER6022-021ME
Included	Not included	3 N/C + 1 N/O	3 × M20	44506-5250 ER6022-031ME
Included	Included (24 VDC)	2 N/C + 1 N/O	3 × M20	44506-5410 ER6022-021MEL
Included	Included (24 VDC)	3 N/C + 1 N/O	3 × M20	44506-5450 ER6022-031MEL
Included	Included (24 VDC)	4 N/C + 2 N/O	4 × M20	44506-6410 ER1022-042MELL
Included	Included (24 VDC)	4 N/C + 2 N/O	4 × M20	44506-6510 ER1022-042MELR
Included	Included (24 VDC)	4 N/C + 2 N/O	4 × M20	44506-7410 ER1032-042MEL

Stainless steel housing

E-Stop	Indicator beacon	Contacts	Wiring entry	Order code
Not included	Not included	2 N/C + 2 N/O	3 × M20	44506-5810 ER6022-022MSS
Not included	Not included	3 N/C + 1 N/O	3 × M20	44506-5830 ER6022-031MSS
Not included	Included	2 N/C + 2 N/O	3 × M20	44506-5910 ER6022-022MLSS
Not included	Included	3 N/C + 1 N/O	3 × M20	44506-5930 ER6022-031MLSS
Included	Not included	2 N/C + 2 N/O	3 × M20	44506-5850 ER6022-022MESS
Included	Not included	3 N/C + 1 N/O	3 × M20	44506-5870 ER6022-031MESS
Included	Included	2 N/C + 2 N/O	3 × M20	44506-5950 ER6022-022MELSS
Included	Included	3 N/C + 1 N/O	3 × M20	44506-5970 ER6022-031MELSS

Explosion proof models

Aluminum die-cast housing

E-Stop	Indicator beacon	Contacts	Wiring entry	Order code
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	44506-5600 XER6022-011C3
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	44506-6600 XER1022-011C3L
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	44506-6610 XER1022-011C3R
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	44506-7600 XER1032-011C3

Stainless steel housing

E-Stop	Indicator beacon	Contacts	Wiring entry	Order code
Not included	Not included	1 N/C + 1 N/O	pre-wired, 3 m	44506-5610 XER6022-011C3SS
Not included	Not included	2 N/C	pre-wired, 3 m	44506-5620 XER6022-020C3SS

Accessories

Item	Applicable model	Order code
Replacement Lid	ER5018	44506-3700 SM06-SL400
	ER6022	44506-5700 SM06-SL500
	ER6022-SS stainless steel	44506-5730 SM06-SLXER6022SS
Replacement Lid/LED, 24 VDC	ER1022	44506-6710 SM06-SL710
	ER1032	44506-7710 SM06-SL711
	ER6022-SS stainless steel	44506-5740 SLER6022LSS

Item	Applicable model	Order code
Replacement Lid/LED	ER6022	44506-5710 SM06-SL510
Rope kit, 5 m, stainless steel	ER5018, ER6022, ER1022, ER1032	44506-2705 RK5
Rope kit, 10 m, stainless steel	ER5018, ER6022, ER1022, ER1032	44506-2710 RK10
Rope kit, 20 m, stainless steel	ER5018, ER6022, ER1022, ER1032	44506-2720 RK20
Rope kit, 50 m, stainless steel	ER5018, ER6022, ER1022, ER1032	44506-2750 RK50
Rope kit, 80 m, stainless steel	ER6022, ER1022, ER1032	44506-2780 RK80
Rope kit 100 m, stainless steel	ER6022, ER1022, ER1032	44506-2711 RK100
Rope kit 126 m, stainless steel	ER1032	44506-2726 RK126
Rope only, 5 m	ER5018, ER6022, ER1022, ER1032	44506-3705 R5M
Rope only, 10 m	ER5018, ER6022, ER1022, ER1032	44506-3710 R10M
Rope only, 20 m	ER5018, ER6022, ER1022, ER1032	44506-3720 R20M
Rope only, 50 m	ER5018, ER6022, ER1022, ER1032	44506-3750 R50M
Rope only, 100 m	ER5018, ER6022, ER1022, ER1032	44506-3711 R100M
Rope only, 126 m	ER5018, ER6022, ER1022, ER1032	44506-3726 R126M
Tensioner gripper, stainless steel	ER5018, ER6022, ER1022, ER1032	44506-4700 SM06-TG00
Eye bolt stainless steel, 8 per pack	ER5018, ER6022, ER1022, ER1032	44506-4710 SM06-EB10
Double loop clip, stainless steel, 4 per pack	ER5018, ER6022, ER1022, ER1032	44506-4720 SM06-DL20
Thimble stainless steel, 4 per pack	ER5018, ER6022, ER1022, ER1032	44506-4770 SM06-THSS
Turnbuckle, stainless steel	ER5018, ER6022, ER1022, ER1032	44506-4730 SM06-TB30
Spring, stainless steel	ER5018, ER6022, ER1022, ER1032	44506-4750 SM06-SP50
Rope pulley, stainless steel	ER5018, ER6022, ER1022, ER1032	44506-4780 SM06-RPSS
E-Stop mechanism	ER5018, ER6022, ER1022, ER1032	44506-4760 SM06-ES60
Yellow E-Stop Background Label	ER5018, ER6022, ER1022, ER1032	44506-4791 SM06-YLES

Specifications

Standard models

Item		Applicable model				
		ER5018	ER6022	ER6022SS	ER1022	ER1032
Electrical	Contact configurations	2 N/C + 1 N/O, 3 N/C	2 N/C + 1 N/O, 3N/C + 1N/O	3 N/C+1 N/O, 2 N/C+2 N/O	4 N/C + 2 N/O	4 N/C + 2 N/O
	Safety contacts	2 N/C, 3 N/C	2 N/C, 3 N/C		4 N/C	
	Switching ability	AC: 120 V–6 A, 240 V–3 A, inductive DC: 24 V–2.5 A, inductive				
	Auxiliary contacts	1 N/O		1 N/O, 2 N/O	2 N/O	
	Max. switching current/Volt/Amp	240 V/720 VA				
	Electrical life	1,000,000 minimum				
	LED indicator beacon	–	24 VDC			
Mechanical	Max. rope span	40 m	80 m	100 m	125 m	125 m each side
	Case material	Die-cast aluminum alloy		Die-cast 316 stainless steel casing	Die-cast aluminum alloy	
	Eye nut material	Stainless steel				
	Wiring entry	3 × M20			4 × M20	
	Mechanical life	1,000,000 minimum				
Environ- mental	Protection	IP67 (NEMA 6)				
	Operating temperature	–25 to 80°C				
	Cleaning	Water washdown				
Com- pliance	Standards	EN60947-5-1:2004, EN60947-5-5:1997+A1:2005; EN60204-1; EN ISO 13850:2006				
	Approvals/listings	CE marked for all applicable directives, UL and C-UL				

Explosion proof models

Item		Applicable model		
		XER6022	XER1022	XER1032
Electrical	Contact configuration	1 N/C + 1 N/O, 2 N/C		
	Safety contact	1 N/C, 2 N/C		
	Auxiliary contact	1 N/O		
	Rated voltage and current (AC15)	400 VAC/2 A AC, 250 VAC/4 A AC		
	Rated voltage and current (DC)	250 VDC/0.15 A DC		
	Switching ability	125 VAC/5 A, 250 VAC/5 A		
	AC ratings	Inductive load 125 VAC/3 A, 250 VAC/3 A		
	Switching ability	30 VDC/7 A, 250 VDC/0.15 A		
Compliance	DC ratings	Inductive load 30 VDC/5 A, 250 VDC/0.03 A		
	Ex-classification	II 2 G EEx d II C T6		
	Certification	PTB00 ATEX 1093X IBExU 01 ATEX 1007X		

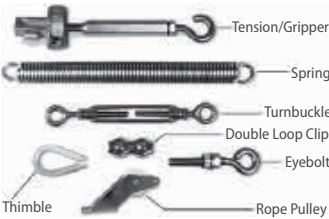
Accessories

RK rope tension kit



The RK rope tension kit comes with all of the required hardware for most installations. A spring is required as shown in the installation example below.

Installation Hardware



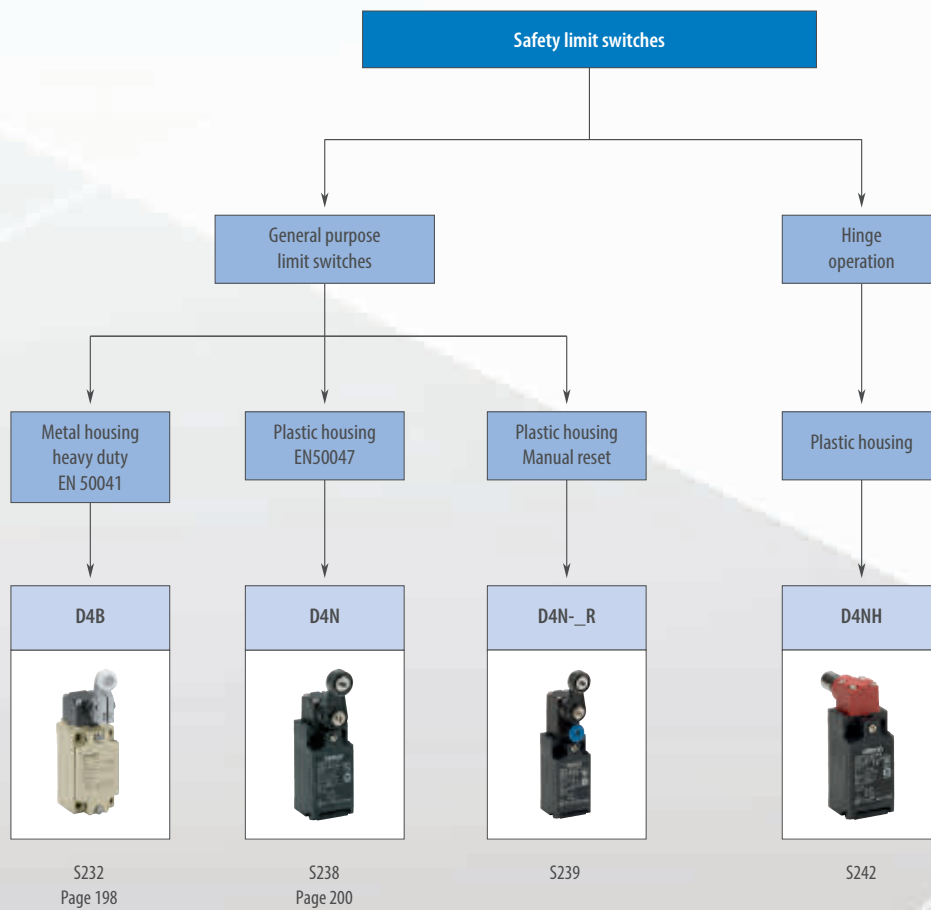
Individual hardware items may be purchased for specific installation requirements.

PRECISE MONITORING OF GUARD POSITION

Detect linear or rotational movement of guards: D4N

Guards and covers on machines protect workers. They limit access to the dangerous parts of the machine. Our safety limit switches guarantee that the guards and covers are in place before the machine is started.

- Wide variety of actuators to fit wide range of applications
- Gold-plated contacts for reliable operation with micro loads



Safety limit switches					
					
Model		D4B	D4N	D4NH	D4N- _R
Selection criteria	Housing	Metal	Plastic	Plastic	Plastic
	M12 Plug connector	–	■	■	–
	Protection class	IP67			
	Operating Temperature Range	–40 to 80°C	–30 to 70°C	–30 to 70°C	–30 to 70°C
	Conformity	EN50047, EN1088			
Features	Conduit size M20	■	■	■	■
	Gold clad contacts	■	■	■	■
	Actuators				
	Resin roller, resin lever	–	■	–	■
	Resin roller, metal lever	■	■	–	–
	Metal roller, metal lever	–	■	–	–
	Bearing lever, metal lever	–	■	–	–
	Adj. resin roller, metal lever	■	■	–	■
	Adj. Rubber roller, metal lever	–	■	–	■
	Adj. Rod lever	■	–	–	–
	Top plunger	■	■	–	■
	Top roller plunger	■	■	–	■
	Horizontal roller arm lever	–	■	–	■
	Vertical roller arm lever	–	■	–	■
	Cat whisker	–	■	–	–
	Plastic Rod	■	■	–	–
	Fork lever lock (right operation)	–	■	–	–
	Fork lever lock (left operation)	–	■	–	–
Application	Hinge operation	■	–	■	–
	Position monitoring	■	■	■	■
Contact configuration	1NC/1NO snap action	■	■	–	–
	2NC snap action	–	■	–	–
	1NC/1NO slow action	■	■	■	■
	2NC slow action	■	■	■	■
	2NC/1NO slow action	–	■	■	■
	3NC slow action	–	■	■	■
	1NC/1NO (MBB slow action)	–	■	■	–
	2NC/1NO (MBB slow action)	–	■	■	–
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■ Standard

– No/not available



Limit switch with metal housing

The D4B series of limit switches in a rugged metal housing is suitable for both safety and non-safety applications due to its direct opening mechanism and TÜV approval. Furthermore with the increased temperature range and enhanced mechanical switching lifetime, the D4B is first choice for all applications from standard to demanding environments and for highest flexibility in mounting and connectivity preferences.

- Direct opening mechanism and approval by notified body
- Rugged metal housing and extended mechanical switching lifetime (snap action models)
- Terminal block for direct wiring

Ordering information

Actuator type		Connection method	Order code*1		
			1NC/1NO (snap-action)	1NC/1NO (slow-action)	2NC (slow-action)
	Roller lever*2	Terminal block with M20 conduit	D4B-4111N	D4B-4511N	D4B-4A11N
	Adjustable roller lever		D4B-4116N	D4B-4516N	D4B-4A16N
	Adjustable rod lever		D4B-4117N	D4B-4517N	D4B-4A17N
	Plain		D4B-4170N	D4B-4570N	D4B-4A70N
	Roller		D4B-4171N	D4B-4571N	D4B-4A71N

*1 The NC contacts provide the approved direct opening mechanism.

*2 For models with stainless steel rollers and temperature resistance of -40°C refer to WL-_-TC.

Specifications

Item		Snap-action	Slow-action
Durability*1	Mechanical	30,000,000 operations min.	10,000,000 operations min.
	Electrical	500,000 operations min. (at a 250 VAC, 10 A resistive load)	
Operating speed		1 mm/s to 0.5 m/s	
Operating frequency	Mechanical	120 operations/min	
	Electrical	30 operations/min	
Rated frequency		50/60 Hz	
Contact resistance		25 mΩ max. (initial value)	
Pollution degree (operating environment)		3 (EN60947-5-1)	
Conditional short-circuit current		100 A (EN60947-5-1)	
Conventional enclosed thermal current (I _{th})		20 A (EN60947-5-1)	
Protection against electric shock		Class I (with ground terminal)	
Ambient temperature	Operating	-40 to 80°C (with no icing)*2	
Degree of protection		IP67 (EN60947-5-1)	

*1 The values are acquired for an ambient temperature of 5 to 35°C and an ambient humidity of 40 to 70%.

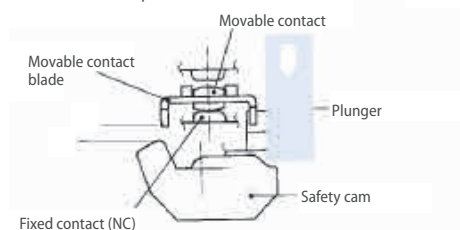
*2 -25 to 80°C for the flexible-rod actuator.

1NO/1NC Contact (Snap-action)

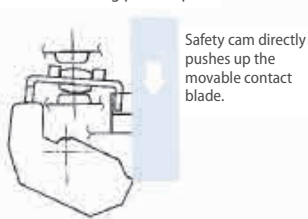
If metal deposition between mating contacts occurs on the NC contact side, they can be pulled apart by the shearing force and tensile force generated when part B of the

safety cam or plunger engages part A of the movable contact blade. When the safety cam or plunger is moved in the direction of the arrow, the Limit Switch releases.

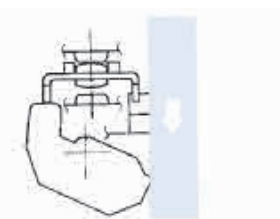
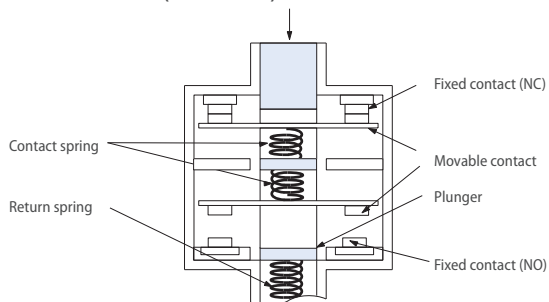
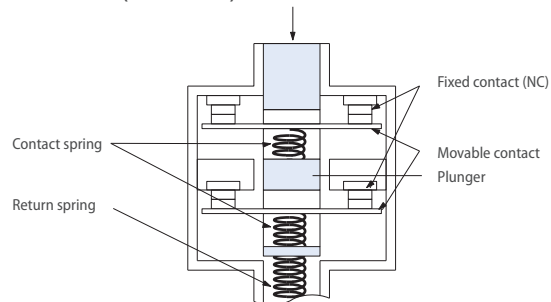
1. When metal deposition occurs.



2. When contacts are being pulled apart.



3. When contacts are completely pulled apart.

**1NC/1NO Contact (Slow-action)****2NC Contact (Slow-action)**

NC contacts conform to EN60947-5-1 Direct Opening

When metal deposition occurs, the contacts are separated from each other by the plunger being pushed in.

⊞ is marked on the product to indicate approval of direct opening.



Limit switch with plastic housing

The D4N series of limit switches in plastic housing is the ideal switch for all standard mechanical position detection applications both for safety and non-safety applications.

- Direct opening mechanism and approval by notified body
- Rugged plastic housing with double insulation
- Wide range of actuators
- M12 connectors or terminal block with M20 conduit

Ordering information

Actuator type		Connection method	Order code*1			
			1NC/1NO (snap-action)	1NC/1NO (slow-action)	2NC (slow-action)	2NC/1NO (slow-action)
	Roller lever (resin lever, resin roller)	M20	D4N-4120	D4N-4A20	D4N-4B20	D4N-4C20
		M12 connector	D4N-9120	D4N-9A20	D4N-9B20	—
	Plunger	M20	D4N-4131	D4N-4A31	D4N-4B31	—
		M12 connector	D4N-9131	D4N-9A31	D4N-9B31	—
	Roller plunger	M20	D4N-4132	D4N-4A32	D4N-4B32	D4N-4C32
		M12 connector	D4N-9132	D4N-9A32	D4N-9B32	—
	One-way roller arm lever (horizontal)	M20	D4N-4162	D4N-4A62	D4N-4B62	D4N-4C62
		M12 connector	D4N-9162	D4N-9A62	D4N-9B62	—
	One-way roller arm lever (vertical)	M20	D4N-4172	D4N-4A72	D4N-4B72	—
	Adjustable roller lever, form lock (metal lever, resin roller)	M20	D4N-412G	D4N-4A2G	D4N-4B2G	—
		M12 connector	D4N-912G	D4N-9A2G	D4N-9B2G	—
	Adjustable roller lever, form lock (metal lever, rubber roller)	M20	D4N-412H	D4N-4A2H	D4N-4B2H	—
		M12 connector	D4N-912H	D4N-9A2H	D4N-9B2H	—

Switches with MBB contacts

MBB (Make Before Break) contacts have an overlapping structure, so that before the normally closed (NC) contact opens the normally open (NO) contact closes.

Actuator type		Connection method	Order code*1	
			1NC/1NO (slow-action)	2NC/1NO (slow-action)
	Roller lever (resin lever, resin roller)	M20	D4N-4E20	D4N-4F20
		M12 connector	D4N-9E20	—
	Roller plunger	M20	D4N-4E32	D4N-4F32
		M12 connector	D4N-9E32	—
	One-way roller arm lever (horizontal)	M20	D4N-4E62	D4N-4F62
		M12 connector	D4N-9E62	—

*1 The NC contacts provide the approved direct opening mechanism. 

Specifications

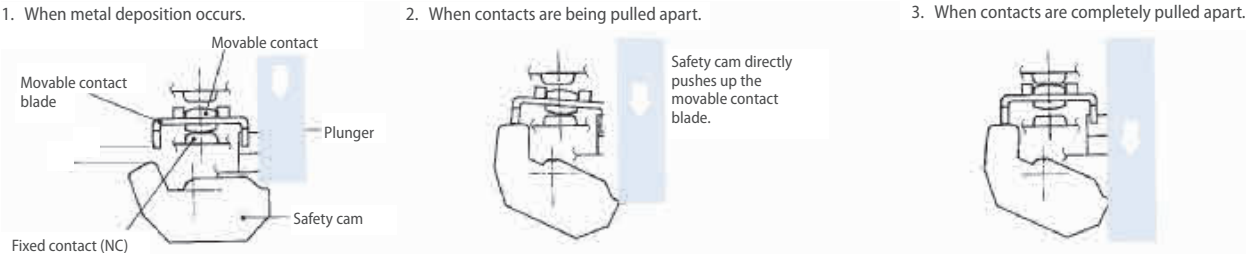
Durability*1	Mechanical	15,000,000 operations min.*2
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC 300,000 operations min. for a resistive load of 10 A at 250 VAC
Operating speed	Roller lever	1 mm/s to 0.5 m/s
Operating frequency		30 operations/minute max.
Minimum applicable load		Resistive load of 1 mA at 5 VDC (N-level reference value)
Protection against electric shock		Class II (double insulation)
Pollution degree (operating environment)		3 (EN60947-5-1)
Contact gap		Snap-action: 2x0.5 mm min Slow-action: 2x2 mm min
Conditional short-circuit current		100 A (EN60947-5-1)
Rated open thermal current (I _{th})		10 A (EN60947-5-1)
Ambient temperature	Operating	−30°C to 70°C with no icing
Degree of protection		IP67 (EN60947-5-1)

*1 The durability is acquired for an ambient temperature of 5°C to 35°C and an ambient humidity of 40 to 70%.
*2 10,000,000 operations min. for fork lever actuator.

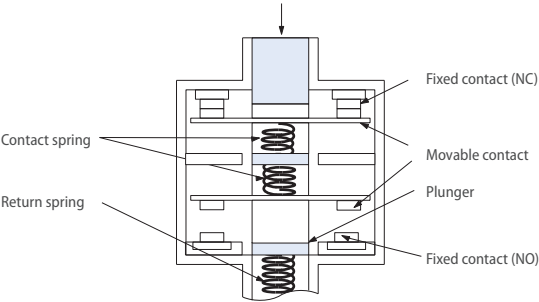
1NO/1NC Contact (Snap-action)

If metal deposition between mating contacts occurs on the NC contact side, they can be pulled apart by the shearing force and tensile force generated when part B of the

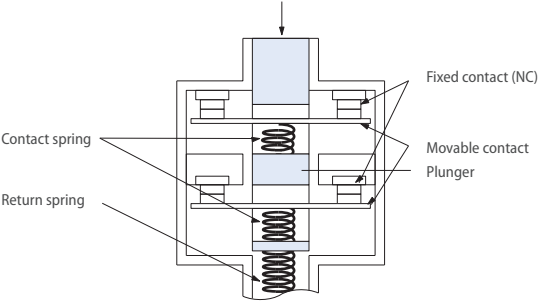
safety cam or plunger engages part A of the movable contact blade. When the safety cam or plunger is moved in the direction of the arrow, the Limit Switch releases.



1NC/1NO Contact (Slow-action)



2NC Contact (Slow-action)



NC contacts conform to EN60947-5-1 Direct Opening

When metal deposition occurs, the contacts are separated from each other by the plunger being pushed in.

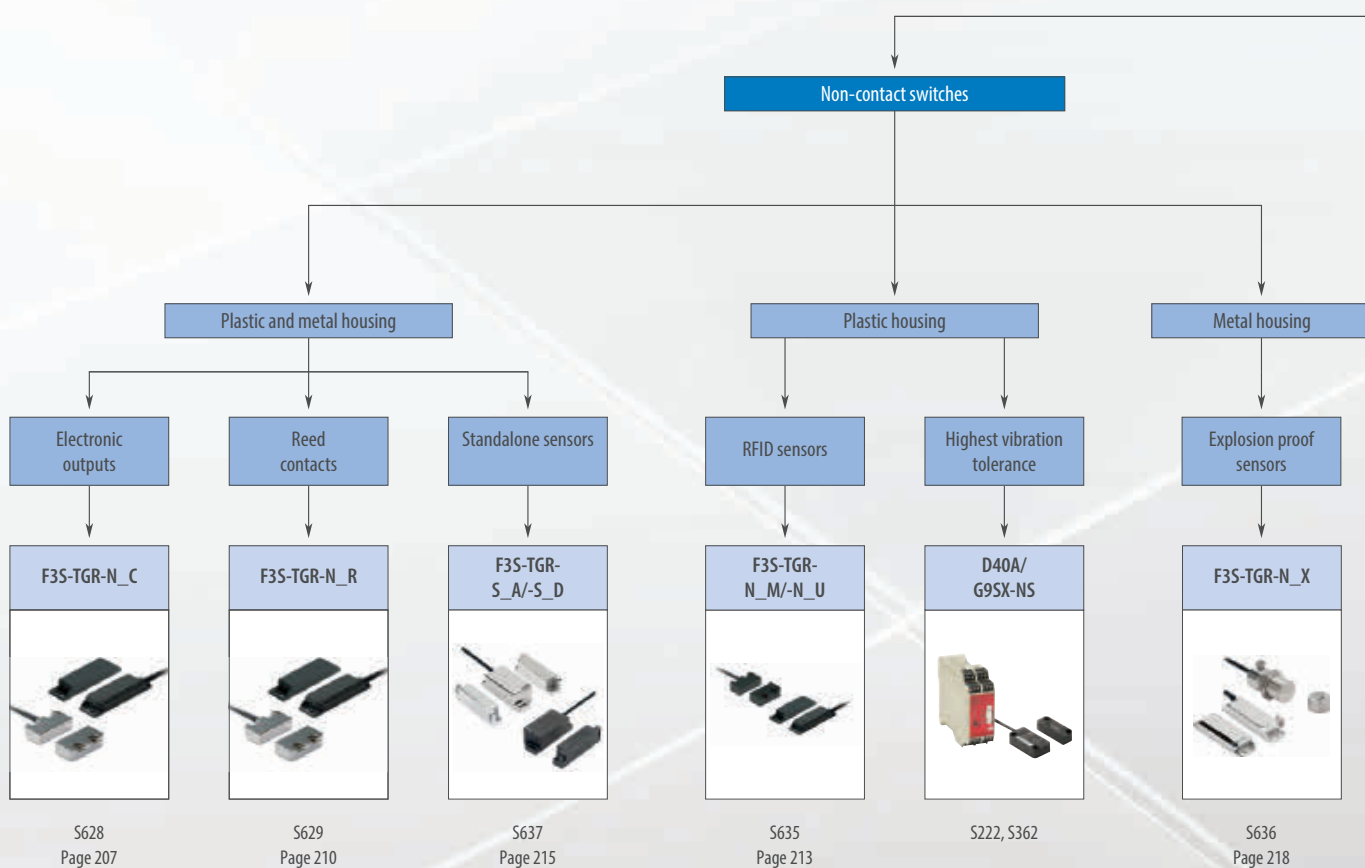
⤵ is marked on the product to indicate approval of direct opening.

BREAK CONVENTIONAL BARRIERS IN SAFETY DESIGN

Flexibility selecting best fit control device for non-contact switch application: F3S-TGR-N

Omron has introduced a series of magnetic coded contactless switches for interlocking machine guard doors. The switches feature a built-in control function, thus saving the cost and space required for an external controller. The non-contact switches offer advantages in applications where a precise approach of the guard and lock is not possible. Applications with a large amount of dirt or high hygienic standards can also be addressed.

- Operates with all Omron safety relay units and safety bus interfaces
- Operates behind stainless steel fittings
- Non-contact – no abrasion – no particles
- Conforms to safety categories up to 4 acc. EN 954-1 and PLe acc. EN ISO 13849-1

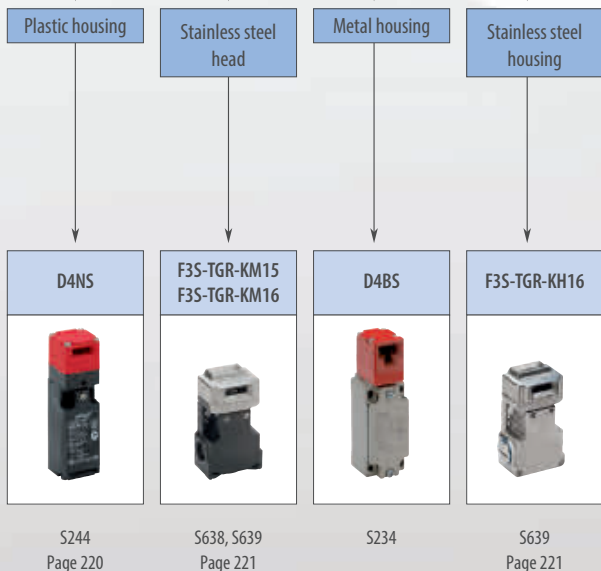




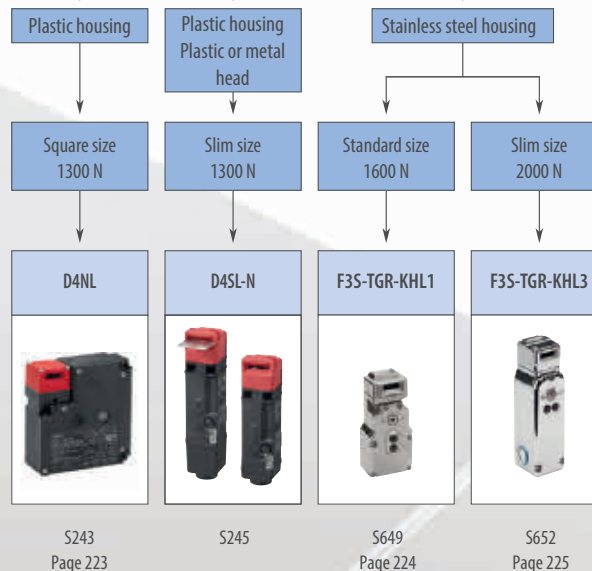
Safety door switches

Key operated switches

Safety switch



Safety guard lock switch



Selection table

		Non-contact safety door switches					
							
Model		F3S-TGR-N_C	F3S-TGR-N_R	F3S-TGR-N_M/-N_U	F3S-TGR-S_A/-S_D	F3S-TGR-N_X	D40A/G9SX-NS
Selection criteria	Housing	Plastic/Metal	Plastic/Metal	Plastic	Plastic/Metal	Metal	Plastic
	Protection class	IP67/IP69K	IP67/IP69K	IP67/IP69K	IP67/IP69K	IP67	IP67
	Conformity	EN ISO 13849-1, EN60947-5-3	EN ISO 13849-1, EN60947-5-3	EN ISO 13849-1, EN60947-5-3	EN ISO 13849-1, EN60947-5-3	EN ISO 13849-1, EN60947-5-3	EN ISO 13849-1
Features	Cable length 2 m	■	■	–	–	–	■
	Cable length 5 m	■	■	■	■	■	■
	Cable length 10 m	■	■	■	■	■	–
	Connector type M12	■	■	■	■	■	–
	High temperature sensor	■	■	–	–	–	–
	Operates with G9SA, G9SB	■	■	■	■	■	–
	Operates with G9SX	■	■	■	■	■	■
	Operates with programmable safety units G9SP and NE1A	■	■	■	■	■	–
Application	Door monitoring	■	■	■	■	■	■
Contact configuration	1NC/1NO	–	–	–	–	–	■
	2NC	■	■	–	–	–	–
	2NC/1NO	■	■	■	■	■	–
	Force guided relays	–	–	–	■	–	–
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		Safety door switches					Safety door lock switches			
										
Model		D4NS	F3S-TGR-KM15	F3S-TGR-KM16	D4B5	F3S-TGR-KH16	D4NL	D4SL-N	F3S-TGR-KHL1	F3S-TGR-KHL3
Selection criteria	Housing	Plastic	Plastic body Metal head	Plastic body Metal head	Metal	Stainless steel	Plastic	Plastic/metal head available	Stainless steel	Stainless steel
	Head mounting	4 directions	2 directions	2 directions	4 directions	2 directions	4 directions	4 directions	2 directions	4 directions
	Actuation	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight	Straight
	Key holding force	—	—	—	—	—	1,300 N	1,300 N	1,600 N	2,000 N
	Protection class	IP67	IP67	IP67	IP67	IP69k	IP67	IP67	IP69k	IP69k
	Conformity	EN50047, EN1088	EN1088	EN1088	EN50047, EN1088	EN1088	EN1088	EN1088	EN1088	EN1088
Features	Conduit size M20	■	■	■	PG 13.5	■	■	■	■	■
	Screw terminal	■	■	■	■	■	■	■	■	■
	Connector terminal	—	—	—	—	—	—	■	—	—
	Operation key horizontal	■	■	■	■	■	■	■	■	■
	Operation key vertical	■	■	■	■	■	■	■	■	■
	Operation key adjustable horizontal	■	■	■	■	■	■	■	■	■
	Operation key adjustable horizontal and vertical	■	■	■	—	■	■	■	■	■
	Mechanical lock/ 24 VDC solenoid release	—	—	—	—	—	■	■	■	■
	Mechanical lock/ 110 VAC solenoid release	—	—	—	—	—	■	—	—	—
	Mechanical lock/ 230 VAC solenoid release	—	—	—	—	—	■	—	—	—
	24 VDC solenoid lock/ mechanical release	—	—	—	—	—	■	■	—	—
	110 VAC solenoid lock mechanical release	—	—	—	—	—	■	—	—	—
	240 VAC solenoid lock mechanical release	—	—	—	—	—	■	—	—	—
	High temperature sensor	—	—	—	—	—	—	—	—	—
	Operates with G9SR	■	■	■	■	■	■	■	■	■
	Operates with G9SA, G9SB	■	■	■	■	■	■	■	■	■
	Operates with G9SX	■	■	■	■	■	■	■	■	■
	Operates with programmable safety units G9SP and NE1A	■	■	■	■	■	■	■	■	■
Application	Door monitoring	■	■	■	■	■	■	■	■	■
	Door locking	—	—	—	—	—	■	■	■	■
Contact configuration	2 contact models	■	—	—	■	—	—	—	—	—
	3 contact models	■	■	■	—	■	—	—	—	—
	4 contact models	—	—	—	—	—	—	■	■	■
	5 contact models	—	—	—	—	—	■	■	—	—
	6 contact models	—	—	—	—	—	—	■	—	—
	Slow action contacts	■	■	■	—	■	—	—	■	■
Page/Quick Link		220/S244	221/S638	221/S639	S234	221/S639	223/S243	S245	224/S649	225/S652

■ Standard

— No/not available



Hall coded non-contact for monitoring the status of guarding doors

Hall coded non-contact switches monitor the status of guarding doors. Stainless steel housing for high hygiene demands in the food industry are available.

- Based on hall technology
- Connect up to 3 switches in series
- LED supports easy diagnosis
- Operates with all OMRON safety controllers
- Operates behind stainless steel fittings
- Non-contact – no abrasion – no particles
- Compensation of mechanical tolerances
- Suitable for high pressure cleaning, CIP/SIP processes due IP69K (pre-wired types)
- Conforms to safety categories up PLe acc. EN ISO13849-1

Ordering information

Polyester housing

Type	Cable connection	Contact configuration	Order code
Elongated sensors 	5 m pre-wired	2NC/1NO	F3S-TGR-NLPC-21-05
	10 m pre-wired		F3S-TGR-NLPC-21-10
	M12, 8-pin		F3S-TGR-NLPC-21-M1J8
Small sensors 	5 m pre-wired		F3S-TGR-NSPC-21-05
	10 m pre-wired		F3S-TGR-NSPC-21-10
	M12, 8-pin		F3S-TGR-NSPC-21-M1J8
Miniature sensors 	5 m pre-wired ^{*1}		F3S-TGR-NMPC-21-05
	10 m pre-wired ^{*1}		F3S-TGR-NMPC-21-10
	M12, 8-pin ^{*1}		F3S-TGR-NMPC-21-M1J8
Barrel sensors 	5 m pre-wired		F3S-TGR-NBPC-21-05
	10 m pre-wired		F3S-TGR-NBPC-21-10
	M12, 8-pin		F3S-TGR-NBPC-21-M1J8

^{*1} Optional cable exit to the right side is available for F3S-TGR-NMPC-types. Please add "R" to the order code (i.e. F3S-TGR-NMPC-21-05-R)

Stainless steel housing

Type	Cable connection	Contact configuration	Order code
Elongated sensors 	5 m pre-wired	2NC/1NO	F3S-TGR-NLMC-21-05
	10 m pre-wired		F3S-TGR-NLMC-21-10
	M12, 8-pin		F3S-TGR-NLMC-21-M1J8
Small sensors 	5 m pre-wired		F3S-TGR-NSMC-21-05
	10 m pre-wired		F3S-TGR-NSMC-21-10
	M12, 8-pin		F3S-TGR-NSMC-21-M1J8
Barrel sensors 	5 m pre-wired		F3S-TGR-NBMC-21-05
	10 m pre-wired		F3S-TGR-NBMC-21-10
	M12, 8-pin		F3S-TGR-NBMC-21-M1J8

Hygienic and food types

Type	Cable connection	Contact configuration	Order code
 Small sensors	5 m pre-wired	2NC/1NO	F3S-TGR-NSHC-21-05
	10 m pre-wired		F3S-TGR-NSHC-21-10
	M12, 8-pin		F3S-TGR-NSHC-21-M1J8
 Small sensors (Special food type)	5 m pre-wired		F3S-TGR-NSFC-21-05
	10 m pre-wired		F3S-TGR-NSFC-21-10
	M12, 8-pin		F3S-TGR-NSFC-21-M1J8
 Miniature sensors	5 m pre-wired ^{*1}		F3S-TGR-NMHC-21-05
	10 m pre-wired ^{*1}		F3S-TGR-NMHC-21-10
	M12, 8-pin ^{*1}		F3S-TGR-NMHC-21-M1J8

^{*1} Optional cable exit to the right side is available for F3S-TGR-NMHC-types. Please add "R" to the order code (i.e. F3S-TGR-NMHC-21-05-R)

Specifications

Mechanical data

Item	Model	Polyester types	Stainless steel types
Serial switching		up to 3 pcs.	
Indicator LED	–	LED green - Indication of safety circuit closed	
Operating distance ^{*1}	OFF → ON (Sao)	Min. 8 mm/max. 10 mm	
	ON → OFF (Sar)	Min. 12 mm/max. 22 mm	
Actuator approach speed	Min.	4 mm/s	
	Max.	1,000 mm/s	
Operating temperature	–	–25 to 80°C	–25 to 105°C
Enclosure protection	Flying lead	IP69K	
	M12 connector	IP67	
Material cable	Flying lead	PVC, Ø 6 mm o.d.	
	M12 connector	250 mm, PVC, Ø 6 mm o.d.	
Material housing	–	Black polyester	Stainless steel 316

^{*1} Depends on type. Please see online data sheet.

Electrical data

Item	Model	Polyester types	Stainless steel types
Sensor technology	–	Hall	
Power supply	–	24 VDC±15%	
Power consumption	Max.	50 mA	
Switching current	Min.	10 mA, 10 VDC	
Rated loads	NC contacts	200 mA, 24 VDC	
	NO contact	200 mA, 24 VDC	
Output type	–	Electronic output (potential-free optocoupler output)	

Approved standards

EN standards certified by TÜV Rheinland
EN ISO13849-1
EN 62061
EN ISO 14119
EN 60204-1
EN/IEC 60947-5-3
UL 508, CSA C22.2
BS 5304
EN 1088-1 conformance

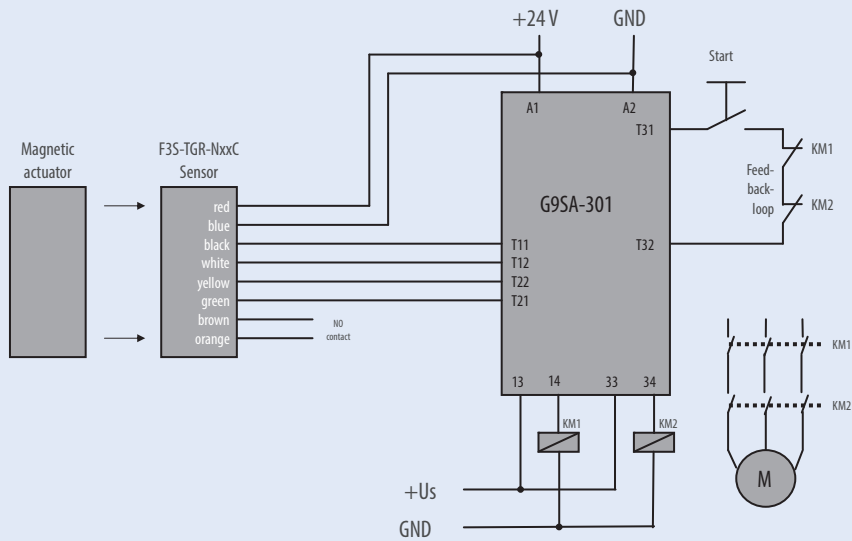
Accessories

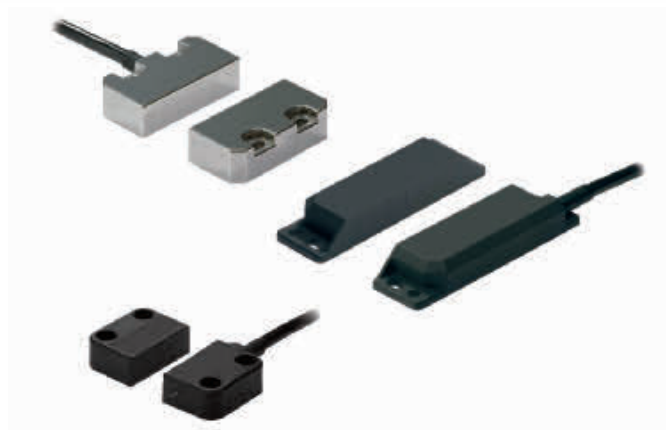
		Order code
Cables 8-pin	2 m	Y92E-M12PURSH8S2M-L
	5 m	Y92E-M12PURSH8S5M-L
	10 m	Y92E-M12PURSH8S10M-L
	25 m	Y92E-M12PURSH8S25M-L
T-connector connection cable	M12 T-connector for M12 connector-types	F39-TGR-NT
	0.6 m, M12-8pin	Y92E-M12FSM12MSPURSH806M-L
	2 m, M12-8pin	Y92E-M12FSM12MSPURSH82M-L
	5 m, M12-8pin	Y92E-M12FSM12MSPURSH85M-L
	10 m, M12-8pin	Y92E-M12FSM12MSPURSH810M-L
Actuators	for F3S-TGR-NLPC	F39-TGR-NLPC-A
	for F3S-TGR-NSPC	F39-TGR-NSPC-A
	for F3S-TGR-NMPC	F39-TGR-NMPC-A
	for F3S-TGR-NCPC	F39-TGR-NCPC-A
	for F3S-TGR-NWPC	F39-TGR-NWPC-A
	for F3S-TGR-NBPC	F39-TGR-NBPC-A
	for F3S-TGR-NLMC	F39-TGR-NLMC-A
	for F3S-TGR-NSMC	F39-TGR-NSMC-A
	for F3S-TGR-NBMC	F39-TGR-NBMC-A
	for F3S-TGR-NSHC	F39-TGR-NSHC-A
	for F3S-TGR-NSFC	F39-TGR-NSFC-A
	for F3S-TGR-NMHC	F39-TGR-NMHC-A
Mounting screws	Set of Torx safety screws (M4, 4 × 30 mm, 4 × 20 mm, 4 × 10 mm; incl. washers and Torx bit)	F39-TGR-N-SCREWS

Wiring examples (Single head connection)

G9SA

Single sensor application with G9SA-301
(up to PLe acc. EN ISO 13849-1)





Reed non-contact switches for monitoring the status of guarding doors

Reed non-contact switches monitor the status of guarding doors. Stainless steel housing for high hygiene demands in the food industry are available.

- Based on reed technology
- Connect up to 6 switches in series
- Operates with all Omron safety controllers
- Operates behind stainless steel fittings
- Non-contact – no abrasion – no particles
- Compensation of mechanical tolerances
- Suitable for high pressure cleaning, CIP/SIP processes due IP69K (pre-wired types)
- Conforms to safety categories up PLe acc. EN ISO13849-1

Ordering information

Polyester housing

Type	Cable connection	Contact configuration	Order code
 Elongated sensors	5 m pre-wired	2NC/1NO ^{*1}	F3S-TGR-NLPR-21-05
	10 m pre-wired		F3S-TGR-NLPR-21-10
	M12, 8-pin		F3S-TGR-NLPR-21-M1J8
 Small sensors	5 m pre-wired	2NC/1NO ^{*1}	F3S-TGR-NSPR-21-05
	10 m pre-wired		F3S-TGR-NSPR-21-10
	M12, 8-pin		F3S-TGR-NSPR-21-M1J8
 Miniature sensors	5 m pre-wired ^{*2}	2NC/1NO ^{*3}	F3S-TGR-NMPR-21-05
	10 m pre-wired ^{*2}		F3S-TGR-NMPR-21-10
	M12, 8-pin ^{*2}		F3S-TGR-NMPR-21-M1J8
 Barrel sensors	5 m pre-wired	2NC/1NO ^{*3}	F3S-TGR-NBPR-21-05
	10 m pre-wired		F3S-TGR-NBPR-21-10
	M12, 8-pin		F3S-TGR-NBPR-21-M1J8

^{*1} 2NC: 1 A, 250 VAC/1NC: 0.2 A, 24 VDC

^{*2} Optional cable exit to the right side is available for F3S-TGR-NMPR-types. Please add "R" to the order code (i.e. F3S-TGR-NMPR-21-05-R)

^{*3} 2NC: 0.5 A, 24 VDC/1NC: 0.2 A, 24 VDC

Stainless steel housing

Type	Cable connection	Contact configuration	Order code
 Elongated sensors	5 m pre-wired	2NC/1NO ^{*1}	F3S-TGR-NLMR-21-05
	10 m pre-wired		F3S-TGR-NLMR-21-10
	M12, 8-pin		F3S-TGR-NLMR-21-M1J8
 Small sensors	5 m pre-wired	2NC/1NO ^{*1}	F3S-TGR-NSMR-21-05
	10 m pre-wired		F3S-TGR-NSMR-21-10
	M12, 8-pin		F3S-TGR-NSMR-21-M1J8
 Barrel sensors	5 m pre-wired	2NC/1NO ^{*2}	F3S-TGR-NBMR-21-05
	10 m pre-wired		F3S-TGR-NBMR-21-10
	M12, 8-pin		F3S-TGR-NBMR-21-M1J8

^{*1} 2NC: 1 A, 250 VAC/1NC: 0.2 A, 24 VDC

^{*2} 2NC: 0.5 A, 24 VDC/1NC: 0.2 A, 24 VDC

Hygienic and food types

Type	Cable connection	Contact configuration	Order code
 Small sensors	5 m pre-wired	2NC/1NO ^{*1}	F3S-TGR-NSHR-21-05
	10 m pre-wired		F3S-TGR-NSHR-21-10
	M12, 8-pin		F3S-TGR-NSHR-21-M1J8
 Small sensors (Special food type)	5 m pre-wired	2NC/1NO ^{*3}	F3S-TGR-NSFR-21-05
	10 m pre-wired		F3S-TGR-NSFR-21-10
	M12, 8-pin		F3S-TGR-NSFR-21-M1J8
 Miniature sensors	5 m pre-wired ^{*2}	2NC/1NO ^{*3}	F3S-TGR-NMHR-21-05
	10 m pre-wired ^{*2}		F3S-TGR-NMHR-21-10
	M12, 8-pin ^{*2}		F3S-TGR-NMHR-21-M1J8

^{*1} 2NC: 1 A, 250 VAC/1NC: 0.2 A, 24 VDC

^{*2} Optional cable exit to the right side is available for F3S-TGR-NMHR-types. Please add "-R" to the order code (i.e. F3S-TGR-NMHR-21-05-R)

^{*3} 2NC: 0.5 A, 24 VDC/1NC: 0.2 A, 24 VDC

Specifications

Mechanical data

Item	Model	Plastic housing	Stainless steel housing
Serial switching		up to 6 pcs.	
Operating distance	OFF → ON (Sao)	10 mm Close	
	ON → OFF (Sar)	20 mm* Open	
Actuator approach speed	Min.	4 mm/s	
	Max.	1,000 mm/s	
Operating temperature	–	–25 to 80°C	–25 to 105°C
Enclosure protection	Flying lead	IP69K	
	M12 connector	IP67	
Material cable	Flying lead	PVC, Ø 6 mm o.d.	
	M12 connector	250 mm, PVC, Ø 6 mm o.d.	
Material housing	–	Black polyester	Stainless steel 316

* max. 22 mm, depends on the type

Electrical data

Item	Model	Plastic housing	Stainless steel housing
Indicator LED		none	
Contact release time	Max.	2 ms	
Initial contact resistance	Max.	500 mΩ	
Switching current	Min.	1 mA, 10 VDC	

Approved standards

EN standards certified by TÜV Rheinland
EN ISO13849-1
EN 60204-1
EN 62061
EN/IEC 60947-5-3
UL 508, CSA C22.2
BS 5304
EN 1088-1 conformance

Accessories

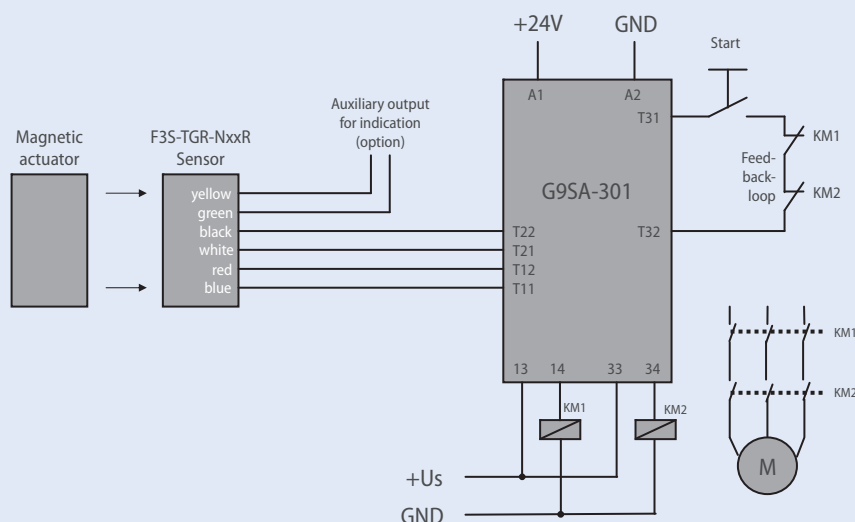
		Order code
Cables 8-pin	2 m	Y92E-M12PURSH8S2M-L
	5 m	Y92E-M12PURSH8S5M-L
	10 m	Y92E-M12PURSH8S10M-L
	25 m	Y92E-M12PURSH8S25M-L
Actuators	for F3S-TGR-NLPR	F39-TGR-NLPR-A
	for F3S-TGR-NSPR	F39-TGR-NSPR-A
	for F3S-TGR-NMPR	F39-TGR-NMPR-A
	for F3S-TGR-NCPR	F39-TGR-NCPR-A
	for F3S-TGR-NWPR	F39-TGR-NWPR-A
	for F3S-TGR-NBPR	F39-TGR-NBPR-A
	for F3S-TGR-NLMR	F39-TGR-NLMR-A
	for F3S-TGR-NSMR	F39-TGR-NSMR-A
	for F3S-TGR-NBMR	F39-TGR-NBMR-A
	for F3S-TGR-NSHR	F39-TGR-NSHR-A
	for F3S-TGR-NSFR	F39-TGR-NSFR-A
	for F3S-TGR-NMHR	F39-TGR-NMHR-A
Mounting screws	Set of Torx safety screws (M4, 4 × 30 mm, 4 × 20 mm, 4 × 10 mm; incl. washers and Torx bit)	F39-TGR-N-SCREWS
Spacer (8 mm, Set of 2pcs.)* ¹	for elongated sensors	F39-TGR-NLR-SPACER
	for small sensors	F39-TGR-NSR-SPACER
	for miniature sensors	F39-TGR-NMR-SPACER
	for long sensors	F39-TGR-NLR-SPACER
	for wide sensors	F39-TGR-NWR-SPACER

*¹ Spacers are needed to prevent influences if switch is mounted on ferromagnetic background (e. g. reduced switching distance, EMC influences)

Wiring examples (Single head connection)

G9SA

Single sensor application with G9SA-301
(up to PLe acc. EN ISO 13849-1)





RFID non-contact switches

RFID Non-contact switches are designed to monitor hinge, sliding or removal guard doors.

- Based on RFID technology (code) and hall technology (distance check)
- The RFID-design covers two operation models with very high anti-tamper level:
- M-types (Master coded): Any sensor works with any actuator, like traditional switches
- U-types (Unique coded): Each sensor and actuator use a unique code. This is a solution for applications that requires even a higher anti-tamper level
- Connect up to 20 switches in series
- LED supports easy diagnosis
- Compensation of mechanical tolerances
- Non-contact – no abrasion – no particles
- Operates with all OMRON safety controllers
- Suitable for CIP/SIP processes and high pressure cleaning due IP69K (pre-wired types)
- Conforms to safety categories up to PLe acc. EN ISO 13849-1

Ordering information

Master coded: Any actuator will operate with any sensor (Power down - power up re-teach needed if exchange of actuator)

Unique coded: Only one actuator fits to the code of the sensor

Elongated sensors

Type	Cable connection	Contact configuration	Order code	
			Master coded	Unique coded
	5 m pre-wired	2NC/1NO	F3S-TGR-NLPM-21-05	F3S-TGR-NLPU-21-05
	10 m pre-wired		F3S-TGR-NLPM-21-10	F3S-TGR-NLPU-21-10
	M12, 8-pin		F3S-TGR-NLPM-21-M1J8	F3S-TGR-NLPU-21-M1J8

Small sensors

Type	Cable connection	Contact configuration	Order code	
			Master coded	Unique coded
	5 m pre-wired	2NC/1NO	F3S-TGR-NSPM-21-05	F3S-TGR-NSPU-21-05
	10 m pre-wired		F3S-TGR-NSPM-21-10	F3S-TGR-NSPU-21-10
	M12, 8-pin		F3S-TGR-NSPM-21-M1J8	F3S-TGR-NSPU-21-M1J8

Specifications

Mechanical data

Item			
Serial switching			up to 20 pcs.
Indicator LED			LED green - Indication of safety circuit closed
Operating distance	OFF → ON (Sao)		10 mm Close
	ON → OFF (Sar)		20 mm Open
Actuator approach speed	Min.		4 mm/s
	Max.		1,000 mm/s
Operating temperature			-25 to 80°C
Enclosure protection	Flying lead		IP69K
	M12 connector		IP67
Material cable	Flying lead		PVC, Ø 6 mm o.d.
	M12 connector		250 mm, PVC, Ø 6 mm o.d.
Material			UL approved Polyester

Electrical data

Item			F3S-TGR-N_M	F3S-TGR-N_U
Code			Master coded: Every switch same code (Power down - Power up re-teach needed, if actuator interchanged)	Unique coded: 32 x 16 ⁶ different codes
Technology			RFID (code) and Hall (distance check)	
Power supply			24 VDC±15%	
Power consumption		Max.	0.2 A	
Switching current		Min.	1 mA, 10 VDC	
Rated loads	NC contacts	Max.	0.2 A, 24 VDC	
	NO contact	Max.	0.2 A, 24 VDC	
Output type			Electronic output (potential-free optocoupler output)	

Approved standards

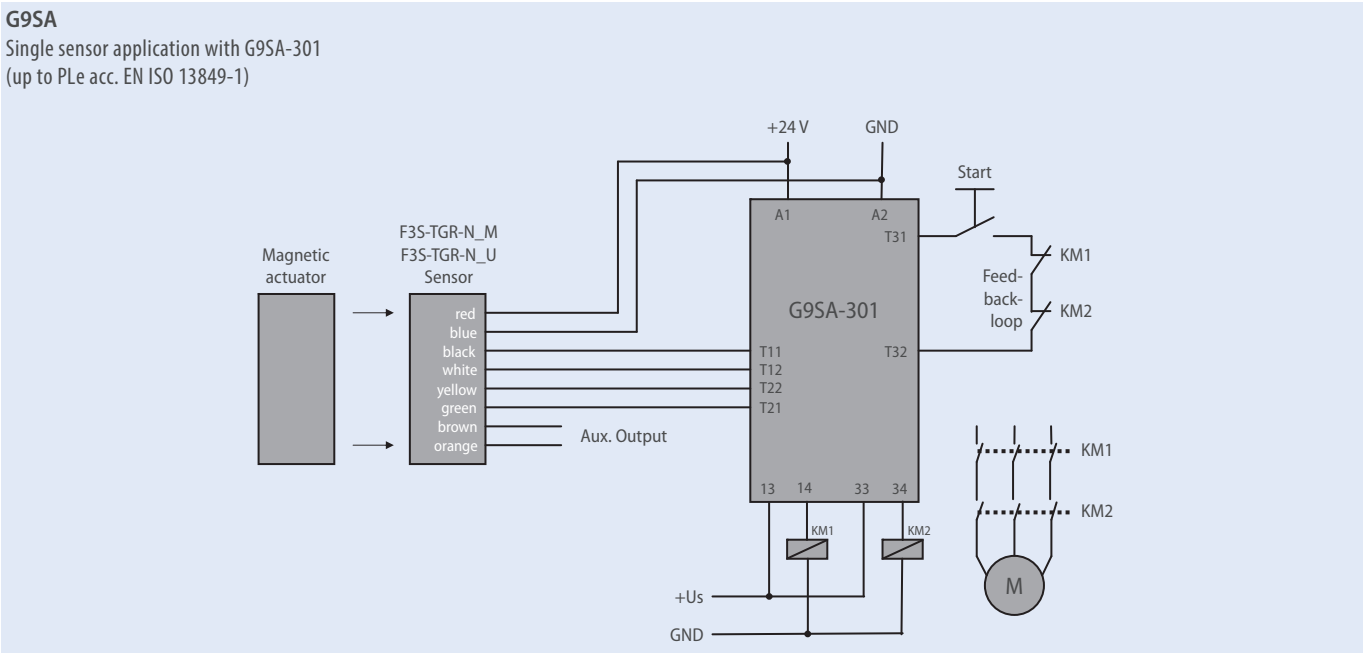
EN standards certified by TÜV Rheinland
EN 62061
EN ISO 14119
EN ISO13849-1
EN 60204-1

EN standards certified by TÜV Rheinland
EN/IEC 60947-5-3
UL 508, CSA C22.2
BS 5304
EN 1088-1 conformance

Accessories

		Order code
Cables 8-pin	2 m	Y92E-M12PURSH8S2M-L
	5 m	Y92E-M12PURSH8S5M-L
	10 m	Y92E-M12PURSH8S10M-L
	25 m	Y92E-M12PURSH8S25M-L
T-Connector connection cable	T-Connector for M12 connector	F39-TGR-NT
	0.6 m, M12-8pin	Y92E-M12FSM12MSPURSH806M-L
	2 m, M12-8pin	Y92E-M12FSM12MSPURSH82M-L
	5 m, M12-8pin	Y92E-M12FSM12MSPURSH85M-L
	10 m, M12-8pin	Y92E-M12FSM12MSPURSH810M-L
Actuators (only for master coded types)	for F3S-TGR-NLPM	F39-TGR-NLPM-A
	for F3S-TGR-NSPM	F39-TGR-NSPM-A
Mounting screws	Set of Torx safety screws (M4, 4 × 30 mm, 4 × 20 mm, 4 × 10 mm; incl. washers and Torx bit)	F39-TGR-N-SCREWS

Wiring examples (Single head connection)





Standalone non-contact safety switches

Standalone non-contact switches support applications like guarding doors or position monitoring in machines. They are using the proven Omron non-contact technology allowing to cover mechanical tolerances and vibrations

- Models with single or dual actuator available (For one or two door systems in e.g.)
- Based on hall technology
- Connect up to 20 switches in series
- LED for easy diagnosis
- Operates behind stainless steel fittings
- Non-contact – no abrasion – no particles
- Compensation of mechanical tolerances
- Suitable for high pressure cleaning, CIP and SIP processes due IP69K (pre-wired types)
- Conforms to safety categories up to PLe acc. EN ISO 13849-1

Ordering information

Switches

Polyester housing

Type	Cable connection	Order code
Single actuator sensing 	5 m pre-wired	F3S-TGR-SPSA-05
	10 m pre-wired	F3S-TGR-SPSA-10
	M12, 8-pin	F3S-TGR-SPSA-M1J8
Dual actuator sensing 	5 m pre-wired	F3S-TGR-SPSD-05
	10 m pre-wired	F3S-TGR-SPSD-10
	M12, 8-pin	F3S-TGR-SPSD-M1J8

Stainless steel housing

Type	Cable connection	Order code
Single actuator sensing 	5 m pre-wired	F3S-TGR-SMSA-05
	10 m pre-wired	F3S-TGR-SMSA-10
	M12, 8-pin	F3S-TGR-SMSA-M1J8
Dual actuator sensing 	5 m pre-wired	F3S-TGR-SMSD-05
	10 m pre-wired	F3S-TGR-SMSD-10
	M12, 8-pin	F3S-TGR-SMSD-M1J8

Accessories

		Order code
Cables 8-pin	2 m	Y92E-M12PURSH8S2M-L
	5 m	Y92E-M12PURSH8S5M-L
	10 m	Y92E-M12PURSH8S10M-L
	25 m	Y92E-M12PURSH8S25M-L
Actuators (only for master coded types)	for F3S-TGR-SPSA and -SPSD	F39-TGR-SPS-A
	for F3S-TGR-SMSA and -SMSD	F39-TGR-SMS-A
Mounting screws	Set of Torx safety screws (M4, 4 × 30 mm, 4 × 20 mm, 4 × 10 mm; incl. washers and Torx bit)	F39-TGR-N-SCREWS

Specifications

Mechanical data

Item	Model	Polyester Sensor	Stainless steel sensor
Indicator	–	Green LED: Indication of safety circuits closed (Guard closed, actuator present, feedback circuit checked) Yellow LED: Indication of safety circuits open (Actuator removed)	
Operating distance	OFF → ON (Sao)	10 mm Close	
	ON → OFF (Sar)	15 mm Open	
Actuator approach speed	Min.	4 mm/s	
	Max.	1,000 mm/s	
Operating temperature		–25 to 45°C	
Enclosure protection	Flying lead	IP69K	
	M12 connector	IP67	
Material cable	Flying lead	PVC, Ø 6 mm o.d.	
	M12 connector	250 mm, PVC, Ø 6 mm o.d.	
Material housing		UL approved Polyester	Stainless steel 316

Electrical data

Item	Model	Polyester sensor	Stainless steel sensor
Sensing technology	–	Hall	
Serial connection	–	up to 20 switches	
Power supply		24 VDC±10%	
Power consumption	Max.	0.1 A	
Switching current	Min.	10 mA, 5 VDC	
Rated loads	Safety outputs	Max.	3 A, 250 VAC/3A, 24 VDC
	Auxiliary output	Max.	0.2 A, 24 VDC

Approved standards

EN standards certified by TÜV Rheinland	
EN ISO13849-1	
EN 62061	
EN ISO 14119	
EN 60204-1	
EN/IEC 60947-5-3	
UL 508, CSA C22.2	
BS 5304	
EN 1088-1 conformance	



Explosion proof non-contact switches

Explosion proof reed non-contact switches monitor the status of guarding doors in petro-chemical and food applications with explosive atmospheres.

- Based on reed technology
- Connect up to 6 switches in series
- Operates with all Omron safety controllers
- Operates behind stainless steel fittings
- Non-contact – no abrasion – no particles
- Compensation of mechanical tolerances
- Suitable for high pressure cleaning, CIP/SIP processes
- Conforms to safety categories up PLe acc. EN ISO13849-1
- For use in hazardous areas IECEx and ATEX EExd IIC T6 (Gas and Dust). Designed for Petro-chemical and food applications where explosive atmospheres are present.

Ordering information

Elongated sensors

Type	Cable connection	Contact configuration	Order code
	5 m pre-wired	2NC/1NO	F3S-TGR-NLXM-21-05
	10 m pre-wired	2NC/1NO	F3S-TGR-NLXM-21-10

Barrel sensors

Type	Cable connection	Contact configuration	Order code
	5 m pre-wired	2NC/1NO	F3S-TGR-NBMX-21-05
	10 m pre-wired	2NC/1NO	F3S-TGR-NBMX-21-10

Specifications

Mechanical data

		Elongated sensors	Barrel sensors
Serial switching		up to 6 pcs.	
Indicator	–	None	
Operating distance	OFF → ON (Sao)	10 mm close	
	ON → OFF (Sar)	22 mm open	
Actuator approach speed	Min.	4 mm/s	
	Max.	1000 mm/s	
Operating temperature	–	–20°C to +60°C	
Enclosure protection	Flying lead	IP 67 Certification for IP67 but can be used for SIP/CIP and high pressure cleaning like IP69K)	
Material	–	Stainless steel 316	

Electrical data

		Elongated sensors	Barrel sensors
Sensor technology	–	Reed	
Power supply	–	24 VDC±15%	
Switching current	Min.	1 mA, 10 VDC	
Rated loads	NC contacts	0.6 A, 230 VAC/24 VDC (internally fused)	
	NO contact		
	Max.	0.2 A, 230 VAC/24 VDC	

Ex specification

II 2G Ex mb IIC T6Gb, II 2D Ex mb IIC T80 Db IP67* (*Product is fully encapsulated which is considered to provide Ingress Protection to at least IP67)
Zones 1 and 2 (Gas), Zones 21 and 22 (Dust) (An area where Gas and Dust is likely to occur in use)
IEC/EN 60079-0, IEC/EN 60079-18

Approved standards

EN standards certified by TÜV Rheinland
EN ISO 13849-1
EN 60204-1
EN 62061
EN ISO 14119
EN/IEC 60947-5-3
UL 508, CSA C22.2
BS 5304
EN 1088-1

Accessories

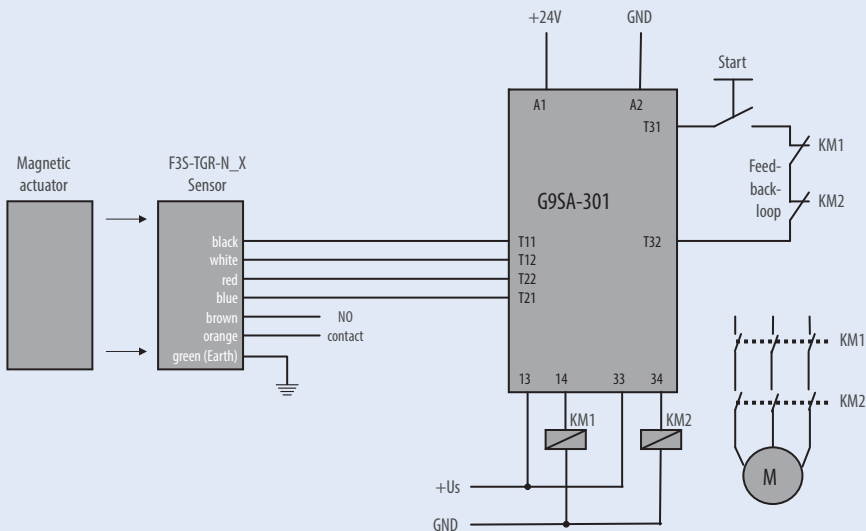
		Order code
Actuators	for F3S-TGR-NLXM	F39-TGR-NLXM-A
	for F3S-TGR-NBMX	F39-TGR-NBMX-A
Mounting screws	Set of Torx safety screws (M4, 4 × 30 mm, 4 × 20 mm, 4 × 10 mm; incl. washers and Torx bit)	F39-TGR-N-Screws
Spacer (8 mm, Set of 2pcs.)*1	for F3S-TGR-NLXM	F39-TGR-NLR-SPACER

*1 Spacers are needed to prevent influences if switch is mounted on ferromagnetic background (e. g. reduced switching distance, EMC influences)

Wiring examples (Single head connection)

G9SA

Single sensor application with G9SA-301
(up to PLe acc. EN ISO 13849-1)





Safety door switch with plastic housing

The D4NS line-up includes three-contact models with 2NC/1NC and 3NC contact forms in addition to the previous contact forms, 1NC/1NO and 2NC. All models have a M20 conduit opening.

- Line-up with three contacts: 2NC/1NC and 3NC contact forms
- Line-up with two contacts 1NC/1NO and 2NC
- Standardised gold-clad contacts for high contact reliability
- Applicable for standard loads and micro loads

Ordering information

Switches (with approved direct opening contacts)

Type	Contact configuration		Conduit opening/connector	Order code
1-conduit	Slow-action	1NC/1NO	M20	D4NS-4AF
		2NC	M20	D4NS-4BF
		2NC/1NO	M20	D4NS-4CF
		3NC	M20	D4NS-4DF
	Slow-action MBB contact	1NC/1NO	M20	D4NS-4EF
		2NC/1NO	M20	D4NS-4FF

Operation keys (order separately)

Type		Order code
Horizontal mounting		D4DS-K1
Vertical mounting		D4DS-K2

Type		Order code
Adjustable mounting (horizontal)		D4DS-K3
Adjustable mounting (horizontal/vertical)		D4DS-K5

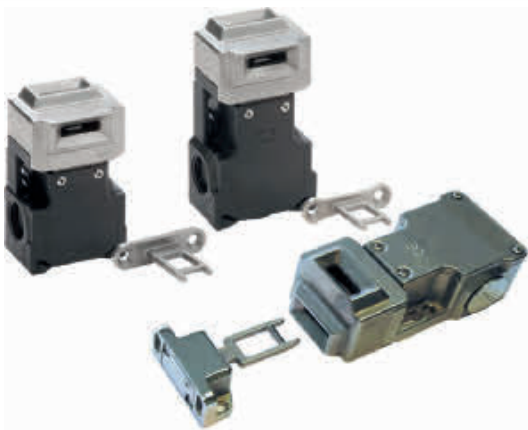
Specifications

Degree of protection		IP67 (EN60947-5-1) (This applies for the switch only. The degree of protection for the key hole is IP00.)
Durability ^{*1}	Mechanical	1,000,000 operations min.
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC 300,000 operations min. for a resistive load of 10 A at 250 VAC
Operating speed		0.05 to 0.5 m/s
Operating frequency		30 operations/minute max.
Direct opening force ^{*2}		60 N min.
Direct opening travel ^{*2}		10 mm min.
Minimum applicable load		Resistive load of 1 mA at 5 VDC (N-level reference value)
Protection against electric shock		Class II (double insulation)
Pollution degree (operating environment)		3 (EN60947-5-1)
Contact gap		2×2 mm min
Conditional short-circuit current		100 A (EN60947-5-1)
Rated open thermal current (I _{th})		10 A (EN60947-5-1)
Ambient temperature		Operating: −30°C to 70°C with no icing

^{*1} The durability is for an ambient temperature of 5°C to 35°C and an ambient humidity of 40 to 70%. For more details, consult your Omron representative.

^{*2} These figures are minimum requirements for safe operation.

Note: The above values are initial values.



Safety door switches with stainless steel head or full stainless steel body

This safety door switches use a stainless steel head or even a full stainless steel body to increase the robustness.

- 2NC/1NO, 2NC/2NO or 3NC contacts
- Key entry turnable to back side
- 4 key insertion positions
- 3 M20 conduit entries
- Positive break contacts (to IEC 60947-5-1)

Ordering information

Switches

Type	Housing	Conduit	Contacts	Order code	
	Plastic body with metal head	M20	2NC/1NO Slow action	F3S-TGR-KM15-21	
			3NC Slow action	F3S-TGR-KM15-30	
	Plastic body with metal head		2NC/2NO Slow action	F3S-TGR-KM16-22	
			3NC Slow action	F3S-TGR-KM16-30	
	Full stainless steel body		2NC/2NO Slow action	F3S-TGR-KH16-22	
			3NC Slow action	F3S-TGR-KH16-30	

Keys (order separately)

Type		Order code
for metal head		F39-TGR-KAM
Horizontal mounting		F39-TGR-KF
plastic flexible		F39-TGR-KPF
heavy flexible		F39-TGR-KHF
hygienic flexible		F39-TGR-KHFH

Accessories

Item	Remarks	Order code
M20 Gland	Stainless steel 316 for F3S-TGR-KH16 types	F39-TGR-M20
Mounting screws	Set of Torx safety screws (M4, 4 × 30 mm, 4 × 20 mm, 4 × 10 mm; incl. washers and Torx bit)	F39-TGR-N-SCREWS

Specifications

Item		F3S-TGR-KM15	F3S-TGR-KM16	F3S-TGR-KH16
Standards		EN1088, IEC 60947-5-1, EN 60204-1, UL508 EN ISO 13849-1: up to PLe ^{*1} EN 62061: up to SIL3 ^{*1}		
Mechanical reliability B10d		2.5 × 10 ⁶ operations at 100mA load		
PFHd		3.44 × 10 ⁻⁸		
Proof test interval (Life)		35 years		
MTTFd		356 years		
Utilization category		AC15 A300 3 A		
Thermal current (Ith)		5 A		
Rated insulation/Withstand voltages		500 VAC/2,500 VAC		
Rated travel for positive opening		8 mm		
Actuator entry minimum radius		175 mm standard, 100mm flexible		
Maximum approach/Withdrawal speed		600 mm/s		
Body dimensions (W × H × D)		54 × 88.4 × 34.5 mm	58 × 100.4 × 34.5 mm	58 × 103.5 × 39.5 mm
Fixing		2 × M5, 40 mm distance	4 × M5, 40 mm distance	
Conduit entry		M20		
Material	Body	Polyester		Stainless steel 316
	Head	Stainless steel 316		
Enclosure Protection		IP67		
Temperature Range		-25 to 80°C		
Vibration		IEC 68-2-6, 10-55 Hz +1 Hz, Excursion: 0.35 mm, 1 octave/min		

^{*1} Depending upon system architecture



Guard-lock safety door switch

The D4NL guard-lock safety-door switches are available with four or five built-in contacts. When locked, they have a key holding force of up to 1300 N. Mechanical lock/solenoid release types and vice versa set up the complete range.

- Safety-door switch with electromagnetic lock or unlock mechanism
- Models with four or five built-in contacts
- Strong key holding force: 1300 N
- For standard loads and micro loads
- Keys are compatible with D4GL and D4NS

Ordering information

Switches (with approved direct opening contacts)

For 110 V and 230 V version ask your local Omron representative

Lock and release types	Contact configuration	Conduit opening	Order code
Mechanical lock solenoid release	1NC/1NO + 1NC/1NO	M20	D4NL-4AFA-B
	1NC/1NO + 2NC	M20	D4NL-4BFA-B
	2NC + 1NC/1NO	M20	D4NL-4CFA-B
	2NC + 2NC	M20	D4NL-4DFA-B
	2NC/1NO + 1NC/1NO	M20	D4NL-4EFA-B
	2NC/1NO + 2NC	M20	D4NL-4FFA-B
	3NC + 1NC/1NO	M20	D4NL-4GFA-B
	3NC + 2NC	M20	D4NL-4HFA-B

- Note**
- Conduit sizes of G1/2 and Pg 13,5 are also available.
 - Solenoid: 24 VDC, Orange LED: 10 to 115 VAC/VDC

Operation keys (order separately)

Type		Order code
Horizontal mounting		D4DS-K1
Vertical mounting		D4DS-K2

Lock and release types	Contact configuration	Conduit opening	Order code
Solenoid lock mechanical release	1NC/1NO + 1NC/1NO	M20	D4NL-4AFG-B
	1NC/1NO + 2NC	M20	D4NL-4BFG-B
	2NC + 1NC/1NO	M20	D4NL-4CFG-B
	2NC + 2NC	M20	D4NL-4DFG-B
	2NC/1NO + 1NC/1NO	M20	D4NL-4EFG-B
	2NC/1NO + 2NC	M20	D4NL-4FFG-B
	3NC + 1NC/1NO	M20	D4NL-4GFG-B
	3NC + 2NC	M20	D4NL-4HFG-B

Type		Order code
Adjustable mounting (horizontal)		D4DS-K3
Adjustable mounting (horizontal/vertical)		D4DS-K5

Specifications

Degree of protection	IP67 (EN60947-5-1) (This applies for the switch only. The degree of protection for the key hole is IP00.)	
Durability ^{*1}	Mechanical	1,000,000 operations min.
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC
Operating speed	0.05 to 0.5 m/s	
Operating frequency	30 operations/minute max.	
Rated frequency	50/60 Hz	
Contact gap	2x2 mm min	
Direct opening force ^{*2}	60 N min. (EN60947-5-1)	
Direct opening travel ^{*2}	10 mm min. (EN60947-5-1)	
Holding force	1,300 N min.	
Minimum applicable load	Resistive load of 1 mA at 5 VDC (N-level reference value)	
Thermal current (I _{th})	10 A (EN60947-5-1)	
Conditional short-circuit current	100 A (EN60947-5-1)	
Pollution degree (operating environment)	3 (EN60947-5-1)	
Protection against electric shock	Class II (double insulation)	
Ambient temperature	Operating: -10°C to 55°C (with no icing or condensation)	

^{*1} The durability is for an ambient temperature of 5°C to 35°C and an ambient humidity of 40 to 70%. For more details, consult your Omron representative.

^{*2} These figures are minimum requirements for safe operation.

Note: The above values are initial values.



Stainless steel guard-lock safety door switch

The F3S-TGR-KHL1 safety-door switch keeps medium to large guard doors closed until hazards have been removed. It has a stainless steel body and is designed to cope with the rigorous applications of the food processing and chemical industries.

- Safety-door switch with electromagnetic lock and unlock mechanism (mechanical lock/solenoid unlock)
- Model with 6 built-in contacts
- Strong key holding force: 1600 N
- LED for diagnosis
- IP69K suitable for SIP and CIP processes
- Positive break contacts to IEC 60947-5-1

Ordering information

Switches

Type	Housing	Conduit	Contacts	Order code
	Stainless steel 316	M20	2NC/1NO+2NC/1NO Each NC Door contact is connected with another Lock monitor contact internally. NO contacts are not connected in series internally.	F3S-TGR-KHL1

Keys (order separately)

Type		Order code
Standard		F39-TGR-KAM
Horizontal mounting		F39-TGR-KF
heavy flexible		F39-TGR-KHF
hygienic flexible		F39-TGR-KHFH

Accessories

Item	Remarks	Order code
M20 Gland	Stainless steel 316	F39-TGR-M20

Specifications

Item	F3S-TGR-KHL1
Standards	EN1088, IEC 60947-5-1, EN 60204-1, UL508 EN ISO 13849-1: up to PLe ^{*1} EN 62061: up to SIL3 ^{*1}
Lock principle	Mechanical lock/solenoid unlock
Indicator LED	Status of solenoid
Holding force	1600 N
Utilization category	AC15 A300 3 A
Thermal current (Ith)	5 A
Rated insulation/Withstand voltages	500 VAC/2,500 VAC
Rated travel for positive opening	10 mm
Actuator entry minimum radius	175 mm standard, 100 mm flexible
Maximum approach/Withdrawal speed	600 mm/s
Body dimensions (W × H × D)	63 × 143 × 41.5 mm
Fixing	2 × M5, 40 mm distance
Conduit entry	M20
Material	Stainless steel 316
Enclosure Protection	IP69K
Temperature Range	-25 to 55°C
Vibration	IEC 68-2-6, 10 to 55 Hz +1 Hz, Excursion: 0.35 mm, 1 octave/min

^{*1} Depending upon system architecture



Stainless steel guard-lock safety door switch

The F3S-TGR-KHL3 safety-door switch keeps medium to large guard doors closed until hazards have been removed. It has a stainless steel body and is designed to cope with the rigorous applications of the food processing and chemical industries.

- Safety-door switch with electromagnetic lock and unlock mechanism (mechanical lock/solenoid unlock)
- Models with 6 built-in contacts
- Strong key holding force: 2000 N
- LED for diagnosis
- IP69K suitable for SIP and CIP processes
- Positive break contacts to IEC 60947-5-1

Ordering information

Switches

Type	Housing	Conduit	Contacts	Order code
	Stainless steel 316	M20	2NC/1NO+2NC/1NO 4NC safety contacts (2 door monitoring, 2 lock monitoring) 2NO Auxiliary contact (guard open, lock status)*1	F3S-TGR-KHL3
	Stainless steel 316 with rear push button manual release			F3S-TGR-KHL3R

*1 1NO lock status if LED2 Lock Status Indicator not used

Keys (order separately)

Type	Order code
Standard 	F39-TGR-KAM
Horizontal mounting 	F39-TGR-KF
heavy flexible 	F39-TGR-KHF
hygienic flexible 	F39-TGR-KHFH

Accessories

Item	Remarks	Order code
M20 Gland	Stainless steel 316	F39-TGR-M20
Key	Manual release key	F39-TGR-MRK

Specifications

	F3S-TGR-KHL3
Standards	EN1088, IEC 60947-5-1, EN 60204-1, UL508 EN ISO 13849-1: up to PLe*1 EN 62061: up to SIL3*1
Lock principle	Mechanical lock/solenoid unlock
Holding force	2000 N
Indicator LEDs	LED1: Status of solenoid LED2: Lock status indication (if 1NO Auxiliary contact not used)
Utilization category	AC15 A300 3 A
Thermal current (Ith)	5 A
Rated insulation/Withstand voltages	500 VAC/2,500 VAC
Rated travel for positive opening	10 mm
Actuator entry minimum radius	175 mm standard, 100 mm flexible
Maximum approach/Withdrawal speed	600 mm/s
Body dimensions (W × H × D)	48 × 177 × 47 mm
Fixing	4 × M5, mounted from backside
Conduit entry	M20
Material	Stainless steel 316
Enclosure Protection	IP69K
Temperature Range	-25 to 55°C
Vibration	IEC 68-2-6, 10-55 Hz +1 Hz, Excursion: 0.35 mm, 1 octave/min

*1 Depending upon system architecture

PROTECT OPERATORS AND PRODUCTION

Safety light curtains

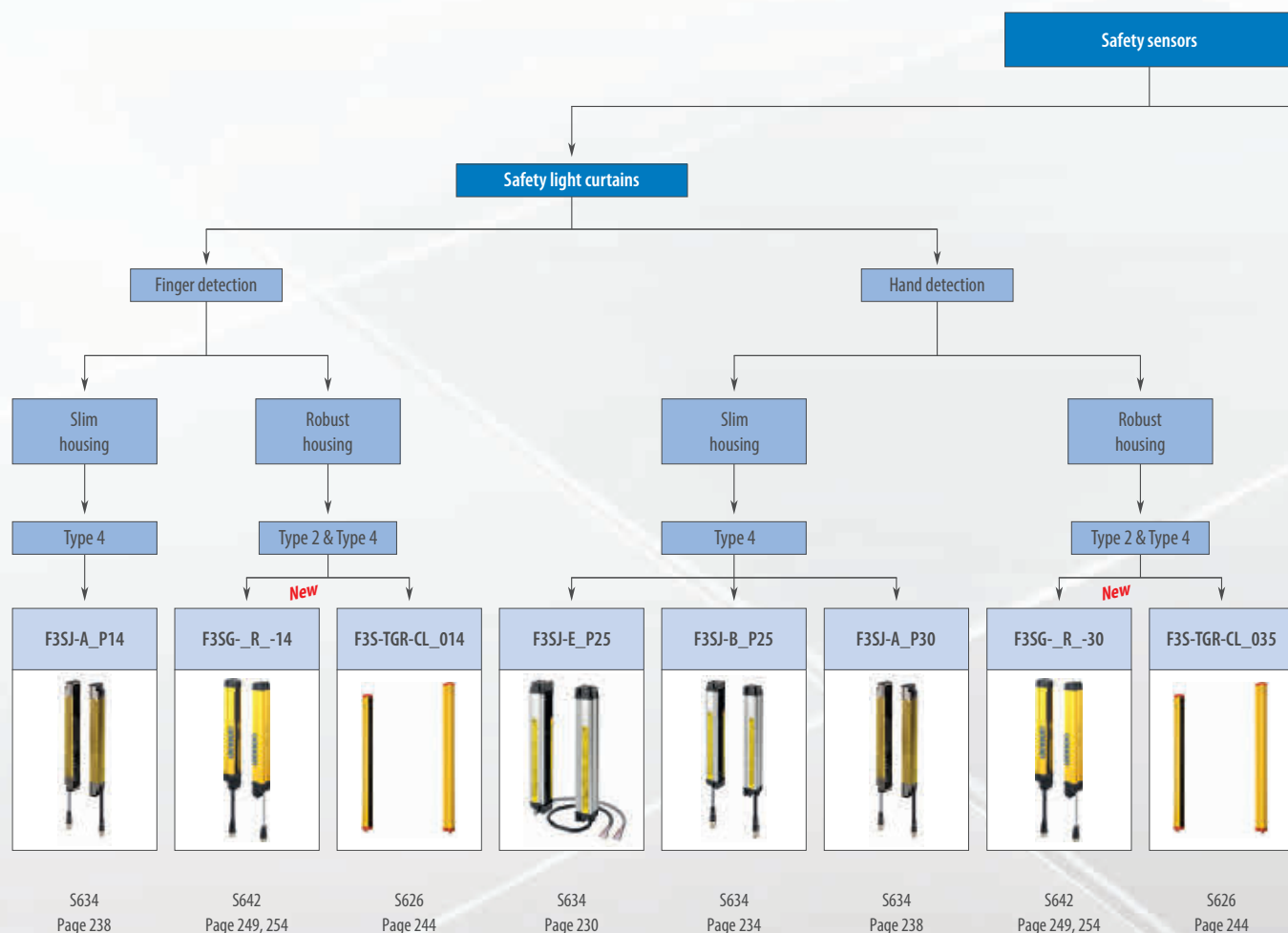
Dangerous points and hazardous areas are safeguarded with safety light curtains. Depending on the type, finger and hand protection are available with operating distances of up to 20m. They are available in safety categories 2 and 4 (according to IEC 61496).

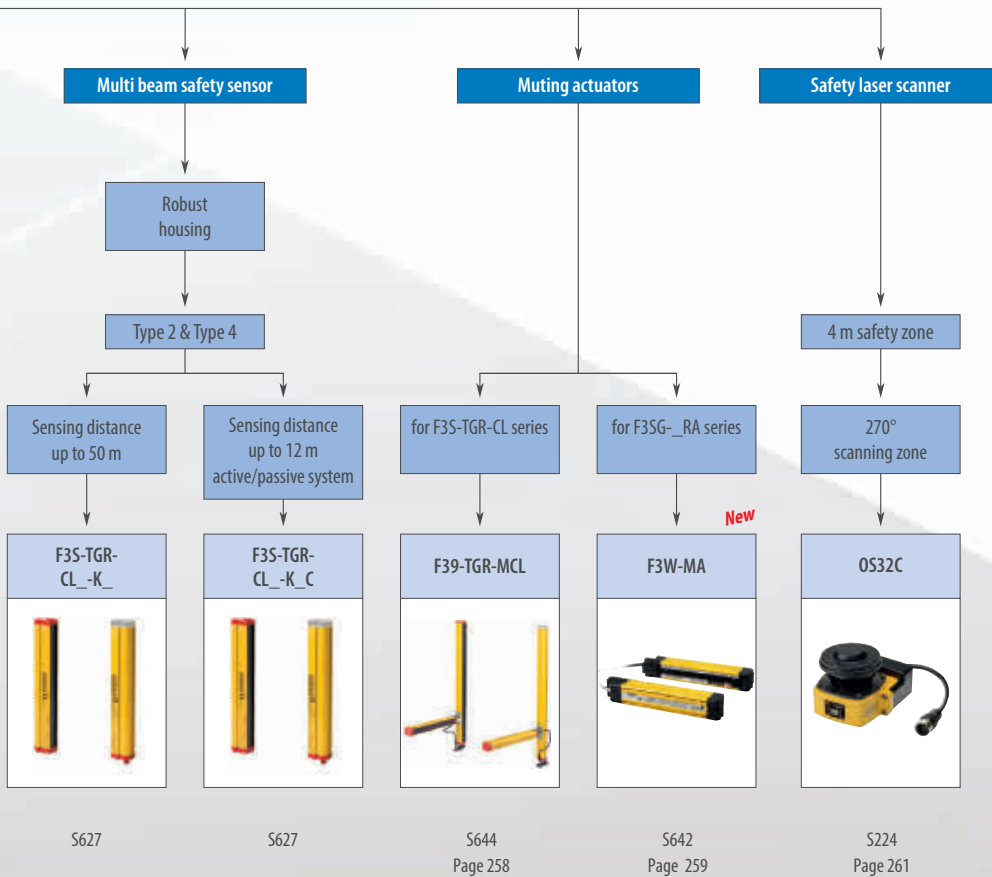
Multi beam safety sensor

Hazardous areas can be safeguarded by using multi-beam photoelectric safety guards. They are used as non-contact access guarding and consist of sender and receiver or can be implemented as an active/passive system to save wiring effort.

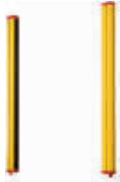
Safety laser scanner

Horizontal and vertical guarding of dangerous areas are the applications for safety laser scanners in mobile and stationary application. This covers collision avoidance on automated guided vehicles (AGVs) as well as presence and intrusion detection on access points of machinery by providing a wide safety scanning range of 3 m covering 270° around the sensor head.





Selection table

Safety light curtain						
						
Model	F3SG- RA	F3SG_RE	F3S-TGR-CL_A	F3S-TGR-CL_B	F3SJ-A	
Selection criteria	Type of ESPE (IEC 61496-1)	Type 2 & 4		Type 2 & 4		Type 4
	Resolution	14, 30 mm		14, 35 mm		14, 30 mm
	Beam pitch	–		–		–
	Protective height	160 to 2,080 mm (14) 190 to 2,510 mm (30)		150 to 2,400 mm		245 to 1,271 mm (14) 245 to 2,495 mm (30)
	Operating range	0.3 to 10.0 m (14) 0.3 to 20.0 m (30)		0.2 to 6.0 m (14) 0.2 to 14.0 m (35)		0.3 to 9.0 m (14) 0.3 to 9.0 m (30)
	Operating temperature	–10 to 55°C		–10 to 55°C		–10 to 55°C
	Degree of protection (IEC 60529)	IP65 and IP67		IP65		IP65
	Response time ON to OFF	8 to 18 ms	5 to 15ms	14 to 103 ms		10 to 25 ms
	Parameter setting	Dip switch	Software	Dip switch		Software
Features	EDM	■	●	–	■	●
	Interlock	■	●	–	■	○
	Pre-Reset	■	●	–	–	–
	External test	■	–	–	■	○
	PNP/NPN selection	■	–	–	–	–
	Scan code selection	■	–	–	■	–
	Operating range selection	■	–	○	■	–
	Fixed blanking	■	●	–	■	●
	Floating blanking	■	●	–	■	●
	SD/BD	–	–	–	■	–
	Muting	– ^{*1}	●	–	■	●
	Override	○	●	–	○	●
	Reduced resolution	–	●	–	–	–
	Warning zone	–	●	–	–	●
	Response time adjustment	–	●	–	–	–
In- and Outputs	Cascade connection	up to 3 sets	–	option	–	up to 4 sets
	Safety outputs (OSSD)	2 PNP transistor outputs		2 PNP transistor outputs		2 PNP transistor outputs
	Non-safety auxiliary output	1 PNP or NPN	–	–	–	2 PNP
	Test input	Yes	Yes	Yes	Yes	Yes
	EDM input	Yes	–	Yes	Yes	Yes
	Reset input	Yes	–	Yes	Yes	Yes
	Muting sensor input	Yes	–	Yes	–	–
	Communication	Bluetooth option	–	–	–	–
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^{*1} Factory default setting: Standard Muting mode

		Safety light curtain		Multi-beam safety sensors		Safety laser scanner
						
Model		F3SJ-B	F3SJ-E	F3S-TGR-CL_A-K	F3S-TGR-CL_B-K	OS32C
Selection criteria	Type of ESPE (IEC 61496-1)	Type 4	Type 4	Type 2 & 4		Type 3
	Resolution	25 mm	25 mm	–		30, 40, 50, 70 mm
	Beam pitch	–	–	300, 400, 500 mm		–
	Protective height	185 to 2,065 mm	185 to 1,105 mm	500 to 1,200 mm		–
	Operating range	0.2 to 7.0 m	0.2 to 7.0 m	0.2 to 40.0 m (K) 0.2 to 12.0 m (K2C)		3, 4m
	Operating temperature	–10 to 55°C	–10 to 55°C	–10 to 55°C		–10 to 55°C
	Degree of protection (IEC 60529)	IP65	IP65	IP65		IP65
	Response time ON to OFF	15 ms	15 ms	13 ms		80 to 680 ms
	Parameter setting	–	–	Dip switch		Software
Features	EDM	○	–	■	■	●
	Interlock	○	–	■	■	●
	Pre-Reset	–	–	■	–	–
	External test	○	○	■	■	–
	PNP/NPN selection	–	–	–	–	–
	Scan code selection	–	–	■	■	–
	Operating range selection	–	–	■	■	–
	Fixed blanking	–	–	–	–	–
	Floating blanking	–	–	–	–	–
	SD/BD	–	–	–	–	–
	Muting	○	–	■	–	–
	Override	○	–	○	–	–
	Reduced resolution	–	–	–	–	–
	Warning zone	–	–	–	–	●
	Response time adjustment	–	–	–	–	●
In- and Outputs	Cascade connection	up to 3 sets	–	–	–	–
	Safety outputs (OSSD)	2 PNP transistor outputs	2 PNP transistor outputs	2 PNP transistor outputs		2 PNP transistor outputs
	Non-safety auxiliary output	1 PNP	–	–	–	2 PNP or NPN
	Test input	Yes	Yes	Yes	Yes	–
	EDM input	Yes	–	Yes	Yes	Yes
	Reset input	Yes	–	Yes	Yes	Yes
	Muting sensor input	–	–	Yes	–	–
	Communication	–	–	–	–	Ethernet/IP option
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Easy type for simple and affordable hand protection

The F3SJ-E-family is a type 4 safety light curtain with an optical resolution of 25 mm. An operation range of up to 7 m and a protective height up to 1,105 mm are provided with no dead zone

- Detection height = sensor height
- Small housing
- Simple and affordable hand protection
- Reduced wiring, quick mount brackets and easy-to-view-alignment beams reduce mounting time
- Type 4 sensor complying with EN 61496-1 and up to PLe according EN ISO 13849

Ordering information

Application	Detection capability	Beam gap	Operating range	Protective height (mm)	Order code
Hand protection	Dia. 25 mm	20 mm	0.2 to 7 m	185 to 1,105	F3SJ-E____P25

Note: F3SJ-E uses a 3 m prewired discrete cable.

Number of beams	Protective height (mm) ^{*1}	Order code
8	185	F3SJ-E0185P25
10	225	F3SJ-E0225P25
14	305	F3SJ-E0305P25
18	385	F3SJ-E0385P25
22	465	F3SJ-E0465P25
26	545	F3SJ-E0545P25
30	625	F3SJ-E0625P25
34	705	F3SJ-E0705P25
38	785	F3SJ-E0785P25
42	865	F3SJ-E0865P25
46	945	F3SJ-E0945P25
50	1,025	F3SJ-E1025P25
54	1,105	F3SJ-E1105P25

^{*1} Protective height (mm) = Total sensor length

Accessories (sold separately)

Sensor mounting bracket

Appearance	Specifications	Application	Remarks	Order code
	Top/bottom bracket	Top/bottom bracket for F3SJ-E/B	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJB1
	Intermediate bracket	In combination use with top/bottom bracket for F3SJ-E/B Can be used as free-location bracket.	1 set with 2 pieces	F39-LJB2 ^{*1} ^{*2}
	Quick mount bracket	Quick mount bracket for F3SJ-E/B Supports M6 slide nut for aluminum frame.	1 set with 2 pieces	F39-LJB3-M6 ^{*1}
		Quick mount bracket for F3SJ-E/B Supports M8 slide nut for aluminum frame.		F39-LJB3-M8 ^{*2}
	Quick mount M6 bracket Quick mount M8 bracket	Bracket to mount an intermediate bracket to the aluminum frame with a single touch.	Hexagon socket head cap screws (M6 × 10) are included.	F39-LJB3-M6K ^{*1}
			Hexagon socket head cap screws (M8 × 14) are included.	F39-LJB3-M8K ^{*2}
	Compatible mounting bracket	Mounting bracket used when replacing existing area sensors (F3SJ-A or F3SN) with the F3SJ-E/B.	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJB4
	Contact mount bracket	Bracket to closely contact the back side of the sensor.	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJB5

^{*1} Combining F39-LJB2 and F39-LJB3-M6K makes F39-LJB3-M6.

^{*2} Combining F39-LJB2 and F39-LJB3-M8K makes F39-LJB3-M8.

Laser pointer

Appearance	Output	Order code
	Laser pointer for F3SJ	F39-PTJ

Specifications

Model		F3SJ-E P25
Sensor type		Type 4 safety light curtain
Setting tool connection ^{*1}		Parameter settings: Not available
Safety category		Safety purpose of category 4, 3, 2, 1, or B
Detection capability		Opaque objects 25 mm in diameter
Beam gap (P)		20 mm
Number of beams (n)		8 to 54
Protective height (PH)		185 to 1,105 mm
Lens diameter		Diameter 5 mm
Operating range ^{*2}		0.2 to 7 m
Response time (under stable light incident condition)	ON to OFF	15 ms max.
	OFF to ON	70 ms max.
Startup waiting time		2 s max.
Power supply voltage (Vs)		SELV/PELV 24 VDC±20% (ripple p-p 10% max.)
Consumption current (no load)		Emitter: Up to 22 beams: 41 mA max., 26 to 42 beams: 57 mA max., 46 to 54 beams: 63 mA max. Receiver: Up to 22 beams: 42 mA max., 26 to 42 beams: 47 mA max., 46 to 54 beams: 51 mA max.
Light source (emitted wavelength)		Infrared LED (870 nm)
Effective aperture angle (EAA)		Based on IEC 61496-2. Within ±2.5° for both emitter and receiver when the detection distance is 3 m or over
Safety outputs (OSSD)		Two PNP transistor outputs, load current 200 mA max., residual voltage 2 V max. (except for voltage drop due to cable extension), Leakage current 1 mA max., load inductance 2.2 H max. ^{*3} , Maximum capacity load 1 μF ^{*4}
Output operation mode		Safety output: On when receiving light
Input voltage		ON voltage: Vs-3 V to Vs, OFF voltage: 0 V to 1/2 Vs or open ^{*5}
Mutual interference prevention function		Mutual interference prevention algorithm prevents interference in up to 3 sets.
Test function		Self test (at power-ON and at power distribution) External test (emission stop function by test input)
Protection circuit		Output short-circuit protection, and power supply reverse polarity protection
Ambient temperature		Operating: -10 to 55°C (non-freezing), Storage: -25 to 70°C
Ambient humidity		Operating: 35% to 85% (no condensation), Storage: 35% to 95% RH
Operating ambient light intensity		Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max.
Insulation resistance		20 MΩ min. (at 500 VDC)
Dielectric strength		1,000 VAC 50/60 Hz, 1 min
Degree of protection		IP65 (IEC 60529)
Vibration resistance		Malfunction: 10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps in X, Y, and Z directions
Shock resistance		Malfunction: 100 m/s ² , 1,000 times each in X, Y, and Z directions
Pollution degree		Pollution degree 3 (IEC 60664-1)
Power cable		Connection method: Pull-out type, cable length 3 m Number of wires: Emitter: 5 wires, receiver: 6 wires Cable diameter: Dia. 6 mm Allowable bending radius: R5 mm
Extension cable		30 m max. ^{*6}
Material		Case: Aluminum Cap: ABS resin, PBT Optical cover: PMMA resin (acrylic) Cable: Oil resistant PVC
Weight (packed state)		Weight (g) = (protective height) × 2.6 + 800
Accessories		Test rod, Instruction Manual, User's Manual (CD-ROM) ^{*7}
Applicable standards		IEC 61496-1, EN 61496-1 UL 61496-1, Type 4 ESPE (Electro-Sensitive Protective Equipment) IEC 61496-2, CLC/TS 61496-2, UL 61496-2, Type 4 AOPD (Active Opto-electronic Protective Devices) IEC 61508-1 to -3, EN 61508-1 to -3 SIL3 IEC 13849-1: 2006, EN ISO 13849-1: 2008 (PLe, Cat.4) UL 508, UL 1998, CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8

^{*1} Do not use the support software and setting console for F3SJ-A. Operation cannot be guaranteed.

^{*2} Use of the spatter protection cover causes a 10% maximum sensing distance attenuation.

^{*3} The load inductance is the maximum value when the safety output frequently repeats ON and OFF. When you use the safety output at 4 Hz or less, the usable load inductance becomes larger.

^{*4} These values must be taken into consideration when connecting elements including a capacitive load such as capacitor.

^{*5} The Vs indicates a voltage value in your environment.

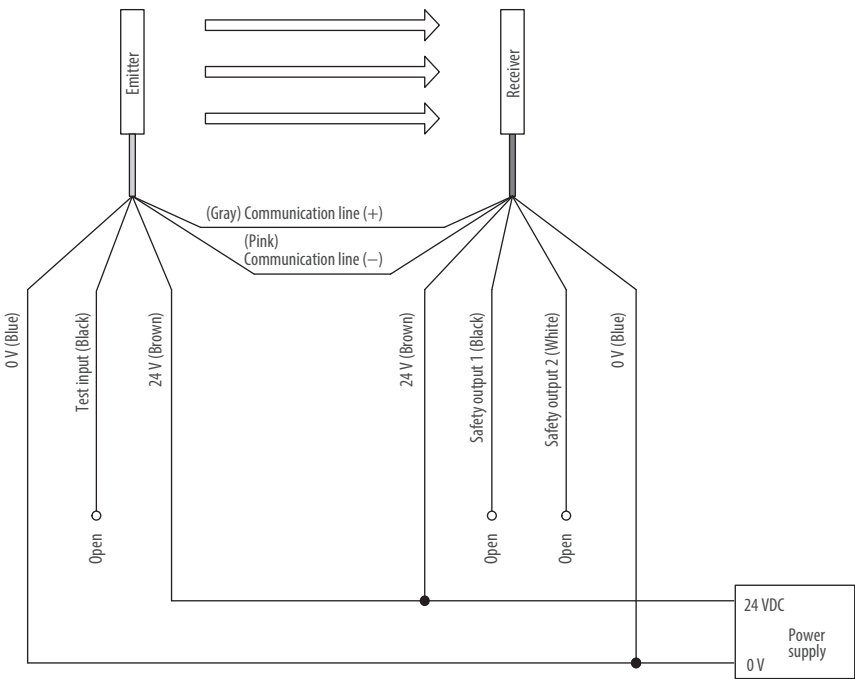
^{*6} To extend a cable of the F3SJ-E, refer to the user's manual (SCHG-733/732).

^{*7} Mounting brackets are sold separately.

Connections

Basic wiring diagram

Minimum wiring required to check the operation of the F3SJ-E





Basic type with a combination of performance and functionality

The F3SJ-B-family is a type 4 safety light curtain with an optical resolution of 25 mm. An operation range of up to 7 m and a protective height up to 2,065 mm are provided with no dead zone

- Detection height = sensor height
- Simple hand protection
- Muting function available
- Series connection up to three sets
- Type 4 sensor complying with EN 61496-1 and up to PLe according EN ISO 13849

Ordering information

Application	Detection capability	Beam gap	Operating range	Protective height (mm)	Order code
Hand protection	Dia. 25 mm	20 mm	0.2 to 7 m	185 to 2,065	F3SJ-B____P25

Number of beams	Protective height (mm) ^{*1}	Order code
8	185	F3SJ-B0185P25
10	225	F3SJ-B0225P25
14	305	F3SJ-B0305P25
18	385	F3SJ-B0385P25
22	465	F3SJ-B0465P25
26	545	F3SJ-B0545P25
30	625	F3SJ-B0625P25
34	705	F3SJ-B0705P25
38	785	F3SJ-B0785P25
42	865	F3SJ-B0865P25
46	945	F3SJ-B0945P25
50	1,025	F3SJ-B1025P25
54	1,105	F3SJ-B1105P25
58	1,185	F3SJ-B1185P25
62	1,265	F3SJ-B1265P25
66	1,345	F3SJ-B1345P25
70	1,425	F3SJ-B1425P25
74	1,505	F3SJ-B1505P25
78	1,585	F3SJ-B1585P25
82	1,665	F3SJ-B1665P25
86	1,745	F3SJ-B1745P25
90	1,825	F3SJ-B1825P25
94	1,905	F3SJ-B1905P25
98	1,985	F3SJ-B1985P25
102	2,065	F3SJ-B2065P25

^{*1} Protective height (mm) = Total sensor length

Accessories (sold separately)

Single-end connector cable (2 cables per set, for emitter and receiver)

For wiring with safety circuit such as single safety relay, safety relay unit, and safety controller.

Appearance	Cable length	Specifications	Order code
	3 m	M12 connector (8-pin)	F39-JD3A
	7 m		F39-JD7A
	10 m		F39-JD10A
	15 m		F39-JD15A
	20 m		F39-JD20A

Sensor mounting bracket

Appearance	Specifications	Application	Remarks	Order code
	Top/bottom bracket	Top/bottom bracket for F3SJ-E/B	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJB1
	Intermediate bracket	In combination use with top/bottom bracket for F3SJ-E/B Can be used as free-location bracket.	1 set with 2 pieces	F39-LJB2 ^{*1} ^{*2}
	Quick mount bracket	Quick mount bracket for F3SJ-E/B Supports M6 slide nut for aluminum frame.	1 set with 2 pieces	F39-LJB3-M6 ^{*1}
		Quick mount bracket for F3SJ-E/B Supports M8 slide nut for aluminum frame.		F39-LJB3-M8 ^{*2}
	Quick mount M6 bracket Quick mount M8 bracket	Bracket to mount an intermediate bracket to the aluminum frame with a single touch.	Hexagon socket head cap screws (M6 × 10) are included.	F39-LJB3-M6K ^{*1}
			Hexagon socket head cap screws (M8 × 14) are included.	F39-LJB3-M8K ^{*2}
	Compatible mounting bracket	Mounting bracket used when replacing existing area sensors (F3SJ-A or F3SN) with the F3SJ-E/B.	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJB4
	Contact mount bracket	Bracket to closely contact the back side of the sensor.	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJB5

^{*1} Combining F39-LJB2 and F39-LJB3-M6K makes F39-LJB3-M6.

^{*2} Combining F39-LJB2 and F39-LJB3-M8K makes F39-LJB3-M8.

Laser pointer

Appearance	Output	Order code
	Laser pointer for F3SJ	F39-PTJ

Specifications

Model		F3SJ-B P25
Sensor type	Type 4 safety light curtain	
Setting tool connection ^{*1}	Parameter settings: Not available	
Safety category	Safety purpose of category 4, 3, 2, 1, or B	
Detection capability	Opaque objects 25 mm in diameter	
Beam gap (P)	20 mm	
Number of beams (n)	8 to 102	
Protective height (PH)	185 to 2,065 mm	
Lens diameter	Diameter 5 mm	
Operating range ^{*2}	0.2 to 7 m	
Response time (under stable light incident condition)	ON to OFF	15 ms max. (response time at 1 set connection, series connection of 2 sets or 3 sets)
	OFF to ON	70 ms max. (response time at 1 set connection, series connection of 2 sets or 3 sets)
Startup waiting time	2 s max.	
Power supply voltage (Vs)	SELV/PELV 24 VDC±20% (ripple p-p 10% max.)	
Consumption current (no load)	Emitter: Up to 22 beams: 52 mA max., 26 to 42 beams: 68 mA max., 46 to 62 beams: 75 mA max., 66 to 82 beams: 88 mA max., 86 to 102 beams: 101 mA max. Receiver: Up to 22 beams: 45 mA max., 26 to 42 beams: 50 mA max., 46 to 62 beams: 56 mA max., 66 to 82 beams: 61 mA max., 86 to 102 beams: 67 mA max.	
Light source (emitted wavelength)	Infrared LED (870 nm)	
Effective aperture angle (EAA)	Based on IEC 61496-2. Within ±2.5° for both emitter and receiver when the detection distance is 3 m or over	
Safety outputs (OSSD)	Two PNP transistor outputs, load current 200 mA max., residual voltage 2 V max. (except for voltage drop due to cable extension), Leakage current 1 mA max., load inductance 2.2 H max. ^{*3} , Maximum capacity load 1 μF ^{*4}	
Auxiliary output 1	One PNP transistor outputs, load current 100 mA max., residual voltage 2 V max. (except for voltage drop due to cable extension), leak current 1 mA max.	
Output operation mode	Safety output: On when receiving light Auxiliary output: – Reverse output of safety output for a basic system – ON when muting/override for a muting system	
Input voltage	ON voltage: Vs-3 V to Vs, OFF voltage: 0 V to 1/2 Vs or open ^{*5}	
Mutual interference prevention function	Mutual interference prevention algorithm prevents interference in up to 3 sets.	
Series connection	Time division emission by series connection Number of connections: up to 3 sets (between F3SJ-Bs only) Other models cannot be connected. Total number of beams: up to 192 beams Maximum cable length for 2 sets: no longer than 7 m	
Test function	Self test (at power-ON and at power distribution) External test (emission stop function by test input)	
Safety-related functions	Interlock (basic system) External device monitoring (basic system) Muting (muting system) Override (muting system)	
Connection type	Connector method (M12, 8-pin)	
Protection circuit	Output short-circuit protection, and power supply reverse polarity protection	
Ambient temperature	Operating: -10 to 55°C (non-freezing), Storage: -25 to 70°C	
Ambient humidity	Operating: 35% to 85% (no condensation), Storage: 35% to 95% RH	
Operating ambient light intensity	Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max.	
Insulation resistance	20 MΩ min. (at 500 VDC)	
Dielectric strength	1,000 VAC 50/60 Hz, 1 min	
Degree of protection	IP65 (IEC 60529)	
Vibration resistance	Malfunction: 10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps in X, Y, and Z directions	
Shock resistance	Malfunction: 100 m/s ² , 1,000 times each in X, Y, and Z directions	
Pollution degree	Pollution degree 3 (IEC 60664-1)	
Power cable	Connection method: Prewired connector cable, cable length 0.3 m, connector type (M12, 8-pin), connector: IP67 rated (when mated) Number of wires: 8 wires Cable diameter: Dia. 6 mm Allowable bending radius: R5 mm	
Extension cable	30 m max.	
Material	Case: Aluminum Cap: ABS resin, PBT Optical cover: PMMA resin (acrylic) Cable: Oil resistant PVC	
Weight (packed state)	Weight (g) = (protective height) × 2.7 + 500	
Accessories	Test rod, Instruction manual, User's manual (CD-ROM) ^{*6}	
Applicable standards	IEC 61496-1, EN 61496-1 UL 61496-1, Type 4 ESPE (Electro-sensitive protective equipment) IEC 61496-2, CLC/TS 61496-2, UL 61496-2, Type 4 AOPD (Active opto-electronic protective devices) IEC 61508-1 to -3, EN 61508-1 to -3 SIL3 IEC 13849-1: 2006, EN ISO 13849-1: 2008 (PLe, Cat.4) UL 508, UL 1998, CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8	

^{*1} Do not use the support software and setting console for F3SJ-A. Operation cannot be guaranteed.

^{*2} Use of the spatter protection cover causes a 10% maximum sensing distance attenuation.

^{*3} The load inductance is the maximum value when the safety output frequently repeats ON and OFF. When you use the safety output at 4 Hz or less, the usable load inductance becomes larger.

^{*4} These values must be taken into consideration when connecting elements including a capacitive load such as capacitor.

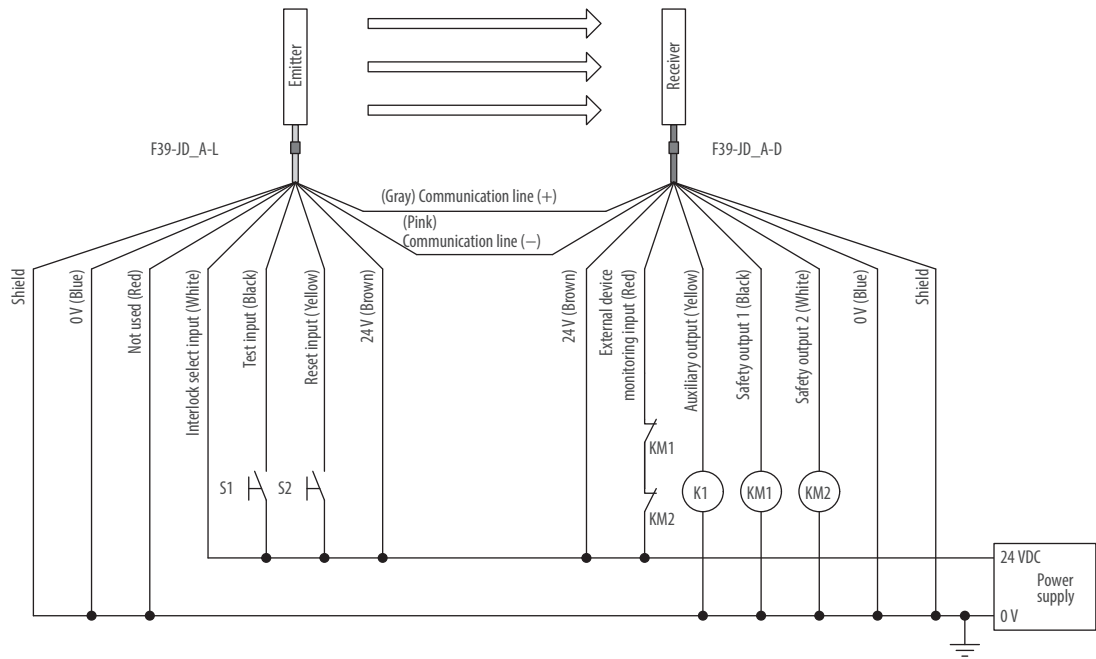
^{*5} The Vs indicates a voltage value in your environment.

^{*6} Mounting brackets are sold separately.

Connections

Basic Wiring Diagram

Wiring when using manual reset mode, external device monitoring (F3SJ-B____P25) (PNP output)



- S1 : External test switch (connect to 0 V if a switch is not required)
- S2 : Interlock/lockout reset switch
- KM1, KM2 : Safety relay with force-guided contact (G7SA) or magnetic contactor
- K1 : Load or PLC, etc. (for monitoring)



Advanced type for complex safety solutions

The F3SJ-A-family is a type 4 safety light curtain with a optical resolution of 14 mm and 30 mm. An operating range of up to 9 m and protective heights up to 2,495 mm providing end to end detection with zero dead zone.

- Detection height = sensor height
- Muting and blanking function available
- Series connection up to 4 Sets
- LED bar for easy alignment and diagnosis
- Type 4 sensor complying with EN 61496-1 and up to PLe according EN ISO 13849-1

Ordering information

Application	Detection capability	Beam gap	Operating range	Protective height (mm)	Order code
Finger protection	Dia. 14 mm	9 mm	0.2 to 9 m	245 to 1,631	F3SJ-A____P14
Hand/arm protection	Dia. 30 mm	25 mm	0.2 to 9 m	245 to 1,620	F3SJ-A____P30
			0.2 to 7 m	1,745 to 2,495	

Safety light curtain model list

F3SJ-A14 series (9 mm gap), F3SJ-A14 TS series (9 mm gap)

Number of beams	Protective height (mm) ^{*1}	Order code
26	245	F3SJ-A0245P14
28	263	F3SJ-A0263P14
34	317	F3SJ-A0317P14
42	389	F3SJ-A0389P14
50	461	F3SJ-A0461P14
60	551	F3SJ-A0551P14
68	623	F3SJ-A0623P14
76	695	F3SJ-A0695P14
80	731	F3SJ-A0731P14
88	803	F3SJ-A0803P14
96	875	F3SJ-A0875P14
108	983	F3SJ-A0983P14
116	1,055	F3SJ-A1055P14
124	1,127	F3SJ-A1127P14
132	1,199	F3SJ-A1199P14
140	1,271	F3SJ-A1271P14

^{*1} Protective height (mm) = Total sensor length

F3SJ-A30 series (25 mm gap)

Number of beams	Protective height (mm) ^{*1}	Order code
10	245	F3SJ-A0245P30
12	295	F3SJ-A0295P30
16	395	F3SJ-A0395P30
19	470	F3SJ-A0470P30
21	520	F3SJ-A0520P30
22	545	F3SJ-A0545P30
23	570	F3SJ-A0570P30
25	620	F3SJ-A0620P30
29	720	F3SJ-A0720P30
32	795	F3SJ-A0795P30
35	870	F3SJ-A0870P30
37	920	F3SJ-A0920P30
38	945	F3SJ-A0945P30
41	1,020	F3SJ-A1020P30
44	1,095	F3SJ-A1095P30
45	1,120	F3SJ-A1120P30
48	1,195	F3SJ-A1195P30
51	1,270	F3SJ-A1270P30
56	1,395	F3SJ-A1395P30
65	1,620	F3SJ-A1620P30
70	1,745	F3SJ-A1745P30
75	1,870	F3SJ-A1870P30
80	1,995	F3SJ-A1995P30
90	2,245	F3SJ-A2245P30
95	2,370	F3SJ-A2370P30
100	2,495	F3SJ-A2495P30

^{*1} Protective height (mm) = Total sensor length

Accessories (sold separately)

Single-end connector cable (2 cables per set, for emitter and receiver)

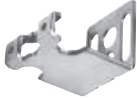
For wiring with safety circuit such as single safety relay, safety relay unit, and safety controller.

Appearance	Cable length	Specifications	Order code
	3 m	M12 connector (8-pin)	F39-JD3A
	7 m		F39-JD7A
	10 m		F39-JD10A
	15 m		F39-JD15A
	20 m		F39-JD20A

Setting Tools

Appearance	Type	Remarks	Order code
	"SD Manager" Setting support software for the F3SJ	Accessories: SD Manager CD-ROM (1), F39-CN1 branch connector (1), Connector cap (1), 2-m Dedicated cable (1), 0.3-m Dedicated cable with plug (1), Instruction manual	F39-GWUM

Sensor Mounting Brackets (Sold separately)

Appearance	Specifications	Application	Remarks	Order code
	Standard mounting bracket (for top/bottom)	(provided with the F3SJ)	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJ1
	Flat side mounting bracket	Use these small-sized brackets when performing side mounting with standard mounting brackets, so that they do not protrude from the detection surface.	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJ2
	Free-location mounting bracket (also used as standard intermediate bracket)	Use these brackets for mounting on any place without using standard bracket.	Two brackets per set	F39-LJ3
	Top/bottom bracket B (mounting hole pitch 19 mm)	Mounting bracket used when replacing existing area sensors (other than F3SN or F3WN) with the F3SJ. For front mounting. Suitable for mounting hole pitch of 18 to 20 mm.	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJ4
	Bracket for replacing short-length F3SN	Mounting bracket used when an F3SN with protective height of 300 mm or less is replaced by an F3SJ.	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJ5
	Space-saving mounting bracket	Use these brackets to mount facing inward. Length is 12 mm shorter than the standard F39-LJ1 bracket.	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJ8
	Top/bottom bracket C (mounting hole pitch 13 mm)	Mounting bracket used when replacing existing area sensors having a mounting pitch of 13 mm with the F3SJ.	2 for an emitter, 2 for a receiver, total of 4 per set	F39-LJ11

Laser pointer

Appearance	Output	Order code
	Laser pointer for F3SJ	F39-PTJ

Specifications

F3SJ-A ____ P14/P30

Model		F3SJ-A ____ P14	F3SJ-A ____ P30
Sensor type		Type 4 safety light curtain	
Version		Ver. 2	
Setting tool connection		Connectable	
Safety category		Safety purpose of category 4, 3, 2, 1, or B	
Detection capability		Opaque objects 14 mm in diameter	Opaque objects 30 mm in diameter
Beam gap (P)		9 mm	25 mm
Number of beams (n)		26 to 180	10 to 100
Protective height (PH)		245 to 1,631 mm	245 to 2,495 mm
Lens diameter		Diameter 5 mm	
Operating range		0.2 to 9 m (protective height 1,640 mm max.), 0.2 to 7 m (protective height 1,655 mm min.) (Depending on the setting tool, the detection distance can be shortened to 0.5 m.)	
Response time (under stable light incident condition)	ON to OFF	1 set, 0245 to 983: 11 ms to 17.5 ms max. 1,055 or higher: 20 ms to 25 ms max.	1 set: 10 ms to 17.5 ms max.
	OFF to ON	1 set, 0245 to 983: 44 ms to 70 ms max. 1,055 or higher: 80 ms to 100 ms max.	1 set: 40 ms to 70 ms max.
Startup waiting time		2 s max. (2.2 s max. for series connection)	
Power supply voltage (Vs)		24 VDC±20% (ripple p-p10% max.)	
Current consumption (no load)	Emitter	To 50 beams: 76 mA max., 51 to 100 beams: 106 mA max., 101 to 150 beams: 130 mA max., 151 to 180 beams: 153 mA max., 201 to 234 beams: 165 mA max.	
	Receiver	To 50 beams: 68 mA max., 51 to 100 beams: 90 mA max., 101 to 150 beams: 111 mA max., 151 to 180 beams: 128 mA max., 201 to 234 beams: 142 mA max.	
Light source (emitted wavelength)		Infrared LED (870 nm)	
Effective aperture angle (EAA)		Based on IEC 61496-2. Within ±2.5° for both emitter and receiver when the detection distance is 3 m or over	
Safety outputs (OSSD)		Two PNP transistor outputs, load current 300 mA max., residual voltage 2 V max. (except for voltage drop due to cable extension), allowable capacity load 2.2 µF, leak current 1 mA max. (This can be different from traditional logic (ON/OFF) because safety circuit is used.)	
Auxiliary output 1 (Non-safety output)		One PNP transistor output, load current 300 mA max., residual voltage 2 V max. (except for voltage drop due to cable extension), leak current 1 mA max.	
Auxiliary output 2 (Non-safety output. Function for Basic System.)		One PNP transistor output, load current 50 mA max., residual voltage 2 V max. (except for voltage drop due to cable extension), leak current 1 mA max.	
External indicator output (Non-safety output)		Available indicators Incandescent lamp: 24 VDC, 3 to 7 W LED lamp: Load current 10 mA to 300 mA max., leak current 1 mA max. (To use an external indicator, an F39-JJ3N universal indicator cable or an F39-A01P-PAC dedicated external indicator kit is required.)	
Output operation mode	Receiver	Safety output 1, 2: ON when receiving light Auxiliary output 1: Inverse of safety output signals (Operation mode can be changed with the setting tool.) External indicator output 1: Inverse of safety output signals for a basic system (Operation mode can be changed with the setting tool.), ON when muting/override for a muting system (Operation mode can be changed with the setting tool.)	
	Emitter	Auxiliary output 2: Turns ON when the point of 30,000 operating hours is reached (Operation mode can be changed with the setting tool.) External indicator output 2: ON when lock-out for a basic system (Operation mode can be changed with the setting tool.) ON when muting/override for a muting system (Operation mode can be changed with the setting tool.)	

Model		F3SJ-A P14	F3SJ-A P30
Input voltage		Test input, interlock selection input, reset input, and muting input are all ON voltage: 9 to 24 V (Vs) (sink current: 3 mA max.), OFF voltage: 0 to 1.5 V, or open External device monitoring input ON voltage: 9 to 24 V (Vs) (sink current: 5 mA max.), OFF voltage: 0 to 1.5 V, or open	
Indicator	Emitter	Light intensity level indicators (green LED × 2, orange LED × 3): ON based on the light intensity Error mode indicators (red LED × 3): Blink to indicate error details Power indicator (green LED × 1): ON while power is on Interlock indicator (yellow LED × 1): ON while under interlock, blinks at lockout. External device monitoring indicator (muting input 1 indicator), Blanking/test indicator (muting input 2 indicator) (green LED × 2): ON/flash according to function	
	Receiver	Light intensity level indicators (green LED × 2, orange LED × 3): ON based on the light intensity Error mode indicators (red LED × 3): Blink to indicate error details OFF output indicator (red LED × 1): ON when safety output is OFF, blinks at lockout. ON output indicator (green LED × 1): ON while safety output is ON Muting error indicator, Blanking/test indicator (green LED × 2): ON/flash according to function	
Mutual interference prevention function		Interference light prevention algorithm, sensing distance change function	
Series connection		Time division emission by series connection Number of connections: up to 4 sets (F3SJ-A only) F3SJ-E, F3SJ-B and F3SJ-TS cannot be connected. Total number of beams: up to 400 beams Maximum cable length for 2 sets: no longer than 15 m	
Test function		Self test (at power-ON and at power distribution) External test (emission stop function by test input)	
Safety-related functions		Start interlock, restart interlock (Must be set with a setting tool when the muting function is used.) External device monitor Muting (Lamp burnout detection, override function included. F39-CN6 key cap for muting is required.) Fixed blanking (must be set by a setting tool) Floating blanking (must be set by a setting tool)	
Connection method		Connector method (M12, 8-pin)	
Protection circuit		Output short-circuit protection, and power supply reverse polarity protection	
Ambient temperature		Operating: -10 to 55°C (no icing), Storage: -30 to 70°C	
Ambient humidity		Operating: 35% to 85% (no condensation), Storage: 35% to 95%	
Operating ambient light intensity		Incandescent lamp: receiving-surface light intensity of 3,000 lx max., Sunlight: receiving-surface light intensity of 10,000 lx max.	
Insulation resistance		20 MΩ min. (at 500 VDC)	
Withstand voltage		1,000 VAC 50/60 Hz, 1 min	
Degree of protection		IP65 (IEC 60529)	
Vibration resistance		Malfunction: 10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps in X, Y, and Z directions	
Shock resistance		Malfunction: 100 m/s ² , 1,000 times each in X, Y, and Z directions	
Material		Casing (including metal parts on both ends): Aluminum, zinc die-cast Cap: ABS resin, Optical cover: PMMA resin (acrylic), Cable: Oil resistant PVC	
Weight (packaged)		Calculate using the following expressions: (1) For F3SJ-A 14, weight (g) = (protective height) × 1.7 + α (2) F3SJ-A 30, weight (g) = (protective height) × 1.5 + α The values for α are as follows: Protected height 245 to 596 mm: = 1,100 protected height 1,660 to 2,180 mm: = 2,400 Protected height 600 to 1,130 mm: = 1,500 protected height 2,195 to 2,500 mm: = 2,600 Protected height 1,136 to 1,658 mm: = 2,000	
Accessories		Test rod (*1), instruction manual, standard mounting bracket (F39-LJ1 bracket for top/bottom mounting), mounting brackets (intermediate) (*2), error mode label, User's Manual (CD-ROM) *1. The F3SJ-A 55 is not included. *2. Number of intermediate brackets depends on protective height of F3SJ. For protective height from 600 to 1,130 mm: 1 set for each of the emitter and receiver is included For protective height from 1,136 to 1,658 mm: 2 sets for each of the emitter and receiver are included For protective height from 1,660 to 2,180 mm: 3 sets for each of the emitter and receiver are included For protective height from 2,195 to 2,500 mm: 4 sets for each of the emitter and receiver are included	
Applicable standards		IEC 61496-1, EN 61496-1 UL 61496-1, Type 4 ESPE (Electro-Sensitive Protective Equipment) IEC 61496-2, CLC/TS 61496-2, UL 61496-2, Type 4 AOPD (Active Opto-electronic Protective Devices) IEC 61508-1 to -3, EN 61508-1 to -3 SIL3 IEC 13849-1: 2006, EN ISO 13849-1: 2008 (PLe, Cat.4) UL 508, UL 1998, CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8	

Response Time

Model	Protected height (mm)	Number of beams	Response time ms (ON to OFF)	Response time ms (OFF to ON)
F3SJ-A____14 Series	245 to 263	26 to 28	11	44
	281 to 389	30 to 42	12	48
	407 to 497	44 to 54	13	52
	515 to 605	56 to 66	14	56
	623 to 731	68 to 80	15	60
	767 to 983	84 to 108	17.5	70
	1,055 to 1,271	116 to 140	20	80
	1,343 to 1,559	148 to 172	22.5	90
	1,631	180	25	100
F3SJ-A____30 Series	245 to 395	10 to 16	10	40
	420 to 720	17 to 29	11	44
	745 to 1,045	30 to 42	12	48
	1,070 to 1,295	43 to 52	13	52
	1,395 to 1,620	56 to 65	14	56
	1,745 to 1,995	70 to 80	15	60
	2,120 to 2,495	85 to 100	17.5	70

Note: Use the following expressions for series connection.

- For 2-set series connection:
Response time (ON to OFF): Response time of the 1st unit + Response time of the 2nd unit – 1 (ms), Response time (OFF to ON): Response time calculated by the above × 4 (ms)
- For 3-set series connection:
Response time (ON to OFF):
Response time of the 1st unit + Response time of the 2nd unit + Response time of 3rd unit – 5 (ms), Response time (OFF to ON): Response time calculated by the above × 5 (ms)
For models with the “-TS” suffix, multiply the response time obtained by the above × 5 (ms), or use 200 ms, whichever is less.)
- For 4-set series connection:
Response time (ON to OFF): Response time of the 1st unit + Response time of the 2nd unit + Response time of the 3rd unit + Response time of the 4th unit – 8 (ms)
Response time (OFF to ON): Response time calculated by the above × 5 (ms)

Cable extension length

Total cable extension length must be no greater than the lengths described below.

When the F3SJ and an external power supply are directly connected, or when the F3SJ is connected to a G9SA-300-SC.

Condition	1 set	2 sets	3 sets	4 sets
Using incandescent lamp for auxiliary output and external indicator output	45 m	40 m	30 m	20 m
Not using incandescent lamp	100 m	60 m	45 m	30 m

When connected to the F3SP-B1P

Condition	1 set	2 sets	3 sets	4 sets
Using incandescent lamp for external indicator output 2	40 m	30 m	25 m	20 m
Using incandescent lamp for external indicator output 1	60 m	45 m	30 m	20 m
Using incandescent lamp for auxiliary output 1				
Not using incandescent lamp	100 m	60 m	45 m	30 m

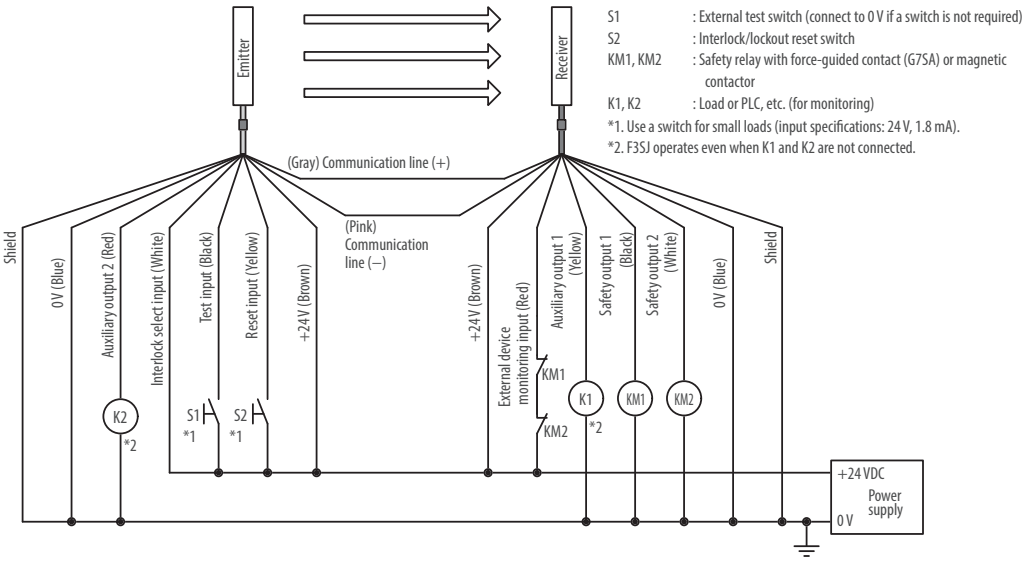
Note: Keep the cable length within the rated length. Failure to do so is dangerous as it may prevent safety functions from operating normally.

Connections

Basic Wiring Diagram

PNP Output

Wiring when using manual reset mode, external device monitoring.





Multi-beam, finger- and hand protection safety sensor

The F3S-TGR-CL multi-beam, finger- and hand protection safety sensors satisfying with integrated safety control functions selectable via built-in dip-switches.

- Type 2 or type 4 acc. EN61496-1
- PL c or PL e acc. ISO13849
- Family concept in wiring and mounting
- All models with dip-switch setup for external device monitoring, interlock function, range setting (short and long range) and optical or wired coding
- Advanced models with pre-reset function, T-, L- or X- muting function and muting lamp integrated

Ordering information

Multi-beam safety sensors

F3S-TGR-CL2_-K_ (Type 2)

System	Sensing distance	Detection capability	Order code	
			Basic feature set ^{*1}	Advanced feature set ^{*2}
Active/passive	0.5 m to 12 m	500	F3S-TGR-CL2B-K2C-500	F3S-TGR-CL2A-K2C-500
	0.5 m to 8 m	400	F3S-TGR-CL2B-K3C-800	F3S-TGR-CL2A-K3C-800
	0.5 m to 7 m	300	F3S-TGR-CL2B-K4C-900	F3S-TGR-CL2A-K4C-900
		400	F3S-TGR-CL2B-K4C-1200	F3S-TGR-CL2A-K4C-1200
Active/active	0.5 m to 40 m	500	F3S-TGR-CL2B-K2-500	F3S-TGR-CL2A-K2-500
		400	F3S-TGR-CL2B-K3-800	F3S-TGR-CL2A-K3-800
		300	F3S-TGR-CL2B-K4-900	F3S-TGR-CL2A-K4-900
		400	F3S-TGR-CL2B-K4-1200	F3S-TGR-CL2A-K4-1200
Active/active, long distance	25 m to 50 m	500	F3S-TGR-CL2B-K2-500-LD	F3S-TGR-CL2A-K2-500-LD
		400	F3S-TGR-CL2B-K3-800-LD	F3S-TGR-CL2A-K3-800-LD
		300	F3S-TGR-CL2B-K4-900-LD	F3S-TGR-CL2A-K4-900-LD
		400	F3S-TGR-CL2B-K4-1200-LD	F3S-TGR-CL2A-K4-1200-LD

F3S-TGR-CL4_-K_ (Type 4)

System	Sensing distance	Detection capability	Order code	
			Basic feature set ^{*1}	Advanced feature set ^{*2}
Active/passive	0.5 m to 12 m	500	F3S-TGR-CL4B-K2C-500	F3S-TGR-CL4A-K2C-500
	0.5 m to 8 m	400	F3S-TGR-CL4B-K3C-800	F3S-TGR-CL4A-K3C-800
	0.5 m to 7 m	300	F3S-TGR-CL4B-K4C-900	F3S-TGR-CL4A-K4C-900
		400	F3S-TGR-CL4B-K4C-1200	F3S-TGR-CL4A-K4C-1200
Active/active	0.5 m to 40 m	500	F3S-TGR-CL4B-K2-500	F3S-TGR-CL4A-K2-500
		400	F3S-TGR-CL4B-K3-800	F3S-TGR-CL4A-K3-800
		300	F3S-TGR-CL4B-K4-900	F3S-TGR-CL4A-K4-900
		400	F3S-TGR-CL4B-K4-1200	F3S-TGR-CL4A-K4-1200
Active/active, long distance	25 m to 50 m	500	F3S-TGR-CL4B-K2-500-LD	F3S-TGR-CL4A-K2-500-LD
		400	F3S-TGR-CL4B-K3-800-LD	F3S-TGR-CL4A-K3-800-LD
		300	F3S-TGR-CL4B-K4-900-LD	F3S-TGR-CL4A-K4-900-LD
		400	F3S-TGR-CL4B-K4-1200-LD	F3S-TGR-CL4A-K4-1200-LD

^{*1} Basic feature set: Manual/automatic restart, coding

^{*2} Advanced feature set: Basic + Muting + integrated Muting lamp + Pre-reset

Safety sensors

F3S-TGR-CL2_ (Type 2)

Feature set	Master/Slave	Sensing distance	Detection capability	Length	Order code
Basic ^{*1}	Standalone	0.2 m to 6 m	14 mm	150 mm to 2,400 mm ^{*3}	F3S-TGR-CL2B-014-__
		0.2 m to 14 m	35 mm		F3S-TGR-CL2B-035-__
Advanced ^{*2}	Standalone	0.2 m to 6 m	14 mm		F3S-TGR-CL2A-014-__
		0.2 m to 14 m	35 mm		F3S-TGR-CL2A-035-__
	Master	0.2 m to 6 m	14 mm	150 mm to 2,250 mm ^{*3}	F3S-TGR-CL2A-014-_M
		0.2 m to 14 m	35 mm		F3S-TGR-CL2A-035-_M
	Slave	0.2 m to 6 m	14 mm		F3S-TGR-CL2A-014-_S
		0.2 m to 14 m	35 mm		F3S-TGR-CL2A-035-_S
			70 mm	300 mm to 2,100 mm	F3S-TGR-CL2A-070-_S

F3S-TGR-CL4_ (Type 4)

Feature set	Master/Slave	Sensing distance	Detection capability	Length	Order code
Basic ^{*1}	Standalone	0.2 m to 6 m	14 mm	150 mm to 2,400 mm ^{*3}	F3S-TGR-CL4B-014-__
		0.2 m to 14 m	35 mm		F3S-TGR-CL4B-035-__
Advanced ^{*2}	Standalone	0.2 m to 6 m	14 mm		F3S-TGR-CL4A-014-__
		0.2 m to 14 m	35 mm		F3S-TGR-CL4A-035-__
	Master ^{*4}	0.2 m to 6 m	14 mm	150 mm to 2,250 mm ^{*3}	F3S-TGR-CL4A-014-_M
		0.2 m to 14 m	35 mm		F3S-TGR-CL4A-035-_M
	Slave ^{*4}	0.2 m to 6 m	14 mm		F3S-TGR-CL4A-014-_S
		0.2 m to 14 m	35 mm		F3S-TGR-CL4A-035-_S
			70 mm	300 mm to 2,100 mm	F3S-TGR-CL4A-070-_S

^{*1} Basic feature set: Manual/automatic restart, coding

^{*2} Advanced feature set: Basic + Muting + integrated Muting lamp + Pre-reset

^{*3} Available length (in mm): 150, 300, 450, 600, 750, 900, 1,050, 1,200, 1,350, 1,500, 1,650, 1,800, 1,950, 2,100, 2,250, (2,400 mm, only standalone versions)

^{*4} Master/slave system: A master/slave system cannot exceed the total length of 2,400 mm

F3S-TGR-CL-__M/S Master-Slave Series

- A Master-Slave cascade system is made of one master segment and one slave segment.
- The length of the total protective field can vary from minimum 300 mm till maximum 2,400 mm.

- The interconnect cable length limitation between master and slave segment is in total max. 0,9 m.

Possible combinations of master and slave are in this table:

		Slave models																					
		14 mm or 35 mm resolution															70 mm resolution						
		150	300	450	600	750	900	1,050	1,200	1,350	1,500	1,650	1,800	1,950	2,150	2,250	300	600	900	1,200	1,500	1,800	2,100
Master models (14 mm or 35 mm resolution)	150	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	300	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	450	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK			OK	OK	OK	OK	OK	OK	
	600	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK				OK	OK	OK	OK	OK	OK	
	750	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK					OK	OK	OK	OK	OK		
	900	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK						OK	OK	OK	OK	OK		
	1,050	OK	OK	OK	OK	OK	OK	OK	OK	OK							OK	OK	OK	OK			
	1,200	OK	OK	OK	OK	OK	OK	OK	OK								OK	OK	OK	OK			
	1,350	OK	OK	OK	OK	OK	OK	OK									OK	OK	OK				
	1,500	OK	OK	OK	OK	OK	OK										OK	OK	OK				
	1,650	OK	OK	OK	OK	OK											OK	OK					
	1,800	OK	OK	OK	OK												OK	OK					
	1,950	OK	OK	OK													OK						
	2,100	OK	OK														OK						
	2,250	OK																					

Accessories

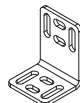
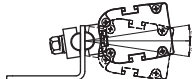
Receiver cables (M12-8pin, shielded, flying leads)

Shape	Description	Remark	Order code
	Sensor connector with open cable end M12-8pin, outer shielding layer	Receiver cable, 2 m length	Y92E-M12PURSH8S2M-L
		Receiver cable, 5 m length	Y92E-M12PURSH8S5M-L
		Receiver cable, 10 m length	Y92E-M12PURSH8S10M-L
		Receiver cable, 25 m length	Y92E-M12PURSH8S25M-L

Transmitter cables (M12-4pin, shielded, flying leads)

Shape	Description	Remark	Order code
	Sensor connector with open cable end M12-4pin, outer shielding layer	Transmitter cable, 2 m length	Y92E-M12PURSH4S2M-L
		Transmitter cable, 5 m length	Y92E-M12PURSH4S5M-L
		Transmitter cable, 10 m length	Y92E-M12PURSH4S10M-L
		Transmitter cable, 25 m length	Y92E-M12PURSH4S25M-L

Mounting brackets

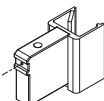
Shape	Description	Remark	Order code
	Mounting bracket	Mounting bracket × 1, SLC mounting screws × 1 set	F39-TGR-ST-SB ^{*1}
	Adjustable bracket	Adjustable bracket × 1, Bracket mounting screws × 1 set	F39-TGR-ST-ADJ

^{*1} Brackets amount included in shipment is shown in table of Dimensions

Master-Slave accessories

Shape	Description	Remark	Order code
	Male-male extension connector M12-8pin, outer shielding layer	Connection cable, 0.3 m length	Y92E-M12MSM12MSPURSH80.3M-L
		Connection cable, 0.9 m length	Y92E-M12MSM12MSPURSH80.9M-L (included in slave system)
	Alignment kit – end cap	To support alignment of a Master-Slave system	F39-TGR-CL-MSA (included in slave system)

Laser alignment kit

Shape	Description	Remark	Order code
	Laser alignment kit	Scanning range: ≤ 60 m Batteries: 2 × 1.5 V Micro/AAA Laser Class 2 (IEC 60825)	F39-TGR-CL-LLK

Mounting systems and mirrors

Adjustable stands

		Order code
Adjustable stand, 1,200 mm high	Safety sensors, Mirror systems	F39-TGR-AS-B1200
Adjustable stand, 1,600 mm high	Safety sensors, Mirror systems, Muting applications	F39-TGR-AS-B1600

Mirror system for multi-beam safety sensors (F3S-TGR-CL-K)

		Order code
Mirror mounting plate	2-, 3- and 4-beam systems ≤900 mm	F39-TGR-AS-MM1
	4-beam system 1,200 mm	F39-TGR-AS-MM2
Adjustable mirror kit	Use 1 pcs F39-TGR-AS-AM1 for each beam of the safety sensor	F39-TGR-AS-AM1

Muting accessories

		Order code
Mounting system for muting sensors	For L-muting	F39-TGR-AS-MA-MBL
	For X- and T-muting	F39-TGR-AS-MA-MBXT
Mounting bracket for muting sensors	For OMRON E3Z and E3G-family	F39-TGR-AS-MA-MSM
Mounting bracket for reflectors	For OMRON E39-R1S	F39-TGR-AS-MA-MRM

Cable cover

		Order code
Cable cover	For 1,200 mm stand	F39-TGR-AS-MA-CC12
	For 1,600 mm stand	F39-TGR-AS-MA-CC16

Specifications

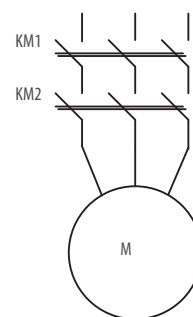
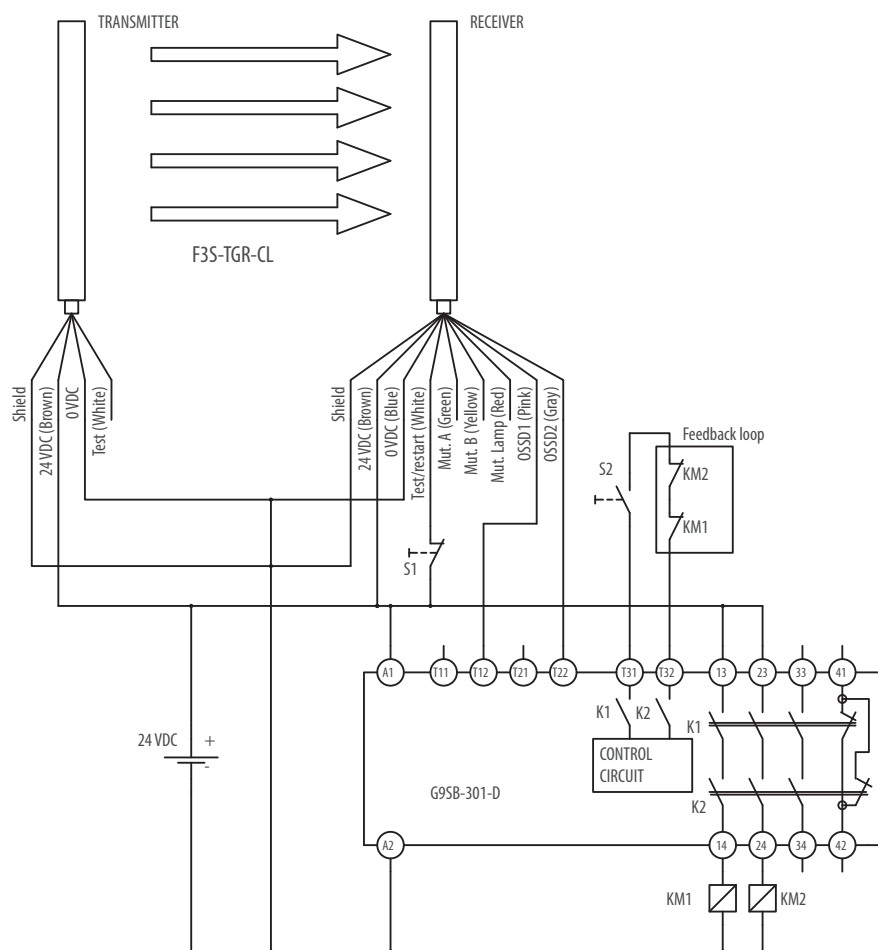
Multi-beam safety sensors

Item	F3S-TGR-CL2_-0__	F3S-TGR-CL4_-0__
Sensor type	Type 2	Type 4
Protective height	500 mm, 800 mm, 900 mm or 1,200 mm	
Operating range	F3S-TGR-CL__-K__ 0.5 to 20 m or 20 to 40 m (Dip switch option) F3S-TGR-CL__-K__-LD 25 to 50 m F3S-TGR-CL__-K2C-500 0.5 to 12 m F3S-TGR-CL__-K3C-800 0.5 to 8 m F3S-TGR-CL__-K4C- 0.5 to 7 m	
Beam pitch	F3S-TGR-CL__-K2_-500: 2 beams, 500 mm F3S-TGR-CL__-K3_-800: 3 beams, 400 mm F3S-TGR-CL__-K4_-900: 4 beams, 300 mm F3S-TGR-CL__-K4_-1200: 4 beams, 400 mm	
Effective aperture angle (EAA)	Within $\pm 5^\circ$	Within $\pm 2.5^\circ$
	for the emitter and receiver at a detection distance of at least 3 m according to IEC 61496-2	
Light source	Infrared LED (880 nm), power dissipation <3 mW, Class 1 per EN 60825-1	
Supply voltage	24 VDC $\pm$ 20%, according EN 60204-1 able to cover a drop of voltage of at least 20 ms	
OSSD	2 PNP transistor outputs, load current 2 $\times$ 250 mA max	
Test functions	Self test (after power ON and during operation)	
Safety-related functions	All models with dip-switch setup for external device monitoring, interlock function, range setting (short and long range) and optical or wired sync. Advanced models with selectable pre-reset function, T-, L-or X- muting function (timeout or infinite muting dip switch option) and muting lamp integrated (only for the non master-slave systems)	
Response time	ON to OFF: Maximum: 13 ms	
Ambient temperature	Operating: -10 to 55°C, Storage: -25 to 70°C (no icing, no condensation)	
Ambient humidity	95% not condensing	
Degree of protection	IP 65 (IEC 60529)	
Materials	Housing: Painted aluminum, Yellow, RAL 1018 Front Window: Acrylic Lexan Red end cap: PA6 (Standalone models), Transparent end cap: PC (Advanced standalone models), Sealing Gasket: EPDM Mounting Bracket: Cold rolled Steel	
Suitable for safety control systems	PLc (ISO 13849-1)	PLe (ISO 13849-1)
Category	Categorie 2	Categorie 4
PFHd	2.5×10^{-9}	
Proof test interval	every 20 years	

Finger- and hand safety protection sensors

Item	F3S-TGR-CL2_-0__	F3S-TGR-CL4_-0__
Sensor type	Type 2	Type 4
Protective height	150 mm to 2,400 mm	
Operating range (short setting or long setting)	F3S-TGR-CL__-014: 0.2 m to 3 m or 3 m to 6 m (Dip switch option) F3S-TGR-CL__-035: 0.2 m to 7 m or 7 m to 14 m (Dip switch option) F3S-TGR-CL__-070: 0.2 m to 7 m or 7 m to 14 m (Dip switch option)	
Detection capability	F3S-TGR-CL__-014: Opaque objects 14 mm in diameter F3S-TGR-CL__-035: Opaque objects 35 mm in diameter F3S-TGR-CL__-070: Opaque objects 70 mm in diameter	
Effective aperture angle (EAA)	Within $\pm 5^\circ$	Within $\pm 2.5^\circ$
	for the emitter and receiver at a detection distance of at least 3 m according to IEC 61496-2	
Light source	Infrared LED (880 nm), power dissipation <3 mW, Class 1 per EN 60825-1	
Supply voltage	24 VDC $\pm$ 20%, according EN 60204-1 able to cover a drop of voltage of at least 20 ms	
OSSD	2 PNP transistor outputs, load current 2 $\times$ 250 mA max	
Series connection	Number of connections: One master and one slave safety light curtain Total number of beams $\leq$ 336 Maximum interconnect cable length: 900 mm	
Test functions	Self test (after power ON and during operation)	
Safety-related functions	All models with dip-switch setup for external device monitoring, interlock function, range setting (short and long range) and optical or wired sync. Advanced models with selectable pre-reset function, T-, L-or X- muting function (timeout muting), blanking, single / double brake function and muting lamp integrated (only for the non master-slave systems)	
Response time	ON to OFF: 14 ms to 103 ms	
Ambient temperature	Operating: -10 to 55°C, Storage: -25 to 70°C (no icing, no condensation)	
Ambient humidity	95% not condensing	
Degree of protection	IP 65 (IEC 60529)	
Materials	Housing: Painted aluminum, Yellow, RAL 1018 Front Window: Acrylic Lexan Red end cap: PA6 (Standalone models), Transparent end cap: PC (Advanced standalone models), Die cast aluminum (Master-, Slave models) Sealing Gasket: EPDM Mounting Bracket: Cold rolled Steel	
Suitable for safety control systems	PLc (ISO 13849-1)	PLe (ISO 13849-1)
Category	Categorie 2	Categorie 4
PFHd	2.5×10^{-9}	
Proof test interval	every 20 years	

F3S-TGR-CL and G95B-301-D in manual reset



Note: This circuit achieves up to PLe according to EN ISO 13849-1 with F3S-TGR-CL4 and up to PLc according to EN ISO 13849-1 with F3S-TGR-CL2.



Advanced type for complex safety solutions

The F3SG-RA advanced safety light curtain provides simplicity in mounting, daily operation and maintenance.

- Torsion-resistant for fast and simple alignment
- Smart-click cable connection for fast set-up and correct torque to ensure IP67
- QR code indication for easy online troubleshooting
- PNP/NPN output selection by DIP switch
- Cascading connection up to 3 segments and up to 255 beams
- Built in blanking, muting and reset functions

Ordering information

Sensors

Application	Type	Detection capability	Operating range	Protective height	Order code
Finger detection	Type 4 / Type 2	14 mm	0.3 to 10 m	160 to 2,080 mm	F3SG-RA__-14
Hand detection	Type 4 / Type 2	30 mm	0.3 to 20 m	190 to 2,510 mm	F3SG-RA__-30

F3SG-RA_14 models (14 mm detection capability)

Protective height	Number of beams	Order code	
		Type 4	Type 2
160 mm	15	F3SG-4RA0160-14	F3SG-2RA0160-14
240 mm	23	F3SG-4RA0240-14	F3SG-2RA0240-14
320 mm	31	F3SG-4RA0320-14	F3SG-2RA0320-14
400 mm	39	F3SG-4RA0400-14	F3SG-2RA0400-14
480 mm	47	F3SG-4RA0480-14	F3SG-2RA0480-14
560 mm	55	F3SG-4RA0560-14	F3SG-2RA0560-14
640 mm	62	F3SG-4RA0640-14	F3SG-2RA0640-14
720 mm	71	F3SG-4RA0720-14	F3SG-2RA0720-14
800 mm	79	F3SG-4RA0800-14	F3SG-2RA0800-14
880 mm	87	F3SG-4RA0880-14	F3SG-2RA0880-14
960 mm	95	F3SG-4RA0960-14	F3SG-2RA0960-14
1040 mm	103	F3SG-4RA1040-14	F3SG-2RA1040-14
1120 mm	111	F3SG-4RA1120-14	F3SG-2RA1120-14
1200 mm	119	F3SG-4RA1200-14	F3SG-2RA1200-14
1280 mm	127	F3SG-4RA1280-14	F3SG-2RA1280-14
1360 mm	135	F3SG-4RA1360-14	F3SG-2RA1360-14
1440 mm	143	F3SG-4RA1440-14	F3SG-2RA1440-14
1520 mm	151	F3SG-4RA1520-14	F3SG-2RA1520-14
1600 mm	159	F3SG-4RA1600-14	F3SG-2RA1600-14
1680 mm	167	F3SG-4RA1680-14	F3SG-2RA1680-14
1760 mm	175	F3SG-4RA1760-14	F3SG-2RA1760-14
1840 mm	183	F3SG-4RA1840-14	F3SG-2RA1840-14
1920 mm	191	F3SG-4RA1920-14	F3SG-2RA1920-14
2000 mm	199	F3SG-4RA2000-14	F3SG-2RA2000-14
2080 mm	207	F3SG-4RA2080-14	F3SG-2RA2080-14

F3SG-RA_30 models (30 mm detection capability)

Protective height	Number of beams	Order code	
		Type 4	Type 2
190 mm	8	F3SG-4RA0190-30	F3SG-2RA0190-30
270 mm	12	F3SG-4RA0270-30	F3SG-2RA0270-30
350 mm	16	F3SG-4RA0350-30	F3SG-2RA0350-30
430 mm	20	F3SG-4RA0430-30	F3SG-2RA0430-30
510 mm	24	F3SG-4RA0510-30	F3SG-2RA0510-30
590 mm	28	F3SG-4RA0590-30	F3SG-2RA0590-30
670 mm	32	F3SG-4RA0670-30	F3SG-2RA0670-30
750 mm	36	F3SG-4RA0750-30	F3SG-2RA0750-30
830 mm	40	F3SG-4RA0830-30	F3SG-2RA0830-30
910 mm	44	F3SG-4RA0910-30	F3SG-2RA0910-30
990 mm	48	F3SG-4RA0990-30	F3SG-2RA0990-30
1070 mm	52	F3SG-4RA1070-30	F3SG-2RA1070-30
1150 mm	56	F3SG-4RA1150-30	F3SG-2RA1150-30
1230 mm	60	F3SG-4RA1230-30	F3SG-2RA1230-30
1310 mm	64	F3SG-4RA1310-30	F3SG-2RA1310-30
1390 mm	68	F3SG-4RA1390-30	F3SG-2RA1390-30
1470 mm	72	F3SG-4RA1470-30	F3SG-2RA1470-30
1550 mm	76	F3SG-4RA1550-30	F3SG-2RA1550-30
1630 mm	80	F3SG-4RA1630-30	F3SG-2RA1630-30
1710 mm	84	F3SG-4RA1710-30	F3SG-2RA1710-30
1790 mm	88	F3SG-4RA1790-30	F3SG-2RA1790-30
1870 mm	92	F3SG-4RA1870-30	F3SG-2RA1870-30
1950 mm	96	F3SG-4RA1950-30	F3SG-2RA1950-30
2030 mm	100	F3SG-4RA2030-30	F3SG-2RA2030-30
2110 mm	104	F3SG-4RA2110-30	F3SG-2RA2110-30
2190 mm	108	F3SG-4RA2190-30	F3SG-2RA2190-30
2270 mm	112	F3SG-4RA2270-30	F3SG-2RA2270-30
2350 mm	116	F3SG-4RA2350-30	F3SG-2RA2350-30
2420 mm	120	F3SG-4RA2430-30	F3SG-2RA2430-30
2510 mm	124	F3SG-4RA2510-30	F3SG-2RA2510-30

Accessories (Sold separately)

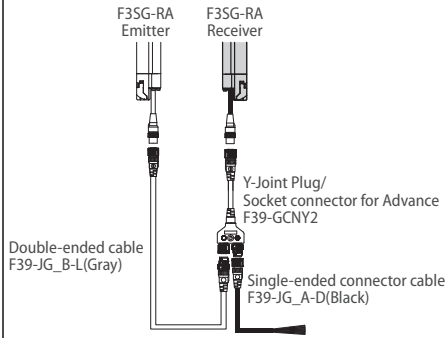
Single-end connector cable

Appearance	Type	Specification	Cable length	Order code																								
	Emitter cable M12 connector 5-Pin Color: Gray	 Female	<table><tr><td>1</td><td>+ 24 VDC</td><td>Brown</td></tr><tr><td>2</td><td>TEST</td><td>Black</td></tr><tr><td>3</td><td>0 VDC</td><td>Blue</td></tr><tr><td>4</td><td>Not used</td><td>White</td></tr><tr><td>5</td><td>Not used</td><td>Yellow</td></tr></table>	1	+ 24 VDC	Brown	2	TEST	Black	3	0 VDC	Blue	4	Not used	White	5	Not used	Yellow	3 m	F39-JG3A-L								
			1	+ 24 VDC	Brown																							
			2	TEST	Black																							
			3	0 VDC	Blue																							
			4	Not used	White																							
	5	Not used	Yellow																									
	7m	F39-JG7A-L																										
	10 m	F39-JG10A-L																										
	15 m	F39-JG15A-L																										
	20 m	F39-JG20A-L																										
Receiver cable M12 connector 8-Pin Color: Black	 Female	<table><tr><td>1</td><td>Reset</td><td>Yellow</td></tr><tr><td>2</td><td>+ 24 VDC</td><td>Brown</td></tr><tr><td>3</td><td>MUTE A</td><td>Gray</td></tr><tr><td>4</td><td>MUTE B</td><td>Pink</td></tr><tr><td>5</td><td>OSSD 1</td><td>Black</td></tr><tr><td>6</td><td>OSSD 2</td><td>White</td></tr><tr><td>7</td><td>0 VDC</td><td>Blue</td></tr><tr><td>8</td><td>AUX(Lamp)</td><td>Red</td></tr></table>	1	Reset	Yellow	2	+ 24 VDC	Brown	3	MUTE A	Gray	4	MUTE B	Pink	5	OSSD 1	Black	6	OSSD 2	White	7	0 VDC	Blue	8	AUX(Lamp)	Red	3 m	F39-JG3A-D
		1	Reset	Yellow																								
		2	+ 24 VDC	Brown																								
		3	MUTE A	Gray																								
		4	MUTE B	Pink																								
5	OSSD 1	Black																										
6	OSSD 2	White																										
7	0 VDC	Blue																										
8	AUX(Lamp)	Red																										
7m	F39-JG7A-D																											
10 m	F39-JG10A-D																											
15 m	F39-JG15A-D																											
20 m	F39-JG20A-D																											

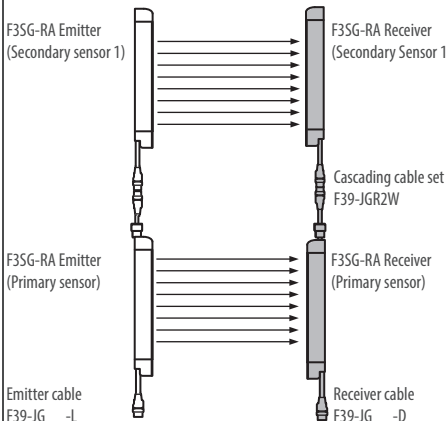
Double-end connector cable

Appearance	Type	Specification	Cable length	Order code
	Emitter cable M12 connector 5-Pin Color: Gray	Connected to power cable or double-ended cable 1 Brown 3 Blue 2 Black 4 White 5 Yellow 1 Brown 3 Blue 2 Black 4 White 5 Yellow Female 1 2 3 4 5 Male 1 2 3 4 5	0.5 m	F39-JGR5B-L
	1 m	F39-JG1B-L		
	3 m	F39-JG3B-L		
	5 m	F39-JG5B-L		
	7m	F39-JG7B-L		
	10 m	F39-JG10B-L		
	15 m	F39-JG15B-L		
	20 m	F39-JG20B-L		
	Receiver cable M12 connector 8-Pin Color: Black	Connected to power cable or double-ended cable 2 Brown 7 Blue 5 Black 6 White 1 Yellow 8 Red 3 Gray 4 Pink 2 Brown 7 Blue 5 Black 6 White 1 Yellow 8 Red 3 Gray 4 Pink Female 1 2 3 4 5 6 7 8 Male 1 2 3 4 5 6 7 8	0.5 m	F39-JGR5B-D
	1 m	F39-JG1B-D		
	3 m	F39-JG3B-D		
	5 m	F39-JG5B-D		
	7m	F39-JG7B-D		
	10 m	F39-JG10B-D		
	15 m	F39-JG15B-D		
	20 m	F39-JG20B-D		

Y-joint Plug/Socket Connector

Appearance	Type	Specification	Cable length	Order code
	M12 connectors. Used for reduced wiring.	 Double-ended cable F39-JG_B-L(Gray) Single-ended connector cable F39-JG_A-D(Black)	0.5 m	F39-GCNY2

Cascading cable

Appearance	Type	Specification	Cable length	Order code
	Cascading cable set Set including: Emitter cable: Cap (5-pin), M12 connector (5-pin) Receiver cable: Cap (8-pin), M12 connector (8-pin)	 F39-JG_RA Emitter (Secondary sensor 1) F39-JG_RA Receiver (Secondary Sensor 1) Cascading cable set F39-JGR2W F39-JG_RA Emitter (Primary sensor) F39-JG_RA Receiver (Primary sensor) Emitter cable F39-JG__-L Receiver cable F39-JG__-D	0.2 m	F39-JGR2W

Mounting brackets

Appearance	Type	Specification	Order code
	Standard fixed bracket set (Two brackets per set)	Bracket to mount the F3SG-R. Side mounting and backside mounting possible. (Included in the F3SG-R product package ^{*1})	F39-LGF
	Standard adjustable bracket set (Two brackets per set)	Bracket to mount the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is $\pm 15^\circ$. Side mounting and backside mounting possible.	F39-LGA
	Top/Bottom adjustable bracket set ^{*2} (Four brackets per set)	Bracket to mount the F3SG-R at the top and bottom position. Beam alignment after mounting possible. The angle adjustment range is $\pm 22.5^\circ$. Can be used in combination with the standard adjustable brackets.	F39-LGTB

^{*1} F3SG-RA____-14: Protective height of 0160 to 1200: 2 sets, protective height of 1280 to 2080: 3 sets

F3SG-RA____-30: Protective height of 0190 to 1230: 2 sets, protective height of 1310 to 2270: 3 sets, protective height of 2350 to 2510: 4 sets

^{*2} Optional available F39-LGTB-1 Top/Bottom adjustable bracket set (4 pcs.) without angle bracket to mount to the wall.

Interface units and configuration tool SD Manager 2

Appearance	Type	Specification	Order code
	SD Manager2	The configuration tool SD Manager2 is available to download from our website at http://www.ia.omron.com/f3sg-r_tool . To change the settings of the F3SG-RA using SD Manager 2, it is necessary to set the receiver's two DIP switches No. 8 to ON.	—
	Interface unit	F39-GIF interface unit to connect the F3SG-RA receiver to a USB port of the PC	F39-GIF
	Bluetooth unit	F39-BT bluetooth unit to enable bluetooth on the F3SG-RA	F39-BT

Lamp and Bluetooth

Appearance	Type	Specification	Order code
	Lamp unit	The lamp unit can be connected to a F3SG-RA receiver. The lamp can indicate red, orange, and green colors, to which three different states can be assigned.	F39-LP
	Bluetooth + Lamp unit	The bluetooth + lamp unit can be connected to a F3SG-RA receiver to enable bluetooth on the F3SG-RA. The lamp can indicate red, orange, and green colors, to which three different states can be assigned.	F39-BTLP

Test rod

Appearance	Type	Specification	Order code
	Test rod 14mm	14 mm diameter	F39-TRD14
	Test rod 30mm	30 mm diameter	F39-TRD30

Spatter protection cover (Two covers per set, for emitter and receiver)

Spatter protection covers include mounting brackets.

For safety light curtain models of the protective height of 2,000 mm or longer, use two spatter protection covers of different lengths.

Appearance	Safety light curtain model		Order code
	Finger protection	Hand and arm protection	
	F3SG-_RA0160-14	F3SG-_RA0190-30	F39-HGA0200
	F3SG-_RA0240-14	F3SG-_RA0270-30	F39-HGA0280
	F3SG-_RA0320-14	F3SG-_RA0350-30	F39-HGA0360
	F3SG-_RA0400-14	F3SG-_RA0430-30	F39-HGA0440
	F3SG-_RA0480-14	F3SG-_RA0510-30	F39-HGA0520
	F3SG-_RA0560-14	F3SG-_RA0590-30	F39-HGA0600
	F3SG-_RA0640-14	F3SG-_RA0670-30	F39-HGA0680
	F3SG-_RA0720-14	F3SG-_RA0750-30	F39-HGA0760
	F3SG-_RA0800-14	F3SG-_RA0830-30	F39-HGA0840
	F3SG-_RA0880-14	F3SG-_RA0910-30	F39-HGA0920
	F3SG-_RA0960-14	F3SG-_RA0990-30	F39-HGA1000
	F3SG-_RA1040-14	F3SG-_RA1070-30	F39-HGA1080
	F3SG-_RA1120-14	F3SG-_RA1150-30	F39-HGA1160
	F3SG-_RA1200-14	F3SG-_RA1230-30	F39-HGA1240
	F3SG-_RA1280-14	F3SG-_RA1310-30	F39-HGA1320
	F3SG-_RA1360-14	F3SG-_RA1390-30	F39-HGA1400
	F3SG-_RA1440-14	F3SG-_RA1470-30	F39-HGA1480
	F3SG-_RA1520-14	F3SG-_RA1550-30	F39-HGA1560
	F3SG-_RA1600-14	F3SG-_RA1630-30	F39-HGA1640
	F3SG-_RA1680-14	F3SG-_RA1710-30	F39-HGA1720
	F3SG-_RA1760-14	F3SG-_RA1790-30	F39-HGA1800
	F3SG-_RA1840-14	F3SG-_RA1870-30	F39-HGA1880
	F3SG-_RA1920-14	F3SG-_RA1950-30	F39-HGA1960
	F3SG-_RA2000-14	F3SG-_RA2030-30	F39-HGA1480
	F3SG-_RA2080-14	F3SG-_RA2110-30	F39-HGA0550
			F39-HGA1560
	—	F3SG-_RA2190-30	F39-HGA0550
			F39-HGA1640
	—	F3SG-_RA2270-30	F39-HGA0550
			F39-HGA1720
	—	F3SG-_RA2350-30	F39-HGA0550
			F39-HGA1800
	—	F3SG-_RA2430-30	F39-HGA0550
			F39-HGA1880
	—	F3SG-_RA2510-30	F39-HGA0550
			F39-HGA1960
			F39-HGA0550

Note: The operating range of the safety light curtain attached with the product is 10% shorter than the rating.**Spare parts**

Appearance	Type	Specification	Order code
	End cap	Housing color: Black For both emitter and receiver (Attached to the F3SG-R. The end cap can be purchased if lost.)	F39-CNM

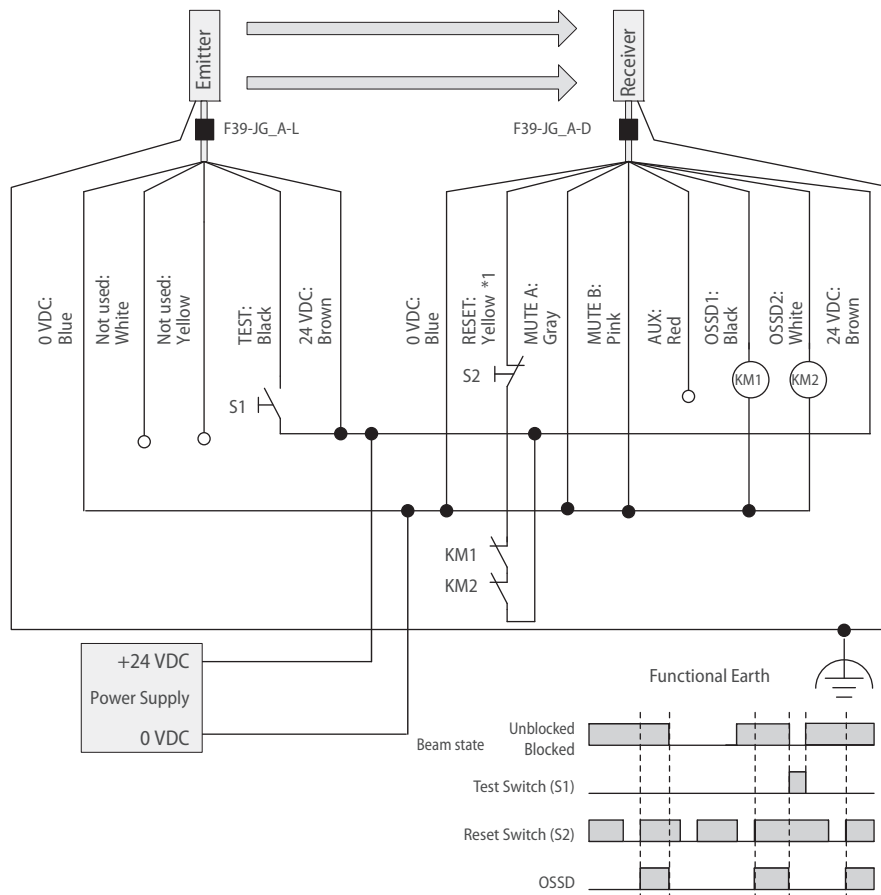
Specifications

Item		F3SG-4RA ____-14 F3SG-2RA ____-14	F3SG-4RA ____-30 F3SG-2RA ____-30
Type of ESPE (IEC 61496-1)	Type 4	F3SG-4RA ____-14/-30	
	Type 2	F3SG-2RA ____-14/-30	
Detection capability (Opaque objects)		14 mm dia.	30 mm dia.
Protective height		160 to 2080 mm	190 to 2510 mm
Operating range (Dip switch option)		0.3 to 3.0 m or 0.3 to 10.0 m	0.3 to 7.0 m or 0.3 to 20.0 m
Effective aperture angle (EAA) (IEC 61496-2)	Type 4	±2.5° max., emitter and receiver at operating range of 3 m or greater	
	Type 2	±5.0° max., emitter and receiver at operating range of 3 m or greater	
Light source		Infrared LEDs, Wavelength: 870 nm	
Power supply voltage (Vs)		SELV/PELV 24 VDC ±20% (ripple p-p 10% max.)	
Safety outputs (OSSD)		2 PNP or NPN transistor outputs (PNP or NPN selectable by DIP switch), load current of 300 mA max.	
Cascade connection		Number of cascaded segments: 3 max., total number of beams: 255 max. Total sum of cable lengths between sensors: 10 m max.	
Test function		Self-test (at power-on, and during operation), External test (light emission stop function by test input)	
Safety-related functions		Interlock, pre-reset, external device monitoring (EDM), fixed blanking/floating blanking, reduced resolution, muting/override, scan code selection, PNP/NPN selection, response time adjustment	
Response time		ON to OFF (normal mode): 8 to 18 ms max., OFF to ON: 40 to 90 ms max.	
Ambient temperature	Operating	-10 to 55°C (non-icing)	
	Storage	-25 to 70°C	
Ambient humidity	Operating	35% to 85% (non-condensing)	
	Storage	35% to 95%	
Degree of protection (IEC 60529)		IP65 and IP67	
Material		Housing: Aluminum, Cap: PBT, Front window: PMMA, Cable: Oil resistant PVC, Mounting bracket: ZDC2, FE plate: SUS	
Performance level (PL)/ Safety category	Type 4	PLe/Category 4 (EN ISO 13849-1:2008)	
	Type 2	PLc/Category 2 (EN ISO 13849-1:2008)	
PFHd		≤ 9.9 × 10 ⁻⁸ (IEC 61508)	
Proof test interval T _M		Every 20 years (IEC 61508)	

Note: For more information, please check the user manual Z352-E1

Connections (Basic wiring diagram)

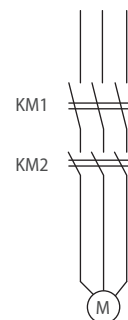
Standalone F3SG-RA using PNP outputs



[DIP Switch settings]*2

Receiver:
- Manual Reset Mode
- EDM enabled
- PNP output

Emitter:
- 24 V Active



S1: Test Switch
S2: Lockout/Interlock Reset Switch
KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
M: 3-phase motor

*1. Also used as EDM input line.
*2. The functions are configurable with DIP Switch.



Easy type for simple ON/OFF detection applications

The F3SG-RE easy safety light curtain provides simplicity in mounting, operation and maintenance.

- Torsion-resistant for fast and simple alignment
- Smart-click cable connection for fast set-up and correct torque to ensure IP67
- QR code indication for easy online troubleshooting

Ordering information

Sensors

Application	Type	Detection capability	Operating range	Protective height	Order code
Finger detection	Type 4 / Type 2	14 mm	0.3 to 10 m	160 to 2,080 mm	F3SG-RE__-14
Hand detection	Type 4 / Type 2	30 mm	0.3 to 20 m	190 to 2,510 mm	F3SG-RE__-30

F3SG-RE_P14 models (PNP and 14 mm detection capability)

Protective height	Number of beams	Order code	
		Type 4	Type 2
160 mm	15	F3SG-4RE0160P14	F3SG-2RE0160P14
240 mm	23	F3SG-4RE0240P14	F3SG-2RE0240P14
320 mm	31	F3SG-4RE0320P14	F3SG-2RE0320P14
400 mm	39	F3SG-4RE0400P14	F3SG-2RE0400P14
480 mm	47	F3SG-4RE0480P14	F3SG-2RE0480P14
560 mm	55	F3SG-4RE0560P14	F3SG-2RE0560P14
640 mm	62	F3SG-4RE0640P14	F3SG-2RE0640P14
720 mm	71	F3SG-4RE0720P14	F3SG-2RE0720P14
800 mm	79	F3SG-4RE0800P14	F3SG-2RE0800P14
880 mm	87	F3SG-4RE0880P14	F3SG-2RE0880P14
960 mm	95	F3SG-4RE0960P14	F3SG-2RE0960P14
1040 mm	103	F3SG-4RE1040P14	F3SG-2RE1040P14
1120 mm	111	F3SG-4RE1120P14	F3SG-2RE1120P14
1200 mm	119	F3SG-4RE1200P14	F3SG-2RE1200P14
1280 mm	127	F3SG-4RE1280P14	F3SG-2RE1280P14
1360 mm	135	F3SG-4RE1360P14	F3SG-2RE1360P14
1440 mm	143	F3SG-4RE1440P14	F3SG-2RE1440P14
1520 mm	151	F3SG-4RE1520P14	F3SG-2RE1520P14
1600 mm	159	F3SG-4RE1600P14	F3SG-2RE1600P14
1680 mm	167	F3SG-4RE1680P14	F3SG-2RE1680P14
1760 mm	175	F3SG-4RE1760P14	F3SG-2RE1760P14
1840 mm	183	F3SG-4RE1840P14	F3SG-2RE1840P14
1920 mm	191	F3SG-4RE1920P14	F3SG-2RE1920P14
2000 mm	199	F3SG-4RE2000P14	F3SG-2RE2000P14
2080 mm	207	F3SG-4RE2080P14	F3SG-2RE2080P14

F3SG-RE_P30 models (PNP and 30 mm detection capability)

Protective height	Number of beams	Order code	
		Type 4	Type 2
190 mm	8	F3SG-4RE0190P30	F3SG-2RE0190P30
270 mm	12	F3SG-4RE0270P30	F3SG-2RE0270P30
350 mm	16	F3SG-4RE0350P30	F3SG-2RE0350P30
430 mm	20	F3SG-4RE0430P30	F3SG-2RE0430P30
510 mm	24	F3SG-4RE0510P30	F3SG-2RE0510P30
590 mm	28	F3SG-4RE0590P30	F3SG-2RE0590P30
670 mm	32	F3SG-4RE0670P30	F3SG-2RE0670P30
750 mm	36	F3SG-4RE0750P30	F3SG-2RE0750P30
830 mm	40	F3SG-4RE0830P30	F3SG-2RE0830P30
910 mm	44	F3SG-4RE0910P30	F3SG-2RE0910P30
990 mm	48	F3SG-4RE0990P30	F3SG-2RE0990P30
1070 mm	52	F3SG-4RE1070P30	F3SG-2RE1070P30
1150 mm	56	F3SG-4RE1150P30	F3SG-2RE1150P30
1230 mm	60	F3SG-4RE1230P30	F3SG-2RE1230P30
1310 mm	64	F3SG-4RE1310P30	F3SG-2RE1310P30
1390 mm	68	F3SG-4RE1390P30	F3SG-2RE1390P30
1470 mm	72	F3SG-4RE1470P30	F3SG-2RE1470P30
1550 mm	76	F3SG-4RE1550P30	F3SG-2RE1550P30
1630 mm	80	F3SG-4RE1630P30	F3SG-2RE1630P30
1710 mm	84	F3SG-4RE1710P30	F3SG-2RE1710P30
1790 mm	88	F3SG-4RE1790P30	F3SG-2RE1790P30
1870 mm	92	F3SG-4RE1870P30	F3SG-2RE1870P30
1950 mm	96	F3SG-4RE1950P30	F3SG-2RE1950P30
2030 mm	100	F3SG-4RE2030P30	F3SG-2RE2030P30
2110 mm	104	F3SG-4RE2110P30	F3SG-2RE2110P30
2190 mm	108	F3SG-4RE2190P30	F3SG-2RE2190P30
2270 mm	112	F3SG-4RE2270P30	F3SG-2RE2270P30
2350 mm	116	F3SG-4RE2350P30	F3SG-2RE2350P30
2420 mm	120	F3SG-4RE2430P30	F3SG-2RE2430P30
2510 mm	124	F3SG-4RE2510P30	F3SG-2RE2510P30

Note: Optional NPN models are available for the F3SG-RE easy types. Please contact your OMRON representative.

Accessories (Sold separately)

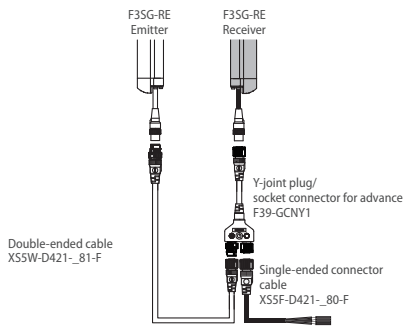
Single-end connector cable

Appearance	Type	Specification	Cable length	Order code																					
	Emitter/receiver cable M12 connector 4-Pin Color: Gray	 Female	<table><tr><th>PIN</th><th>Emitter</th><th>Receiver</th><th>Color</th></tr><tr><td>1</td><td>+24 VDC</td><td>+24 VDC</td><td>Brown</td></tr><tr><td>2</td><td>Range setting</td><td>OSSD 2</td><td>White</td></tr><tr><td>3</td><td>0 VDC</td><td>0 VDC</td><td>Blue</td></tr><tr><td>4</td><td>Not used</td><td>OSSD 1</td><td>Black</td></tr></table>	PIN	Emitter	Receiver	Color	1	+24 VDC	+24 VDC	Brown	2	Range setting	OSSD 2	White	3	0 VDC	0 VDC	Blue	4	Not used	OSSD 1	Black	1 m	XS5F-D421-C80-F
			PIN	Emitter	Receiver	Color																			
			1	+24 VDC	+24 VDC	Brown																			
			2	Range setting	OSSD 2	White																			
			3	0 VDC	0 VDC	Blue																			
			4	Not used	OSSD 1	Black																			
2m	XS5F-D421-D80-F																								
3 m	XS5F-D421-E80-F																								
5 m	XS5F-D421-G80-F																								
10 m	XS5F-D421-J80-F																								

Double-end connector cable

Appearance	Type	Specification	Cable length	Order code								
	Emitter/receiver cable M12 connector 4-Pin Color: Gray	<table><tr><td>1</td><td>Brown</td></tr><tr><td>2</td><td>White</td></tr><tr><td>3</td><td>Blue</td></tr><tr><td>4</td><td>Black</td></tr></table> Female Male	1	Brown	2	White	3	Blue	4	Black	1 m	XS5W-D421-C81-F
			1	Brown								
			2	White								
			3	Blue								
			4	Black								
			2m	XS5W-D421-D81-F								
3 m	XS5W-D421-E81-F											
5 m	XS5W-D421-G81-F											
10 m	XS5W-D421-J81-F											

Y-joint Plug/Socket Connector

Appearance	Type	Specification	Cable length	Order code
	M12 connector (4-pin) on both ends	 Double-ended cable XS5W-D421-J81-F F3SG-RE Emitter F3SG-RE Receiver Y-joint plug/ socket connector for advance F39-GCNY1 Single-ended connector cable XS5F-D421-J80-F Using the Y-joint connector the F3SG-RE is set to long operation mode	0.5 m	F39-GCNY1

Mounting brackets

Appearance	Type	Specification	Order code
	Standard fixed bracket set (Two brackets per set)	Bracket to mount the F3SG-R. Side mounting and backside mounting possible. (Included in the F3SG-R product package ^{*1})	F39-LGF
	Standard adjustable bracket set (Two brackets per set)	Bracket to mount the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is $\pm 15^\circ$. Side mounting and backside mounting possible.	F39-LGA
	Top/Bottom adjustable bracket set ^{*2} (Four brackets per set)	Bracket to mount the F3SG-R at the top and bottom position. Beam alignment after mounting possible. The angle adjustment range is $\pm 22.5^\circ$. Can be used in combination with the standard adjustable brackets.	F39-LGTB

^{*1} F3SG-RA____-14: Protective height of 0160 to 1200: 2 sets, protective height of 1280 to 2080: 3 sets

F3SG-RA____-30: Protective height of 0190 to 1230: 2 sets, protective height of 1310 to 2270: 3 sets, protective height of 2350 to 2510: 4 sets

^{*2} Optional available F39-LGTB-1 Top/Bottom adjustable bracket set (4 pcs.) without angle bracket to mount to the wall.

Test rod

Appearance	Type	Specification	Order code
	Test rod 14mm	14 mm diameter	F39-TRD14
	Test rod 30mm	30 mm diameter	F39-TRD30

Spatter protection cover (Two covers per set, for emitter and receiver)

Spatter protection covers include mounting brackets.

For safety light curtain models of the protective height of 2,000 mm or longer, use two spatter protection covers of different lengths.

Appearance	Safety light curtain model		Order code
	Finger protection	Hand and arm protection	
	F3SG-_RE0160-14	F3SG-_RE0190-30	F39-HGB0180
	F3SG-_RE0240-14	F3SG-_RE0270-30	F39-HGB0260
	F3SG-_RE0320-14	F3SG-_RE0350-30	F39-HGB0340
	F3SG-_RE0400-14	F3SG-_RE0430-30	F39-HGB0420
	F3SG-_RE0480-14	F3SG-_RE0510-30	F39-HGB0500
	F3SG-_RE0560-14	F3SG-_RE0590-30	F39-HGB0580
	F3SG-_RE0640-14	F3SG-_RE0670-30	F39-HGB0660
	F3SG-_RE0720-14	F3SG-_RE0750-30	F39-HGB0740
	F3SG-_RE0800-14	F3SG-_RE0830-30	F39-HGB0820
	F3SG-_RE0880-14	F3SG-_RE0910-30	F39-HGB0900
	F3SG-_RE0960-14	F3SG-_RE0990-30	F39-HGB0980
	F3SG-_RE1040-14	F3SG-_RE1070-30	F39-HGB1060
	F3SG-_RE1120-14	F3SG-_RE1150-30	F39-HGB1140
	F3SG-_RE1200-14	F3SG-_RE1230-30	F39-HGB1220
	F3SG-_RE1280-14	F3SG-_RE1310-30	F39-HGB1300
	F3SG-_RE1360-14	F3SG-_RE1390-30	F39-HGB1380
	F3SG-_RE1440-14	F3SG-_RE1470-30	F39-HGB1460
	F3SG-_RE1520-14	F3SG-_RE1550-30	F39-HGB1540
	F3SG-_RE1600-14	F3SG-_RE1630-30	F39-HGB1620
	F3SG-_RE1680-14	F3SG-_RE1710-30	F39-HGB1700
	F3SG-_RE1760-14	F3SG-_RE1790-30	F39-HGB1780
	F3SG-_RE1840-14	F3SG-_RE1870-30	F39-HGB1860
	F3SG-_RE1920-14	F3SG-_RE1950-30	F39-HGB1940
	F3SG-_RE2000-14	F3SG-_RE2030-30	F39-HGB1460
	F3SG-_RE2080-14	F3SG-_RE2110-30	F39-HGA0550
			F39-HGB1540
	–	F3SG-_RE2190-30	F39-HGA0550
			F39-HGB1620
	–	F3SG-_RE2270-30	F39-HGA0550
			F39-HGB1700
	–	F3SG-_RE2350-30	F39-HGA0550
			F39-HGB1780
	–	F3SG-_RE2430-30	F39-HGA0550
			F39-HGB1860
	–	F3SG-_RE2510-30	F39-HGA0550
			F39-HGB1940
			F39-HGA0550

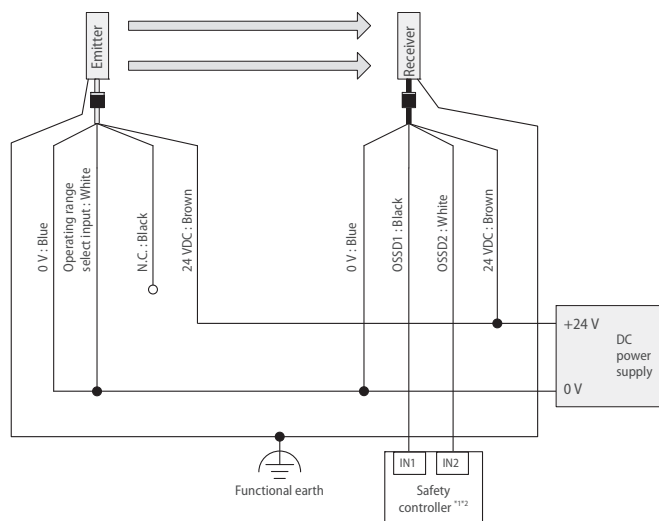
Specifications

Item		F3SG-4RE ____-14 F3SG-2RE ____-14	F3SG-4RE ____-30 F3SG-2RE ____-30
Type of ESPE (IEC 61496-1)	Type 4	F3SG-4RE ____-14/30	
	Type 2	F3SG-2RE ____-14/30	
Detection capability (Opaque objects)		14 mm dia.	30-mm dia.
Protective height		160 to 2080 mm	190 to 2510 mm
Operating range (Wiring connection option)		0.3 to 3.0 m or 0.3 to 10.0 m	0.3 to 7.0 m or 0.3 to 20.0 m
Effective aperture angle (EAA) (IEC 61496-2)	Type 4	$\pm 2.5^\circ$ max., emitter and receiver at operating range of 3 m or greater	
	Type 2	$\pm 5.0^\circ$ max., emitter and receiver at operating range of 3 m or greater	
Light source		Infrared LEDs, Wavelength: 870 nm	
Power supply voltage (Vs)		SELV/PELV 24 VDC $\pm 20\%$ (ripple p-p 10% max.)	
Safety outputs (OSSD)		F3SG-RE ____P ____: 2 PNP transistor outputs, load current of 300 mA max. F3SG-RE ____N ____: 2 NPN transistor outputs, load current of 300 mA max.	
Test function		Self-test (at power-on, and during operation)	
Response time		ON to OFF (normal mode): 5 to 15ms, OFF to ON: 25 to 75ms	
Ambient temperature	Operating	-10 to 55°C (non-icing)	
	Storage	-25 to 70°C	
Ambient humidity	Operating	35% to 85% (non-condensing)	
	Storage	35% to 95%	
Degree of protection (IEC 60529)		IP65 and IP67	
Material		Housing: Aluminum, Cap: PBT, Front window: PMMA, Cable: Oil resistant PVC, Mounting bracket: ZDC2, FE plate: SUS	
Performance level (PL)/ Safety category	Type 4	PLe/Category 4 (EN ISO 13849-1:2008)	
	Type 2	PLc/Category 2 (EN ISO 13849-1:2008)	
PFHd		$\leq 9.9 \times 10^{-8}$ (IEC 61508)	
Proof test interval T_M		Every 20 years (IEC 61508)	

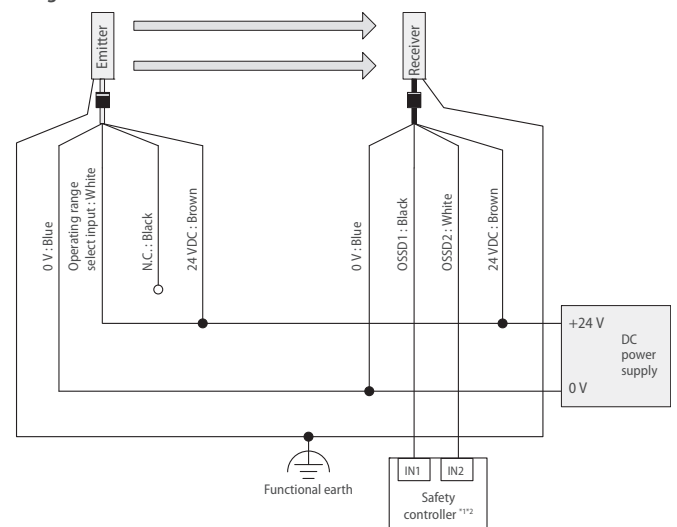
Note: For more information, please check the user manual Z352-E1

Connections (Basic wiring diagram)

Short mode



Long mode



*1 Refer to user's manual Z352-E1 for more information.

*2 The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.



Muting actuators

The F39-TGR-MCL-__ muting actuators are plug-and-play accessories for the F3S-TGR-CL Safety Sensors. Easy wiring of the entire muting system is provided by connection boxes managing all connections needed.

- Active/active and active/passive systems supported
- T- and L- shape muting by using same parts
- Selectable muting sensor sequence
- Pre-installed mounting brackets
- Pre-wired connection cables
- Supporting Type 2 and Type 4 applications

Ordering information

Muting actuators (mounting brackets are included)

		Order code
Transmitter + Receiver set	active/active	F39-TGR-MCL
Receiver only	active/active	F39-TGR-MCL-D
Transmitter only	active/active	F39-TGR-MCL-L
Transceiver + Reflector set	active/passive	F39-TGR-MCL-R
Transceiver only	active/passive	F39-TGR-MCL-R-A
Reflector only	active/passive	F39-TGR-MCL-R-P

Connection boxes

	Order code
Connection box for Receivers and Transceivers	F39-TGR-MCL-CMD
Connection box for Transmitters	F39-TGR-MCL-CML

Mounting brackets

	Order code
Mounting bracket for one muting actuator	F39-TGR-MCL-ST

Specifications

Power supply		24 VDC±20%
Consumption		5 W max (F39-TGR-MCL-__ only)
Ambient temperature		During operation; -10 to + 55°C (with no dew condensation)
Cable connector	Length	30 cm pre-wired
	RX	M12 5-pin female
	TX	M12 5-pin female
Degree of protection		IP65
Distance between muting beams		250mm
F39-TGR-MCL	Optical data	Through-beam system
	Operating distance	0 ... 7 m; max. 0 ... 8,4 m
	Light source	Red emitting LEDs, Wavelength 630 nm
F39-TGR-MCL-R	Optical data	Polarized retro-reflective system
	Operating distance	0 ... 4 m; max. 0 ... 4,8 m
	Light source	Red emitting LEDs, Wavelength 660 nm

Configuration examples

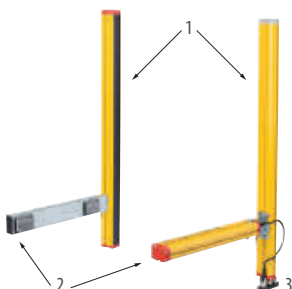
L-muting, active/active

- 1) Safety sensor (e.g. F3S-TGR-CL4A-K2-500)
- 2) Muting actuators F39-TGR-MCL
- 3) Connector box F39-TGR-MCL-CML
- 4) Connector box F39-TGR-MCL-CMD



L-muting, active/passive

- 1) Safety Sensor (e.g. F3S-TGR-CL4A-K2C-500)
- 2) Muting actuators F39-TGR-MCL-R
- 3) Connection box F39-TGR-MCL-CMD



Smart actuator for muting applications

The F3W-MA smart muting actuator is an integrated sensor system utilizing multiple-beam sensor technology to configure muting systems in combination with the safety light curtain.

- Point-to-point detection mode for workpieces with constant shape
- Chattering/void space prevention mode to prevent impact of small object holes



Ordering information

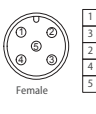
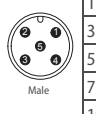
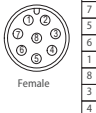
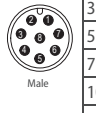
Application	Type	Specification	Order code
	Smart muting actuator for small objects detection	100 mm beam gap between muting trigger beams	F3W-MA0100P
	Smart muting actuator for objects detection	300 mm beam gap between muting trigger beams in accordance with EN/IEC TS 62046	F3W-MA0300P

Accessories (Sold separately)

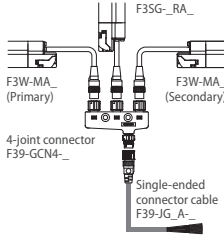
Single-end connector cable

Appearance	Type	Specification	Cable length	Order code
	Emitter cable M12 connector 5-Pin Color: Gray	 Female	1 + 24 VDC Brown	3 m F39-JG3A-L
			2 TEST Black	7m F39-JG7A-L
			3 0 VDC Blue	10 m F39-JG10A-L
			4 Not used White	15 m F39-JG15A-L
			5 Not used Yellow	20 m F39-JG20A-L
	Receiver cable M12 connector 8-Pin Color: Black	 Female	1 Reset Yellow	3 m F39-JG3A-D
			2 + 24 VDC Brown	7m F39-JG7A-D
			3 MUTE A Gray	10 m F39-JG10A-D
			4 MUTE B Pink	15 m F39-JG15A-D
			5 OSSD 1 Black	20 m F39-JG20A-D
			6 OSSD 2 White	
7 0 VDC Blue				
8 AUX(Lamp) Red				

Double-end connector cable

Appearance	Type	Specification	Cable length	Order code
	Emitter cable M12 connector 5-Pin Color: Gray	Connected to power cable or double-ended cable:  Connected to single-ended cable, or double-ended cable: 	0.5 m	F39-JGR5B-L
			1 m	F39-JG1B-L
			3 m	F39-JG3B-L
			5 m	F39-JG5B-L
			7m	F39-JG7B-L
			10 m	F39-JG10B-L
			15 m	F39-JG15B-L
			20 m	F39-JG20B-L
	Receiver cable M12 connector 8-Pin Color: Black	Connected to power cable or double-ended cable:  Connected to single-ended cable, or double-ended cable: 	0.5 m	F39-JGR5B-D
			1 m	F39-JG1B-D
			3 m	F39-JG3B-D
			5 m	F39-JG5B-D
			7m	F39-JG7B-D
			10 m	F39-JG10B-D
			15 m	F39-JG15B-D
			20 m	F39-JG20B-D

4-joint plug/socket connector for connection of F3W-MA and F3SG-RA

Appearance	Type	Specification	Order code
	4 joint connector set Includes one each of: F39-GCN4-D for receiver F39-GCN4-L for emitter		F39-GCN4

Mounting brackets

Appearance	Type	Specification	Order code
	Standard fixed bracket set (Two brackets per set)	Bracket to mount the F3SG-R. Side mounting and backside mounting possible. (Included in the F3SG-R product package)	F39-LGF
	Standard adjustable bracket set (Two brackets per set)	Bracket to mount the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is $\pm 15^\circ$. Side mounting and backside mounting possible.	F39-LGA
	Top/Bottom adjustable bracket set ^{*1} (Four brackets per set)	Bracket to mount the F3SG-R at the top and bottom position. Beam alignment after mounting possible. The angle adjustment range is $\pm 22.5^\circ$. Can be used in combination with the standard adjustable brackets.	F39-LGTB

^{*1} Optional available F39-LGTB-1 Top/Bottom adjustable bracket set (4 pcs.) without angle bracket to mount to the wall.

Specifications

Item		F3W-MA0300P	F3W-MA0100P
Beam gap between muting trigger beams		300 mm	100 mm
Operating range (Dip switch option)		0.3 to 7.0 m or 0.3 to 20.0 m	
Light source		Infrared LEDs, Wavelength: 870 nm	
Power supply voltage (Vs)		SELV/PELV 24 VDC $\pm 20\%$ (ripple p-p 10% max.)	
Functions		Scan code selection, operation mode selection (Point to point detection/chattering and void space prevention), Off-delay, muting enable, muting trigger beam allocation, operating range selection	
Ambient temperature	Operating	-10 to 55°C (non-icing)	
	Storage	-25 to 70°C	
Ambient humidity	Operating	35% to 85% (non-condensing)	
	Storage	35% to 95%	
Degree of protection (IEC 60529)		IP65 and IP67	
Material		Housing: Aluminum, Cap: PBT, Front window: PMMA, Cable: Oil resistant PVC, Mounting bracket: ZDC2, FE plate: SUS	

Note: For more information, please check the user manual Z355-E1



OS32C Safety laser scanner

- Type 3 safety laser scanner complies with IEC61496-1/-3
- 70 sets of safety zone and warning zone combinations are available, supporting complicated changes in working environments
- A safety radius up to 4 m and warning zone(s) radius up to 10 m can be set
- 8 Individual sector indicators and various LED indications allow the user to determine scanner status at a glance
- Reference boundary monitoring function prevents unauthorized changes in the scanner position
- Configurable minimum object resolution of 30, 40, 50 or 70 mm, for hand and arm detection applications

Ordering information

Description	Max. operating range	Order code
OS32C with back location cable entry	3 m	OS32C-BP
	4 m	OS32C-BP-4M
OS32C with side location cable entry ^{*1}	3 m	OS32C-SP1
	4 m	OS32C-SP1-4M
OS32C with back location cable entry EtherNet/IP capable for status measurement data reporting	3 m	OS32C-BP-DM
	4 m	OS32C-BP-DM-4M
OS32C with side location cable entry ^{*1} EtherNet/IP capable for status measurement data reporting	3 m	OS32C-SP1-DM
	4 m	OS32C-SP1-DM-4M

^{*1} Each connector is located on the left as viewed from the back of the I/O block.

Description	Remarks	Order code
Configuration tool	CD-ROM OS supported: Windows 2000, XP, Vista, Windows 7	included

Specifications

Sensors

Sensor type	Type 3 safety laser scanner
Safety category	Category 3, performance level d (ISO13849-1: 2006)
Detection capability	Configurable; Non-transparent with a diameter of 30, 40, 50 or 70 mm (1.8% reflectivity or greater)
Monitoring zone	Monitoring zone set count: (Safety zone + 2 warning zones) × 70 sets
Operating range	Safety Zone: 4.0 m (min. obj. resolution of 70mm, only OS32C-_-4M types) 3.0 m (min. obj. resolution of 50 mm or 70 mm) 2.5 m (min. obj. resolution of 40 mm) 1.75 m (min. obj. resolution of 30 mm) Warning Zone: 10.0 m (15.0 m for OS32C-_-4M types)
Detection angle	270°
Response time	Response time from ON to OFF: From 80 ms (2 scans) to 680 ms (up to 17 scans) ^{*1} Response time from OFF to ON: Response time from ON to OFF + 100 ms to 60 s (configurable)
Line voltage	24 VDC +25%/−30% (ripple p-p 2.5 V max.)
Power consumption	Normal operation: 5 W max., 4 W typical (without output load) ^{*2} Standby mode: 3.75 W (without output load)
Safety output (OSSD)	PNP transistor × 2, load current of 250mA max., residual voltage of 2 V max., load capacity of 2.2 μf max., leak current of 1 mA max. ^{*2,*3,*4}
Auxiliary output (Non-safety)	NPN/PNP transistor × 1, load current of 100 mA max., residual voltage of 2 V max., leak current of 1 mA max. ^{*3,*4,*5}
Warning output (Non-safety)	NPN/PNP transistor × 1, load current of 100 mA max., residual voltage of 2 V max., leak current of 1 mA max. ^{*3,*4,*5}
Output operation mode	Auto start, start interlock, start/restart interlock
Input	External Device Monitoring (EDM) ON: 0 V short (input current of 50 mA), OFF: Open
	Start ON: 0 V short (input current of 20 mA), OFF: Open
	Zone select ON: 24 V short (input current of 5 mA), OFF: Open
	Stand-by ON: 24 V short (input current of 5 mA), OFF: Open
Connection type	Power cable: 18-pin mini-connector (pigtail) Communication cable: M12, 4-pin connector
Connection with PC	Communication: EtherNet/IP
Indicators	RUN indicator: Green, STOP indicator: Red, Interlock indicator: Yellow, Warning output indicator: Orange, Status/diagnostic display: 2 × 7-segment LEDs, Intrusion indicators: Red LED × 8
Enclosure rating	IP65 (IEC60529)
Dimensions (W × H × D)	133.0 × 104.5 × 142.7 mm (except cable)
Weight (Main Unit only)	1.3 kg
Approvals	Certified by: TÜV Rheinland, UL Major standards: IEC61496-1/-3 (Type 3), IEC61508 (SIL2), ISO13849-1:2008 (Category 3, performance level d), UL508, UL1998

^{*1} Pollution Tolerance will add 6 ms to each scan time.

^{*2} Rated current of OS32C is 1.025 A max. (OS32C 210 mA + OSSD A load + OSSD B load + auxiliary output load + warning output load + functional Inputs). Where functional inputs are: EDM input ... 50 mA, Start input ... 20 mA, Standby input ... 5 mA, Zone X input ... 5 mA × 8 (eight zone set select inputs).

^{*3} Output voltage is input voltage − 2.0 VDC.

^{*4} Total consumption current of 2 OSSDs, auxiliary output, and warning output must not exceed 700 mA.

^{*5} Output polarity (NPN/PNP) is configurable via the configuration tool.

Accessories (sold separately)

Power cable

Appearance	Description	Remarks	Order code
	Cable length: 3 m	One cable is required per sensor	OS32C-CBL-03M
	Cable length: 10 m		OS32C-CBL-10M
	Cable length: 20 m		OS32C-CBL-20M
	Cable length: 30 m		OS32C-CBL-30M

Ethernet cable

Appearance	Description	Remarks	Order code
	Cable length: 2 m	Required for configuration and monitoring	OS32C-ECBL-02M
	Cable length: 5 m		OS32C-ECBL-05M
	Cable length: 15 m		OS32C-ECBL-15M

Note: An ethernet cable with an M12, 4-pin connector is required.

Mounting brackets

Appearance	Description	Remarks	Order code
	Bottom/side mounting bracket	Bottom/side mounting bracket × 1, unit mounting screws × 4 sets	OS32C-BKT1
	XY axis rotation mounting bracket	XY axis rotation mounting bracket × 1, unit mounting screws × 6 sets, bracket mounting screws × 1 set (must be used with OS32C-BKT1)	OS32C-BKT2
	Simple mounting bracket	Simple mounting brackets × 2, unit mounting screws × 4 sets ^{*1}	OS32C-BKT3
	Protective cover for window		OS32C-BKT4
	Mounting stand	When using a mounting stand, use an OS32C with side location cable entry (OS32C-SP1). The OS32C with back location cable entry (OS32C-BP) cannot be mounted. Use with mounting brackets (OS32C-BKT1 and OS32C-BKT2).	OS32C-MT
	Hardware kit for mounting stand	Mounting screws × 3 sets Use this when mounting a bracket to the mounting stand.	OS32C-HDT

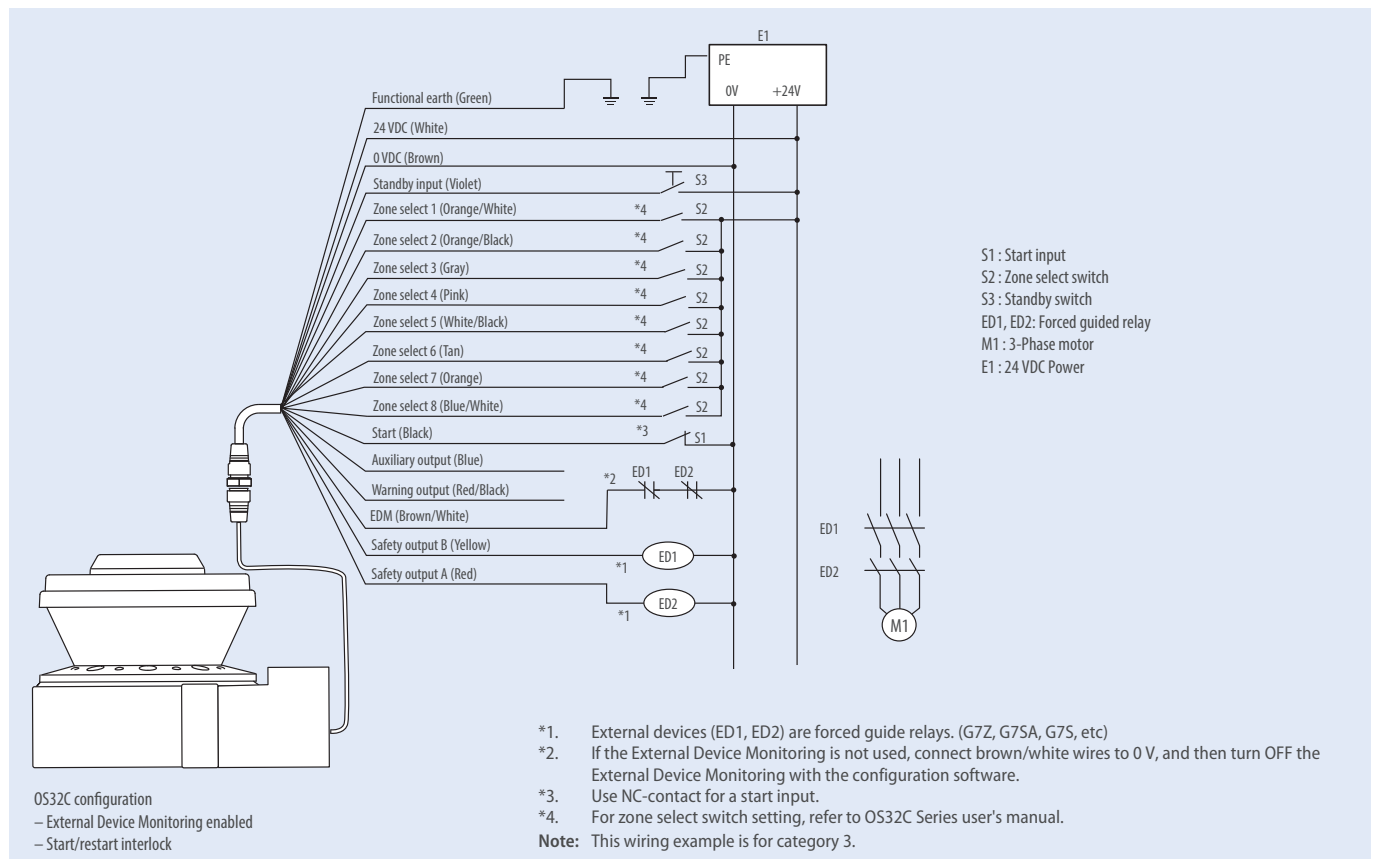
^{*1} There are eight OS32C mounting screws: four screws for singular use, and four screws for protective cover for window.

Miscellaneous

Appearance	Description	Remarks	Order code
	Scan window	Spare for replacement	OS32C-WIN-KT
	Sensor block without I/O block Max. operating range: 3 m	Spare for replacement	OS32C-SN
	Sensor block without I/O block Max. operating range: 4 m		OS32C-SN-4M
	Sensor block without I/O block for EtherNet/IP Max. operating range: 3 m	Spare replacement for EtherNet/IP	OS32C-SN-DM
	Sensor block without I/O block for EtherNet/IP Max. operating range: 4 m		OS32C-SN-DM-4M
	I/O block	With cable access from the back	Spare for replacement
	I/O block	With cable access from the left side	Spare for replacement
	Window cleaning kit, anti-static cleaner	Accessory	WIN-CLN-KT

Connection

Basic connection with single OS32C unit
Category 3, performance level d (ISO13849-1)



Safety logic control systems

BREAK THROUGH BARRIERS IN SAFETY DESIGN

Configurable, scalable and simple

Omron safety controllers, offer a wide solution portfolio from safety relay units to a distributed and integrated safety logic control systems. It allows to solve any safety needs from a simple machines through to manufacturing cells.

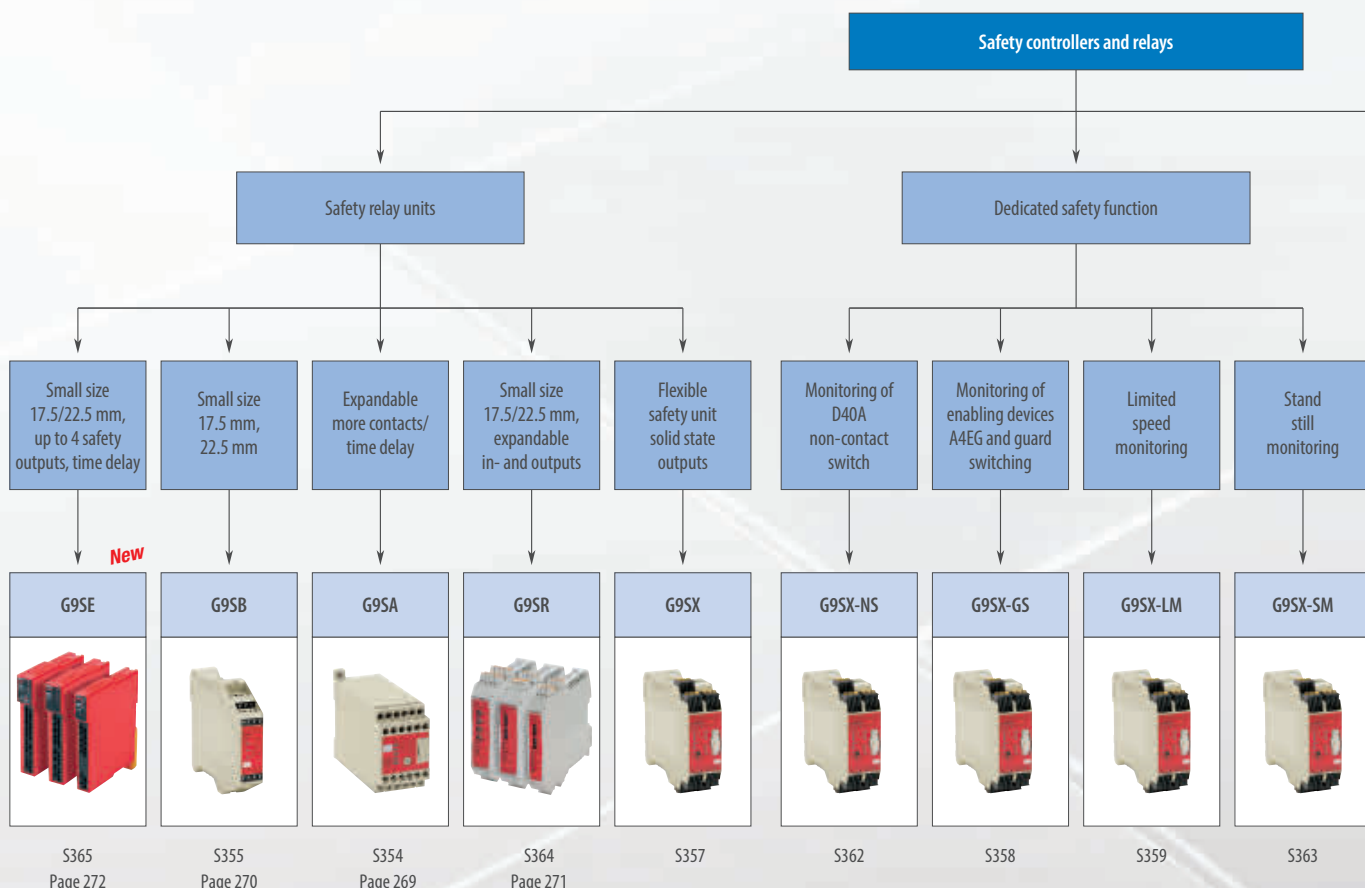
Safety relay units covers the most exigent safety wired needs. The compact safety controller is simple to configure and setup and overcomes limitations of hard-wired solutions by adding flexibility of a software - based solution. The expandable and programmable modular safety controller series provides a complex logic solution for stand alone designs. The distributed safety, allows to manage all safety complexity and integrated architecture types reducing your engineering time.

Omron provides from dedicated safety network such as DeviceNet Safety to Integrated and distributed safety like Fail Safe over EtherCAT.

- EN ISO 13849-1 (PLe) and IEC 61508 (SIL3) certification for future-proof design of the safety system
- Predefined and validated function blocks for simple configuration
- Scalable safety solution for compact, distributed and fully integrated safety systems



Safety relay unit





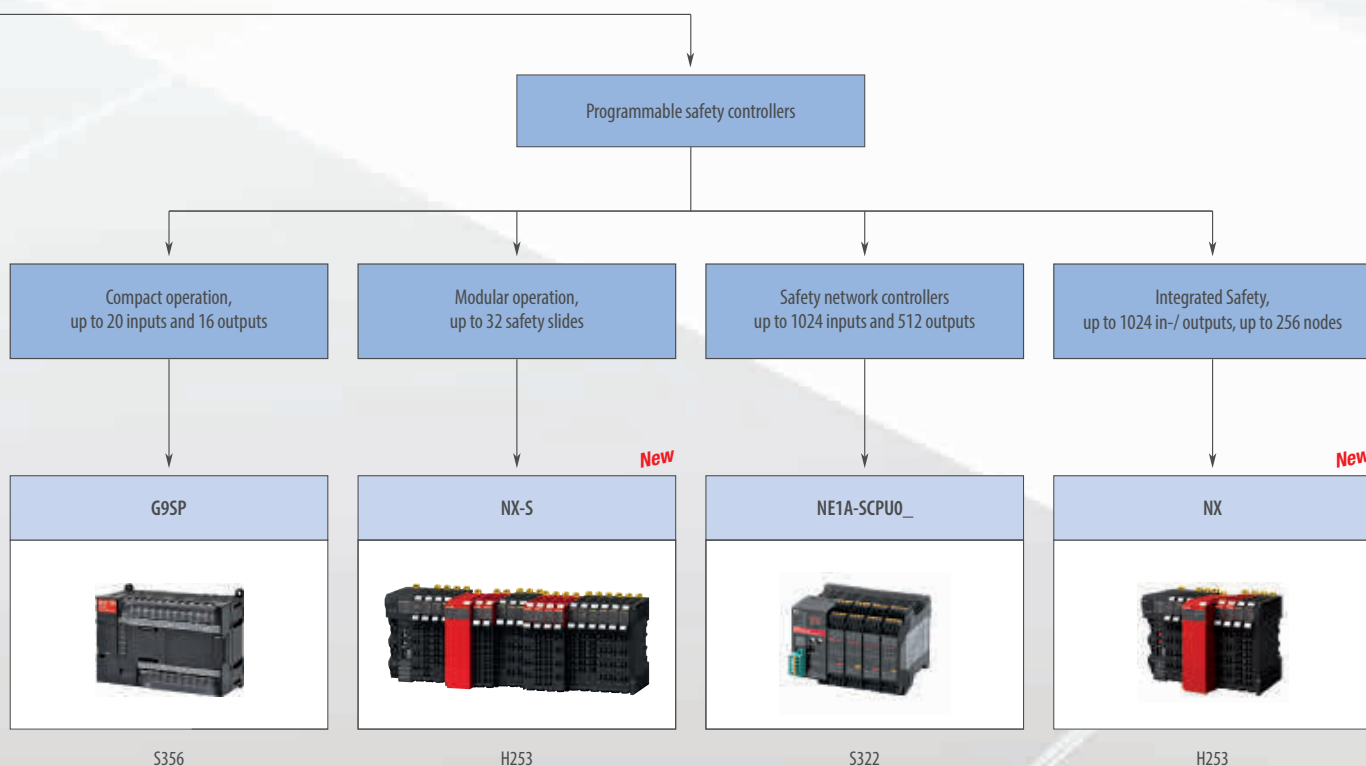
Distributed and integrated Programmable safety controller



Modular Programmable safety controller



Compact Programmable safety controller



Selection table

		Safety relay units				
						
Model		G9SE	G9SA	G9SB	G9SR	G9SX
Selection criteria	Performance level	up to PLe acc. EN ISO 13849-1 depending on application				
	Safety integrity level (IEC 61508)	SIL 3	–	–	SIL 3	SIL 3
	Reaction time	max. 15 ms	max. 10 ms	max. 10 ms	depend on safety application	15 ms
	DeviceNet safety Bus interface	–	–	–	–	–
	Standard DeviceNet Bus interface	–	–	–	–	–
	EDM function	■	■	■	■	■
	Interlock function	■	■	■	■	■
	Logical 'AND' connection	–	–	–	■	■
	Relay expansion units	–	■	–	–	■
	Housing	Plastic	Plastic	Plastic	Plastic	Plastic
	Operating temperature	–10 to 55°C	–25 to 55°C	–25 to 55°C	–10 to 55°C	–10 to 55°C
	Flux-tight	–	–	–	–	–
Features	Number of poles	–	–	–	–	–
	Gold clad contacts	–	–	–	–	–
	Relay socket	–	–	–	–	–
	Detachable cage clamp terminals	–	–	–	■	■
	Screw terminals	–	■	■	optional	■
	Push-in terminals	■	–	–	–	–
	Safe timing functions	off-delay	■	–	on-delay and off-delay	■
	USB-interface	–	–	–	–	–
Application	Programming software	–	–	–	–	–
	E-Stop application	■	■	■	■	■
	Door switch monitoring	■	■	■	■	■
	Safety light curtain monitoring	■	■	■	■	■
	EDM monitoring	■	■	■	■	■
	Interlock function	■	■	■	■	■
	Logic function blocks	–	–	–	■	–
	Safe ON delay timer	–	–	–	■	–
	Safe OFF delay timer	■ (Off delay)	■	–	■	■
	Two-Hand control	–	■	–	–	–
	Manual/automatic reset	■	■	■	■	■
	Non-contact switches monitoring	■	–	–	■	■
	Guard switching/enabling function	–	–	–	■	■
	limited speed monitoring	–	–	–	–	■
	standstill monitoring	–	–	–	–	■
Supply voltage	General safety application	■	■	■	■	■
	24 VDC	■	■	■	■	■
	100 VAC to 240 VAC	–	■	–	–	–
In- and outputs	Safety inputs	–	■	■	■	■
	Test signal output	–	–	–	■	■
	Solid state safety outputs	–	–	–	■	■
	Safety relay outputs	DPST-NO, 4PST-NO	3PST-NO, 5PST-NO	DPST-NO, 3PST-NO	DPST-NO, 3PST-NO	■
	Auxiliary outputs	Solid state, SPST-NO	SPST-NC	SPST-NC	Solid state, SPST-NO	■
	4PST-NO + DPST-NC	–	–	–	–	–
	3PST-NO + 3PST-NC	–	–	–	–	–
	3PST-NO + SPST-NC	–	–	–	–	–
	DPST-NO + DPST-NC	–	–	–	–	–
Page/Quick Link	5PST-NO + SPST-NC	–	–	–	–	–
		272/S365	269/S354	270/S355	271/S364	S357

Programmable safety system				
				
Model	G9SP	NX-Safety stand alone modular I/O system	NE1A	NX-Safety
Safety Architecture	Compact	Modular	Distributed	Distributed and Integrated
Programing Language	FBs	IEC 61131-3	FB's	IEC 61131-3
PL (Performance Level)	PL e (EN ISO 13849-1)	PL e (EN ISO 13849-1)	PL e (EN ISO 13849-1)	PL e (EN ISO 13849-1)
SIL (Safety Integrity Level)	SIL3 (IEC 61508) SILCL3 (EN 62061)	SIL3 (IEC 61508) SILCL3 (EN 62061)	SIL3 (IEC 61508) SILCL3 (EN 62061)	SIL3 (IEC 61508) SILCL3 (EN 62061)
PFH	9.4E-11	3.1E-10	5.1E-10	3.0E-10
TM Mission time	20 years (ISO 13849)	20 years (ISO 13849)	20 years (ISO 13849)	20 years (ISO 13849)
Approvals	TÜV- Rheinland; CE,UL, CSA, KOSHA	TÜV- Rheinland; CE,UL, CSA, cULus, ANSI, C-Tick, KC,	TÜV- Rheinland; CE,UL, CSA, ANSI, KOSHA	TÜV- Rheinland; CE,UL, CSA, cULus, ANSI, C-Tick, KC,
Safety Network	Non	Non	Device Net Safety	FSOE EtherCAT safety
No. of safety connections	non	32	32	128
Safety I/O Refreshing mode	–	yes	–	yes
Standard Fieldbus/Industrial Network	via gateway: EtherNet/IP	on board: EtherNet/IP	on board: DeviceNet	On system: EtherCAT, EtherNet/IP
Programing Software tool	G9SP Configurator	Sysmac Studio	DeviceNet Network Configurator	Sysmac Studio
Safety Zones	1	Multiple	Multiple	Multiple
Simulation	yes	yes	yes	yes
Housing	Plastic	Plastic	Plastic	Plastic
Operating Temperature	0 to +55°C	0 to +55°C	0 to +55°C	0 to +55°C
Programing connection	USB	USB	USB	USB/EtherNet
Safety memory for user program	cassette	internal 512 KB	internal	internal up to 2 MB
Terminal type	Screw	Clamp	Clamp	Clamp
Power Supply	24 VDC	24 VDC	24 VDC	24 VDC
Safety Digital Inputs (S-DI's)	10/10/20	up to 256	up to 1024	up to 1024
Test Signal Outputs	yes	yes	yes	yes
Safety Digital Outputs (S-DO's)	4/16/8	up to 256	up to 512	up to 512
Safety Relay Outputs	–	–	yes	–
Enclosure rating	IP20	IP20	IP20	IP20
Page/Quick Link	273/S356	H253	S322	H253

■ Standard

– No/not available



Expandable safety relay unit

G9SA-family offers a complete line-up of compact and expandable safety relay units. Modules with safe OFF-delay timing are available as well as a two-hand controller. Simple multiplication of safety contacts is possible by using the connection on the front.

- 45 mm-wide housing, expansion units are 17.5 mm wide
- Safe OFF-delay timer
- Simple expansion connection
- Certification up to PLe according to EN ISO 13849-1 depending on the application

Ordering information

Emergency-stop units

Main contacts	Auxiliary contact	Number of input channels	Rated voltage	Order code
3PST-NO	SPST-NC	1 channel or 2 channels possible	24 VAC/VDC 100 to 240 VAC	G9SA-301
5PST-NO	SPST-NC	1 channel or 2 channels possible	24 VAC/VDC 100 to 240 VAC	G9SA-501

Emergency-stop OFF-delay units

Main contacts	OFF-delay contacts	Auxiliary contact	Number of input channels	OFF-delay time	Rated voltage	Order code
3PST-NO	DPST-NO	SPST-NC	1 channel or 2 channels possible	7.5 s	24 VAC/VDC 100 to 240 VAC	G9SA-321-T075
				15 s	24 VAC/VDC 100 to 240 VAC	G9SA-321-T15
				30 s	24 VAC/VDC 100 to 240 VAC	G9SA-321-T30

Two-hand controller

Main contacts	Auxiliary contact	Number of input channels	Rated voltage	Order code
3PST-NO	SPST-NC	2 channels	24 VAC/VDC 100 to 240 VAC	G9SA-TH301

Expansion unit

The expansion unit connects to a G9SA-301, G9SA-501, G9SA-321, or G9SA-TH301.

Main contacts	Auxiliary contact	Category	Order code
3PST-NO	SPST-NC	4	G9SA-EX301

Expansion units with OFF-delay outputs

The expansion unit connects to a G9SA-301, G9SA-501, G9SA-321, or G9SA-TH301.

Main contact form	Auxiliary contact	OFF-delay time	Order code
3PST-NO	SPST-NC	7.5 s	G9SA-EX031-T075
		15 s	G9SA-EX031-T15
		30 s	G9SA-EX031-T30

Specifications

Power input

Item	G9SA-301/TH301 / G9SA-501 / G9SA-321-T_
Power supply voltage	24 VAC/VDC: 24 VAC, 50/60 Hz, or 24 VDC 100 to 240 VAC: 100 to 240 VAC, 50/60 Hz
Operating voltage range	85 to 110% of rated power supply voltage

Inputs

Item	G9SA-301/321-T_/TH301	G9SA-501
Input current	40 mA max.	60 mA max.

Contacts

Item	G9SA-301/501/321-T_/TH301/EX301/EX031-T_
	Resistive load (cosφ= 1)
Rated load	250 VAC, 5 A
Rated carry current	5 A

Characteristics

Item		G9SA-301/TH301 / G9SA-501/321-T_ / G9SA-EX301/EX031-T_
Operating time		30 ms max. (not including bounce time)
Response time *1		10 ms max. (not including bounce time)
Durability	Mechanical	5,000,000 operations min. (at approx. 7,200 operations/hr)
	Electrical	100,000 operations min. (at approx. 1,800 operations/hr)
Minimum permissible load (reference value)		5 VDC, 1 mA
Ambient temperature		Operating: −25 to 55°C (with no icing or condensation) Storage: −25 to 85°C (with no icing or condensation)

*1 The response time is the time it takes for the main contact to open after the input is turned OFF.



Slim-size safety unit

G9SB is a family of slender safety relay units, providing two safety contacts in a 17.5 mm- and three safety contacts in a 22.5mm-wide housing.

- 17.5 mm- and 22.5 mm-wide housing
- 1- and 2-input channel units
- Manual and automatic reset units
- Certification up to PLe according to EN ISO 13849-1 depending on the application

Ordering information

Main contacts	Auxiliary contact	Number of input channels	Reset mode	Input type	Rated voltage	Size (H×W×D)	Order code
DPST-NO 2 safety contacts	None	2 channels	Auto-reset	Inverse	24 VAC/VDC	100 mm × 17.5 mm × 112 mm	G9SB-2002-A
		1 channel or 2 channels		+ common			G9SB-200-B
		2 channels	Manual-reset	Inverse			G9SB-2002-C
		1 channel or 2 channels		+ common			G9SB-200-D
3PST-NO 3 safety contacts	SPST-NC	None (direct breaking)	Auto-reset	–	24 VDC	100 mm × 17.5 mm × 112 mm	G9SB-3010
		2 channels		Inverse	24 VAC/VDC	100 mm × 22.5 mm × 112 mm	G9SB-3012-A
		1 channel or 2 channels		+ common			G9SB-301-B
		2 channels	Manual-reset	Inverse			G9SB-3012-C
		1 channel or 2 channels		+ common			G9SB-301-D

Specifications

Power input

Item	G9SB-200 _ _	G9SB-3010	G9SB-301 _ _
Power supply voltage	24 VAC/VDC: 24 VAC, 50/60 Hz, or 24VDC 24 VDC: 24 VDC		
Operating voltage range	85 to 110% of rated power supply voltage		
Power consumption	1.4 VA/1.4 W max.	1.7 W max.	1.7 VA/1.7 W max.

Inputs

Item	G9SB-200 _ _	G9SB-3010	G9SB-301 _ _
Input current	25 mA max.	60 mA max. (See note.)	30 mA max.

Note: Indicates the current between terminals A1 and A2.

Contacts

Item	G9SB-200 _ _	G9SB-3010	G9SB-301 _ _
Resistive load (cosφ= 1)			
Rated load	250 VAC, 5 A		
Rated carry current	5 A		

Characteristics

Item		G9SB-200 _ _	G9SB-3010	G9SB-301 _ _
Response time *1		10 ms max.		
Durability	Mechanical	5,000,000 operations min. (at approx. 7,200 operations/hr)		
	Electrical	100,000 operations min. (at approx. 1,800 operations/hr)		
Minimum permissible load (reference value)		5 VDC, 1 mA		
Ambient operating temperature		-25°C +55°C (with no icing or condensation)		

*1 The response time is the time it takes for the main contact to open after the input is turned OFF.



Compact safety relay unit family

G9SR family modules operate standalone and as a system with input and output extension. All modules are simple to set up using DIP-switches and provide clear diagnosis via LEDs on the front.

- Three modules for all safety relay unit applications
- 17.5 or 22.5 mm width to save mounting space
- Solid-state outputs for long life and high current safety relay outputs
- Detailed LED indications enable easy diagnosis
- Safe on- and off-delay function up to PLe
- Up to PLe according to EN ISO 13849-1 and SIL 3 according to EN 61508

Ordering information

Advanced unit

Safety outputs	Auxiliary outputs	No. of input channels	Rated voltage	Terminal block type	Order code
Instantaneous					
2 PST-NO (contact)	1 PNP transistor output	1 or 2 channels	24 VDC	removable cage clamp terminals	G9SR-AD201-RC

Basic unit

Safety outputs	Auxiliary outputs	No. of input channels	Rated voltage	Terminal block type	Order code
Instantaneous					
2 P channel MOS FET transistor output	1 PNP transistor output	1 or 2 channels	24 VDC	removable cage clamp terminals	G9SR-BC201-RC

Expansion unit

Safety outputs		Auxiliary outputs	Rated voltage	Terminal block type	Order code
Instantaneous	ON/OFF-delayed				
—	3 PST-NO (contact) ^{*1}	1 (solid state) PNP transistor outputs	24 VDC	removable cage clamp terminals	G9SR-EX031-T90-RC

^{*1} The ON/OFF delay time can be set in 16 steps as follows: 0/0.1/0.2/0.5/1/1.5/2/2.5/5/10/20/30/45/60/75/90 s

Specifications

Power input

Item	G9SR-AD_	G9SR-BC_	G9SR-EX_
Rated supply voltage	19.2 to 28.8 VDC (24 VDC ±20%)		

Inputs

Item	G9SR-AD_	G9SR-BC_	G9SR-EX_
Safety input	Operating voltage: 17 VDC to 28.8 VDC, internal impedance: Approx. 3 kΩ		
Feedback/reset input			

Outputs

Item	G9SR-BC_	G9SR-AD_	G9SR-EX_
Instantaneous safety output	P channel MOS FET transistor output Load current (Using 2 outputs): 2 A DC max.	—	
Auxiliary output	PNP transistor output Load current: 500 mA max.		
Rated load	—	250 VAC, 5 A AC15 (inductive load)	
Rated carry current	—	5 A	
Maximum switching voltage	—	250 VAC	

Characteristics

Item		G9SR-BC_	G9SR-AD_	G9SR-EX_
Operating time (OFF to ON)		150 ms max.		
Response time (ON to OFF)		50 ms max.		
Durability	Electrical	–	100,000 cycles min.	
	Mechanical	–	10,000,000 cycles min.	
Ambient temperature		–10 to 55°C (with no icing or condensation)		



Compact safety relay units for general safety monitoring applications

G9SE-family offers a complete line-up of compact units. Modules with two safety contacts, four safety contacts and OFF-delay timing are available on slim-size housing.

- Simple front side wiring using screw-less terminals.
- 17.5 or 22.5 mm width to save mounting space
- 15 ms max. response time
- Safe OFF delay function up to PLe
- Easy maintenance with status indicators
- Approved standards:
EN ISO13849-1: 2008 PLe Safety Category 4, IEC/EN 60947-5-1, IEC/EN 62061 SIL3, EN 81-1, EN81-2, UL508, CAN/CSA C22.2 No.14

Ordering information

Safety outputs		Auxiliary outputs ^{*1}	Max. OFF-delay time ^{*2}	Rated voltage	Order code
Instantaneous	OFF-delayed				
DPST-NO	–	1 PNP transistor output	–	24 VDC	G9SE-201
4PST-NO	–		–		G9SE-401
DPST-NO	DPST-NO		5 s		G9SE-221-T05
DPST-NO	DPST-NO		30 s		G9SE-221-T30

^{*1} PNP transistor output

^{*2} The OFF-delay time can be set in 16 steps as follows:

T05: 0/0.1/0.2/0.3/0.4/0.5/0.6/0.7/0.8/1/1.5/2/2.5/3/4/5 s

T30: 0/1/2/4/5/6/7/8/9/10/12/14/16/20/25/30 s

Specifications

Ratings

Power Input

Item	G9SE-201	G9SE-401	G9SE-221-T_
Rated supply voltage	24 VDC		
Operating voltage range	–15% to 10% of rated supply voltage		
Rated power consumption ^{*1}	3 W max.	4 W max.	

^{*1} Power consumption of loads not included.

Outputs

Item	G9SE-201	G9SE-401	G9SE-221-T_
Safety output	Contact output		
OFF-delayed safety output	250 VAC 5 A 30 VDC 5 A (resistance load)		
Auxiliary output	PNP transistor output Load current: 100 mA DC max.		

Characteristics

Item		G9SE-201	G9SE-401	G9SE-221-T_
Operating time (OFF to ON state) *1		100 ms Max. *2		
Response time (ON to OFF state) *3		15 ms Max.		
Inputs	Input current	5 mA Min.		
	ON voltage	11 VDC Min.		
	OFF voltage	5 VDC Max.		
	OFF current	1 mA Max.		
	Maximum cable length	100 m Max.		
	Reset input time	250 ms Min.		
Contact outputs	Contact resistance *4	100 mΩ		
	Mechanical durability	5,000,000 operations Min.		
	Electrical durability	50,000 operations Min.		
	Switching specification Inductive load (IEC/EN60947-5-1)	AC15: 240 VAC 2 A DC13: 24 VDC 1.5 A		
	Minimum applicable load	24 VDC 4 mA		
	Conditional short-circuit current (IEC/EN60947-5-1)	100A *5		
Surrounding air temperature		−10 to 55°C (No freezing or condensation)		

^{*1} The operating time is the time it takes for the safety contact to close after the safety inputs and feedback-reset input are turned ON. Not including bounce time.

^{*2} This is in normal operation. When executing non-regular self-diagnosis for Safety output circuit, G9SE operating time become 500 ms max..

^{*3} The response time is the time it takes for the safety main contact to open after the safety input is turned OFF. Includes bounce time.

^{*4} This is initial value using the voltage-drop method with 1 A at 5 VDC.

^{*5} Use an 8 A fuse that conforms to IEC 60127 as a short-circuit protection device. This fuse is not included with the G9SE.



Standalone safety controller

The G9SP safety controller provides all local safety based in- and outputs and controls the safety application.

- Three CPU-types to suit different applications
- Clear diagnosis and monitoring via Ethernet or serial connection
- Memory cassette for easy duplication of configuration
- Unique programming software to support easy design, verification, standardization and reuse of the program.
- Certified according to PLe (EN ISO 13849-1) and SIL 3 (IEC 61508)

Ordering information

Appearance	Appearance description	Order code
Standalone safety controller	10 PNP safety inputs 4 PNP safety outputs 4 test outputs 4 PNP standard outputs	G9SP-N10S
	10 PNP safety inputs 16 PNP safety outputs 6 test outputs	G9SP-N10D
	20 PNP safety inputs 8 PNP safety outputs 6 test outputs	G9SP-N20S

Software

Appearance	Media	Applicable OS	Order code
G9SP configurator	Setup disk 1 license	Windows 2000	WS02-G9SP01-V1
	Setup disk 10 licenses	Windows XP	WS02-G9SP10-V1
	Setup disk 50 licenses	Windows Vista	WS02-G9SP50-V1
	Setup disk Site license	Windows 7	WS02-G9SPXX-V1

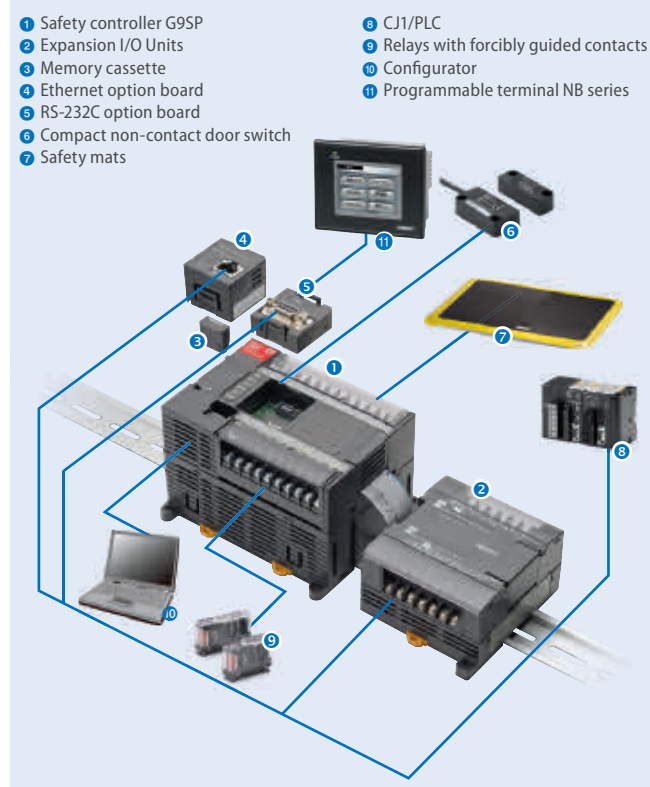
Expansion units (standard I/O)

Appearance	Type	Number of I/O		Model
		In	Out	
Expansion I/O unit	Sinking	12	8 (solid state)	CP1W-20EDT
	Sourcing	12	8 (solid state)	CP1W-20EDT1
	Sinking	–	32 (solid state)	CP1W-32ET
	Sourcing	–	32 (solid state)	CP1W-32ET1
I/O Connecting cable, 80 cm long				CP1W-CN811

Option units

Appearance	Order code
RS-232 option board	CP1W-CIF01
Ethernet option board (Ver. 2.0 or later)	CP1W-CIF41
Memory cassette	CP1W-ME05M
G9SP Status Display Touchscreen with 1.8 m cable	82614-0010 H-T40M-P
G9SP-N10S Display Kit (G9SP, Touchscreen, cable, CP1W-CIF01)	82612-0010 G9SP-N10S-SDK
G9SP-N10D Display Kit (G9SP, Touchscreen, cable, CP1W-CIF01)	82612-0020 G9SP-N10D-SDK
G9SP-N20S Display Kit (G9SP, Touchscreen, cable, CP1W-CIF01)	82612-0030 G9SP-N20S-SDK
G9SP-N10S kit with EtherNet/IP module	82608-0010 G9SP-N10S-EIP
G9SP-N10D kit with EtherNet/IP module	82608-0020 G9SP-N10D-EIP
G9SP-N20S kit with EtherNet/IP module	82608-0030 G9SP-N20S-EIP

G9SP configuration



Specifications

General specifications

Power supply voltage		20.4 to 26.4 VDC (24 VDC -15% +10%)
Consumption current	G9SP-N10S	400 mA (V1: 300 mA, V2: 100 mA)
	G9SP-N10D	500 mA (V1: 300 mA, V2: 200 mA)
	G9SP-N20S	500 mA (V1: 400 mA, V2: 100 mA)
Mounting method		35-mm DIN track
Ambient operating temperature		0°C to 55°C
Ambient storage temperature		-20°C to 75°C
Degree of protection		IP20 (IEC 60529)

Safety input specifications

Input type	Sinking inputs (PNP)
ON voltage	11 VDC min. between each input terminal and G1
OFF voltage	5 VDC max. between each input terminal and G1
OFF current	1 mA max.
Input current	6 mA

Safety output specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.8 A max. per output*
Residual voltage	1.2 V max. between each output terminal and V2

Test output specifications

Output type	Sourcing outputs (PNP)
Rated output current	0.3 A max. per output*
Residual voltage	1.2 V max. between each output terminal and V1

Standard output specifications (G9SP-N10S)

Output type	Sourcing outputs (PNP)
ON Residual voltage	1.5 V max. (between each output terminal and V2)
Rated output current	100 mA max.*

*For details on the rated output current, please refer to the user manual of G9SP.

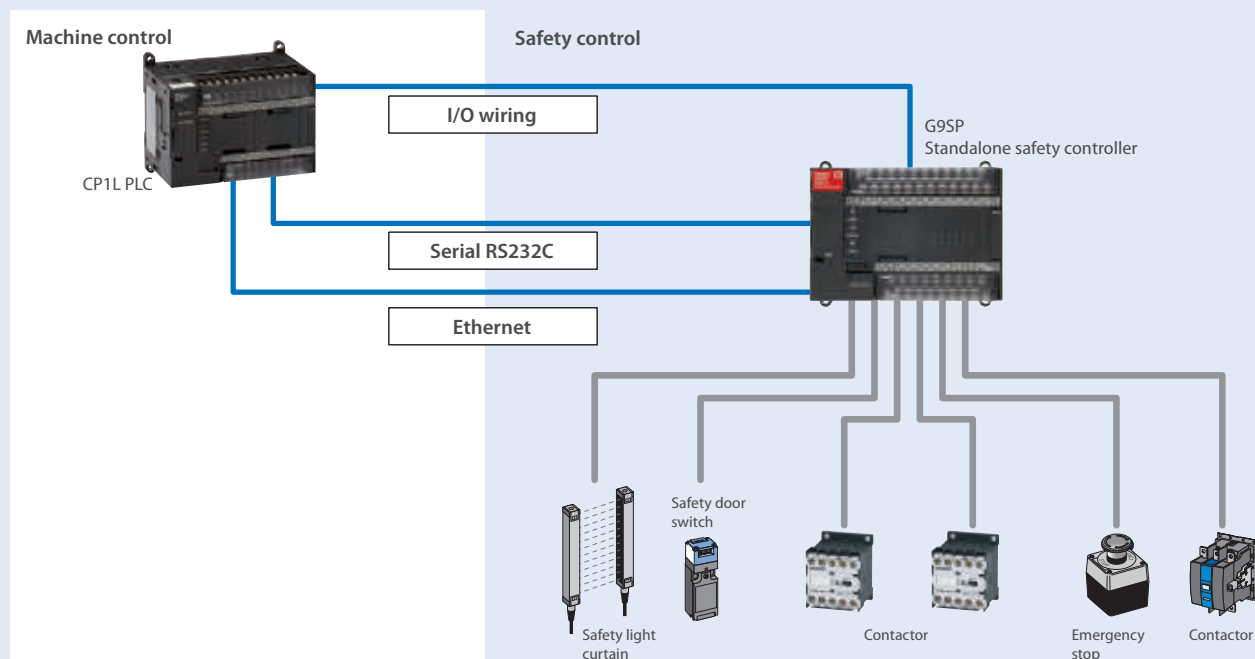
Control system integration

Safety - I/O-status becomes transparent

The standalone safety controller offers diagnosis information in 3 ways:

- 1) via parallel wiring
- 2) via serial RS232C interface (option)
- 3) via Ethernet interface (option).

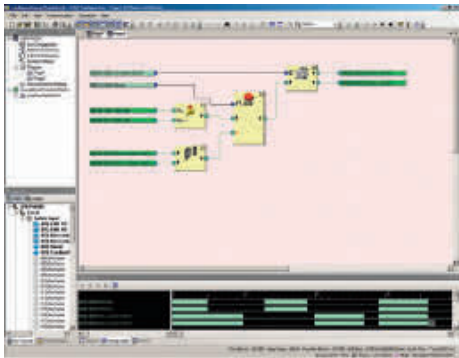
Information of all safety in- and outputs on the standard control system ensure minimum downtime of the machine.



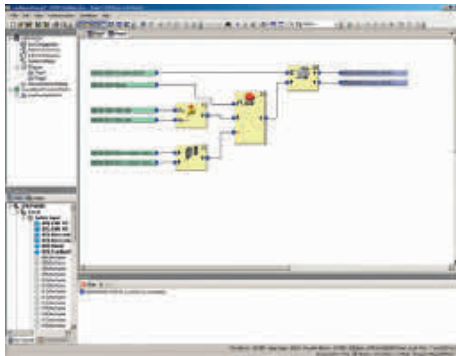
G9SP configuration tool



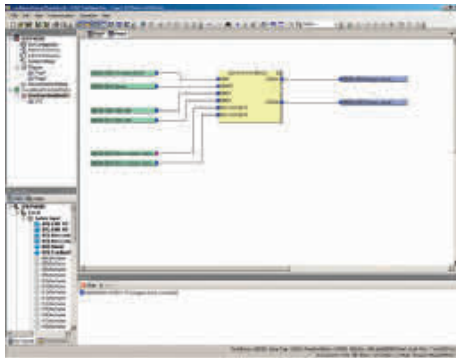
Easy setup and configuration is provided by a setup wizard supporting the hardware selection.



Integrated Simulator
All functions can be tested and simulated in the Configuration Tool, so there's no unnecessary additional workload for the engineer. In addition, on-line diagnosis reduces debug time to a minimum during implementation in the machine control system.



User-defined function blocks
Approved configuration elements such as a tested door monitoring solution can be easily stored as a user defined function block and re-used in future projects. This minimises the time it takes to create a new system configuration.

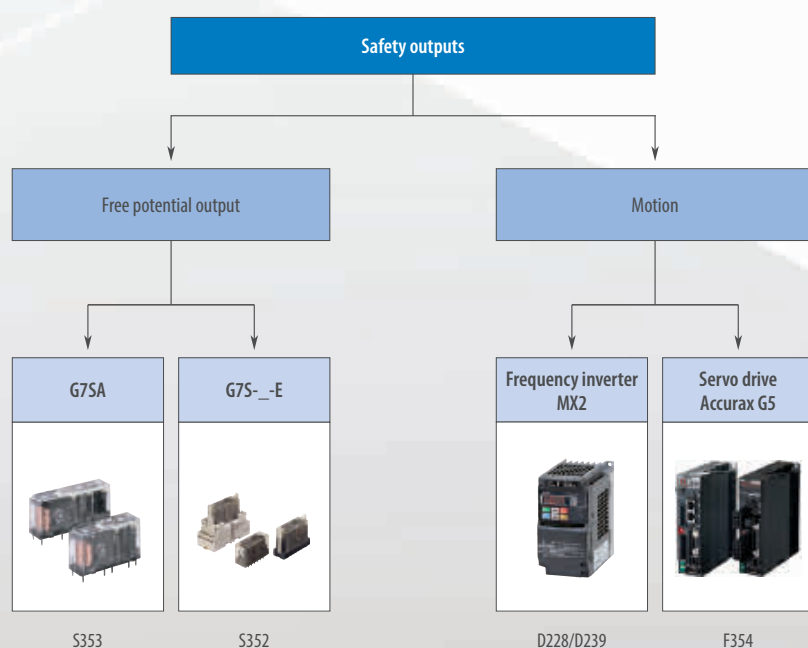


Knowledge-building
Existing configurations are the basis for new projects. The G9SP Configuration Tool supports re-use of existing and proven know-how in safety control, as well as user-defined function blocks. Which means no more repetition of effort, instead a growing library of safety solutions.

STOPPING ALL DANGEROUS MOVEMENTS

Our solution helps you to stop all dangerous movements that you have in your machine. From a switch off the power, until stop some safety motion movement.

- Free potential outputs -Safety relays
- Frequency Inverters
- Servo Drives



		Safety relays	
			
Model		G7SA	G7S- -E
Selection criteria	Housing	Plastic	Plastic
	Operating temperature	-40 to 85°C	-25 to 70°C
	Flux-tight	■	■
	Number of poles	4 pole and 6 pole	6 pole
Features	Gold clad contacts	■	—
	Relay socket	■	■
Application	General safety application	■	■
Supply voltage	24 VDC	■	■
In- and outputs	4PST-NO + DPST-NC	■	■
	3PST-NO + 3PST-NC	■	■
	3PST-NO + SPST-NC	■	—
	DPST-NO + DPST-NC	■	—
	5PST-NO + SPST-NC	■	—
Page/Quick Link		S353	S352

		Frequency inverters	
			IP54

Model	MX2
400 V three-phase	0.4 kW to 15 kW
200 V three-phase	0.1 kW to 15 kW
200 V single-phase	0.1 kW to 2.2 kW
Application	Harmonized motor and machine control
Control method	Open loop speed and torque control for vector and speed for V/F control
Torque features	200% at 0.5 Hz
Connectivity	Modbus, DeviceNet, PROFIBUS, MECHATROLINK-II, EtherCAT, CompoNet, EtherNet IP
Logic programming	Standard firmware
Safety approvals	ISO13849-1 Category 3, Performance Level PLd
Customisation options	IP54 enclosure
Page/Quick Link	D228, D239

		Servo drives	
			
		Accurax G5	
		EtherCAT network and safety built-in	
Ratings 230 V single-phase		100 W to 1.5 kW	
Ratings 400 V three-phase		600 W to 15 kW	
Applicable servomotor		Accurax G5 and G-Series rotary motors	
Position control		EtherCAT, MECHATROLINK-II or Pulse train input	
Speed control		EtherCAT, MECHATROLINK-II or Analog input ± 10 V	
Torque control		EtherCAT, MECHATROLINK-II or Analog input ± 10 V	
		Embedded indexer functionality	
Safety approvals		ISO13849-1:2008 (PL d), EN 954-1:1996 (Cat-3)	
Full closed loop		Built-in	
Page/Quick Link		F354	

Temperature controllers

E5_C – THE NEW STANDARD

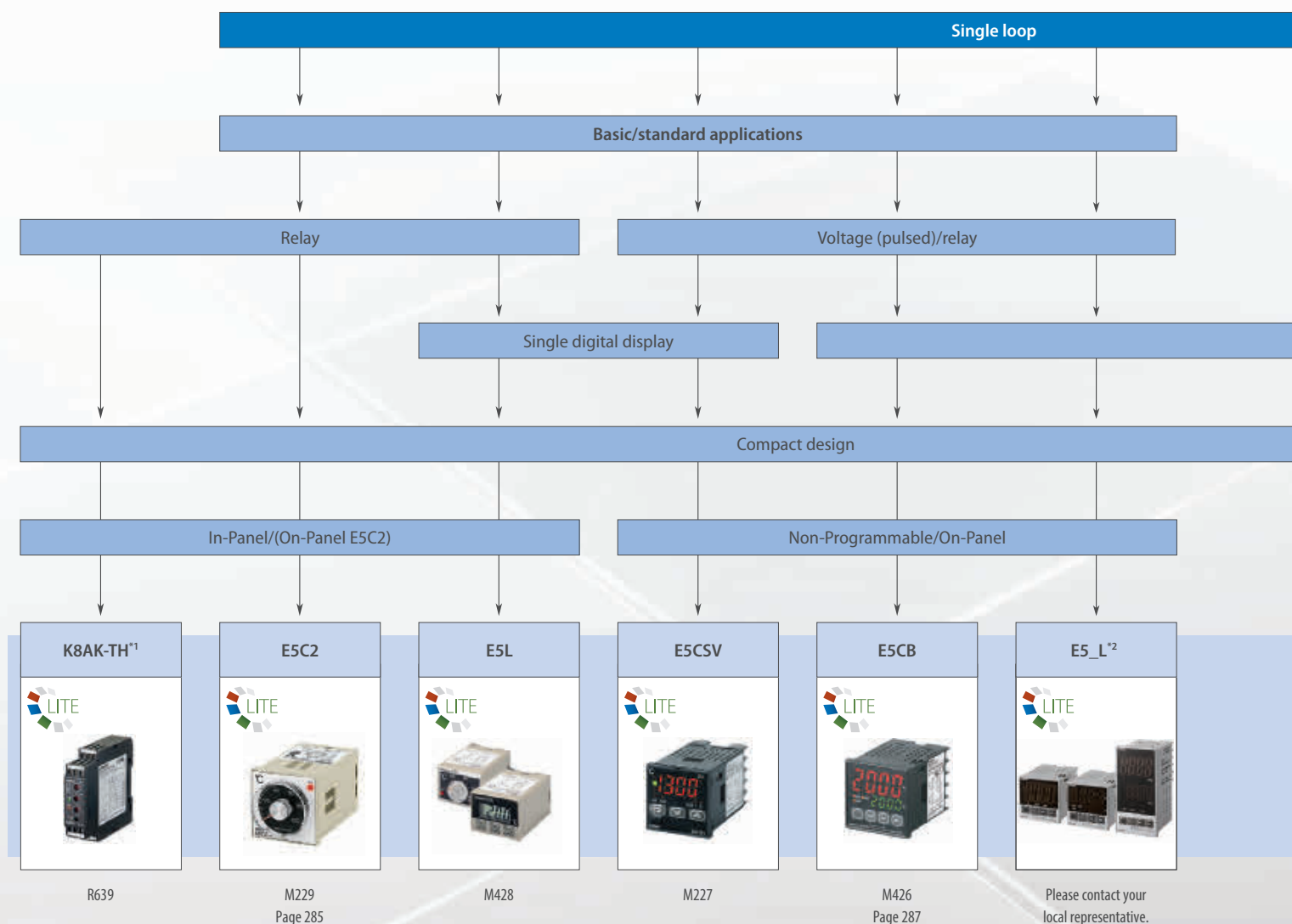
...in temperature control

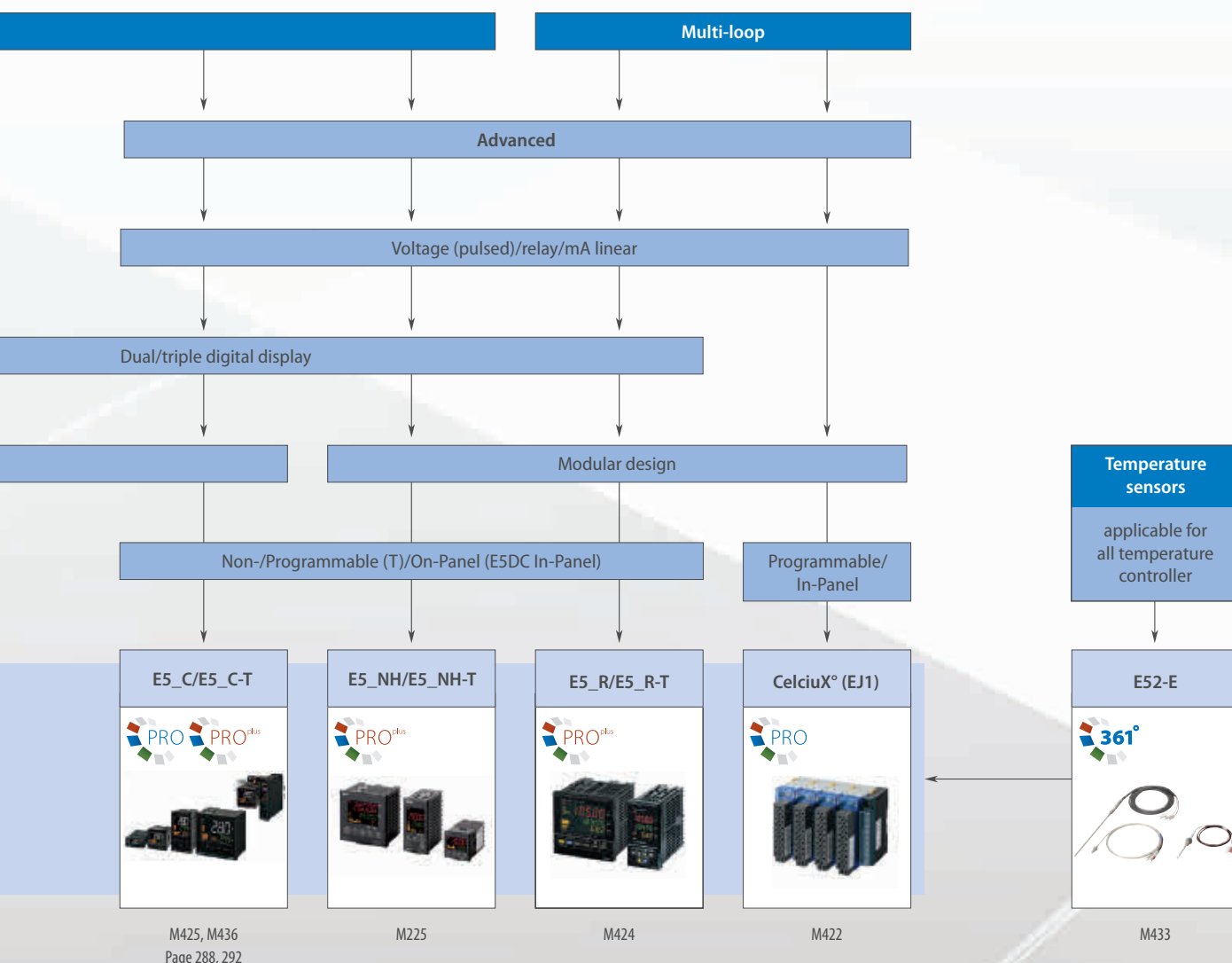
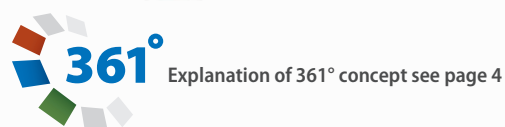
Omron has been an active innovator in temperature control since introducing its first temperature controller in 1967. Now temperature control has taken a giant leap forward with Omron's next generation of controllers – the E_C, which set new global standards in the crucial areas of precision, user friendliness and control performance. The E_C series will save you time and effort in set-up and operation, while enabling faster and more accurate monitoring/control of your process. The high visibility display of the new series is also extremely easy to read and virtually eliminates any possibility for human error.



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*1 Temperature limiter

*2 Only available in Africa, Middle East and Russia

Selection table

Category		Analog temperature controller	Analog/digital temperature controller	Digital temperature controller		
						
Model		E5C2	E5L-A/C	E5CSV	E5CB	E5_L
Selection criteria	Type	Lite line				
	Panel	On-panel/In-Panel	In-Panel	On-panel		
	Loops	1	1	1	1	1
	Size	1/16 DIN	45 × 35 mm	1/16 DIN	1/16 DIN	1/16, 1/32 DIN
Control mode	ON/OFF PID 2-PID ^{*1}	■/P ■ -	■ - -	■ - ■	■ - ■	■ - ■
	Operation ^{*2}	H/C	H/C	H/C	H/C	H/C
	Valve Control ^{*3}	-	-	-	-	-
Features	Accuracy	-	±1°C	±0.5%	±0.5%	±0.5%
	Auto-/Self-/Gradient-tuning	- -	- -	■ ■	■ ■ -	■ ■ -
	Transfer output	-	-	-	-	-
	Remote input	-	-	-	-	-
	Number of alarms	-	-	1	1	1
	Heater alarm	-	-	-	-	-
	IP rating front panel	IP40	IP40	IP66	IP66	IP50
Supply voltage	Display	-	Analog (A)/3 digit (C)	Single 3.5 digit	Dual 4 digit	Dual 4 digit
	110/240 VAC	■	■	■	■	■
Comms	24 VAC/VDC	-	-	□	□	-
	RS-232 RS-485	- -	- -	- -	- -	- -
	Event IP	-	-	-	-	-
	QLP port	-	-	-	■ ^{*4}	-
	DeviceNet	-	-	-	-	-
	Modbus	-	-	-	■	-
	PROFIBUS	-	-	-	-	-
	Modbus TCP	-	-	-	-	-
Control output	ProfiNet	-	-	-	-	-
	Relay SSR	- -	- -	■ -	■ -	■ -
	Voltage (pulse)	-	-	■	■	■
	Linear voltage	-	-	-	-	-
Input type – linear	Linear current	-	-	-	-	-
	mA	-	-	-	-	-
	mV	-	-	-	-	-
Input type	V	-	-	-	-	-
	Thermocouple	K	■	-	■	■
		J	■	-	■	■
		T	-	-	■	■
		E	-	-	-	-
		L	-	-	■	-
		U	-	-	■	-
		N	-	-	■	-
		R	-	-	■	■
		S	-	-	■	■
		B	-	-	-	-
		W	-	-	-	-
		PLII	-	-	-	-
	RTD	Pt100 JPt100 THE	■ - ■	- - ■ ^{*5}	■ ■ -	■ - -
Page/Quick Link		285/M229	Please contact your local representative.	M227	287/M426	Please contact your local representative.

^{*1} 2-PID is Omron's easy to use high performance PID algorithm

^{*2} H = heat, H/C = heat or cool, H & C = heat and/or cool

^{*3} Valve control = relay up and down

^{*4} QLP: Quick Link Port to connected TC to PC using the smart USB cable E58-CIFQ2

^{*5} SP sensor provided

*6 Heater alarm = heater burnout & SSR failure detection
*7 Quick link port using comm. cable E58-CIFQ2
*8 PROFIBUS-DP communication option via PRT1-SCU11
*9 E1N-HFU-ETN Serial gateway
*10 QLP: Quick link Port to connected TC to PC using the smart USB cable E58-CIFQ1



Easy-to-use, basic temperature controller with analog dial setting

Omron's basic ON/OFF or PD controller features an analog setting dial. This compact, low-cost controller has a setting accuracy of 2% of full scale. It incorporates a plug-in socket allowing for DIN-rail or flush mounting.

- Compact, cost-effective controller
- Control mode: ON/OFF or P
- Control output: relay
- Power supply: 100 to 240 VAC
- Thermocouple K: 0 to 1200°C, J: 0 to 400°C, Pt100: -50 to 400°C

Ordering information

Standard models (Power supply: 100 to 240 VAC)

Input			Control method	On/OFF	Proportional (P)
			Output/Indication method	Relay/No indication	
Input/ standard scale (°C)	Thermocouple	K (CA) Chromel vs. Alumel	0 to 200 °C	E5C2-R20K AC100-240 0-200	E5C2-R40K AC100-240 0-200
			0 to 300 °C	—	E5C2-R40K AC100-240 0-300
			0 to 400 °C	E5C2-R20K AC100-240 0-400	E5C2-R40K AC100-240 0-400
			0 to 600 °C	E5C2-R20K AC100-240 0-600	E5C2-R40K AC100-240 0-600
			0 to 800 °C	E5C2-R20K AC100-240 0-800	E5C2-R40K AC100-240 0-800
			0 to 1000 °C	E5C2-R20K AC100-240 0-1000	—
			0 to 1200 °C	E5C2-R20K AC100-240 0-1200	—
		J (IC) Iron versus Constantan	0 to 200 °C	E5C2-R20J AC100-240 0-200	—
			0 to 300 °C	E5C2-R20J AC100-240 0-300	—
			0 to 400 °C	E5C2-R20J AC100-240 0-400	—
	Resistance thermometer	Platinum resistance thermometer	-50 to 50 °C	E5C2-R20P-D AC100-240 -50-50	—
			0 to 50 °C	E5C2-R20P-D AC100-240 0-50	—
			0 to 100 °C	E5C2-R20P-D AC100-240 0-100	—
			0 to 200 °C	E5C2-R20P-D AC100-240 0-200	—
			0 to 300 °C	E5C2-R20P-D AC100-240 0-300	—
			0 to 400 °C	E5C2-R20P-D AC100-240 0-400	—
	Thermistor	THE (replaceable element)	0 to 100 °C	E5C2-R20G AC100-240 0-100	—
			100 to 200 °C	E5C2-R20G AC100-240 100-200	—
			150 to 300 °C	E5C2-R20G AC100-240 150-300	—

Input ranges	Thermocouple *1		Platinum resistance thermometer	Thermistor *2
	K (CA) chromel vs. alumel	J (IC) iron vs. constantan	Pt100	THE
°C	0 to 200 (5), 0 to 400 (10), 0 to 600 (20), 0 to 800 (20), 0 to 1,000 (25), 0 to 1,200 (25)	0 to 200 (5), 0 to 300 (10), 0 to 400 (10)	-50 to 50 (2), 0 to 50 (1), 0 to 100 (2), 0 to 200 (5), 0 to 300 (10), 0 to 400 (10)	0 to 100 (2) (6 kΩ at 0°C), 100 to 200 (2) (550 Ω @ 200°C), 150 to 300 (2) (4 kΩ @ 200°C)

*1 Values in () are the minimum unit.

*2 Values in () are the thermistor resistive value.

Accessories

Functions	Order code
Front connecting socket with finger protection	P2CF-08-E
Back connecting socket (for flush mounting)	P3G-08
Finger protection cover (for P3G-08)	Y92A-48G
Protective front cover (IP66)	Y92A-48B

Specifications

Supply voltage	100 to 240 VAC, 50/60 Hz
Thermocouple input type	K, J (with sensor break detection)
RTD input type	Pt100, THE
Control mode	ON/OFF or P control
Setting method	analog setting
Output	Relay, SPDT, 3 A at 250 VAC
Life expectancy	Electrical: 100,000 operations min.
Setting accuracy	±2% FS max.
Hysteresis	Approx. 0.5% FS (fixed)
Proportional band	3% FS (fixed)
Reset range	5 ±1% FS min.
Control period	20 s
IP Rating front panel	IP40 (IP66 cover available)
IP rating terminals	IP00
Ambient temperature	−10 to 55°C
Size in mm (HxWxD)	48×48×96



Best price performance ratio and user-friendliness combined with ergonomic design

Thanks to a clear and easy-to-use menu structure, the E5CB General Purpose Controller is extremely user friendly. Despite being very simply layered, the E5CB still offers a high performance inherited from the E5CN series. Even if no power is available, the E5CB can be powered and parameterized with only a few clicks using the free ThermoMini remote software.

- Set up your configuration in only 30 s
- Large display (16.2 mm) legible up to 5 m
- Built to last and precisely regulate with Omron unique 2-PID algorithm
- Easy and quick remote parameterization via free ThermoMini software
- Speed up your application with a sampling period time of 250 ms

Ordering information

Size	Power supply voltage	Input type	Alarm output	Control output	Order code
E5CB 48 × 48 mm	100 to 240 VAC	Thermocouple	1	Relay output	E5CB-R1TC
		Platinum resistance thermometer			E5CB-R1P
		Thermocouple		Voltage output (for driving SSR)	E5CB-Q1TC
		Platinum resistance thermometer			E5CB-Q1P
	24 VAC/VDC	Thermocouple		Relay output	E5CB-R1TCD
		Platinum resistance thermometer			E5CB-R1PD
		Thermocouple		Voltage output (for driving SSR)	E5CB-Q1TCD
		Platinum resistance thermometer			E5CB-Q1PD

Accessories

Option	Order code
USB-Serial conversion cable	E58-C1FQ2



Software

Description	Features
ThermoMini	Freeware/Parameter copying and cloning tool Parameter export (.csv), self-expressing

Specifications

Item	E5CB
Power supply voltage	100 to 240 VAC 50/60 Hz, 24 VAC 50/60 Hz, or 24 VDC
Operating voltage range	85% to 110% of rated supply voltage
Power consumption	Approx. 3.5 VA (100 to 240 VAC) Approx. 3.5 VA (24 VAC) Approx. 2.5 W (24 VDC)
Sensor input	Models with thermocouple inputs Thermocouple: K, J, T, R, or S (JIS C 1602-1995, IEC60584-1) Models with platinum resistance thermometer inputs Platinum resistance thermometer: Pt100 (JIS C 1604-1997, IEC60751)
Control output	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA Output voltage: 12 VDC +25%/–15% (PNP), max. load current: 21 mA, with short-circuit protection circuit
Alarm output	SPST-NO, 250 VAC, 1 A (resistive load), electrical life: 100,000 operations, minimum load: 5 V, 10 mA
Control method	ON/OFF control or 2-PID control (with auto-tuning)
Setting method	Digital setting using front panel keys
Indication method	7-segment digital display and individual indicators Character height: 16.2 mm (PV)
Other functions	Temperature input shift, run/stop, protection functions, etc.
Ambient operating temperature	–10 to 55°C (with no condensation or icing)/With a three-year guarantee: –10 to 50°C
Ambient operating humidity	25% to 85%
Storage temperature	–25 to 65°C (with no condensation or icing)
Size in mm (H × W × D)	48×48×65

Note: Other models (E5C_L/E5EW) with similar features but without USB communication are only available for "Emerging Countries". Please ask your local Sales representative for further information.

High performance & simplicity

The next generation E5_C temperature controller is setting a new global standard in terms of precision and user-friendly design. Best control performance, easy set-up and outstanding visibility of the white IP66 LCD display have been integrated into a space-saving housing only 60 mm deep.

- Fast and precise regulation: 50 ms sampling loop period time
- Easy to set up, and operate intuitively via CX-Thermo without power supply
- Best contrast display using white LCD technology which is visible from a far distance and from any angle
- Useful alarm and diagnosis functions for secure operation
- Practical timer and logic operation functions eliminating the need of a PLC
- Additional models with different features are available. Please check related product catalogue.



Ordering information

E5CC (48 × 48 mm)

Control Output	Option no	Option description	Alarm outputs	Order code	
				100 to 240 VAC	24 VAC/DC
Out1: Relay Out2: non	000	No option	3	E5CC-RX3A5M-000	E5CC-RX3D5M-000
	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	3	E5CC-RX3A5M-001	E5CC-RX3D5M-001
	003	HB/HS alarm for 3-phase heaters, RS485	3	E5CC-RX3A5M-003	E5CC-RX3D5M-003
	006	2 EV inputs, transfer output	3	E5CC-RX3A5M-006	E5CC-RX3D5M-006
	007	2 EV inputs, remote SP	3	E5CC-RX3A5M-007	E5CC-RX3D5M-007
Out1: Voltage (pulse) Out2: non	000	No option	3	E5CC-QX3A5M-000	E5CC-QX3D5M-000
	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	3	E5CC-QX3A5M-001	E5CC-QX3D5M-001
	003	HB/HS alarm for 3-phase heaters, RS485	3	E5CC-QX3A5M-003	E5CC-QX3D5M-003
	006	2 EV inputs, transfer output	3	E5CC-QX3A5M-006	E5CC-QX3D5M-006
	007	2 EV inputs, remote SP	3	E5CC-QX3A5M-007	E5CC-QX3D5M-007
Out1: Linear current Out2: non	000	No option	3	E5CC-CX3A5M-000	E5CC-CX3D5M-000
	004	RS485, 2 EV inputs	3	E5CC-CX3A5M-004	E5CC-CX3D5M-004
	006	2 EV inputs, transfer output	3	E5CC-CX3A5M-006	E5CC-CX3D5M-006
	007	2 EV inputs, remote SP	3	E5CC-CX3A5M-007	E5CC-CX3D5M-007

Note: Other models with 2 control outputs, 4 EV inputs or with different kind of option combination are available on request. Please contact the local sales office for special request.

E5EC (48 × 96 mm)/E5AC (96 × 96 mm)

Control Output	Option no	Option description	Alarm outputs	Order code	
				100 to 240 VAC	24 VAC/DC
Out1: Relay Out2: non	000	No option	4	E5_C-RX4A5M-000	E5_C-RX4D5M-000
	009	HB/HS alarm for 3-phase heaters, RS485, 2 EV inputs	4	E5_C-RX4A5M-009	E5_C-RX4D5M-009
	010	HB/HS alarm for 1-phase heaters, 4 EV inputs	4	E5_C-RX4A5M-010	E5_C-RX4D5M-010
	011	HB/HS alarm for 1-phase heaters, 6 EV inputs, remote SP, transfer output	4	E5_C-RX4A5M-011	E5_C-RX4D5M-011
Out1: Voltage (pulse) Out2: non	000	No option	4	E5_C-QX4A5M-000	E5_C-QX4D5M-000
	009	HB/HS alarm for 3-phase heaters, RS485, 2 EV inputs	4	E5_C-QX4A5M-009	E5_C-QX4D5M-009
	010	HB/HS alarm for 1-phase heaters, 4 EV inputs	4	E5_C-QX4A5M-010	E5_C-QX4D5M-010
	011	HB/HS alarm for 1-phase heaters, 6 EV inputs, remote SP, transfer output	4	E5_C-QX4A5M-011	E5_C-QX4D5M-011
Out1: Linear current Out2: non	000	No option	4	E5_C-CX4A5M-000	E5_C-CX4D5M-000
	004	2 EV inputs, RS485	4	E5_C-CX4A5M-004	E5_C-CX4D5M-004
	014	RS485, 4 EV inputs, remote SP, transfer output	4	E5_C-CX4A5M-014	E5_C-CX4D5M-014
Out1: Relay Out2: Relay Positional proportional control model	000	No option	4	E5_C-PR4A5M-000	E5_C-PR4D5M-000
	004	2 EV inputs, RS485	4	E5_C-PR4A5M-004	E5_C-PR4D5M-004
	014	RS485, 4 EV inputs, remote SP, transfer output	4	E5_C-PR4A5M-014	E5_C-PR4D5M-014

Note: Other models with 2 control outputs or with different kind of option combination are available on request. Please contact the local sales office for special request. Replace “_” with “A” for E5AC or “E” for E5EC

E5GC (48 × 24 mm)

Control Output	Terminal type	Option no	Option description	Alarm outputs	Order code	
					100 to 240 VAC	24 VAC/DC
Out1: Relay	Screwless clamp	000	No option	1	E5GC-RX1ACM-000	E5GC-RX1DCM-000
		015	RS485	1	E5GC-RX1ACM-015	E5GC-RX1DCM-015
		024	2 EV inputs	1	E5GC-RX1ACM-024	E5GC-RX1DCM-024
Out1: Voltage (pulse)	Screwless clamp	000	No option	1	E5GC-QX1ACM-000	E5GC-QX1DCM-000
		015	RS485	1	E5GC-QX1ACM-015	E5GC-QX1DCM-015
		024	2 EV inputs	1	E5GC-QX1ACM-024	E5GC-QX1DCM-024
Out1: Linear current	Screwless clamp	000	No option	1	E5GC-CX1ACM-000	E5GC-CX1DCM-000
		015	RS485	1	E5GC-CX1ACM-015	E5GC-CX1DCM-015
		024	2 EV inputs	1	E5GC-CX1ACM-024	E5GC-CX1DCM-024

Note: Other models with screw terminals, 0 or 2 Alarm outputs, 1 Event input or HBA alarm are available on request. Please contact the local sales office for special request.

E5DC (In-panel mounting)

Control Output	Option no	Option description	Alarm outputs	Order code	
				100 to 240 VAC	24 VAC/DC
Out1: Relay	000	No option	2	E5DC-RX2ASM-000	E5DC-RX2DSM-000
	002	HB/HS alarm for 1-phase heaters, RS485	2	E5DC-RX2ASM-002	E5DC-RX2DSM-002
	017	HB/HS alarm for 1-phase heaters, 1 EV input	2	E5DC-RX2ASM-017	E5DC-RX2DSM-017
Out1: Voltage (pulse)	000	No option	2	E5DC-QX2ASM-000	E5DC-QX2DSM-000
	002	HB/HS alarm for 1-phase heaters, RS485	2	E5DC-QX2ASM-002	E5DC-QX2DSM-002
	017	HB/HS alarm for 1-phase heaters, 1 EV input	2	E5DC-QX2ASM-017	E5DC-QX2DSM-017
Out1: Linear current	000	No option	2	E5DC-CX2ASM-000	E5DC-CX2DSM-000
	015	RS485	2	E5DC-CX2ASM-015	E5DC-CX2DSM-015
	016	1 EV input	2	E5DC-CX2ASM-016	E5DC-CX2DSM-016

Note: Other models with no Alarm output or with different kind of option combination are available on request. Please contact the local sales office for special request.

E5_C optional tools

Option	Order code
USB based configuration cable	E58-CIFQ2, E58-CIFQ2-E (for E5AC, E5DC, E5EC and E5GC)
PC based configuration and tuning software	EST2-2C-MV4

Specifications

E5CC/E5EC/E5AC

Item	E5CC	E5EC	E5AC
Power supply voltage	A in model number: 100 to 240 VAC, 50/60 Hz D in model number: 24 VAC, 50/60 Hz; 24 VDC		
Operating voltage range	85% to 110% of rated supply voltage		
Power consumption	6.5 VA max. at 100 to 240 VAC, and 4.1 VA max. at 24 VAC or 2.3 W max. at 24 VDC	8.3 VA max. at 100 to 240 VAC, and 5.5 VA max. at 24 VAC or 3.2 W max. at 24 VDC	9.0 VA max. at 100 to 240 VAC, and 5.6 VA max. at 24 VAC or 3.4 W max. at 24 VDC
Sensor input	- Temperature inputs Thermocouple: K, J, T, E, L, U, N, R, S, B, W, or PL II Platinum resistance thermometer: Pt100 or JPt100 Infrared temperature sensor (E51B): 10 to 70°C, 60 to 120°C, 115 to 165°C, or 140 to 260°C - Analog inputs Current input (mA): 4 to 20 or 0 to 20 Voltage input (V): 1 to 5, 0 to 5, or 0 to 10		
Input impedance	Current input: 150 Ω max., Voltage input: 1 MΩ min. (Use a 1:1 connection when connecting the E52-HB/THB.)		
Control method	ON/OFF control or 2-PID control (with auto-tuning)		
Indication accuracy	Thermocouple input: (±0.3% of indicated value or ±1°C, whichever is greater) ±1 digit max. Platinum resistance thermometer input: (±0.2% of indicated value or ±0.8°C, whichever is greater) ±1 digit max. Analog input: ±0.2% FS ±1 digit max. CT input: ±5% FS ±1 digit max.	Thermocouple input: (±0.3% of indicated value or ±1°C, whichever is greater) ±1 digit max. Platinum resistance thermometer input: (±0.2% of indicated value or ±0.8°C, whichever is greater) ±1 digit max. Analog input: ±0.2% FS ±1 digit max. CT input: ±5% FS ±1 digit max. Potentiometer input: ±5% FS ±1 digit max.	
Auto-Tuning	Yes, 40%/100% MV output limit selection. When using Heat/Cool: Automatic cool gain adjustment		
Self-Tuning	Yes		
Control outputs	Relay output	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA	
	Voltage output (for driving SSR)	Output voltage: 12 VDC ±20% (PNP), max. load current: 21 mA, with short-circuit protection circuit	
	Linear current output	4 to 20 mA DC/0 to 20 mA DC, load: 500 Ω max., resolution: approx. 10,000	
Auxiliary outputs	Number of outputs	3	4
	Output specifications	N.O. relay outputs, 250 VAC, Models with 3 outputs: 2 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA	

Item		E5CC	E5EC	E5AC
Event inputs	Number of inputs	2 or 4 or 6 max (depends on the model)		
	External contact input specifications	Contact input: ON: 1 k Ω max., OFF: 100 k Ω min.		
		Non-contact input: ON: Residual voltage: 1.5 V max., OFF: Leakage current: 0.1 mA max.		
		Current flow: approx. 7 mA per contact		
Setting method		Digital setting using front panel keys or via Remote Software CX-Thermo V4.5		
Indication method		11-segment digital display and individual indicators		
Multi SP		Up to eight set points (SP0 to SP7) can be saved and selected using event inputs, key operations, or serial communications.		
Other functions		Manual output, heating/cooling control, loop burnout alarm, SP ramp, other alarm functions, heater burnout detection (including SSR failure detection), 40% AT, 100% AT, MV limiter, input digital filter, self-tuning, temperature input shift, run/stop, protection functions, extraction of square root, MV change rate limit, logic operations, PV/SV status display, simple program, automatic cooling coefficient adjustment		
Ambient operating temperature		−10 to 55°C (with no condensation or icing)		
Ambient operating humidity		25% to 85%		
Storage temperature		−25 to 65°C (with no condensation or icing)		
Degree of protection		Front panel: IP66, Rear case: IP20, Terminals: IP00		
Sampling period		50 ms		
Size in mm (H×W×D)		48×48×64	48×96×64	96×96×64

E5GC

Item		E5GC
Power supply voltage		A in model number: 100 to 240 VAC, 50/60 Hz D in model number: 24 VAC, 50/60 Hz; 24 VDC
Sensor input		- Temperature input Thermocouple: K, J, T, E, L, U, N, R, S, B, W, or PL II Platinum resistance thermometer: Pt100 or JPt100 Infrared temperature sensor (ES1B): 10 to 70°C, 60 to 120°C, 115 to 165°C, or 140 to 260°C - Analog input Current input: 4 to 20 mA or 0 to 20 mA Voltage input: 1 to 5 V, 0 to 5 V, or 0 to 10 V
Control method		ON/OFF control or 2-PID control (with auto-tuning)
Control output	Relay output	SPST-NO, 250 VAC, 2 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA (reference value)
	Voltage output (for driving SSR)	Output voltage 12 VDC $\pm$ 20% (PNP), max. Load current: 21 mA, with short-circuit protection circuit
	Linear current output	4 to 20 mA DC/0 to 20 mA DC, load: 500 Ω max., resolution: Approx. 10,000
Auxiliary output	Number of outputs	1 or 2 (depends on model)
	Output specifications	SPST-NO relay outputs, 250 VAC, 2 A (resistive load), Electrical life: 100,000 operations, Minimum applicable load: 10 mA at 5 V (reference value)
Indication method		11-segment digital displays and individual indicators Character height: PV: 10.5 mm, SV: 5.0 mm
Multi SP		Up to eight set points (SP0 to SP7) can be saved and selected using the event inputs, key operations, or serial communications. ^{*1}
Other functions		Manual output, heating/cooling control, loop burnout alarm, SP ramp, other alarm functions, heater burnout (HB) alarm (including SSR failure (HS) alarm), 40% AT, 100% AT, MV limiter, input digital filter, self tuning, robust tuning, PV input shift, run/stop, protection functions, extraction of square root, MV change rate limit, logic operations, temperature status display, simple programming, moving average of input value, display brightness setting, simple transfer output, and work bit message. ^{*2}
Size in mm (H×W×D)		24×48×93

^{*1} Only four set points are selectable for event inputs.

^{*2} Simple transfer output and work bit message are only for E5GC.

E5DC

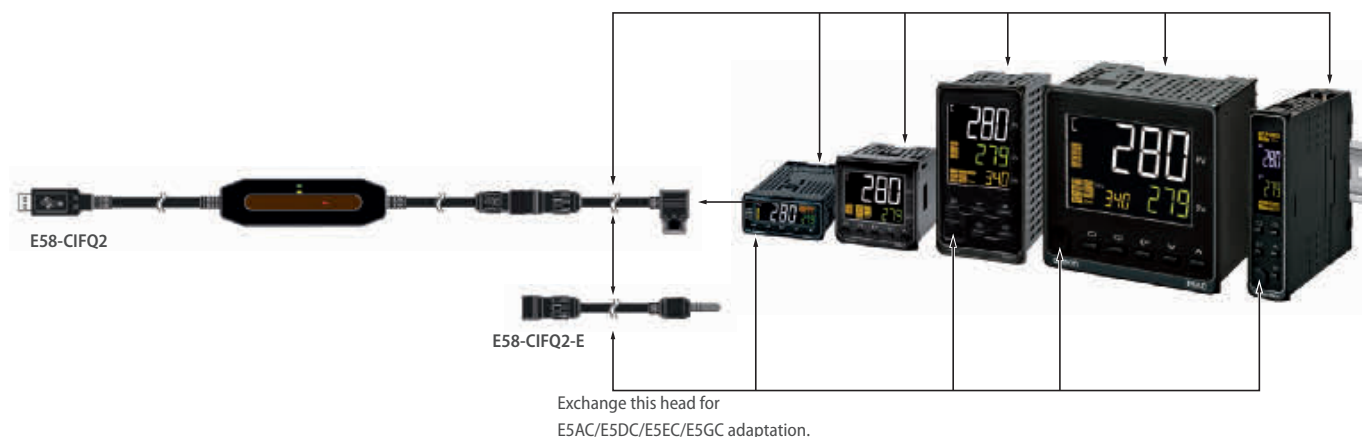
Item		E5DC
Power supply voltage		A in model number: 100 to 240 VAC, 50/60 Hz D in model number: 24 VAC, 50/60 Hz; 24 VDC
Operating voltage range		85% to 110% of rated supply voltage
Power consumption		4.9 VA max. at 100 to 240 VAC, and 2.8 VA max. at 24 VDC or 1.5 W max. at 24 VDC
Sensor input		- Temperature inputs Thermocouple: K, J, T, E, L, U, N, R, S, B, W, or PL II Platinum resistance thermometer: Pt100 or JPt100 Infrared temperature sensor (ES1B): 10 to 70°C, 60 to 120°C, 115 to 165°C, or 140 to 260°C - Analog inputs Current input (mA): 4 to 20 or 0 to 20 Voltage input (V): 1 to 5, 0 to 5, or 0 to 10
Input impedance		Current input: 150 Ω max., Voltage input: 1 M Ω min. (Use a 1:1 connection when connecting the ES2-HB/THB.)
Control method		ON/OFF control or 2-PID control (with auto-tuning)
Indication accuracy		Thermocouple input: ($\pm$ 0.3% of PV or $\pm$ 1°C, whichever is greater) $\pm$ 1 digit max. Platinum resistance thermometer input: ($\pm$ 0.2% of PV or $\pm$ 0.8°C, whichever is greater) $\pm$ 1 digit max. Analog input: $\pm$ 0.2% FS $\pm$ 1 digit max. CT input: $\pm$ 5% FS $\pm$ 1 digit max.
Auto-Tuning		Yes, 40%/100% MV output limit selection. When using Heat/Cool: Automatic cool gain adjustment
Self-Tuning		Yes
Control outputs	Relay output	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA
	Voltage output (for driving SSR)	Output voltage: 12 VDC $\pm$ 20% (PNP), max. load current: 20 mA, with short-circuit protection circuit
	Linear current output	4 to 20 mA DC/0 to 20 mA DC, load: 500 Ω max., resolution: approx. 10,000
Auxiliary outputs	Number of outputs	2 (depends on model)
	Output specifications	SPST-NO relay outputs: 250 VAC, 2 A (resistive load), Electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA

Item		E5DC
Event inputs	Number of inputs	1 (depends on model)
	External contact input specifications	Contact input: ON: 1 k Ω max., OFF: 100 k Ω min.
		Non-contact input: ON: Residual voltage: 1.5 V max., OFF: Leakage current: 0.1 mA max. Current flow: approx. 7 mA per contact
Setting method		Digital setting using front panel keys
Indication method		11-segment digital displays and individual indicators Character height: PV 8.5 mm, SV: 8.0 mm
Multi SP		Up to eight set points (SP0 to SP7) can be saved and selected using event inputs, key operations, or serial communications.*1
Other functions		Manual output, heating/cooling control, loop burnout alarm, SP ramp, other alarm functions, heater burnout (HB) alarm (including SSR failure (HB) alarm), 40% AT, 100% AT, MV limiter, input digital filter, self tuning, robust tuning, PV input shift, run/stop, protection functions, extraction of square root, MV change rate limit, simple calculations, temperature status display, simple programming, moving average of input value, and display brightness setting
Ambient operating temperature		-10 to 55°C (with no condensation or icing), for 3-year warranty: -10 to 50°C (with no condensation or icing)
Ambient operating humidity		25% to 85%
Storage temperature		-25 to 65°C (with no condensation or icing)
Degree of protection		Main unit: IP20, Terminal unit: IP00
Sampling period		50 ms
Size in mm (H×W×D)		96×22.5×85

*1 Only two set points are selectable for event inputs.

USB communication cable E58-CIFQ2

Item	E5AC	E5CC	E5DC	E5EC	E5GC
E58-CIFQ2	■	■	■	■	■
E58-CIFQ2-E	■	—	■	■	■



Compact and intelligent Ramp/Soak controller

The E5_C-T Ramp/Soak temperature controllers expand the E5_C family to handle process applications. Capable of addressing up to 6 event inputs and up to 4 auxiliary outputs all in a compact 60 mm (depth) housing, makes this controller series one of Omron's most powerful and versatile temperature controllers.

- Set up to 8 programs with 32 segments totaling 256 program segments simply via CX-Thermo software.
- The three-level display is visible simultaneously so each process status can be easily identified.
- "Segment Jump" allows users to move directly to the specified segment reducing programming time and increase production throughput.
- Additional models with different features are available. Please check related product catalog.



Ordering information

E5CC-T (48 × 48 mm)

Control Output	Option no	Option description	Alarm outputs	Order code	
				100 to 240 VAC	24 VAC/DC
Out1: Relay Out2: non	000	No option	3	E5CC-TRX3A5M-000	E5CC-TRX3D5M-000
	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	3	E5CC-TRX3A5M-001	E5CC-TRX3D5M-001
	003	HB/HS alarm for 3-phase heaters, RS485	3	E5CC-TRX3A5M-003	E5CC-TRX3D5M-003
	006	2 EV inputs, transfer output	3	E5CC-TRX3A5M-006	E5CC-TRX3D5M-006
Out1: Voltage (pulse) Out2: non	000	No option	3	E5CC-TQX3A5M-000	E5CC-TQX3D5M-000
	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	3	E5CC-TQX3A5M-001	E5CC-TQX3D5M-001
	003	HB/HS alarm for 3-phase heaters, RS485	3	E5CC-TQX3A5M-003	E5CC-TQX3D5M-003
	006	2 EV inputs, transfer output	3	E5CC-TQX3A5M-006	E5CC-TQX3D5M-006
Out1: Linear current Out2: non	000	No option	3	E5CC-TCX3A5M-000	E5CC-TCX3D5M-000
	004	RS485, 2 EV inputs	3	E5CC-TCX3A5M-004	E5CC-TCX3D5M-004
	006	2 EV inputs, transfer output	3	E5CC-TCX3A5M-006	E5CC-TCX3D5M-006

Note: Other models with 2 control outputs, 4 EV inputs or with different kind of option combination are available on request. Please contact the local sales office for special request.

E5EC-T (48 × 96 mm)/E5AC-T (96 × 96 mm)

Control Output	Option no	Option description	Alarm outputs	Order code	
				100 to 240 VAC	24 VAC/DC
Out1: Relay Out2: non	000	No option	4	E5_C-TRX4A5M-000	E5_C-TRX4D5M-000
	008	HB/HS alarm for 1-phase heaters, RS485, 2 EV inputs	4	E5_C-TRX4A5M-008	E5_C-TRX4D5M-008
	019	HB/HS alarm for 1-phase heaters, 6 EV inputs, transfer output	4	E5_C-TRX4A5M-019	E5_C-TRX4D5M-019
Out1: Voltage (pulse) Out2: non	000	No option	4	E5_C-TQX4A5M-000	E5_C-TQX4D5M-000
	008	HB/HS alarm for 1-phase heaters, RS485, 2 EV inputs	4	E5_C-TQX4A5M-008	E5_C-TQX4D5M-008
	019	HB/HS alarm for 1-phase heaters, 6 EV inputs, transfer output	4	E5_C-TQX4A5M-019	E5_C-TQX4D5M-019
Out1: Linear current Out2: non	000	No option	4	E5_C-TCX4A5M-000	E5_C-TCX4D5M-000
	004	RS485, 2 EV inputs	4	E5_C-TCX4A5M-004	E5_C-TCX4D5M-004
	021	6 EV inputs, transfer output	4	E5_C-TCX4A5M-021	E5_C-TCX4D5M-021
	022	RS485, 4 EV inputs, transfer output	4	E5_C-TCX4A5M-022	E5_C-TCX4D5M-022
Out1: Relay Out2: Relay Positional proportional control model	000	No option	4	E5_C-TPR4A5M-000	E5_C-TPR4D5M-000
	004	RS485, 2 EV inputs	4	E5_C-TPR4A5M-004	E5_C-TPR4D5M-004
	022	RS485, 4 EV inputs, transfer output	4	E5_C-TPR4A5M-022	E5_C-TPR4D5M-022

Note: Other models with 2 control outputs or with different kind of option combination are available on request. Please contact the local sales office for special request. Replace " _ " with "A" for E5AC or "E" for E5EC

Specifications

E5CC-T/E5AC-T/E5EC-T

	E5CC-T	E5EC-T	E5AC-T
Sizes in mm (W × H × D)	48×48×60	48×96×60	96×96×60
Supply voltage	100 to 240 VAC 50/60Hz or 24 VAC/VDC		
Sensor input	Temperature input Thermocouple: K, J, T, E, L, U, N, R, S, B, W, or PL II Platinum resistance thermometer: Pt100 or JPt100 Infrared temperature sensor (ES1B): 10 to 70°C, 60 to 120°C, 115 to 165°C, or 140 to 260°C Analog input Current input: 4 to 20 mA or 0 to 20 mA Voltage input: 1 to 5 V, 0 to 5 V, or 0 to 10 V		
Control mode	2-PID control (with auto-tuning) or ON/OFF control		
Accuracy	Thermocouple: (±0.3% of indication value or ±1°C, whichever is greater) ±1 digit max. /Platinum resistance thermometer: (±0.2% of indication value or ±0.8°C, whichever is greater) ±1 digit max. Analog input: ±0.2% FS ±1 digit max. CT input: ±5% FS ±1 digit max. Potentiometer input: ±5% FS ±1 digit max.		
Functions	Manual output, heating/cooling control, loop burnout alarm, other alarm functions, heater burnout (HB) alarm (including SSR failure (HS) alarm), 40% AT, 100% AT, MV limiter, input digital filter, robust tuning, PV input shift, protection functions, extraction of square root, MV change rate limit, logic operations, temperature status display, moving average of input value, and display brightness setting		
Programs / segments	8/32		
PID sets	8		
Communication	RS-485 (multi-drop), CompowayF or Modbus RTU		
Event inputs	2-6		
QLP (Quick link port)	Yes, via USB and E58-CIFQ2 conversion cable		
Ambient temperature	-10 to 55 °C		
IP rating of front panel	IP66		
Sampling period time	50 ms		

Program control

Number of programs (patterns)	8
Number of segments (steps)	32
Segment setting method	Time setting (Segment set with set point and time.) Slope setting (Segment set with segment type, set point, slope, and time.)
Segment times	0 h 0 min to 99 h 59 min 0 min 0 s to 99 min 59 s
Alarm setting	Set separately for each program.
Reset operation	Select either stopping control or fixed SP operation.
Startup operation	Select continuing, resetting, manual operation, or run mode.
PID sets	Number of sets: 8 Setting method: Set separately for each program (automatic PID group selection also supported).
Alarm SP function	Select from ramp SP and target SP.
Program status control	Segment operation: Advance, segment jump, hold, and wait Program operation: Program repetitions and program links
Wait operation	Wait method: Waiting at segment ends Wait width setting: Same wait width setting for all programs
Time signals	Number of outputs: 2 Number of ON/OFF Operations: 1 each per output Setting method: Set separately for each program.
Program status output	Program end output (pulse width can be set), run output, stage output
Program startup operation	PV start: Select from segment 1 set point, slope-priority PV start Standby: 0 h 0 min to 99 h 59 min 0 day 0 h to 99 day 23h
Operation end operation	Select from resetting, continuing control at final set point, and fixed SP control.
Program SP shift	Same program SP shift for all programs

E5CC-T/E5AC-T/E5EC-T series optional tools

USB PC based configuration cable	E58-CIFQ2 for E5CC-T
	E58-CIFQ2 (& E58-CIFQ2-E) for E5AC-T and E5EC-T

E5CC-T/E5AC-T/E5EC-T series software

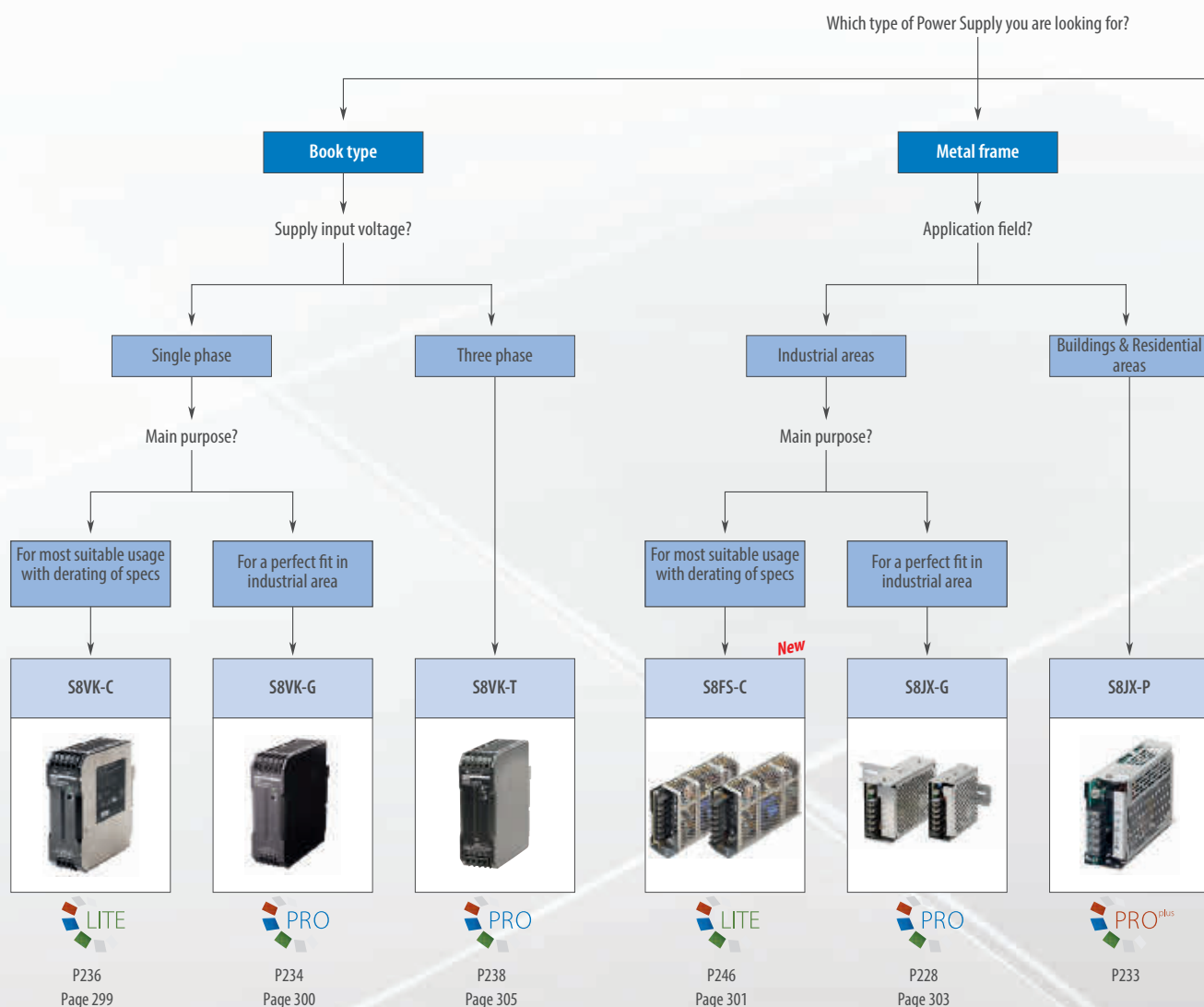
CX-Thermo >4.62	Professional parameterization and cloning software, data-logging, Fine-Tuning, logic operations, easy setting of process steps Operation system: Microsoft Windows XP (Service Pack 3 or higher)/Vista/7/8
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RELIABLE AND EASY OPERATION – WORLDWIDE

S8VK-G – The right power supply for your application

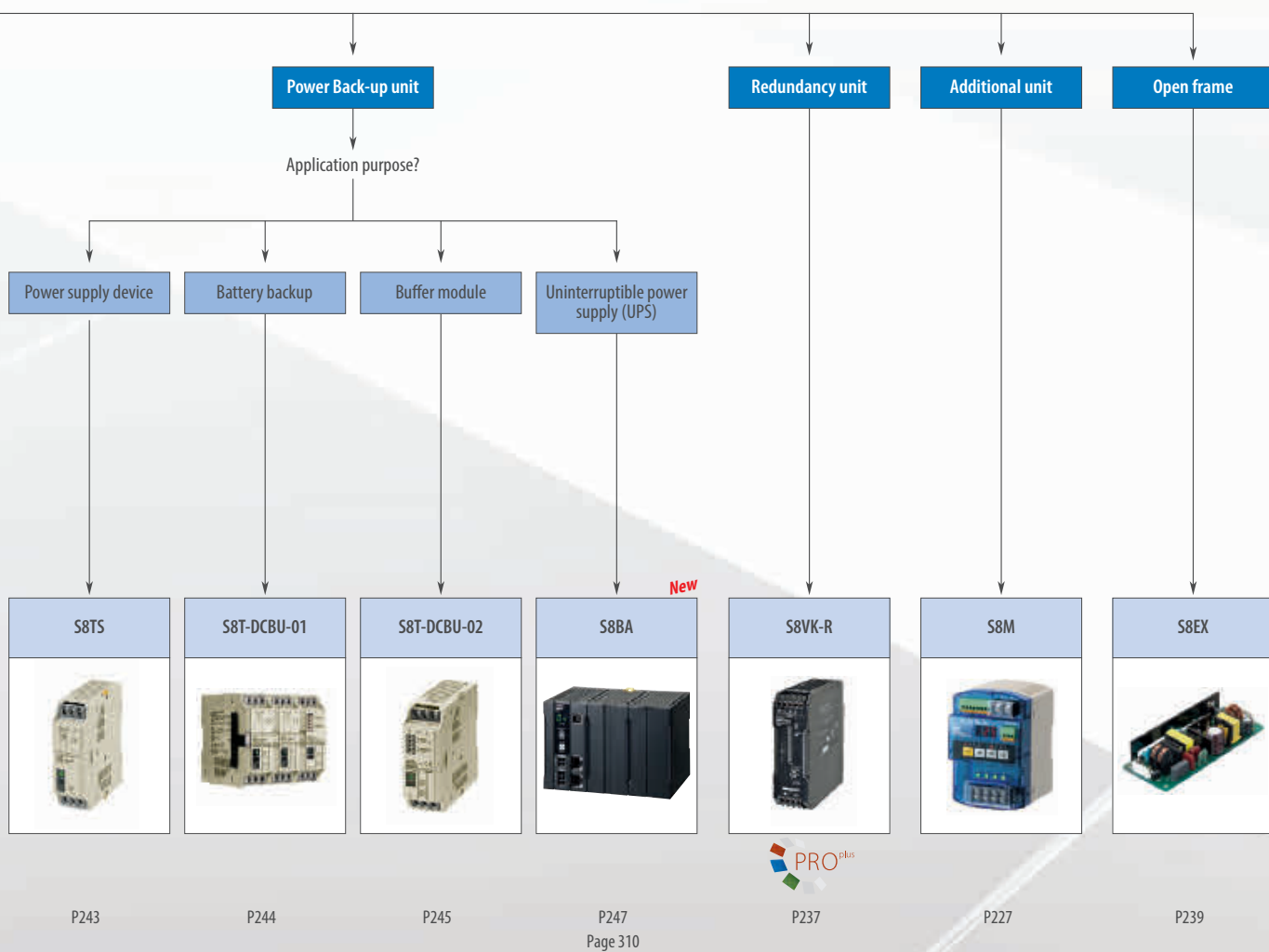
The S8VK-G offers a wide product range (from 15 W up to 480 W), in a very compact size. It is 13% smaller than comparable power supplies and the smallest on the market of its type.

- Wide operating temperature range (–40 to +70°C) to guarantee operation stability
- Double set of DC output terminals (three for the negative) to provide easy wiring
- High efficiency (90%) to reduce energy consumption
- Power Boost functionality (120%)
- Improved DIN-rail mounting clip to provide better vibration resistance and allow for easy installation
- For harsh environments coated models are now available. PCB coating protects against dust, corrosive gas and humidity.
- RoHS compliant





Explanation of 361° concept see page 4



Selection table

Category		Book type power supply						Metal frame power supply			
											
Model		S8VK-G				S8VK-C	S8VK-T	S8JX-P			
Selection Criteria	Type	Pro line				Lite line	Pro line	Pro ^{plus} line			
	Phases	Single phase					Three phases	Single phase			
	Rated voltage	100 V to 240 VAC (90 to 350 VDC)				100 V to 240 VAC	3 × 320 V to 576 VAC	100 V to 240 VAC			
	Voltage	5 V	12 V	24 V	48 V	24 V	24 V	5 V	12 V	24 V	48 V
Power	15 W	■ 3 A	■ 1.2 A	■ 0.65 A	–	–	–	–			
	25 W	–				–	–	–			
	30 W	■ 5 A	■ 2.5 A	■ 1.3 A	–	–	–	–			
	35 W	–				–	–	–			
	50 W	–				–	–	■ 10 A	■ 4.2 A	■ 2.1 A	■ 1.1 A
	60 W	–	■ 4.5 A	■ 2.5 A	–	■ 2.5 A	–	–			
	75 W	–				–	–	–			
	90 W	–				–	–	–			
	100 W	–				–	–	■ 20 A	■ 8.5 A	■ 4.5 A	■ 2.1 A
	120 W	–		■ 5 A	–	■ 5 A	■ 5 A	–			
	150 W	–				–	–	■ 30 A	■ 13 A	■ 6.5 A	■ 3.3 A
	180 W	–				–	–	–			
	200 W	–				–	–	–			
	240 W	–		■ 10 A	■ 5 A	■ 10 A	■ 10 A	–			
	300 W	–				–	–	■ 60 A	■ 27 A	■ 14 A	■ 7 A
	350 W	–				–	–	–			
	480 W	–		■ 20 A	■ 10 A	■ 20 A	■ 20 A	–			
	600 W	–				–	–	■ 120 A	■ 53 A	■ 27 A	■ 13 A
	960 W	–				–	■ 40 A	–			
	1,500 W	–				–	–	–			
Features	Conforms to EN61000-3-2	■				–	■	■			
	DC back-up	–				–	–	–			
	Capacitor back-up	□				□	□	□			
	Undervoltage alarm	–				–	–	–			
	Overvoltage protection	■				■	■	■			
	Overload protection	■				■	■	■			
	DIN-rail mounting	■				■	■	■			
	Screw mounting (with bracket)	■				■	■	■			
	EMI Class B	■				–	■	■			
	UL Class 2	■ 15 W, 30 W, 60 W only				–	–	–			
	N+1 Redundancy	□				□	□	–			
Parallel operation	■ by 2 units				–	■ by 2 units	■ 300 W, 600 W only by 5 units				
Power Boost	■ 120%				–	■ 120%	■ 300 W, 600 W at 24 V 115%				
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■ Standard □ Available – No/not available



The cost effective book type power supply

The S8VK-C Lite family is an ideal choice for cost-sensitive applications that require a dependable high-quality power supply. The S8VK-C have an universal 100 to 240 V 50/60 Hz input capability (DC input (90 to 350 VDC) also possible) and they are available with power ratings from 60 to 480 W.

- Operating temperature range of –25 to 60°C
- Double set of DC output terminals (three for the negative) provide easy wiring
- Overload and overvoltage protection
- Conforms to EN61204-3, EN55011 Class A
- RoHS compliant

Ordering information

Type	Power ratings	Input voltage	Output voltage	Output current	Size (W × H × D) [mm]	Order code
Power supply Single-phase	60 W	Single phase 100 to 240 VAC Allowable range: 85 to 264 VAC, 90 to 350 VDC	24 V	2.5 A	32 × 90 × 110	S8VK-C06024
	120 W		24 V	5 A	40 × 125 × 113	S8VK-C12024
	240 W		24 V	10 A	60 × 125 × 140	S8VK-C24024
	480 W		24 V	20 A	95 × 125 × 140	S8VK-C48024

Specifications

Item		60 W	120 W	240 W	480 W
Efficiency (Typ. at 230 VAC)		88%	89%	89%	92%
Input	Rated input voltage	100 to 240 VAC			
	Allowable range	85 to 264 VAC, 90 to 350 VDC			
Output	Voltage adjustment range (with V.ADJ)	–10% to 15%			
	Input variation influence	0.5% max. (at 85 to 264 VAC input, 100% load)			
	Load variation influence	1.5% max. at 0% to 100% load			
	Temperature variation influence	0.05%/°C max.			
Overload protection		Yes			
Overvoltage protection		Yes			
Operating ambient temperature		–25 to 60°C (–13 to 140°F)			
Series operation		Yes, up to 2 units			
Parallel operation		No			
EMI		Conforms to EN 61204-3, EN 55011 Class A			
EMS		Conforms to EN 61204-3 high severity levels			
Approved standards		UL: UL 508 (Listing), UL 60950-1, cUL: CSA C22.2 No. 107.1 and No. 60950-1, EN/VDE: EN 50178 (=VDE0160), EN 60950-1 (=VDE0805)			
Degree of protection		IP20 by EN/IEC 60529			

For more information, please enter “P236” in the search field on our website industrial.omron.eu.



The standard book type power supply

The standard S8VK-G Pro line is our “install and forget” option, offering longer lifetime, higher protection and more features. The S8VK-G offers a wide product range (from 15 up to 480 W), in a very compact package. There are models available for 5, 12, 24 and 48 VDC output voltage. DC input (90 to 350 VDC) is also available through the whole range.

- Wide operating temperature range (–40 to 70°C) that guarantees stable operation
- Double set of DC output terminals (three for the negative) provide easy wiring
- High efficiency 90% to reduce the energy consumption
- Power boost functionality (120%) for the right start of the application
- Improved DIN-rail mounting clip provides a better resistance to vibrations and allows easy installation (using one hand to mount in a flash)
- For harsh environments coated models are now available. PCB coating protects against dust, corrosive gas and humidity.
- RoHS compliant

Ordering information

Type	Power ratings	Input voltage	Output voltage	Output current	Size (W × H × D) [mm]	Order code	
						Standard models	Coated models
Power supply Single-phase	15 W	100 to 240 VAC Allowable range: 85 to 264 VAC, 90 to 350 VDC, 2 phases less than 240 VAC	5 V	3 A	22.5 × 90 × 90	S8VK-G01505	S8VK-G01505-400
			12 V	1.2 A		S8VK-G01512	S8VK-G01512-400
			24 V	0.65 A		S8VK-G01524	S8VK-G01524-400
	30 W		5 V	5 A	32 × 90 × 90	S8VK-G03005	S8VK-G03005-400
			12 V	2.5 A		S8VK-G03012	S8VK-G03012-400
			24 V	1.3 A		S8VK-G03024	S8VK-G03024-400
	60 W		12 V	4.5 A	32 × 90 × 110	S8VK-G06012	S8VK-G06012-400
			24 V	2.5 A		S8VK-G06024	S8VK-G06024-400
	120 W		24 V	5 A	40 × 125 × 113	S8VK-G12024	S8VK-G12024-400
	240 W		24 V	10 A	60 × 125 × 140	S8VK-G24024	S8VK-G24024-400
			48 V	5 A		S8VK-G24048	S8VK-G24048-400
	480 W		24 V	20 A	95 × 125 × 140	S8VK-G48024	S8VK-G48024-400
			48 V	10 A		S8VK-G48048	S8VK-G48048-400

Specifications

Item		15 W	30 W	60 W	120 W	240 W	480 W
Efficiency (Typ. at 230 VAC)		80% (24 V)	86% (24 V)	88% (24 V)	89% (24 V)	92% (24 V)	93% (24 V)
Input	Rated input voltage	100 to 240 VAC					
	Allowable range	85 to 264 VAC, 90 to 350 VDC. 2 phases less than 240 VAC					
Output	Voltage adjustment range (with V.ADJ)	–10% to 15%					
	Input variation influence	0.5% max. (at 85 to 264 VAC input, 100% load)					
	Load variation influence	3.0% max. (5 V), 2.0% max. (12 V), 1.5% max. (24, 48 V), at 0% to 100% load					
	Temperature variation influence	0.05%/°C max.					
Overload protection		Yes, 130% of rated current typ.					
Power Boost		120% of rated current					
Overvoltage protection		Yes					
Operating ambient temperature		–40 to 70°C (–40 to 158°F)					
Series operation		Yes, up to 2 units					
Parallel operation		Yes, up to 2 units					
EMI		Conforms to EN 61204-3, EN 55011 Class B					
EMS		Conforms to EN 61204-3 high severity levels					
Harmonic current emissions		Conforms to EN 61000-3-2					
Approved standards		UL: UL 508 (Listing), UL 60950-1, cUL: CSA C22.2 No. 107.1 and No. 60950-1, UL 1310 Class 2 output for 15 W, 30 W, 60 W EN/VDE: EN 50178 (=VDE0160), EN 60950-1 (=VDE0805), Lloyd's Register ANSI/ISA 12.12.01					
Fulfilled standards		SELV (EN 60950-1/EN 50178/UL 60950-1), PELV(EN 60204-1,EN 50178), Safety of power transformers (EN 61558-2-16), EN 50274 for terminal parts					
Degree of protection		IP20 by EN/IEC 60529					

For more information, please enter “P234” in the search field on our website industrial.omron.eu.



High reliability at a reasonable price

The S8FS-C Lite family of metal framed power supplies is our best standard power supply for material cost reduction. S8FS-C has high reliability. The range covers up to 350 W and is available with 5, 12, 15, 24, 36 or 48 VDC output voltages.

- Wide range in wattage (15, 25, 35, 50, 75, 100, 150, 200, 350 W) and DC-output voltage (5, 12, 15, 24, 36 or 48 VDC)
- Wide input ranges: 100 to 120 VAC and 200 to 240 VAC
- Overload, over-voltage and short circuit protection
- Easy mounting to DIN-rail with mounting brackets (sold separately)
- Global standards: Conforms to CE (all models), approved for UL (all models) and CCC (15 to 150 W models)
- EMI EN 55011 Class B compliant (15 to 150 W models)

Ordering information

Power rating	Output voltage (VDC)	Output current	Size in mm (H x W x D)	Order code	
				Model with terminal block facing upward	Model with terminal block facing forward
15 W	5 V	3 A	51×28×78	—	S8FS-C01505J
	12 V	1.3 A			S8FS-C01512J
	15 V	1 A			S8FS-C01515J
	24 V	0.7 A			S8FS-C01524J
25 W	5 V	5 A	82×35×99	S8FS-C02505	S8FS-C02505J
	12 V	2.1 A		S8FS-C02512	S8FS-C02512J
	15 V	1.7 A		S8FS-C02515	S8FS-C02515J
	24 V	1.1 A		S8FS-C02524	S8FS-C02524J
35 W	5 V	7 A	97×36×99	S8FS-C03505	S8FS-C03505J
	12 V	3 A		S8FS-C03512	S8FS-C03512J
	15 V	2.4 A		S8FS-C03515	S8FS-C03515J
	24 V	1.5 A		S8FS-C03524	S8FS-C03524J
50 W	5 V	10 A	97×38×129	S8FS-C05005	S8FS-C05005J
	12 V	4.2 A		S8FS-C05012	S8FS-C05012J
	15 V	3.4 A		S8FS-C05015	S8FS-C05015J
	24 V	2.2 A		S8FS-C05024	S8FS-C05024J
	48 V	1.1 A		S8FS-C05048	S8FS-C05048J
75 W	5 V	14 A	97×38×159	S8FS-C07505	S8FS-C07505J
	12 V	6.2 A		S8FS-C07512	S8FS-C07512J
	15 V	5 A		S8FS-C07515	S8FS-C07515J
	24 V	3.2 A		S8FS-C07524	S8FS-C07524J
	48 V	1.6 A		S8FS-C07548	S8FS-C07548J
100 W	5 V	20 A	97×38×159	S8FS-C10005	S8FS-C10005J
	12 V	8.5 A		S8FS-C10012	S8FS-C10012J
	15 V	7 A		S8FS-C10015	S8FS-C10015J
	24 V	4.5 A		S8FS-C10024	S8FS-C10024J
	36 V	2.8 A		S8FS-C10036	S8FS-C10036J
	48 V	2.3 A		S8FS-C10048	S8FS-C10048J
150 W	5 V	26 A	97×38×199	S8FS-C15005	S8FS-C15005J
	12 V	12.5 A		S8FS-C15012	S8FS-C15012J
	15 V	10 A		S8FS-C15015	S8FS-C15015J
	24 V	6.5 A		S8FS-C15024	S8FS-C15024J
	36 V	4.3 A		S8FS-C15036	S8FS-C15036J
	48 V	3.3 A		S8FS-C15048	S8FS-C15048J
200 W	5 V	40 A	112.5×50×212	S8FS-C20005	S8FS-C20005J
	12 V	17 A		S8FS-C20012	S8FS-C20012J
	24 V	8.8 A		S8FS-C20024	S8FS-C20024J
	36 V	5.9 A		S8FS-C20036	S8FS-C20036J
	48 V	4.43 A		S8FS-C20048	S8FS-C20048J
350 W	5 V	60 A	112.5×50×212	S8FS-C35005	S8FS-C35005J
	12 V	29 A		S8FS-C35012	S8FS-C35012J
	24 V	14.6 A		S8FS-C35024	S8FS-C35024J
	36 V	9.7 A		S8FS-C35036	S8FS-C35036J
	48 V	7.32 A		S8FS-C35048	S8FS-C35048J

Specifications

Item		15 W	25 W	35 W	50 W	75 W	100 W	150 W	200 W	350 W	
Efficiency (Typ. at 230 VAC)		87% (24 V)	88% (24 V)	87% (24 V)	86% (24 V)	87% (24 V)	87% (24 V)	87% (24 V)	88% (24 V)	88% (24 V)	
Input	Rated input voltage	100 to 240 VAC					100 to 120 VAC/200 to 240 VAC, Switchable				
	Allowable range	85 to 264 VAC or 120 to 370 VDC (DC is not applicable for the safety standards.)					85 to 132 VAC/ 176 to 264 VAC or 248 to 373 VDC	90 to 132 VAC/180 to 264 VAC or 254 to 373 VDC			
Output	Voltage adjustment range (with V.ADJ)	-10% to 10% (with V.ADJ)									
	Input variation influence	0.5% max. (at 85 to 264 VAC input, 100% load)									
	Load variation Influence	1.0% max. at 0% to 100% load								1.0% max. at 0% to 100% load (2.0% for 5 V)	
	Temperature variation influence	0.03%/°C max.									
Overload protection		Yes, automatic reset									
Overvoltage protection		Yes, 115% or higher of rated output voltage, power shut off (shut off the input voltage and turn on the input again)									
Operating ambient temperature		-20 to 60°C (with no condensation or icing)							-20 to 50°C (with no condensation or icing)	-20 to 60°C (with no condensation or icing)	
Series operation		Yes, up to 2 units (external diodes are required)									
Parallel operation		No (However, backup operation is possible, external diodes are required)									
EMI		Conforms to EN 61204-3, EN 55011 Class B							Conforms to EN 61204-3, EN 55011 Class A		
EMS		Conforms to EN 61204-3 high severity levels									
Approved standards		UL: UL60950-1, cUL: CSA C22.2 No. 60950-1 EN: EN60950-1 CCC: GB4943 (up to 150 W model)									



Slim and economic power supply

The S8JX-G is Omron's cost effective power supply delivering Omron's quality and reliability. The range of this Power Supply covers up to 600 W, the output voltages are 5, 12, 15, 24 or 48 VDC. The low profile and multiple mounting options help you reduce panel space. With a minimum life expectancy of 10 years and protection against over-voltage, over-current and short circuiting, the S8JX-G has the reliability you expect from Omron.

- Wide range in DC-output voltage (5 V, 12 V, 15 V, 24 V and 48 V) and wattage (15 to 600 W)
- LED indication power ON
- Over-voltage, over-current, and short circuit protection
- Vibration resistance 4,5 g
- All models can be DIN-rail mounted
- Approvals: UL, cUL, UL508 Listed, SEMI F47, VDE

Ordering information

Power ratings	Output voltage	Output current	Size in mm (H × W × D)	Order code
15 W	5 V	3 A	91 × 40 × 90	S8JX-G01505CD
	12 V	1.3 A		S8JX-G01512CD
	15 V	1 A		S8JX-G01515CD
	24 V	0.65 A		S8JX-G01524CD
	48 V	0.35 A		S8JX-G01548CD
35 W	5 V	7 A	92 × 40 × 100	S8JX-G03505CD
	12 V	3 A		S8JX-G03512CD
	15 V	2.4 A		S8JX-G03515CD
	24 V	1.5 A		S8JX-G03524CD
	48 V	0.75 A		S8JX-G03548CD
50 W	5 V	10 A	92 × 40 × 100	S8JX-G05005CD
	12 V	4.2 A		S8JX-G05012CD
	24 V	2.1 A		S8JX-G05024CD
	48 V	1.1 A		S8JX-G05048CD
100 W	5 V	20 A	92 × 50 × 150	S8JX-G10005CD
	12 V	8.5 A		S8JX-G10012CD
	24 V	4.5 A		S8JX-G10024CD
	48 V	2.1 A		S8JX-G10048CD
150 W	5 V	30 A	92 × 60 × 178	S8JX-G15005CD
	12 V	13 A	92 × 50 × 150	S8JX-G15012CD
	24 V	6.5 A		S8JX-G15024CD
	48 V	3.3 A		S8JX-G15048CD
300 W	5 V	60 A	92 × 110 × 164.5	S8JX-G30005CD
	12 V	27 A	92 × 110 × 167	S8JX-G30012CD
	24 V	14 A		S8JX-G30024CD
	48 V	7 A		S8JX-G30048CD
600 W	5 V	120 A	92 × 150 × 160	S8JX-G60005C
	12 V	53 A		S8JX-G60012C
	24 V	27 A		S8JX-G60024C
	48 V	13 A		S8JX-G60048C

Specifications

Item		15 W	35 W	50 W	100 W	150 W	300 W	600 W
Efficiency (Typ. at 230 VAC)		81% (24 V)	84% (24 V)	86% (24 V)	88% (24 V)	90% (24 V)	88% (24 V)	84% (24 V)
Input	Rated input voltage	100 to 240 VAC					100 to 120 VAC/200 to 240 VAC, Switchable	
	Allowable range	85 to 264 VAC, 80 to 370 VDC (DC is not applicable for the safety standards.)					85 to 132 VAC/170 to 264 VAC	
Output	Voltage adjustment range (with V.ADJ)	−10% to 15% for 5 V to 24 V, ±10% for 48 V (with V.ADJ)						
	Input variation influence	0.4% max. (at 85 to 264 VAC input, 100% load)						
	Load variation Influence	0.8% max. at 0% to 100% load						
	Temperature variation influence	0.05%/°C max.						
Overload protection		Yes, 105% to 160% of rated current						
Overvoltage protection		Yes						
Operating ambient temperature		−10 to 60°C (14 to 140°F)						
Series operation		Yes, up to 2 units					Yes, up to 2 units	
Parallel operation		No					Yes, up to 5 units	
EMI		Conforms to EN 61204-3, EN 55011 Class A						
EMS		Conforms to EN 61204-3 high severity levels						
Approved standards		UL: UL 508 (Listing), UL 60950-1, cUL: CSA C22.2 No. 107.1 and No. 60950-1, EN/VDE: EN 50178 (=VDE0160), EN 60950-1 (=VDE0805)					UL: UL 508 (Recognition), UL 60950-1, cUR: CSA C22.2 No. 107.1 and No. 60950-1, EN/VDE: EN 50178 (=VDE0160), EN 60950-1 (=VDE0805)	
Fulfilled standards		EN 50274 for terminal parts						



Compact 3-phase input power supply

The S8VK-T has an exceptionally wide operating temperature range -40 to 70°C . These models also have high endurance against vibration and guarantee stable operation in even the harshest of environments.

- Input range: 3×320 to 576 VAC, 2×340 to 576 VAC
- Safety standard, UL 508, ANSI 12.12.01, EN 50178, EN 60950-1, UL 60950-1, CSA No. 60950-1, EN 60204-1 PELV, EN 61558-2-16 Safety transformer. Lloyd's Register
- Protection IP20 by EN/IEC 60529
- EMI Class B
- 120% boost function
- For harsh environments coated models are now available. PCB coating protects against dust, corrosive gas and humidity.
- RoHS compliant

Ordering information

Type	Power ratings	Input voltage	Output voltage	Output current	Size (W × H × D) [mm]	Order code	
						Standard models	Coated models
Power supply three-phase	120 W	3 × 380 to 480 VAC, 2 × 380 to 480 VAC	24 V	5 A	40×125×113	S8VK-T12024	S8VK-T12024-400
	240 W	450 to 600 VDC (Excluding 960 W)		10 A	60×125×140	S8VK-T24024	S8VK-T24024-400
	480 W	Allowable range: 3 × 320 to 576 VAC, 2 × 340 to 576 VAC, 450 to 810 VDC (Excluding 960 W)		20 A	95×125×140	S8VK-T48024	S8VK-T48024-400
	960 W			40 A	135×125×170	S8VK-T96024	S8VK-T96024-400

Specifications

Item		120 W	240 W	480 W	960 W
Efficiency (Typ. at 400 VAC)		89%	89%	91%	92%
Input	Rated Input Voltage	3 × 380 to 480 VAC, 2 × 380 to 480 VAC, 450 to 600 VDC			3 × 380 to 480 VAC, 2 × 380 to 480 VAC
	Allowable range	3 × 320 to 576 VAC, 2 × 340 to 576 VAC, 450 to 810 VDC			3 × 320 to 576 VAC, 2 × 340 to 576 VAC
Output	Voltage adjustment range (with V.ADJ)	22.5 to 29.5 V			
	Input variation influence	0.5% max. (at 3 × 320 to 576 VAC input, 100% load)			
	Load variation influence	1.5% max. at 0 to 100% load			
	Temperature variation influence	0.05%/°C max.			
Overload protection		Yes, 125% of rated current typ.			
Power Boost		120% of rated current			
Overvoltage protection		Yes			
Operating ambient temperature		−40 to 70°C (−40 to 158°F)			
Series Operation		Yes, Up to 2 units			
Parallel Operation		Yes, Up to 2 units			
EMI		Conforms to EN 61204-3, EN 55011 Class B			
EMS		Conforms to EN 61204-3 high severity levels			
Harmonic current emissions		Conforms to EN 61000-3-2			
Approved Standards		UL: UL 508 (Listing), ANSI/ISA 12.12.01 EN/VDE: EN 50178, Lloyd's Register	UL: UL 508 (Listing), ANSI/ISA 12.12.01, UL 60950-1, CSA: C22.2 No.60950-1, EN/VDE: EN 50178, EN 60950-1, Lloyd's Register		
Fulfilled Standards		SELV (EN 50178), PELV (EN 60204-1, EN 50178), Safety of Power Transformers (EN 61558-2-16), EN 50274 for Terminal parts	SELV (EN 60950-1/EN 50178/UL 60950-1), PELV (EN 60204-1, EN 50178), Safety of Power Transformers (EN 61558-2-16), EN 50274 for Terminal parts		
Degree of protection		IP20 by EN / IEC 60529			

For more information, please enter "P238" in the search field on our website industrial.omron.eu.

Uninterruptible power supplies (UPS)

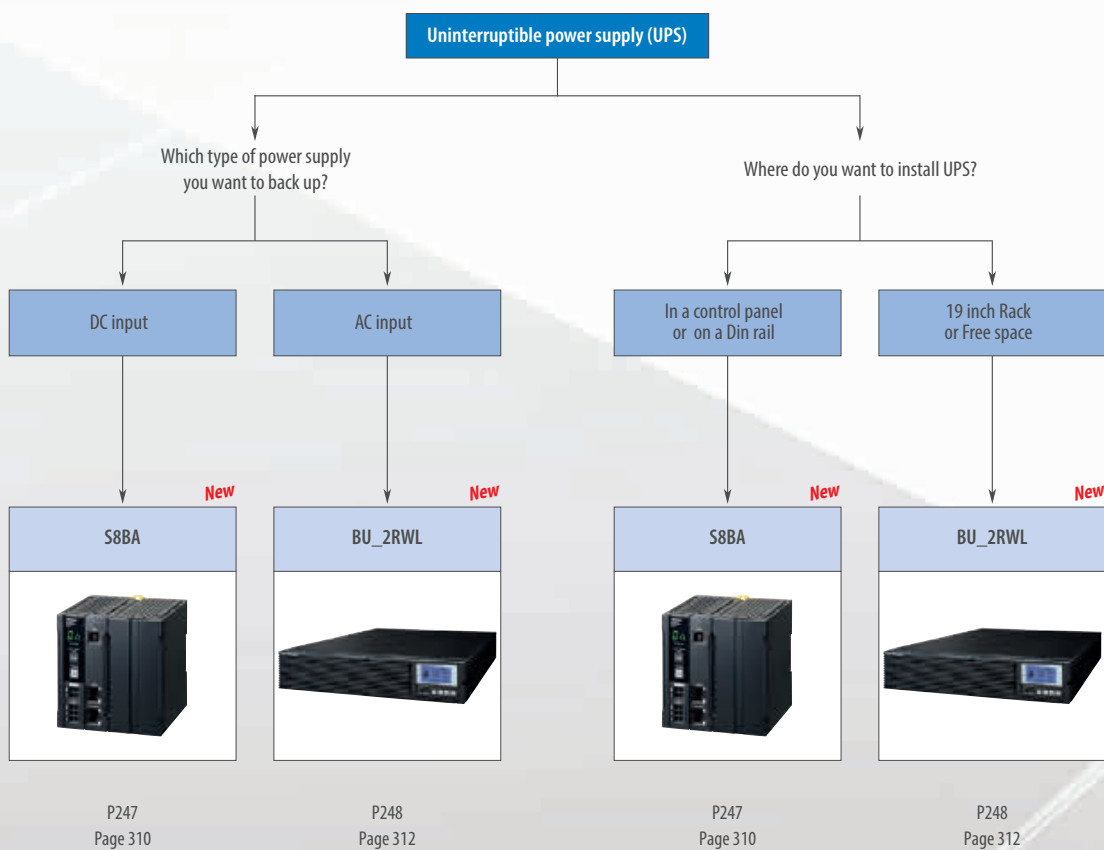
RELIABLE AND EASY OPERATION – WORLDWIDE

S8BA

The easy DIN-rail mountable, DC-DC type UPS is ideal countermeasure for momentary voltage drops and power failures of industrial computers (IPCs) and controllers, switching power supply. They secure full functional reliability of systems by backing up the supply of 24 VDC power source for a guaranteed period of time.

BU_2RWL

- Multiple mounting online AC-AC type UPS, useful in variety of applications.
- They are available as a stand-alone device or for mounting in a 19" rack.
- Optimum UPS for industrial equipment and embedded applications.
- UPS devices are single-phase uninterruptible power supplies.



S8BA					BU_2RWL			
								
Model	S8BA-24D24D120LF	S8BA-24D24D240LF	S8BA-24D24D360LF	S8BA-24D24D480LF	BU2002RWLG	BU3002RWLG	BU5002RWLG	
Selection Criteria	Type	Din-rail mounting				19 inch rack mounting		
	Input-Output type	DC-DC				AC-AC		
	Phases	Single phase						
	Input rated voltage/Maximum current	24 VDC/5.9 A	24 VDC/11.7 A	24 VDC/17.5 A	24 VDC/23.3 A	200 to 240 VAC/9 A	200 to 240 VAC/14 A	200 to 240 VAC/23 A
	Input terminal	Push-in terminal block				Terminal block		NEMA L6-30P/ Terminal block
	Output rated voltage/Maximum current	24 VDC/5 A	24 VDC/10 A	24 VDC/15 A	24 VDC/20 A	Terminal block		NEMA L6-30P/ Terminal block
	Output terminal	Push-in terminal block				Terminal block		NEMA L6-30R × 2, Terminal block
Power	120W	■	–	–	–	–	–	
	240W	–	■	–	–	–	–	
	360W	–	–	■	–	–	–	
	480W	–	–	–	■	–	–	
	1400W	–	–	–	–	■	–	
	2100W	–	–	–	–	–	■	
	3500W	–	–	–	–	–	■	
Battery	Type	Lithium-ion				Sealed lead		
	Expected battery life	2.5 years (50°C), 5 years (40°C), 10 years (25°C)				2.5 year (40°C), 5 years (25°C)		
	Hot swapping	■						
	Backup time (Maximum power)	6 min				5 min		
	Auto battery check function	■						
Features	Battery life counter function	■						
	Under voltage alarm	■						
	Overvoltage protection	■						
	Overload protection	■						
	UL508	■				–		
	C22.2 No.107.1-01	■				–		
	UL1778	–				■		
	CE	■				–		
	VCCI class A	–				■		
	Serial communication/RS232C (Interface terminal)	■ (RJ45)				■ (D-sub 9pin)		
	Serial communication/USB (Interface terminal)	■ (B connector)				–		
	I/O signal	■ (RJ45)				■ (D-sub 9pin)		
Page/Quick Link		310/P247				312/P248		



Compact DC-DC UPS with a DIN-rail for mounting, best suited for the prevention of voltage drop and power failure in industrial PCs (IPC)/controllers

- System reliability greatly improved because 24 VDC power supply is backed up for a certain period of time in the event of voltage drop or power failure.
- Compact, weight reduction, and long battery life thanks to the adoption of a lithium-ion battery.
- Push-in terminal block adopted for the power input and output connections.
- Shutdown in conjunction with the IPC or controller realized by the USB, RS-232C, I/O port installed in the UPS.

Ordering information

Uninterruptible power supply (UPS)

Input voltage	Output voltage	Output current/capacity	Battery type	Terminal block shape	Order code
24 VDC	24 VDC	5 A/120 W	Lithium-ion battery	Push-in terminal block	S8BA-24D24D120LF
		10 A/240 W			S8BA-24D24D240LF
		15 A/360 W			S8BA-24D24D360LF
		20 A/480 W ^{*1}			S8BA-24D24D480LF

^{*1} 16.7 A/400 W for use as a UL compliant device.

Communication cable

Specifications	Type	Length	Order code
For RS-232C port	RJ45/Dsub9Pin	2 m	S8BW-C01
For Contact port	RJ45/Discrete wire x 8P	2 m	S8BW-C02

Specifications

Item	Capacity		120 W	240 W	360 W	480 W ^{*1}
DC input	Rated input voltage		24 VDC			
	Input voltage range	(When standard voltage sensitivity is set)	24 VDC±10%			
		(When low voltage sensitivity is set)	24 VDC±12.5%			
		(When high voltage sensitivity is set)	24 VDC±5%			
	Input maximum current	(for rated input voltage)	5.9 A	11.7 A	17.5 A	23.3 A ^{*2}
	Input terminal		Push-in terminal block			
Inrush current		12 A max., 0.1 ms max.		14 A max., 0.1 ms max.	16 A max., 0.1 ms max.	
DC output	Rated current	(for rated output voltage)	5 A	10 A	15 A	20 A ^{*3}
	Switching time		Uninterrupted			
	Output voltage	Normal operation	Output of input voltage as-is			
		Backup operation	24 V±5%			
	Output terminal		Push-in terminal block			
Battery	Type		Lithium-ion battery			
	Rated voltage		14.4 VDC			
	Rated capacity		1600 mAh × 1 parallel	1600 mAh × 2 parallel	1600 mAh × 3 parallel	1600 mAh × 4 parallel
	Expected battery life ^{*4}		2.5 years (50°C), 5 years (40°C), 10 years (25°C)			
	Replacement by user		Yes (Hot swapping)			
	Charging time		4 hours ^{*5}			
Backup time (25°C, initial characteristics)			6 min. (120 W)	6 min. (240 W)	6 min. (360 W)	6 min. (480 W)
Environment	Operating ambient temperature/humidity		0 to 55°/10 to 90% (with no condensation)			
	Storage ambient temperature/humidity		-20° to 55°/10 to 90% (with no condensation)			
Enclosure	Dimensions (W × D × H mm)		94 × 100 × 100	148 × 100 × 100	270 × 100 × 100	
	Weight of unit		Approx. 0.8 kg	Approx. 1.3 kg	Approx. 2.0 kg	Approx. 2.3 kg
	Cooling method		Natural cooling			
Safety standard compliance			UL508/CE/C22.2 No.107.1-01			
Internal power consumption (normal ^{*6} /maximum ^{*7})			7 W/22 W	11 W/41 W	14 W/60 W	18 W/80 W
Serial communication	RS232C (Interface terminal)		Yes (RJ45)			
	USB (interface terminal)		Yes (B connector)			
I/O signal			Yes (RJ45)			

^{*1} 400 W for use as a UL compliant device.

^{*2} 20 A for use as a UL compliant device.

^{*3} 16.7 A for use as a UL compliant device.

^{*4} An estimated value for standard mounting. Not a guaranteed value.

^{*5} When using in an environment at a high temperature, charging may be paused by charging temperature protection, then the charging time will be longer than specified time.
“CS” will be displayed when charging temperature protection is operated.
^{*6} Conditions: With rated loads connected, at a rated input voltage, and with the battery fully charged.
^{*7} Conditions: With rated loads connected, at a rated input voltage, and at the maximum battery charging current.

Backup time table (Time unit: minutes)

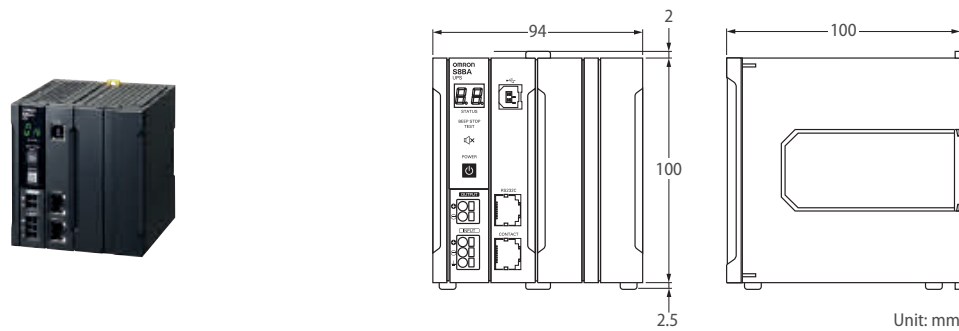
For devices that use the A indication, convert the capacity into W: $W = A \times 24$

	Capacity (W)									
	30	60	90	120	180	240	300	360	420	480
120 W	29	14	9	6	—	—	—	—	—	—
240 W	58	29	19	15	9	6	—	—	—	—
360 W	87	43	28	22	14	10	8	6	—	—
480 W	119	59	39	29	19	15	11	9	8	6

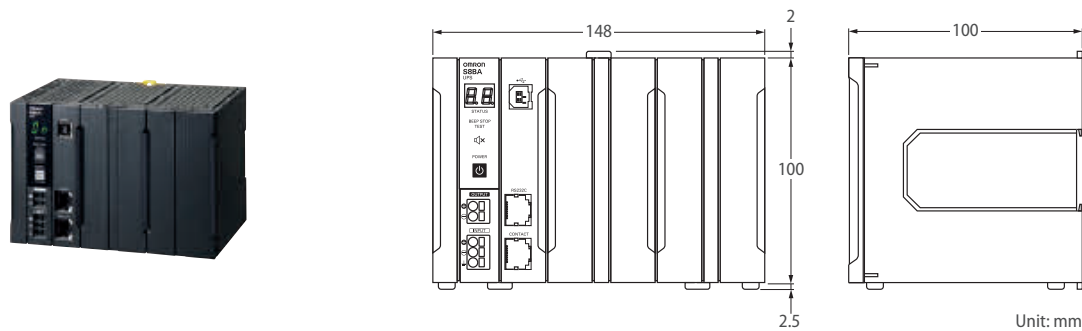
Note: The above backup times are for reference only. They may change depending on the battery life and external environment (such as temperature).

Dimensions

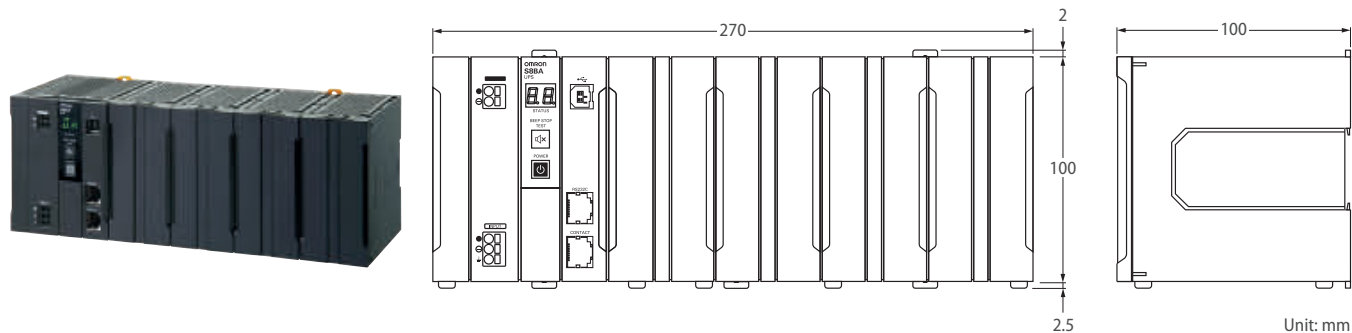
S8BA-24D24D120LF (120 W)



S8BA-24D24D240LF (240 W)



S8BA-24D24D360LF (360 W)
S8BA-24D24D480LF (480 W)





Multiple mounting online AC-AC type UPS, useful in a variety of applications

- Online power supply method: Continuous power supply against instantaneous voltage drop or power interruptions
- Easy LCD operation without PC & multiple mounting methods.
- Multiple connections, input/output terminal block and RS232-C, I/O for external communication, plus external remote ON/OFF signal
- Hot-swappable batteries: Ensures clean, uninterrupted power to protect equipment during battery replacement

Ordering information

Input voltage	Output voltage	Capacity	Type	Order code
200/208/220/230/240 VAC	200/208/220/230/240 VAC	2000 VA/1400 W	Rackmount ^{*1} , Multi voltage power, Low power consumption	BU2002RWLG
		3000 VA/2100 W		BU3002RWLG
		5000 VA/3500 W		BU5002RWLG

^{*1} Can also use the included vertical stand when positioning the unit vertically

Specifications

		BU2002RWLG	BU3002RWLG	BU5002RWLG
Operation method		Full-time inverter supply method (high efficiency)		
AC input	Rated input voltage	200/208/220/230/240 VAC		
	Startup voltage range	200 V mode: 160±2 to 288±2 VAC, 208 V mode: 167±2 to 278±2 VAC 220 V mode: 176±2 to 278±2 VAC, 230 V mode: 184±2 to 278±2 VAC 240 V mode: 192±2 to 278±2 VAC, 100 V mode: 160±2 to 288±2 VAC		
	Input voltage range	200 V mode: 170±2 to 278±2 VAC, 208 V mode: 177±2 to 278±2 VAC 220 V mode: 186±2 to 278±2 VAC, 230 V mode: 194±2 to 278±2 VAC 240 V mode: 202±2 to 278±2 VAC, 100 V mode: 170±2 to 278±2 VAC		
	Input frequency	50/60 Hz±1, 3, 5, or 14% (5% in the factory settings)		
	Maximum current (at rated voltage)	9 A	14 A	23 A
	Phase	Single-phase, two-wire (grounded)		
	Input plug	Terminal block		NEMA L6-30P / Terminal block
AC output	Output capacity (upper limit)	2000 VA/1400 W (1000 VA/700 W in 100 V mode)	3000 VA/2100 W (1500 VA/1050 W in 100 V mode)	5000 VA/3500 W (2500 VA/1750 W in 100 V mode)
	Rated current (at rated voltage)	10 A	15 A	25 A
	Switching time	Uninterrupted		
	Output voltage (commercial operation)	200 V mode: 200 VAC±2%, 208 V mode: 208 VAC±2% 220 V mode: 220 VAC±2%, 230 V mode: 230 VAC±2% 240 V mode: 240 VAC±2%, 100 V mode: 100 VAC±5%		
	Output voltage (backup operation)	200 V mode: 200 VAC±2%, 208 V mode: 208 VAC±2% 220 V mode: 220 VAC±2%, 230 V mode: 230 VAC±2% 240 V mode: 240 VAC±2%, 100 V mode: 100 VAC±5%		
	Output frequency (commercial operation)	Synchronized with input frequency		
	Output frequency (backup operation)	50/60±0.5 Hz		
	Output waveform (in commercial power mode/battery mode)	Sine wave/Sine wave		
	Phase	Single-phase, two-wire		
	Output receptacles	Terminal block		NEMA L6-30R × 2, terminal block
Battery	Sealed lead battery life expectancy	5 years (ultralong operating life) (ambient temperature 25°C)		
	Battery capacity (V/Ah) (× Quantity)	12 VDC/9 Ah (× 4)	12 VDC/9 Ah (× 6)	12 VDC/9 Ah (× 12)
	Charging time	8 hours		
Backup time (25°C, initial characteristics)		5 min (1400 W)	5 min (2100 W)	5 min (3500 W)
Dimensions in mm (W × D × H)		430×660×88 (2U)		430×700×132 (3U)
Weight of unit		Approx. 28 kg	Approx. 33 kg	Approx. 61 kg
Operating environment temperature/humidity		0 to 40°C/25% to 85% with no condensation		
Storage environment temperature/humidity		−15 to 50°C/10% to 90% (with battery fully charged, stored with no condensation)		
Noise regulation		VCCI Class A compliant		
Safety standard compliance		UL1778/CE/RoHS compliance		
Internal power consumption (normal*1/maximum*2)		70 W/145 W	148 W/265 W	249 W/480 W
Cooling method		Forced air cooling		
Serial communication (RS-232C) (interface)		■ (D-sub 9pin)		
Contact signal (interface)		■ (D-sub 9pin)		

^{*1} Rated load/rated input voltage/when fully charged

^{*2} Rated load/rated input voltage/when battery charge current is at maximum

Backup time table (Time unit: minutes)

Model	Capacity (W)																	
	20	50	100	200	300	400	600	800	1000	1200	1400	1600	1800	2000	2100	2700	3000	3500
BU5002RWLG	660	480	320	200	140	106	68	50	39	31	25	21	18	16	15	10	8	5
BU3002RWLG	450	260	165	93	63	45	28	19	15	11	9	7.5	6	5.2	5	—	—	—
BU2002RWLG	360	190	110	60	39	27	16	12	9.5	7	5	—	—	—	—	—	—	—

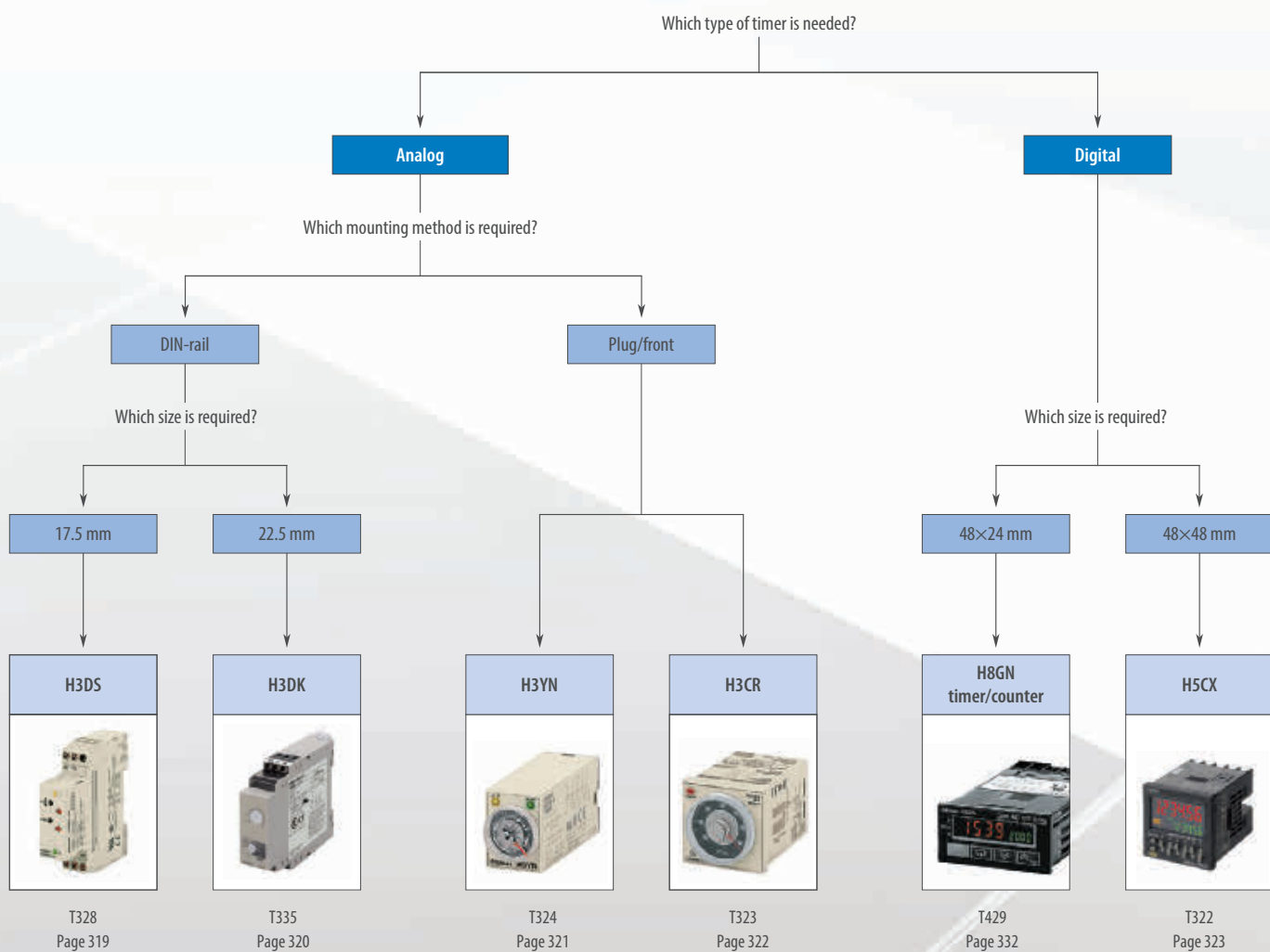
Note: These backup times are for reference only. Times may vary according to battery life and external environmental conditions (temperature, etc.)

WHEN TIMING ACCURACY MATTERS!

H5CX – The most complete digital timer

The H5CX series offers multiple-functions and -timing ranges for precise timing control, as well as real twin-timing and memory function. These and other added-value features ensure that the H5CX covers almost every possible user requirement in timers.

- 15 different time functions
- Three color display value, red, orange or green
- Models with instantaneous contact outputs
- 0.001 s to 9999 h, 10 ranges



Selection table

Category		Analog solid state timer										
												
Model		H3DS-M	H3DS-S	H3DS-A	H3DS-F	H3DS-G	H3DS-X	H3DK-M	H3DK-S	H3DK-F	H3DK-G	H3DK-H
Selection criteria	Mounting	DIN-rail										
	Size	17.5 mm						22.5 mm				
	Type	Multi-functional			Twin timer	Star-delta	Two-wired	Multi-functional		Twin timer	Star-delta	Power OFF-delay
Contact configuration	Time limit	■	■	■	■	■	■	■	■	■	■	■
	Instantaneous	–	–	–	–	–	–	■	■	–	–	–
	Programmable contacts	–	–	–	–	–	–	■	■	–	–	–
	14 pins	–	–	–	–	–	–	–	–	–	–	–
	11 pins	–	–	–	–	–	–	–	–	–	–	–
	8 pins	–	–	–	–	–	–	–	–	–	–	–
	Screw terminals	■	■	■	■	■	■	■	■	■	■	■
	Screw-less clamp terminals	□	□	□	□	□	□	–	–	–	–	–
	Screw-less clamp sockets	–	–	–	–	–	–	–	–	–	–	–
Inputs	Voltage input	□	□	□	–	–	–	□	□	–	–	–
	Transistor	–	–	–	–	–	–	–	–	–	–	–
Outputs	Relay	■	■	■	■	■	–	■	■	■	■	■
	SCR	–	–	–	–	–	■	–	–	–	–	–
	Relay output type	SPDT	■	■	■	–	–	□	■	■	■ (2x)	■
		SPST-NO	–	–	–	■ (2x)	–	–	–	–	–	–
		DPDT	–	–	–	–	–	□	■	–	–	–
		4PDT	–	–	–	–	–	–	–	–	–	–
Features	Time range	Total time range	0.1 s to 120 h	1 s to 120 h	2 s to 120 h	0.1 s to 12 h	1 s to 120 s	0.1 s to 120 h	0.1 s to 1,200 h	0.1 s to 1,200 h	1 s to 120 s	0.1 s to 120 s
		Number of sub ranges	7	7	7	6	2	7	12	12	8	2 (model dependent)
	Supply voltage	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 230 VAC or 24 to 48 VDC	24 to 240 VAC/DC or 12 VDC	24 to 240 VAC/DC or 12 VDC	24 to 240 VAC/DC or 12 VDC	24 to 240 VAC/DC, 240 to 440 VAC, 12 VDC	100 to 120 VAC, 200 to 240 VAC, 24 to 48 VAC/DC
	Number of operating modes	8	4	1	2	1	1	8	4	1	1	1
Functions	ON-delay	■	■	–	–	–	■	■	■	–	–	–
	Flicker OFF start	■	–	–	■	–	–	■	–	■	–	–
	Flicker ON start	■	■	–	■	–	–	■	■	■	–	–
	Signal ON-/OFF-delay	■	–	–	–	–	–	■	–	–	–	–
	Signal OFF-delay	■	–	–	–	–	–	■	–	–	–	■
	Interval (signal or power start)	■	■	–	–	–	–	■	■	–	–	–
	One-shot output (ON-delay)	■	■	–	–	–	–	■	■	–	–	–
	ON-delay (fixed)	–	–	■	–	–	–	–	–	–	■	–
	Independent ON/OFF time setting	–	–	–	–	–	–	–	–	–	–	–
	Star-delta	–	–	–	–	■	–	–	–	–	–	–
Remarks	Transistor	–	–	–	–	–	■	–	–	–	–	–
Page/Quick Link		319/T328						320/T335				

Category		Analog solid state timer					Digital timer		
									
Model		H3YN	H3CR-A	H3CR-F	H3CR-G	H3CR-H	H5CX	H8GN	
Selection criteria	Mounting	Socket/on panel							
	Size	21.5 mm	1/16 DIN						1/32 DIN
	Type	Miniature	Multi-functional	Twin timer	Star-delta	Power OFF-delay	Multi-functional	Preset counter/timer	
Contact configuration	Time limit	■	■	■	■	■	■	■	
	Instantaneous	–	■	–	■	■	■	–	
	Programmable contacts	–	–	–	–	–	■	■	
	14 pins	■	–	–	–	–	–	–	
	11 pins	–	□	□	□	□	□	–	
	8 pins	■	□	□	□	□	□	–	
	Screw terminals	–	–	–	–	–	□	■	
	Screw-less clamp terminals	–	–	–	–	–	–	–	
	Screw-less clamp sockets	□	–	–	–	–	–	–	
Inputs	Voltage input	–	□	–	–	–	–	–	
Outputs	Transistor		–	□	–	–	–	□	–
	Relay		■	□	■	■	■	□	■
	SCR		–	–	–	–	–	–	–
	Relay output type	SPDT	–	□	–	–	□	□	■
		SPST-NO	–	–	–	■ (2x)	–	–	–
		DPDT	□	□	■	–	□	–	–
4PDT		□	–	–	–	–	–	–	
Features	Time range	Total time range	0.1 s to 10 h (model dependent)	0.05 s to 300 h, 0.1 s to 600 h (model dependent)	0.05 s to 30 h or 1.2 s to 300 h (model dependent)	0.5 s to 120 s	0.05 s to 12 s, 1.2 s to 12 min	0.001 s to 9999 h (configurable)	0.000 s to 9999 h (configurable)
		Number of sub ranges	2	9	14	4	4	10	9
	Supply voltage		24, 100 to 120, 200 to 230 VAC, 12, 24, 48, 100 to 110, 125 VDC	100 to 240 VAC, 100 to 125 VDC, 24 to 48 VAC, 12 to 48 VDC	100 to 240 VAC, 12 VDC, 24 VAC/DC, 48 to 125 VDC	100 to 120 VAC, 200 to 240 VAC	100 to 120 VAC, 200 to 240 VAC, 24 VAC/DC, 48 VDC, 100 to 125 VDC	100 to 240 VAC, 24 VAC, 12 to 24 VDC	24 VDC
	Number of operating modes		4	6 (model dependent)	–	1	1	15	6
Functions	ON-delay		■	□	–	–	–	■	■
	Flicker OFF start		■	□	■	–	–	■	■
	Flicker ON start		■	□	■	–	–	■	–
	Signal ON-/OFF-delay		–	□	–	–	–	■	–
	Signal OFF-delay		–	□	–	–	■	■	■
	Interval (signal or power start)		■	□	–	–	–	■	■
	One-shot output (ON-delay)		–	□	–	–	–	■	–
	ON-delay (fixed)		–	–	–	–	–	■	–
	Independent ON/OFF time setting		–	–	–	–	–	■	■
	Star-delta		–	–	–	■	–	–	–
Remarks	Transistor	–	□	–	–	–	■	–	
Page/Quick Link		321/T324	322/T323				323/T322	332/T429	

■ Standard □ Available – No/not available



DIN-rail mounted, standard 17.5 mm wide solid state timer range

This broad range of timers includes many functionalities and has a wide AC/DC power supply range. Models with screwless clamp connection available.

- 17.5 mm width, modular 45 mm
- DIN-rail mounting
- 24-48 VDC and 24-230 VAC
- 0.1 s to 120 h, 7 ranges

Ordering information

Type	Supply voltage	Control output	Time setting range	Operating modes	Order code	
					Screw terminal type	Screw-less clamp type
Multi-functional timer	24 to 230 VAC (50/60 Hz)/ 24 to 48 VDC	SPDT	0.1 s to 120 h	ON-delay, flicker OFF start, flicker ON start, signal ON/OFF-delay, signal OFF-delay, interval, one-shot	H3DS-ML	H3DS-MLC
Standard timer				ON-delay, flicker ON start, interval, one-shot	H3DS-SL	H3DS-SLC
Single function timer				ON-delay	H3DS-AL	H3DS-ALC
Twin timer		Relay SPDT	0.1 s to 12 h	Flicker OFF start, flicker ON start	H3DS-FL	H3DS-FLC
Star-delta timer	24 to 230 VAC/VDC (50/60 Hz)	2× Relay SPST-NO	1 s to 120 s	Star-delta	H3DS-GL	H3DS-GLC
Two-wired timer		SCR output	0.1 s to 120 h	ON-delay	H3DS-XL	H3DS-XLC

Specifications

Terminal block	Screw terminal type: Clamps two 2.5 mm ² max. bar terminals without sleeves Screw-less clamp type: Clamps two 1.5 mm ² max. bar terminals without sleeves
Mounting method	DIN-rail mounting
Operating voltage range	85 to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.1 s, 0.5 s for H3DS-G
Reset voltage	2.4 VAC/VDC max., 1.0 VAC/VDC max. for H3DS-X
Voltage input	Max. permissible capacitance between input lines (terminals B1 and A2): 2,000 pF
	Load connectable in parallel with inputs (terminals B1 and A1)
	H-level: 20.4 to 253 VAC/20.4 to 52.8 VDC
	L-level: 0 to 2.4 VAC/VDC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$)
	5 A at 30 VDC with resistive load ($\cos\phi = 1$)
Ambient temperature	Operating: -10 to 55°C (with no icing)
	Storage: -25 to 65°C (with no icing)
Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2 s range)
Setting error	±10% ±50 ms max. of FS
Influence of voltage	±0.7% max. of FS (±0.7% ±10 ms max. at 1.2 s range)
Influence of temperature	±5% max. of FS (±5% ±10 ms max. at 1.2 s range)
Life expectancy (not H3DS-X)	Mechanical: 10 million operations min. (under no load at 1,800 operations/h)
	Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h)
Size in mm(HxWxD)	80x17.5x73



DIN-rail mounted, standard 22.5 mm wide solid state timer range

The H3DK series of timers provides a wide AC/DC power supply and time range to reduce the number of items.

- Size in mm (H×W×D): 79×22.5×100
- DIN-rail mounting
- 12 VDC and 24-240 VAC/VDC (except -H). 240-440 VAC for -G
- Wide time setting range: 0.10 s - 1,200 h (except -H and -G), 12 ranges (for -M and -S)

Ordering information

Type	Supply voltage	Control output	Time setting range	Operating modes	Order code
Multi-functional standard timers	12 VDC	SPDT	0.1 s to 1200 h	ON-delay, flicker OFF start, flicker ON start, signal ON/OFF-delay, signal OFF-delay, interval, one-shot	H3DK-M1A DC12
		DPDT			H3DK-M2A DC12 ^{*1}
		SPDT		ON-delay, flicker ON start, interval, one-shot	H3DK-S1A DC12
		DPDT			H3DK-S2A DC12 ^{*1}
	24 to 240 VAC/VDC	SPDT		ON-delay, flicker OFF start, flicker ON start, signal ON/OFF-delay, signal OFF-delay, interval, one-shot	H3DK-M1 AC/DC24-240
		DPDT			H3DK-M2 AC/DC24-240 ^{*1}
		SPDT		ON-delay, flicker ON start, interval, one-shot	H3DK-S1 AC/DC24-240
		DPDT			H3DK-S2 AC/DC24-240 ^{*1}
Twin timer	12 VDC	SPDT	0.1 s to 12 h	Flicker OFF start, flicker ON start	H3DK-FA DC12
	24 to 240 VAC/VDC				H3DK-F AC/DC24-240
Star-delta timer	12 VDC	2× SPDT	1 to 120 s	Star-delta	H3DK-GA DC12
	24 to 240 VAC/VDC				H3DK-G AC/DC24-240
	240 to 440 VAC				H3DK-GE AC/DC240-440
Power OFF-delay timer	24 to 48 VAC/VDC	SPDT	1 to 120 s	Signal OFF-delay	H3DK-HBL AC/DC24-48
			0.1 to 12 s		H3DK-HBS AC/DC24-48
	100 to 120 VAC		1 to 120 s		H3DK-HCL AC100-120V
			0.1 to 12 s		H3DK-HCS AC100-120V
	200 to 240 VAC		1 to 120 s		H3DK-HDL AC200-240V
			0.1 to 12 s		H3DK-HDS AC200-240V

^{*1} One output can be set to instantaneous.

Specifications

Operating voltage range	85 to 110% of rated supply voltage (90 to 110% for the 12 VDC models).
Power reset	Minimum power-off time: H3DK-M/S, H3DK-F: 0.1 s, H3DK-G: 0.5 s. (Not for H3DK-H)
Reset voltage	10% of rated voltage. (Not for H3DK-H)
Voltage input (H3DK-M/-S)	24 to 240 VAC/DC: H-level 20.4 to 264 VAC/VDC, L-level 0 to 2.4 VAC/VDC.
	12 VDC: H-level 10.8 to 13.2 VDC, L-level 0 to 1.2 VDC.
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$), 5 A at 24 VDC (30 VDC for -M/-S) with resistive load (not for H3DK-GE)
Ambient temperature	Operating: -20 to 55°C (with no icing), storage: -40 to 70°C (with no icing)
Accuracy of operating time	±1% of FS max. (±1% ±10 ms max. at 1.2 s range)
Setting error	±10% of FS ±0.05 s max.
Minimum input signal width	50 ms (start input) (Only for H3DK-M/S)
Influence of voltage	±0.5% of FS max. (±0.5% ±10 ms max. at 1.2 s range). For H3DK-G: ±0.5% of FS max.
Influence of temperature	±2% of FS max. (±2% ±10 ms max. at 1.2s range). For H3DK-G: ±2% of FS max.
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h)
	Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h)
Degree of protection	IP30 (terminal block: IP20)
Terminal block	Clamps two 2.5 mm ² max. bar terminals without sleeves
Size in mm (H×W×D)	79×22.5×100



Miniature timer with multiple time ranges and multiple operating modes

H3YN features 4 multi-operating modes: ON-delay, interval, flicker ON start and flicker OFF start.

- Size in mm (H×W×D): 28×21.5×52.6
- Plug-in
- All supply voltages available
- 0.1 s to 10 h
- DPDT (5A) or 4PDT (3A)

Ordering information

Supply voltage	Functions	Time-limit contact	Order code	
			Short-time range model (0.1 s to 10 min)	Long-time range model (0.1 min to 10 h)
12 VDC	ON-delay Interval Flicker ON Flicker OFF	DPDT	H3YN-2 12DC	H3YN-21 12DC
24 VAC			H3YN-2 24AC	H3YN-21 24AC
24 VDC			H3YN-2 24DC	H3YN-21 24DC
100 to 120 VAC			H3YN-2 100-120AC	H3YN-21 100-120AC
200 to 230 VAC			H3YN-2 200-230AC	H3YN-21 200-230AC
12 VDC		4PDT	H3YN-4 12DC	H3YN-41 12DC
24 VAC			H3YN-4 24AC	H3YN-41 24AC
24 VDC			H3YN-4 24DC	H3YN-41 24DC
100 to 120 VAC			H3YN-4 100-120AC	H3YN-41 100-120AC
200 to 230 VAC			H3YN-4 200-230AC	H3YN-41 200-230AC

Accessories

Connecting socket

Timer	DIN-rail mounting/ front-connecting socket	Back-connecting socket
		PCB terminal
H3YN-2/-21	PYF08A, PYF08A-N, PYF08A-E	PY08-02
H3YN-4/-41	PYF14A, PYF14A-N, PYF14A-E	PY14-02

Hold-down clips

Applicable socket	Order code
PYF08A, PYF08A-N, PYF08A-E, PYF14A, PYF14A-N, PYF14A-E	Y92H-3 (pair)
PY08, PY08-02, PY14-02	Y92H-4

Specifications

Item	H3YN-2/-4	H3YN-21/-41
Time ranges	0.1 s to 10 min (1 s, 10 s, 1 min, or 10 min max. selectable)	0.1 min to 10 h (1 min, 10 min, 1 h, or 10 h max. selectable)
Rated supply voltage	24, 100 to 120, 200 to 230 VAC (50/60 Hz) 12, 24, 48, 100 to 110, 125 VDC	
Pin type	Plug-in	
Operating mode	ON-delay, interval, flicker OFF start, or flicker ON start (selectable with DIP switch)	
Operating voltage range	85 to 110% of rated supply voltage (12 VDC: 90 to 110% of rated supply voltage)	
Reset voltage	10% min. of rated supply voltage	
Control outputs	DPDT: 5 A at 250 VAC, resistive load ($\cos\phi = 1$), 4PDT: 3 A at 250 VAC, resistive load ($\cos\phi = 1$)	
Accuracy of operating time	$\pm 1\%$ FS max. (1 s range: $\pm 1\% \pm 10$ ms max.)	
Setting error	$\pm 10\% \pm 50$ ms FS max.	
Reset time	Min. power-opening time: 0.1 s max. (including halfway reset)	
Influence of voltage	$\pm 2\%$ FS max.	
Influence of temperature	$\pm 2\%$ FS max.	
Ambient temperature	Operating: -10 to 50°C (with no icing), storage: -25 to 65°C (with no icing)	
Degree of protection	IP40	
Size in mm (H×W×D)	28×21.5×52.6	



DIN 48 × 48 mm multi-functional timer series

This elaborate range of solid state timers provides you with a multi-functional timer, twin timer, star-delta timer and a power OFF-delay timer.

- 48 × 48 mm front-panel/plug-in
- High-/low-voltage models (except -H and -G)
- 0.05 s to 300 h (except -H and -G)
- DPDT, 5 A at 250 VAC
- Transistor 100 mA at 30 VDC

Ordering information

Output	Number of pins	Supply voltage	Time range	Operating mode	Order code
Relay DPDT	11	100 to 240 VAC/100 to 125 VDC	0.05 s to 300 h	ON-delay, flicker OFF start, flicker ON start, signal ON/OFF-delay, signal OFF-delay, interval	H3CR-A 100-240AC/100-125DC
		24 to 48 VAC/12 to 48 VDC			H3CR-A 24-48AC/12-48DC
Transistor		24 to 48 VAC/12 to 48 VDC	0.05 s to 300 h		H3CR-AS 24-48AC/12-48DC
Relay DPDT	8	100 to 240 VAC/100 to 125 VDC	0.05 s to 300 h	ON-delay, flicker ON start, interval, one-shot	H3CR-A8 100-240AC/100-125DC
		24 to 48 VAC/12 to 48 VDC			H3CR-A8 24-48AC/12-48DC
Transistor		24 to 48 VAC/12 to 48 VDC	0.05 s to 300 h		H3CR-A8S 24-48AC/12-48DC
Relay SPDT		100 to 240 VAC/100 to 125 VDC			H3CR-A8E 100-240AC/100-125DC
		24 to 48 VAC/VDC		H3CR-A8E 24-48AC/DC	
Relay DPDT	11	100 to 240 VAC	0.05 s to 30 h	Flicker OFF start	H3CR-F 100-240AC
		24 VAC/VDC			H3CR-F 24AC/DC
	8	100 to 240 VAC			H3CR-F8 100-240AC
		24 VAC/VDC			H3CR-F8 24AC/DC
	11	100 to 240 VAC	0.05 s to 30 h	Flicker ON start	H3CR-FN 100-240AC
		24 VAC/VDC			H3CR-FN 24AC/DC
	8	100 to 240 VAC			H3CR-F8N 100-240AC
		24 VAC/VDC			H3CR-F8N 24AC/DC
Time-limit contact and instantaneous contact		100 to 120 VAC		Star-delta	H3CR-G8EL 100-120AC
		200 to 240 VAC			H3CR-G8EL 200-240AC
DPDT	8	100 to 120 VAC	0.05 to 12 s	Power OFF-delay	H3CR-H8LS 100-120AC
		200 to 240 VAC			H3CR-H8LS 200-240AC
		24 VAC/VDC			H3CR-H8LS 24AC/DC
		100 to 120 VAC	0.05 to 12 m		H3CR-H8LM 100-120AC
		200 to 240 VAC			H3CR-H8LM 200-240AC
		24 VAC/VDC			H3CR-H8LM 24AC/DC

Accessories

Name/specifications		Order code
Flush-mounting adapter		Y92F-30
Protective cover		Y92A-48B
Front connecting socket	8-pin, finger-safe type, DIN-rail	P2CF-08-E
Front connecting socket	11-pin, finger-safe type, DIN-rail	P2CF-11-E
Back connecting socket	8-pin	P3G-08
	11-pin	P3GA-11

Name/specifications		Order code
Time setting ring	Setting a specific time	Y92S-27
	Limiting the setting range	Y92S-28
Panel cover	Light grey (5Y7/1)	Y92P-48GL
	Black (N1.5)	Y92P-48GB

Specifications

Accuracy of operating time		±0.2% FS max. (±0.2% ±10 ms max. in a range of 1.2 s)
Influence of voltage		±0.2% FS max. (±0.2% ±10 ms max. in a range of 1.2 s)
Influence of temperature		±1% FS max. (±1% ±10 ms max. in a range of 1.2 s)
Ambient temperature		Operating: -10 to 55°C (with no icing), storage: -25 to 65°C (with no icing)
Life expectancy	Mechanical	20,000,000 operations min. (under no load at 1,800 operations/h)
	Electrical	100,000 operations min. (5 A at 250 VAC, resistive load at 1,800 operations/h)
Size in mm (H×W×D)		48×48×66.6 (H3CR-A, -F), 48×48×78 (H3CR-G, -H)
Setting error		±5% FS ±50 ms
Degree of protection		IP40 (panel surface)
Weight		Approx. 90 g



The most complete digital standard timer on the market

H5CX offers you the most complete series of products on the market today. Based on extensive customer research, these new timers have been designed with value added features that users both need and appreciate.

- Size in mm (H×W×D): 48×48×59 to 78 mm
- Three color display value, red, green or orange
- Models with Instantaneous Contact Outputs
- 0.001 s to 9999 h, 10 ranges
- Input NPN, PNP and contact

Ordering information

Output type	Supply voltage	Functions	External connection	Size in mm (H×W×D)	Inputs	Order code
Contact output	100 to 240 VAC	A: Signal ON-delay	Screw terminals	48×48×84	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-A-N
	12 to 24 VDC/24 VAC	A-1: Signal ON-delay 2		48×48×65		H5CX-AD-N
Transistor output	100 to 240 VAC	A-2: Power ON-delay 1		48×48×84		H5CX-AS-N
	12 to 24 VDC/24 VAC	A-3: Power ON-delay 2		48×48×65		H5CX-ASD-N
Contact output	100 to 240 VAC	b-1: Repeat cycle 1	11-pin socket	48×48×69.7	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-A11-N
	12 to 24 VDC/24 VAC	b-2: Repeat cycle 2				H5CX-A11D-N
Transistor output	100 to 240 VAC	d: Signal OFF-delay				H5CX-A11S-N
	12 to 24 VDC/24 VAC	E: Interval				H5CX-A11SD-N
Contact output	100 to 240 VAC	F: Cumulative	8-pin socket	48×48×69.7	Signal, Reset (NPN inputs)	H5CX-L8-N
	12 to 24 VDC/24 VAC	Z: ON/OFF-duty adjustable flicker				H5CX-L8D-N
Transistor output	100 to 240 VAC	toff: Twin timer OFF start				H5CX-L8S-N
	12 to 24 VDC/24 VAC	ton: Twin timer ON start				H5CX-L8SD-N
Contact output	100 to 240 VAC	A-2: Power ON-delay 1	Screw terminals	48×48×65	—	H5CX-L8E-N
Models with instantaneous contact outputs	12 to 24 VDC/24 VAC	b: Repeat cycle 1				H5CX-L8ED-N
		E: Interval				
		Z: ON/OFF-duty adjustable flicker				
Transistor output	12 to 24 VDC	toff: Twin timer OFF start 1	Screw terminals	48×48×65	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-BWSD-N
		ton: Twin timer ON start 1				

Accessories

Name	Order code
Flush-mounting adapter	Y92F-30
Waterproof packing	Y92S-29
Front-connecting socket	8-pin, finger safe type
	11-pin, finger safe type
Back-connecting socket	8-pin
	11-pin
Hard cover	Y92A-48
Soft cover	Y92A-48F1
Front panels (4-digit models)	Light gray
	White

Specifications

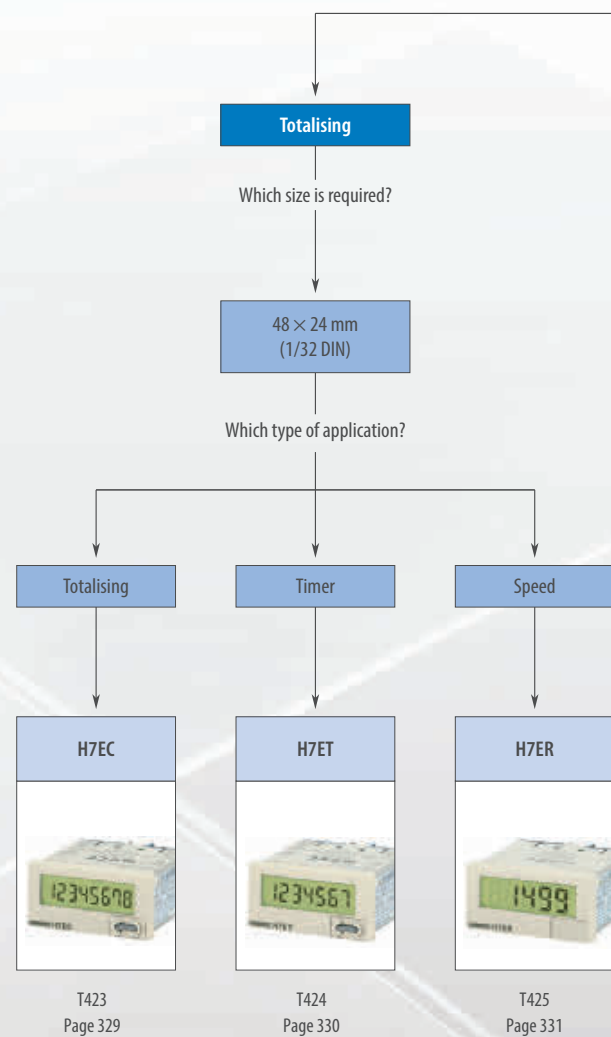
Item	H5CX-A_	H5CX-A11_	H5CX-L8_
Display	7-segment, negative transmissive LCD		
	Present value: 12 mm high characters		
	red, orange or green (programmable)		
	Set value: 6 mm high characters, green		
Digits	4 digits		
Total time range	0.001 s to 9,999 h (configurable)		
Timer mode	Elapsed time (Up), remaining time (Down) (selectable)		
Input signals	Signal, reset, gate		Signal, reset
Key protection	Yes		
Memory backup	EEPROM (overwrites: 100,000 times min.) that can store data for 10 years min.		
Ambient temperature	Operating: -10 to 55°C (no icing or condensation), side-by-side mounting: -10 to 50°C		
Case color	Black (N1.5)		

MULTI-FUNCTIONAL PRESET COUNTER

H7CX – Designed with value added features

The H7CX series offers the ultimate in versatility and intuitive programming.

- 7 basic functions in one
- Switching color on threshold, green, orange & red
- Twin counter mode
- 12 different outputs modes
- Display 6 digits from -100 K +1 up to 1 M -1





What is the type of counting application?

Pre-set counter
time count

Which size is required?

48 × 24 mm
(1/32 DIN)

48 × 48 mm
(1/16 DIN)

H8GN
counter/timer



T429
Page 332

H7CX



T422
Page 333

Cam positioner

Which size is required?

96 × 96 mm
(1/4 DIN)

H8PS



F424

Selection table

Category		Self-powered total	Self-powered timer	Self-powered tachometer
				
Model		H7EC	H7ET	H7ER
Selection criteria	Display	LCD		
	Size	1/32 DIN		
Outputs	Control outputs	–	–	–
	5 stage	–	–	–
	Total	■	■	–
	Time	–	■	–
	Preset	–	–	–
	Batch	–	–	–
	Dual	–	–	–
Inputs	Tachometer	■	–	■
	Control inputs	No-voltage, PNP/NPN, DC-voltage, AC/DC multi-voltage	No-voltage, PNP/NPN, DC-voltage, AC/DC multi-voltage	No-voltage, PNP/NPN
Features	Dual operation	–	–	–
	Number of digits	8	7	4 or 5
	NPN/PNP switch	■	■	■
	Back-lit	□	□	□
	External reset	■	■	–
	Manual reset	■	■	–
	Number of banks	–	–	–
	Built-in sensor power supply	–	–	–
Terminals	IP rating	IP66	IP66	IP66
	Screw terminals	■	■	■
	PCB terminals	–	–	–
Supply voltage	11-pin socket	–	–	–
	100 to 240 VAC	–	–	–
	12 to 24 VDC	–	–	–
Comms	24 VDC	□	□	□
	Comms	–	–	–
Functions	Up	■	■	–
	Down	–	–	–
	Up/down	–	–	–
	Reversible	–	–	–
	Speed	0 to 30 Hz or 0 to 1 kHz	–	1 or 10 kHz
	Counting range	0 to 99999999	0.0 h to 999999.9 h <--> 0.0 h to 3999 d 23.9 h or 0 s to 999 h 59 min 59 s <--> 0.0 min to 9999 h 59.9 min	1000 s-1 or 1000 min-1; 1000 s-1 or 1000 min-1 <--> 10000 min-1
Color	Beige	■	■	■
	Black	■	■	■
Page/Quick Link		329/T423	330/T424	331/T425

Counter type		Pre-set counter/timer	Pre-set counter	Cam positioner
				
Model		H8GN	H7CX	H8PS
Selection criteria	Display	LCD negative transmissive		
	Size	1/32 DIN	1/16 DIN	1/4 DIN
Outputs	Control outputs	1 relay (SPDT)	1 relay (SPDT), transistor	NPN or PNP, cam outputs 8/16/32, run out, tachometer
	5 stage	■	□	—
	Total	■	□	—
	Time	■	—	—
	Preset	■	□	—
	Batch	■	□	—
	Dual	■	□	—
	Tachometer	—	□	—
Inputs	Control inputs	No-voltage	No-voltage, PNP/NPN	Encoder
Features	Dual operation	■	■	□
	Number of digits	PV: 4, SV: 4	PV: 4, SV: 4 or PV: 6, SV: 6	7
	NPN/PNP switch	—	■	—
	Back-lit	—	■	■
	External reset	■	■	—
	Manual reset	■	■	8 (16- and 32-output models only)
	Number of banks	4	—	—
	Built-in sensor power supply	—	■	—
	IP rating	IP66	IP66	IP40
Terminals	Screw terminals	■	■	■
	PCB terminals	—	—	■
	11-pin socket	—	□	—
Supply voltage	100 to 240 VAC	—	■	—
	12 to 24 VDC	—	■	—
	24 VDC	■	—	■
Comms		□	—	—
Functions	Up	■	■	—
	Down	■	■	—
	Up/down	—	■	—
	Reversible	■	■	—
	Speed	0 to 30 Hz or 0 to 5 kHz	0 to 30 Hz or 0 to 5 kHz	—
	Counting range	-999 to 9999	-99999 to 999999	—
Color	Beige	—	—	■
	Black	■	■	—
Page/Quick Link		332/T429	333/T422	F424

■ Standard

□ Available

— No/not available



Self-powered LCD totaliser

The H7E series is available with large display with 8.6 mm character height. It includes models with backlight for improved visibility in dimly lit places. The H7E family includes total counters, time counters, tachometers and PCB mounted counters.

- Size in mm (H×W×D): 24×48×55.5, 1/32 DIN size housing
- 8 digits, 8.6 mm character height
- Black or light-grey housing
- Dual input speed: 30 Hz <-> 1 kHz
- Short body: all models have a depth of 48.5 mm

Ordering information

Count input	Max. counting speed	Display	Order code	
			Light grey body	Black body
No-voltage	30 Hz <-> 1 kHz (switchable)	7-segment LCD	H7EC-N	H7EC-N-B
PNP/NPN universal DC voltage input	30 Hz <-> 1 kHz (switchable)	7-segment LCD	H7EC-NV	H7EC-NV-B
		7-segment LCD with backlight	H7EC-NV-H	H7EC-NV-BH
AC/DC multi-voltage input	20 Hz	7-segment LCD	H7EC-NFV	H7EC-NFV-B

Specifications

Item	H7EC-NV-_/H7EC-NV-_H	H7EC-NFV-_	H7EC-N-_
Operating mode	Up type		
Mounting method	Flush mounting		
External connections	Screw terminals, optional wire-wrap terminals		
Number of digits	8		
Display	7-segment LCD with or without backlight, zero suppression (character height: 8.6 mm)		
Max. counting speed	30 Hz/1 kHz	20 Hz	30 Hz/1 kHz
Case color	Light grey or black (-B models)		
Attachment	Waterproof packing, flush mounting bracket		
Supply voltage	Backlight model: 24 VDC (0.3 W max.) (only for backlight) No-backlight model: Not required (powered by built-in battery)	Not required (powered by built-in battery)	
Count input	High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (input impedance: Approx. 4.7 kΩ)	High (logic) level: 24 to 240 VAC/VDC, 50/60 Hz Low (logic) level: 0 to 2.4 VAC/VDC, 50/60 Hz	No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.
Reset input		No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.	
Minimum signal width	20 Hz: 25 ms, 30 Hz: 16.7 ms, 1 KHz: 0.5 ms		
Reset system	External reset and manual reset: Minimum signal width of 20 ms		
Ambient temperature	Operating: -10 to 55°C (with no condensation or icing), storage: -25 to 65°C (with no condensation or icing)		
Degree of protection	Front-panel: IP66, NEMA4, terminal block: IP20		
Battery life (reference)	7 years min. with continuous input at 25°C (lithium battery)		
Size in mm (H×W×D)	24×48×55.5		



Self-powered time counter

The H7E series is available with large display with 8.6 mm character height. It includes models with backlight for improved visibility in dimly lit places. The H7E family includes total counters, time counters, tachometers and PCB mounted counters.

- Size in mm (H×W×D) 24×48×55.5, 1/32 DIN size housing
- 7 digits, 8.6 mm character height
- Black or light-grey housing
- Dual time range 999999.9 h <-> 3999 d 23.9 h
or 999 h 59 m 59 s <-> 9999 h 59.9m

Ordering information

Timer input	Display	Order code			
		Time range 999999.9h <-> 3999d23.9h (switchable)		Time range 999h59m59s <-> 9999h59.9m	
		Light grey body	Black body	Light grey body	Black body
No-voltage input	7-segment LCD	H7ET-N	H7ET-N-B	H7ET-N1	H7ET-N1-B
PNP/NPN universal	7-segment LCD	H7ET-NV	H7ET-NV-B	H7ET-NV1	H7ET-NV1-B
DC voltage input	7-segment LCD with backlight	H7ET-NV-H	H7ET-NV-BH	H7ET-NV1-H	H7ET-NV1-BH
AC/DC multi-voltage input	7-segment LCD	H7ET-NFV	H7ET-NFV-B	H7ET-NFV1	H7ET-NFV1-B

Specifications

Item	H7ET-NV _ _ /H7ET-NV _ _ H	H7ET-NFV _ _	H7ET-N _ _
Operating mode	Accumulating		
Mounting method	Flush mounting		
External connections	Screw terminals		
Display	7-segment LCD with or without backlight, zero suppression (character height: 8.6 mm)		
Number of digits	7		
Case color	Light grey or black (-B models)		
Attachment	Waterproof packing, flush mounting bracket, time unit labels		
Supply voltage	Backlight model: 24 VDC (0.3 W max.) (for backlight) No-backlight model: Not required (powered by built-in battery)	Not required (powered by built-in battery)	
Timer input	High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (Input impedance: Approx. 4.7 kΩ)	High (logic) level: 24 to 240 VAC/VDC, 50/60 Hz Low (logic) level: 0 to 2.4 VAC/VDC, 50/60 Hz	No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.
Reset input		No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.	
Minimum pulse width	1 s		
Reset system	External reset and manual reset: Minimum signal width of 20 ms		
Ambient temperature	Operating: -10 to 55°C (with no condensation or icing), storage: -25 to 65°C (with no condensation or icing)		
Time accuracy	±100 ppm (25°C)		
Degree of protection	Front-panel: IP66, NEMA4 with waterproof packing, terminal block: IP20		
Battery life (reference)	10 years min. with continuous input at 25°C (lithium battery)		
Size in mm (H×W×D)	24×48×55.5		



Self-powered tachometer

The H7E series is available with large display with 8.6 mm character height. It includes models with backlight for improved visibility in dimly lit places. The H7E family includes total counters, time counters, tachometers and PCB mounted counters.

- Size in mm (H×W×D) 24×48×53.5, 1/32 DIN size housing
- 5 digits, 8.6 mm character height
- Black or light-grey housing
- Dual revolution display

Ordering information

Count input	Display	Order code			
		Max. revolutions displayed (applicable encoder resolution)			
		1,000 s ⁻¹ (1 pulse/rev.) 1,000 min ⁻¹ (60 pulse/rev.)		1,000.0 s ⁻¹ (10 pulse/rev) 1,000.0 min ⁻¹ (600 pulse/rev) <-> 10,000 min ⁻¹ (60 pulse/rev) (switchable)	
		Light grey body	Black body	Light grey body	Black body
No-voltage input	7-segment LCD	H7ER-N	H7ER-N-B		
PNP/NPN universal	7-segment LCD	H7ER-NV	H7ER-NV-B	H7ER-NV1	H7ER-NV1-B
DC voltage input	7-segment LCD with backlight	H7ER-NV-H	H7ER-NV-BH	H7ER-NV1-H	H7ER-NV1-BH

Specifications

Item	H7ER-NV1-_/H7ER-NV1-_H	H7ER-NV-_ /H7ER-NV-_H	H7ER-N-_
Operating mode	Up type		
Mounting method	Flush mounting		
External connections	Screw terminals, wire-wrap terminals		
Display	7-segment LCD with or without backlight, zero suppression (character height: 8.6 mm)		
Number of digits	5	4	
Max. revolutions displayed	1,000.0 s ⁻¹ (when encoder resolution of 10 pulse/rev is used) 1,000.0 min ⁻¹ (when encoder resolution of 600 pulse/rev is used) <-> 10,000 min ⁻¹ (when encoder resolution of 60 pulse/rev is used) (switchable with switch)	1,000 s ⁻¹ (when encoder resolution of 1 pulse/rev is used) 1,000 min ⁻¹ (when encoder resolution of 60 pulse/rev is used)	
Attachment	Waterproof packing, flush mounting bracket, revolution unit labels		
Supply voltage	Backlight model: 24 VDC (0.3 W max.) (for backlight lit) No-backlight model: Not required (powered by built-in battery)		Not required (powered by built-in battery)
Count input	High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (Input impedance: Approx. 4.7 kΩ)		No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.
Max. counting speed	10 kHz	1 kHz	
Minimum signal width	10 kHz: 0.05 ms, 1 kHz: 0.5 ms		
Ambient temperature	Operating: -10 to 55°C (with no condensation or icing), storage: -25 to 65°C (with no condensation or icing)		
Degree of protection	Front-panel: IP66, NEMA4 with waterproof packing, terminal block: IP20		
Battery life (reference)	7 years min. with continuous input at 25°C (lithium battery)		
Size in mm (H×W×D)	24×48×53.5		



World's smallest compact preset counter/timer

The H8GN is a 1/32 DIN timer and counter in one. It is simple to switch between the timer and counter functions. During operation it is also possible to switch the display to monitor the totalising count value in 8 digits. Many sophisticated functions come as standard with H8GN.

- Size in mm (H×W×D) 24×48×83, 1/32 DIN size housing
- 8 digit display, 4 value and 4 set value
- Front mounting
- –999 to 9999
- 24 VDC

Ordering information

Functions		Supply voltage	Output	Order code	
				Communications	
Counter	Timer			No communications	RS-485
Counter: Up/down/reversible, 4 digits, N, F, C or K output modes Total counter: 8 digits	A: ON-delay B: Flicker D: Signal OFF-delay E: Interval F: Accumulative Z: ON/OFF-duty adjustable flicker	24 VDC	Contact output (SPDT)	H8GN-AD	H8GN-AD-FLK

Specifications

Rated supply voltage		24 VDC
Operating voltage range		85 to 110% of rated supply voltage
Power consumption		1.5 W max. (for max. DC load) (inrush current: 15 A max.)
Mounting method		Flush-mounting
External connections		Screw terminals (M3 screws)
Terminal screw tightening torque		0.5 Nm max.
Attachment		Waterproof packing, flush-mounting bracket
Display		7-segment, negative transmissive LCD; time display (h, min, s); CMW, OUT, RST, TOTAL Present value (red, 7 mm high characters); set value (green, 3.4 mm high characters)
Digits		PV: 4 digits, SV: 4 digits, when total count value is displayed: 8 digits (zeros suppressed)
Memory backup		EEPROM (non-volatile memory) (number of writes: 100,000 times)
Counter	Maximum counting speed	30 Hz or 5 kHz
	Counting range	–999 to 9,999
	Input modes	Increment, decrement, individual, quadrature inputs
Timer	Timer modes	Elapsed time (up), remaining time (down)
Inputs	Input signals	For counter: CP1, CP2, and reset For timer: Start, gate, and reset
	Input method	No-voltage input (contact short-circuit and open input) Short-circuit (ON) impedance: 1 kΩ max. (approx. 2 mA runoff current at 0 Ω) Short-circuit (ON) residual voltage: 2 VDC max. Open (OFF) impedance: 100 kΩ min. Applied voltage: 30 VDC max.
	Start, reset, gate	Minimum input signal width: 1 or 20 ms (selectable)
	Power reset	Minimum power-opening time: 0.5 s
Control output		SPDT contact output: 3 A at 250 VAC/30 VDC, resistive load (cosφ = 1)
Minimum applied load		10 mA at 5 VDC (failure level: P, reference value)
Reset system		External, manual, and power supply resets (for timer in A, B, D, E, or Z modes)
Sensor waiting time		260 ms max. (inputs cannot be received during sensor wait time if control outputs are turned OFF)
Timer function	Accuracy of operating time and setting error (including temperature and voltage effects)	Signal start: ±0.03% ±30 ms max. Power-ON start: ±0.03% ±50 ms max.
Ambient temperature	Operating storage	–10 to 55°C (with no icing or condensation)
		–25 to 65°C (with no icing or condensation)
Case color		Rear section: Grey smoke; front section: N1.5 (black)
Degree of protection		Panel surface: IP66 and NEMA Type 4X (indoors); rear case: IP20, terminal block: IP20
Size in mm (H×W×D)		24×48×83



The most complete digital standard counter on the market

H7CX offers you the most complete series of products on the market today. Based on extensive customer research, these new counters have been designed with value added features that users both need and appreciate.

- Size in mm (H×W×D) 48×48×59 to 78 mm 1/16 DIN size housing
- Three color display value, red, green or orange
- Twin counter mode
- 6 digit model –99,999 to 999,999, set value –99,999 to 999,999 or 0 to 999,999
- Input contact, NPN or PNP

Ordering information

Type	External connection	Sensor power supply	Supply voltage	Output type	Digits	Size in mm (H×W×D)	Order code
1-stage counter	Screw terminal	12 VDC	100 to 240 VAC	Contact and transistor output	6	48×48×84	H7CX-AU-N
1-stage counter with total counter			12 to 24 VDC/24 VAC				H7CX-AUD1-N
2-stage counter				Transistor output (2×)			H7CX-AUSD1-N
1-stage counter with batch counter				Contact output (2×)			H7CX-AW-N
Dual counter (addition/subtraction)			100 to 240 VAC				H7CX-AWD1-N
Tachometer			12 to 24 VDC/24 VAC				
Twin counter							
1-stage counter	11-pin socket	12 VDC	100 to 240 VAC	Contact output		48×48×69.7	H7CX-A11-N
1-stage counter with total counter			12 to 24 VDC/24 VAC				H7CX-A11D1-N
			100 to 240 VAC	Transistor output			H7CX-A11S-N
			12 to 24 VDC/24 VAC				H7CX-A11SD1-N
	Screw terminal		100 to 240 VAC	Contact output		48×48×84	H7CX-A-N
			100 to 240 VAC	Transistor output			H7CX-AS-N

Accessories

Name	Order code
Flush-mounting adapter	Y92F-30
Waterproof packing	Y92S-29
DIN-rail mounting/front-connecting socket	P2CF-11-E
Back-connecting socket	P3GA-11
	Finger safe terminal cover for P3GA-11
	Y92A-48G
Hard cover	Y92A-48
Soft cover	Y92A-48F1
Front panels (4-digit models)	Light gray
	White
	Y92P-CXC4G
	Y92P-CXC4S
Front panels (6-digit models)	Light gray
	White
	Y92P-CXC6G
	Y92P-CXC6S

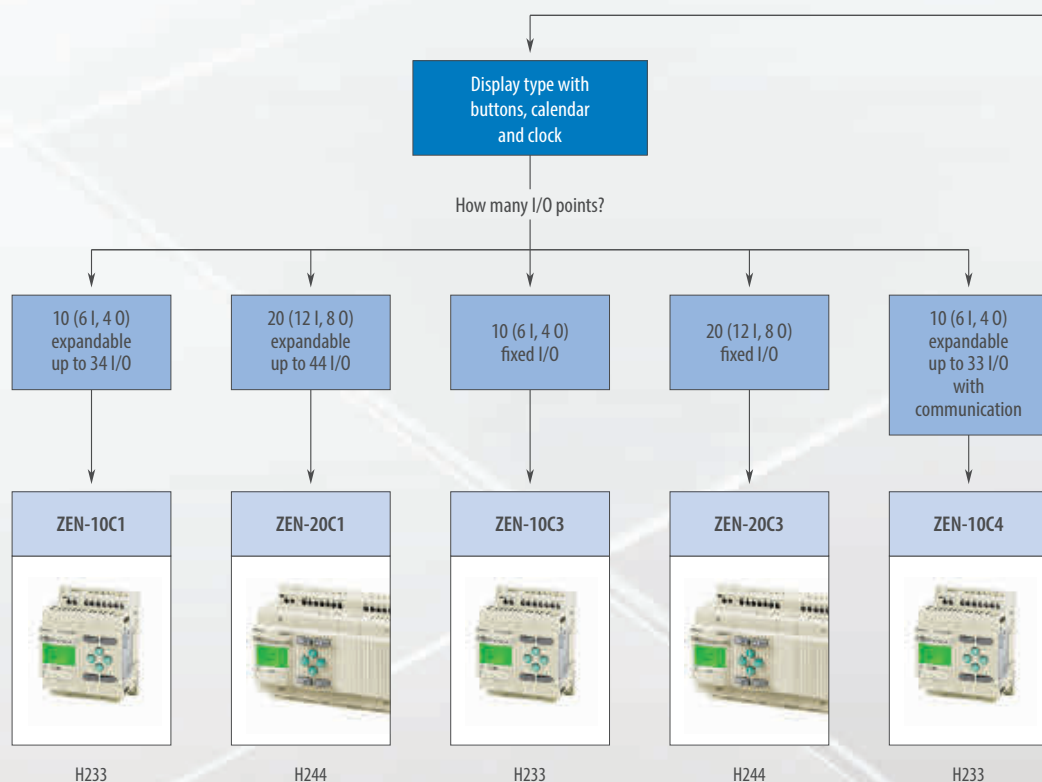
Specifications

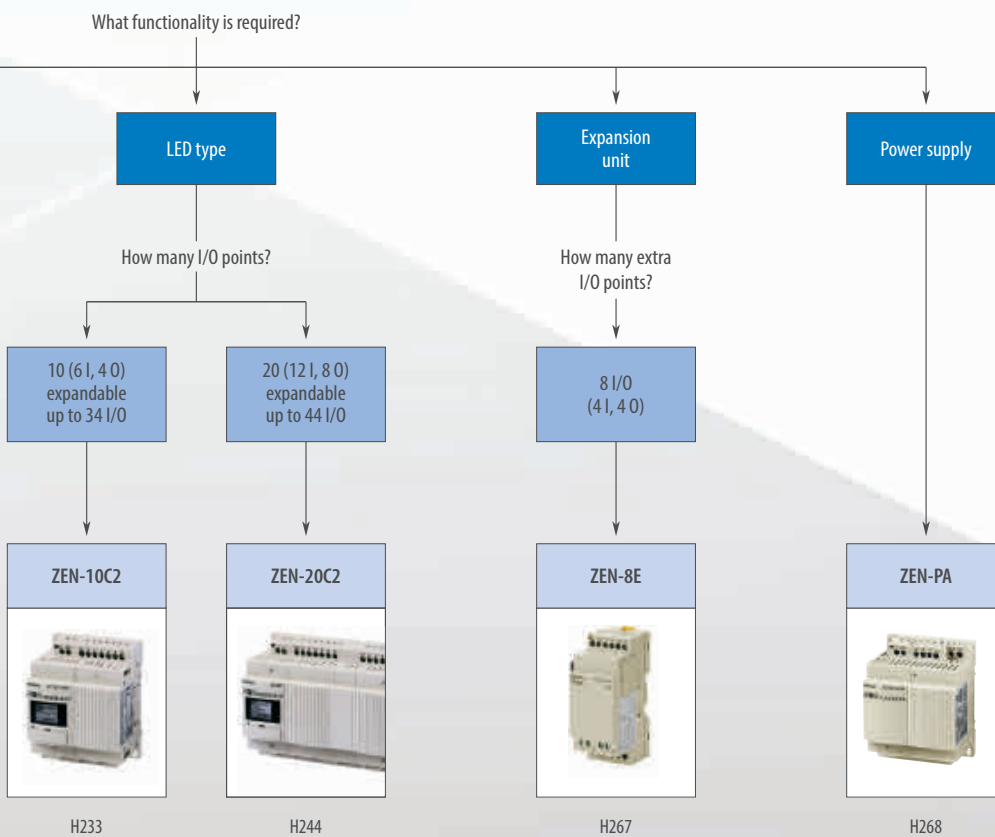
Display	7-segment, negative transmissive LCD
Digits	6-digits: –99,999 to 999,999, SV range: –99999 to 999999 or 0 to 999999
Max. counting speed	30 Hz or 5 kHz (selectable, ON/OFF ratio 1:1)
Input modes	Increment, decrement, increment/decrement (UP/DOWN A (command input), UP/DOWN B (individual inputs), or UP/DOWN C (quadrature inputs))
Control output	Contact output: 3 A at 250 VAC/30 VDC, resistive load (cosφ = 1) Minimum applied load: 10 mA at 5 VDC Transistor output: NPN open collector, 100 mA at 30 VDC Residual voltage: 1.5 VDC max. (approx. 1V) Leakage current: 0.1 mA max.
Key protection	Yes
Decimal point adjustment	Yes (rightmost 3 digits)
Sensor waiting time	290 ms max.
Memory backup	EEPROM (overwrites: 100,000 times min.) stores data 10 years min.
Ambient temperature	Operating: –10 to 55°C (–10 to 50°C when mounted side by side)
Case color	Black (N1.5) (Optional Front Panels are available to change the Front Panel color to light gray or white.)
Life expectancy	Mechanical: 10,000,000 operations min. Electrical: 100,000 operations min. (3 A at 250 VAC, resistive load)
Degree of protection	Panel surface: IP66, NEMA 4 (indoors), and UL Type 4X (indoors)

ZEN - SIMPLICITY AT ITS BEST

The ZEN series offers simple logic control for a wide variety of applications. With many on-board functions like season and weekly timers, counters, analog inputs and using the ladder logic, you can automate the application very quickly. Adjustments and maintenance is easy using the models with an LCD.

- RS-485 communication
- Expandable I/O
- Memory Data backup





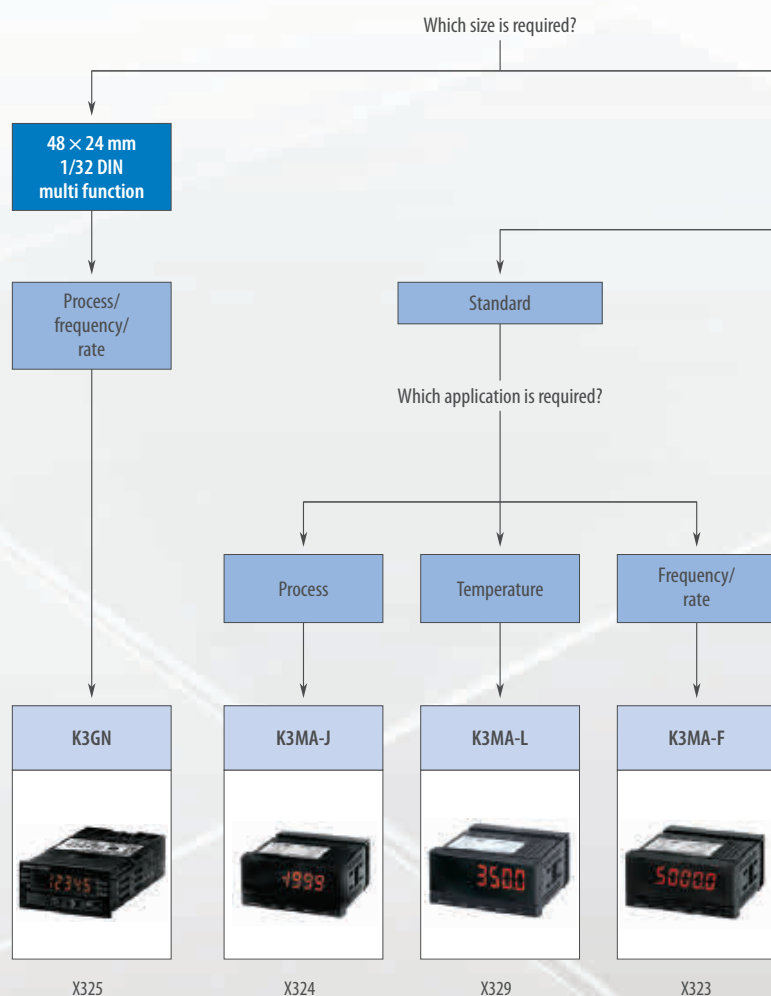
				
Model	ZEN-10C	ZEN-20C		
Type	CPU unit	CPU unit		
Features C1	With LCD Display, program/control buttons, calendar and real-time clock	With LCD display, program/control buttons, calendar and real-time clock		
Features C2	With LED indication Logic control Programming by software	With LED indication Logic control Programming by software		
Features C3	Same as C1 but not expandable.	Same as C1 but not expandable.		
Features C4	Same as C1 but instead of one output relay you get RS-485 communication.	–		
Features Starter kits	Complete set with C1 CPU including software, cable and manual	–		
Number of I / O points	10 expandable up to 34 I/O (C4 up to 33 I/O)	20 expandable up to 44 I/O		
Inputs	6	12		
Inputs/power supply	100 to 240 VAC or 12 to 24 VDC	100 to 240 VAC or 12 to 24 VDC		
Outputs	4 relays (C4 = 3 relays) or 4 transistors	8 relays or 8 transistors		
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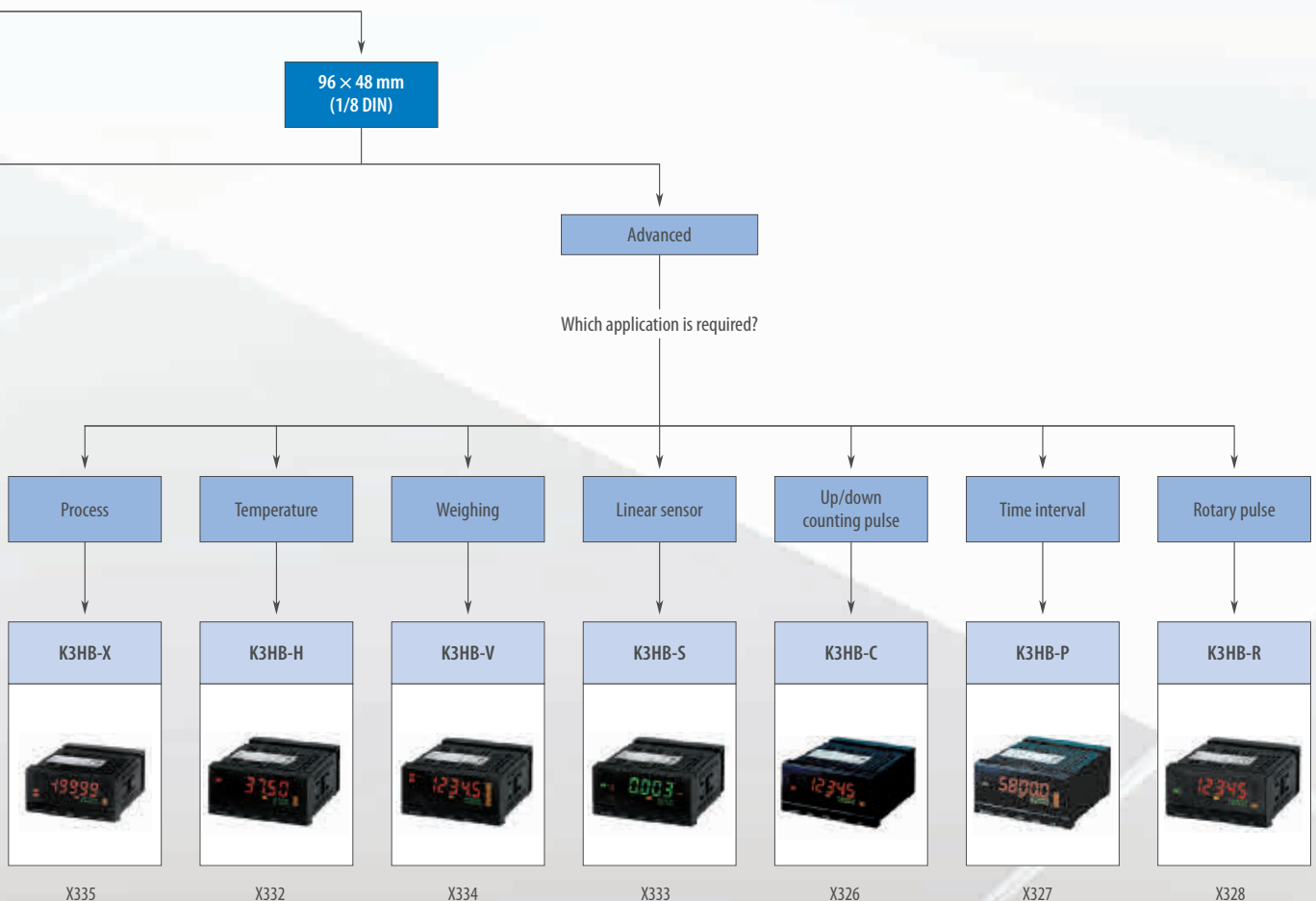
LOOKING FOR PERFECT MEASURING & READ-OUT?

K3HB-V – For perfect weighing

With our K3HB series we cover a wide range of applications. One of them is the weighing indicator which performs perfect measurement in any weighing application. The instrument can be equipped with a load-cell power supply of 10V/100mA. Several option boards for communication, contact output boards or event inputs are also available. On top of these you can get direct DeviceNet communication.

- High speed sampling 20 ms
- Equipped with position meter
- Two color display for easy recognition





X335

X332

X334

X333

X326

X327

X328

Selection table

Category		Multifunctional digital panel indicator	Process indicator	Temperature indicator	Frequency/rate indicator	Process indicator
						
Model		K3GN	K3MA-J	K3MA-L	K3MA-F	K3HB-X
Size		1/32 DIN	1/8 DIN			
Features	Color change display	■	■	■	■	■
	Number of digits	5	5	4	5	5
	Leading zero suppression	■	■	■	■	■
	Forced zero function	■	■	■	■	■
	Min./max. hold function	■	■	■	■	■
	Average processing	■	■	■	■	■
	User selectable inputs	■	■	■	■	■
	Start-up compensating time	■	—	—	■	—
	Key protection	■	■	■	■	■
	Decimal point position setting	■	■	■	■	■
Features	Accuracy	±0.1% of full scale	±0.1% of full scale	±0.1% of full scale	±0.1% of full scale	±0.1% of full scale (DC voltage & DC current), ±0.5% of full scale (AC voltage & AC current)
	Input range	0 to 20 mA, 4 to 20 mA or 0 to 5 V, 1 to 5 V, -5 to 5 V, -10 to 10 V or 0 to 30 Hz or 0 to 5 kHz	0 to 20 mA, 4 to 20 mA or 0 to 5 V, 1 to 5 V, -5 to 5 V, -10 to 10 V	Pt100, JPt100 or thermocouple K, J, T, E, L, U, N, R, S, B	0 to 30 Hz or 0 to 5 kHz	0.000 to 10.000 A, 0.0000 to 19.999 mA, -199.99 to 199.99 mA, 4.000 to 20.000 mA, 0.0 to 400.0 V, 0.0000 to 1.999 V, -199.99 to 199.99 V, 1.0000 to 5.0000 V
	Sample rate	250 ms	250 ms	500 ms	—	20 ms
	Features	Remote/local processing, parameter initialisation, programmable output configuration, process value hold	Teaching, comparative output pattern selection, parameter initialisation, programmable output configuration, process value hold	Programmable output configuration, process value hold	Teaching, comparative output pattern selection, programmable output configuration, process value hold	Scaling, teaching, averaging, output hysteresis, output OFF-delay, output test, bank selection, reset, comparative output
	Sensor power supply	—	—	—	■	□
Front protection	IP rating	IP66	IP66	IP66	IP66	IP66
	Supply voltage	24 VDC	24 VAC/VDC or 100 to 240 VAC	24 VAC/VDC or 100 to 240 VAC	24 VAC/VDC or 100 to 240 VAC	100 to 240 VAC or 24 VAC/VDC
Inputs	NPN	■	—	■	■	□
	PNP	■	—	■	■	□
	Temperature	—	—	—	—	—
	Contact	—	—	—	■	—
	Voltage pulse	—	—	—	■	—
	Load cell	—	—	—	—	—
	DC voltage	■	■	■	—	□
	DC current	■	■	—	—	□
	AC voltage	—	—	—	—	□
	AC current	—	—	—	—	□
Outputs	Relay	■	■	■	■	□
	NPN	■	—	—	—	□
	PNP	■	—	—	—	□
	Linear	—	—	—	—	□
	BCD	—	—	—	—	—
	Comms	■	—	—	—	□
Page/Quick Link		X325	X324	X329	X323	X335

Temperature indicator	Weighing indicator	Linear sensor indicator	Up/down counting pulse indicator	Time interval indicator	Rotary pulse indicator
					
K3HB-H	K3HB-V	K3HB-S	K3HB-C	K3HB-P	K3HB-R
1/8 DIN				—	—
■	■	■	■	■	■
5	5	5	5	5	5
■	■	■	■	■	■
■	■	■	■	■	■
■	■	■	■	■	■
■	■	■	■	■	■
■	■	■	■	■	■
—	—	—	—	—	■
■	■	■	■	■	■
■	■	■	■	■	■
Thermocouple: $\pm 0.3\%$ of full scale, Pt-100: $\pm 0.2\%$ of full scale	$\pm 0.1\%$ of full scale	One input: $\pm 0.1\%$ of full scale, two inputs: $\pm 0.2\%$ of full scale		$\pm 0.08\%$ rgd ± 1 digit	$\pm 0.006\%$ rgd ± 1 digit $\pm 0.02\%$ rgd ± 1 digit
Pt100, thermocouple K, J, T, E, L, U, N, R, S, B, W	0.00 to 199.99 mV, 0.000 to 19.999 mV, 100.00 mV, 199.99 mV	0 to 20 mA, 4 to 20 mA, 0 to 5 V, -5 to 5 V, -10 to 10 V	No voltage contact: 30 Hz, voltage pulse: 50 kHz, open collector: 50 kHz	No voltage contact: 30 Hz, voltage pulse: 50 kHz, open collector: 50 kHz	No voltage contact: 30 Hz, voltage pulse: 50 kHz, open collector: 50 kHz
20 ms	20 ms	0.5 ms	—	—	—
Scaling, teaching, averaging, output hysteresis, output OFF-delay, output test, bank selection, reset, comparative output	Scaling, teaching, averaging, output hysteresis, output OFF-delay, output test, bank selection, reset, comparative output	Scaling, 2-input calculation, teaching, averaging, output hysteresis, output OFF-delay, output test, bank selection, reset, comparative output	Scaling, measurement operation selection, output hysteresis, output OFF-delay, output test, display value selection, display color selection, key protection, bank selection, display refresh period, maximum/minimum hold, reset	Scaling, measurement operation selection, output hysteresis, output OFF-delay, output test, teaching, display value selection, display color selection, key protection, bank selection, display refresh period, maximum/minimum hold, reset	Scaling, measurement operation selection, averaging, previous average value comparison, output hysteresis, output OFF-delay, output test, teaching, display value selection, display color selection, key protection, bank selection, display refresh period, maximum/minimum hold, reset
□	□	□	□	□	□
IP66	IP66	IP66	IP66	IP66	IP66
100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC	100 to 240 VAC or 24 VAC/VDC
□	□	□	■	■	■
□	□	□	■	■	■
■	—	—	—	—	—
—	—	—	—	—	—
—	—	—	■	■	■
—	■	—	—	—	—
—	—	■	—	—	—
—	—	■	—	—	—
—	—	—	—	—	—
—	—	—	—	—	—
□	□	□	□	□	□
□	□	□	□	□	□
□	□	□	□	□	□
□	□	□	□	□	□
—	—	—	□	□	□
□	□	□	□	□	□
X332	X334	X333	X326	X327	X328

■ Standard

□ Available

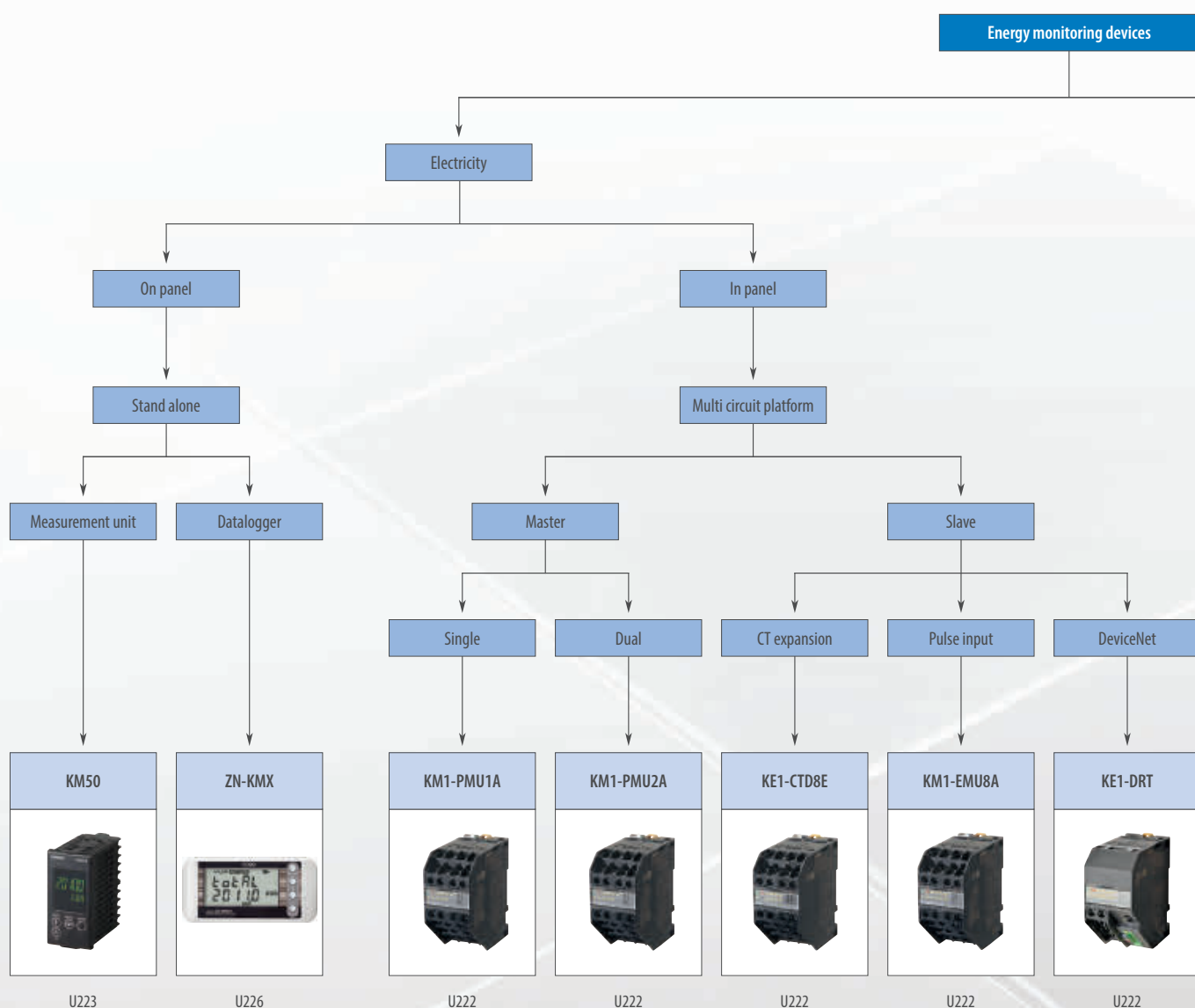
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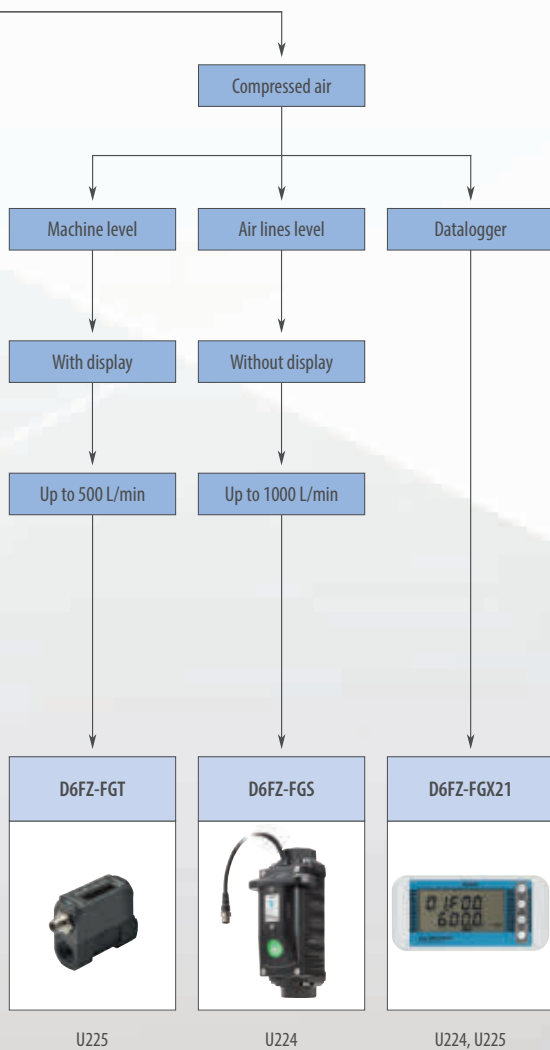
RISE ABOVE YOUR ENERGY CHALLENGES

Energy monitoring devices

Understanding energy usage is the first step in becoming energy efficient. Learn how to expose energy waste deep within your system with new hardware and software solutions that target devices consuming excess power.

- Measure more lines with fewer devices
- Accurate measurements with minimal installation space
- Monitor electrical and other forms of energy





Selection table

		KM1 series				KM50 series	ZN-KMX series
							
Model		KM1-PMU_A	KE1-CTD8E	KM1-EMU8A	KE1-DRT-FLK	KM50-E1-FLK	ZN-KMX-21A
Type		In panel, reduced wiring, space-saving, multi-circuit measurement				On panel type	Data logger for KM50 series
Application		Electricity measurements					
Installation		In panel, DIN track				On panel, option DIN track	Magnet mounting, screw mounting, hook, free standing
Display		–				Eleven segment LEDs	7-seg. 5-digit 2-step LCD display
Size (W × H × D) [mm]		45 × 96 × 90 (maximum width of 45 × 5 when five Units are linked together)				DIN 48 × 96, Depth: 88	117.2 × 56.8 × 24.6
Applicable phase	Single-phase, two-wire	Yes	Yes	–	–	Yes	Depending on connected KMs
	Three-phase, three-wire	Yes	Yes	–	–	Yes	
	Three-phase, four-wire	PMU1A only	Yes	–	–	Yes	
400-V direct measurement		Yes	–	–	–	Yes	
Power supply		100 to 240 VAC	Provided by Master	100 to 240 VAC		100 to 240 VAC	DC input: 24 VDC ±10%
Measured items	Energy	Yes	Yes	–	–	Yes	Yes
	Active power	Yes	Yes	–	–	Yes	Yes
	Reactive power	Yes	Yes	–	–	Yes	–
	Current	Yes	Yes	–	–	Yes	–
	Voltage	Yes	–	–	–	Yes	–
	Power factor	Yes	Yes	–	–	Yes	–
	Frequency	Yes	–	–	–	Yes	–
	Pulse count	–	–	Yes	–	Yes	Yes
Communication interface		RS-485	–	RS-485	DeviceNet or RS485	RS-485	RS-485 KM side/ Ethernet PC side
Alarm output		Yes	Yes	–	–	Yes	Yes
Data logging		Yes	–	–	–	Yes	SD card
Page/Quick Link		U222				U223	U226

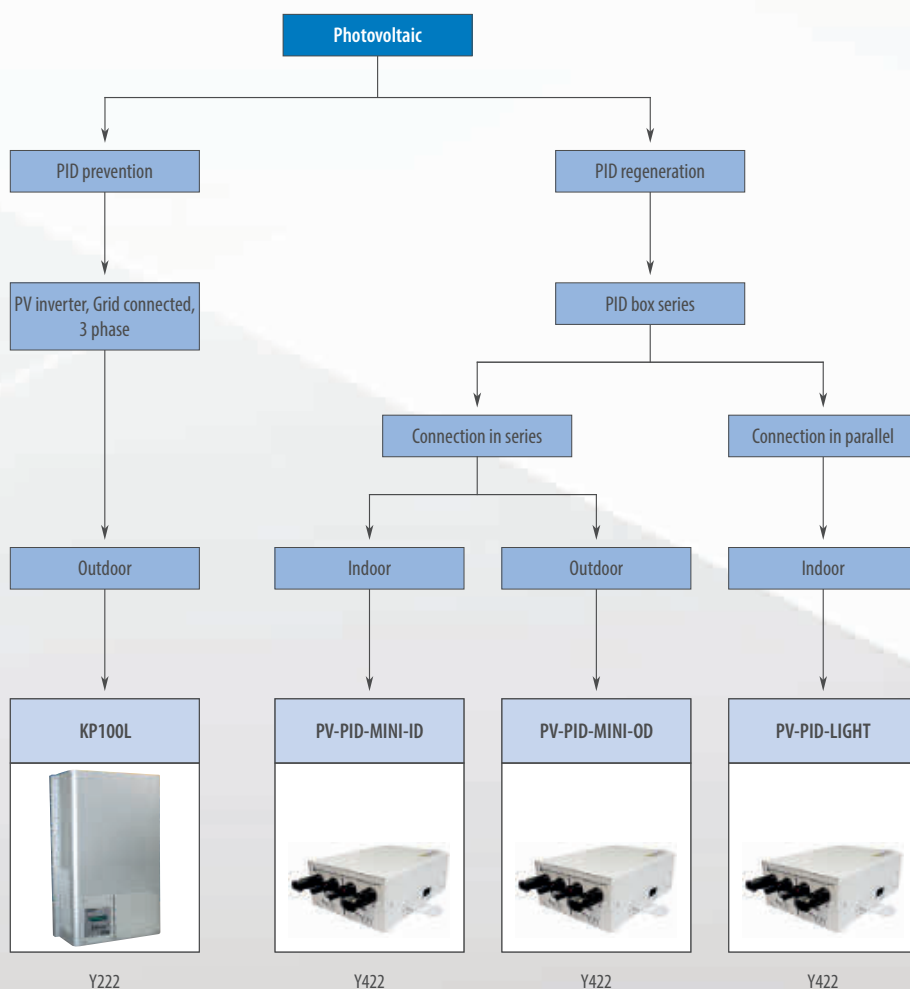
D6FZ series				
				
Model	D6FZ-FGT200	D6FZ-FGT500	D6FZ-FGS1000	D6FZ-FGX21
Type	Air flow sensor up to 200 l/min	Air flow sensor up to 500 l/min	Air flow sensor up to 1,000 l/min	Data logger for D6FZ series
Application	Air flow and nitrogen (N2) measurement			
Installation	Mounting bracket		–	Mounting magnet
Display	11-segment digital display		–	7-seg. 5-digit 2-step LCD display
Size (W × H × D) [mm]	30 × 77 × 63.7		64 × 93 × 195	117.2 × 56.8 × 24.6
Applicable pipe	Rc1/4 (8 A)	Rc1/2 (15 A)	Rc1 (25 A)	–
Power supply	12 to 24 VDC ±10%			24 VDC ±10%
Measured items	Flow	Yes	Yes	Yes
	Leakage	Yes	Yes	Yes
	Pressure	–	–	Yes
	Temperature	–	–	Yes
Communication interface	Analog (4 to 20 mA), pulse, RS-485			Ethernet PC side
Alarm output	Threshold value			Yes
Data logging	–	–	–	SD card
Page/Quick Link	U225		U224	U224, U225

REVIVE & RENEW PV PLANTS

Protection against the problem of PID

Improve your power generation with our new photovoltaic technologies. Whether you are designing a new system or improving an existing installation, we have the photovoltaic solutions to help optimize your solar plant.

- Prevent PID with ZCC technology integrated in the PV inverter
- Revive PV panels with a complete retrofit solution based on PID box series
- TÜV Rheinland test approved



Y222

Y422

Y422

Y422

	PID recovering box			Photovoltaic inverter
				
Model	PV-PID-MINI-ID	PV-PID-MINI-OD	PV-PID-LIGHT	KP100L-OD-EU
Description	PID box for retrofit	PID box for retrofit	PID box for retrofit	On grid, 10 kW, three-phase PV inverter
Prevents PID on installed PV modules	–	–	–	Yes
Regenerates modules affected with PID	Yes	Yes	Yes	–
Connection type	series	series	parallel	–
Fast PID recovery	+++	+++	+ ^{*1}	–
Able to recover modules in all stages of PID	+++	+++	+ ^{*1}	–
System size ^{*2}	0 to 20 A per independent input	0 to 20 A per independent input	max. 100 kWp ^{*3}	0 to 13 A per independent input (max. 33 A)
Number of MPPT's	2	2	2	3
Grounding possible at inverter side	Yes	Yes	No	Negative pole always grounded during inverter operation, due to ZCC.
Disconnects from the inverter	Yes	Yes	No	–
Outdoor use	No	Yes ^{*4}	No	Yes
Approval is required from the manufacturer of the inverter	No	No	Yes	–
Easy to implement	++	++	+++	+
Page/Quick Link	Y422	Y422	Y422	Y222

^{*1} Depending on the inverter

^{*2} Look at the Isc of the modules and the number of strings in parallel. This may never exceed the max current of the PID-box. Also consider the tolerances.

^{*3} Inputs have to be secured with 2 A fuses

^{*4} Power supply is rated IP30. Place it indoor.

Electromechanical relays

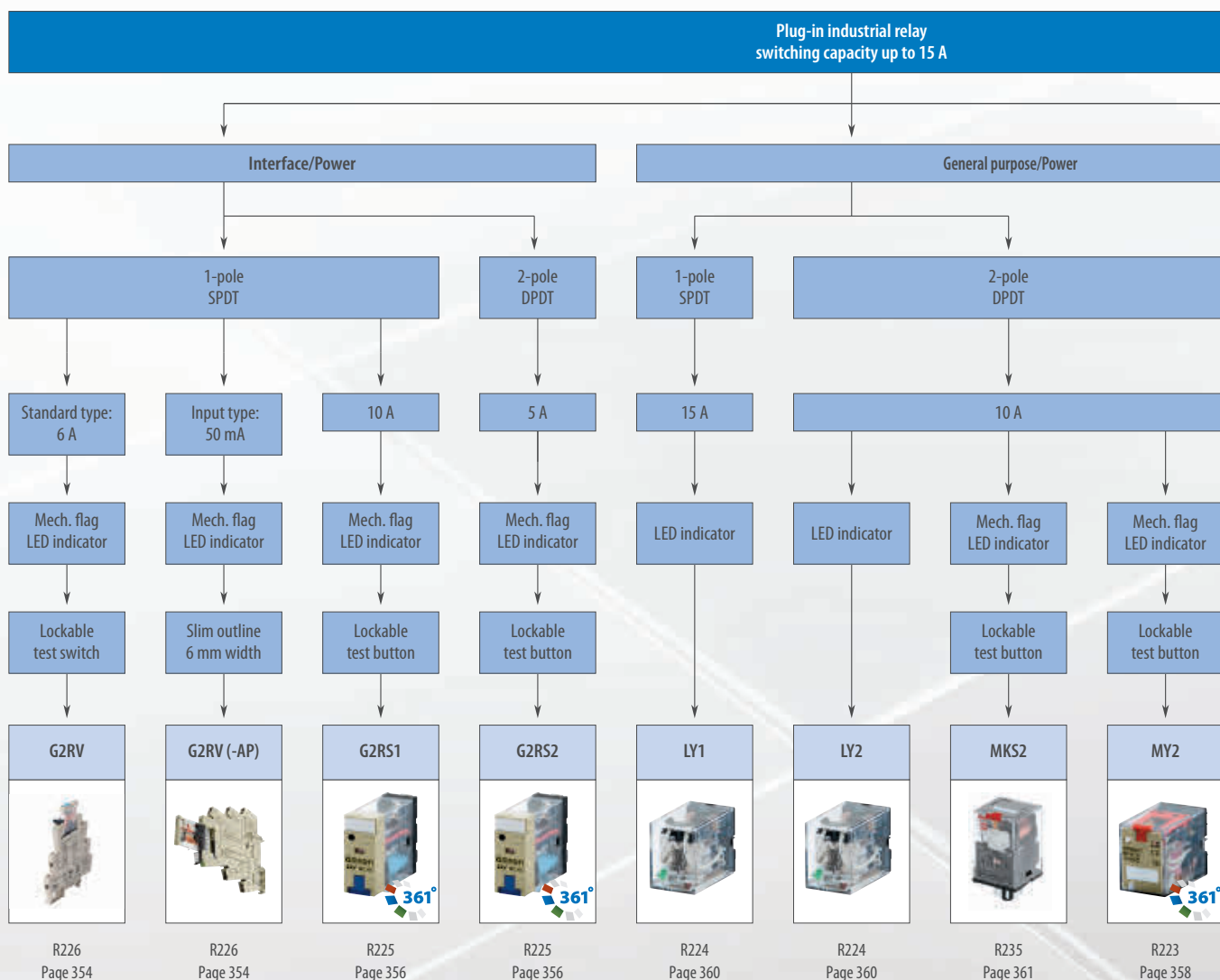
UNIQUE!

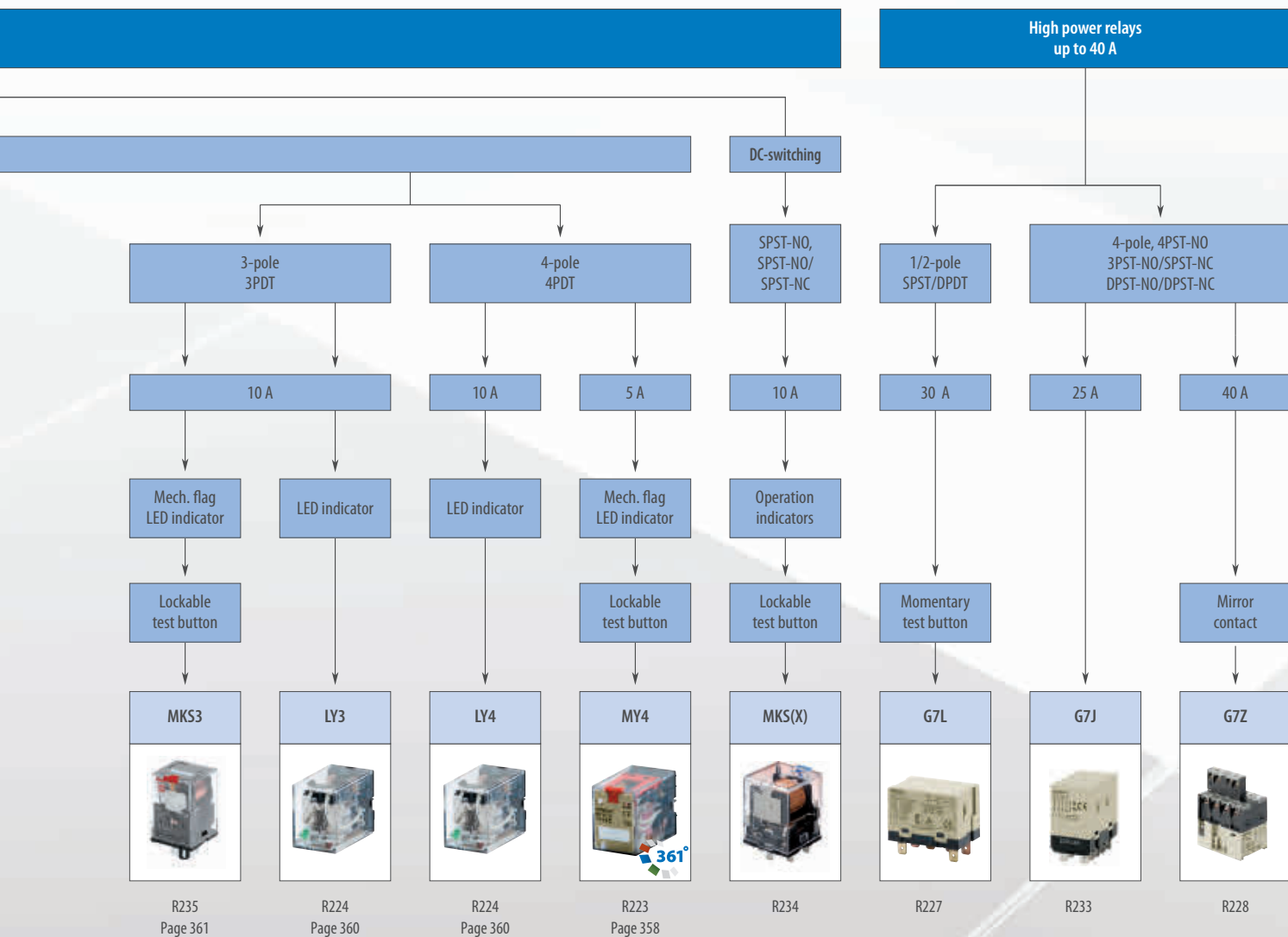
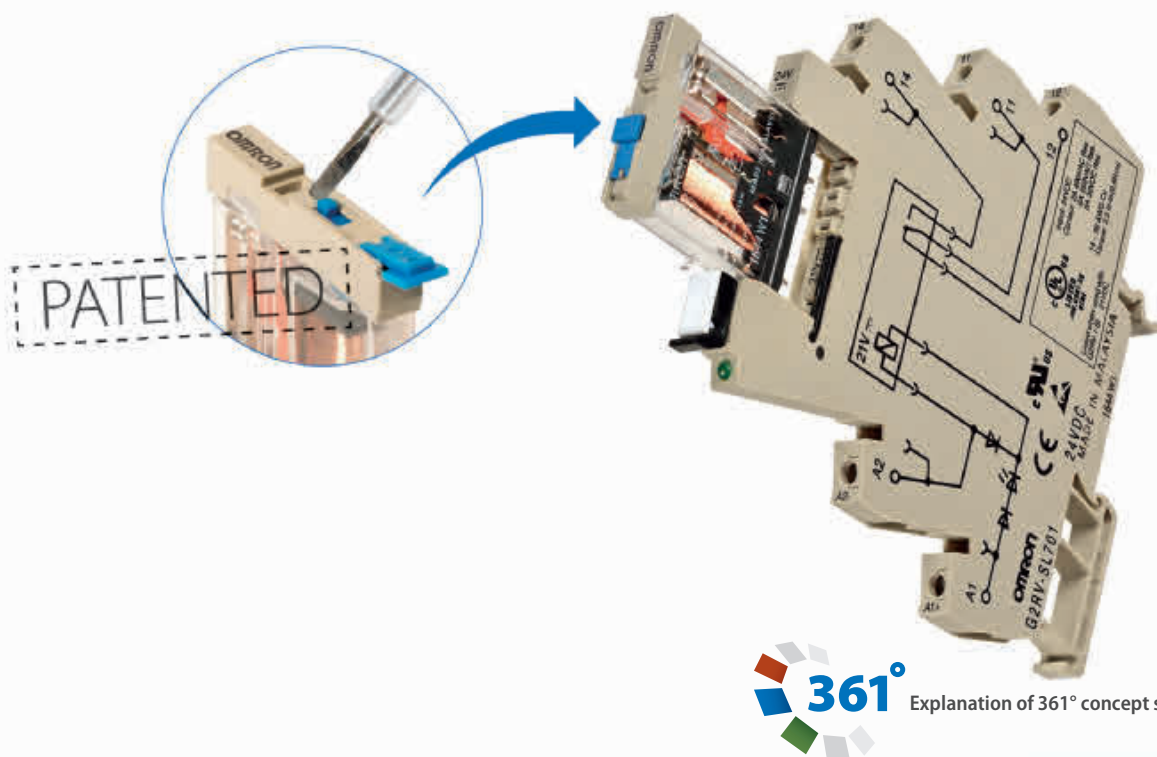
G2RV-SL□□ 1-6 mm relay with lockable test switch

At the heart of the industrial G2RV relay is a strong mechanical pin with a large contact surface that ensures reliable connection and high conductivity between the socket and relay. The patented switch design with rotating protection cover is (almost) impossible to achieve in an adapted PCB relay.

Benefits lockable test switch:

- Test panel, machine or system functionality, or simulate an actuator when one or more modules are offline or have been removed
- Rotating protection cover stops accidental operation
- See from distance that the switch is protected – eg, in a hazardous environment





Selection table

Category		Interface/Power				General purpose/Power		
		  						
Family		G2RV		G2R-_-S		MY		
Selection criteria	1-pole	■	■	■	–	–	–	–
	2-pole	–	–	–	■	■	–	–
	3-pole	–	–	–	–	–	–	–
	4-pole	–	–	–	–	–	■	■
	Contact configuration	SPDT	SPDT	SPDT	DPDT	DPDT	4PDT	4PDT bifurcated
	Contact material	AgSnIn	AgSnIn + gold plating	AgSnIn	AgSnIn	Ag	AgNi + Au	AgNi + Au
	Max. switching current	6 A	50 mA	10 A	5 A	10 A	5 A	5 A
	Min. switching current	10 mA at 5 VDC	1 mA at 100 mVDC	100 mA at 5 VDC	10 mA at 5 VDC	1 mA at 5 VDC	1 mA at 1 VDC	0.1 mA at 1 VDC
	Gold clad/plate	–	■	□	□	–	■	■
	Width max. (Relay only)	5.2 mm	5.2 mm	13.0 mm	13.0 mm	21.5 mm	21.5 mm	21.5 mm
Features	LED indication	■	■	□	□	□	□	□
	Mechanical flag	■	■	■	■	■	■	■
	Momentary testbutton	–	–	–	–	–	–	–
	Momentary/Lockable testbutton (/switch)	□	–	□	□	□	□	□
	Label	□	□	□	□	□	□	□
	Diode (DC coil)	■	■	□	□	□	□	□
	Varistor (AC coil)	–	–	–	–	–	–	–
	CR network (AC coil)	■	■	–	–	□	□	□
Wiring to socket	Screw (plate clamp)	–	–	□	□	□	□	□
	Screw (box clamp)	□	□	□	□	□	□	□
	Screw-less clamp	□	□	□	□	□	□	□
Page/Quick Link		354/R226		356/R225		358/R223		

Category		High power relays								
		  								
Family		G7J				G7L		G7Z		
Selection criteria	1-pole	–	–	–	–	■	–	–	–	–
	2-pole	–	–	–	–	–	■	–	–	–
	3-pole	–	–	–	–	–	–	–	–	–
	4-pole	■	■	■	■	–	–	■	■	■
	Contact configuration	4PST-NO	4PST-NO	3PST-NO/SPST-NC	DPST-NO/DPST-NC	SPST-NO	DPST-NO	4PST-NO	3PST-NO/SPST-NC	DPST-NO/DPST-NC
	Max. switching current	25 A	25 A	25 A	25 A	30 A	25 A	40 A	40 A	40 A
	Min. permissible load	100 mA at 24 VDC	100 mA at 24 VDC	100 mA at 24 VDC	100 mA at 24 VDC	100 mA at 5 VDC	100 mA at 5 VDC	2 A at 24 VDC	2 A at 24 VDC	2 A at 24 VDC
	Auxiliary contact block mirror contact	–	–	–	–	–	–	■	■	■
	Momentary testbutton	–	–	–	–	□	□	–	–	–
	Screw	□	□	□	□	□	□	□	□	□
Relay terminals	Quick-connect	□	□	□	□	□	□	–	–	–
	PCB terminals	□	□	□	□	□	□	–	–	–
	Screw	–	–	–	–	–	–	□	□	□
Mounting	DIN rail	–	–	–	–	–	–	□	□	□
	Clip (screw)	□	□	□	□	□	□	–	–	–
	Flange (screw)	□	□	□	□	□	□	–	–	–
	DIN rail (adapter)	–	–	–	–	□	□	–	–	–
Page/Quick Link		R233				R227		R228		

Category		General purpose/Power									
											
Family		LY					MKS		MKS(X)		
Selection criteria	1-pole	■	–	–	–	–	–	–	■	–	–
	2-pole	–	■	■	–	–	■	–	–	■	–
	3-pole	–	–	–	■	–	–	■	–	–	–
	4-pole	–	–	–	–	■	–	–	–	–	–
	Contact configuration	SPDT	DPDT	DPDT bifurcated	3PDT	4PDT	DPDT	3PDT	SPST-NO	SPST-NO/SPST-NC	–
	Contact material	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn
	Max. switching current	15 A	10 A	7 A	10 A	10 A	10 A	10 A	10 A, 220 VDC; 15 A, 250 VAC	5 A, 220 VDC; 15 A, 250 VAC	–
	Min. switching current	100 mA at 5 VDC	100 mA at 5 VDC	10 mA at 5 VDC	100 mA at 5 VDC	100 mA at 5 VDC	10 mA at 1 VDC	10 mA at 1 VDC	10 mA at 24 VDC	10 mA at 24 VDC	–
	Gold clad/plate	–	□	■	–	–	–	–	–	–	–
	Width max. (Relay only)	21.5 mm	21.5 mm	21.5 mm	31.5 mm	41.5 mm	34.5 mm	34.5 mm	34.5 mm	34.5 mm	–
Features	LED indication	□	□	□	□	□	□	□	□	□	□
	Mechanical flag	–	–	–	–	–	■	■	–	–	–
	Momentary testbutton	–	–	–	–	–	–	–	–	–	–
	Momentary/Lockable testbutton	–	–	–	–	–	□	□	□	□	–
	Label	–	–	–	–	–	□	□	–	–	–
	Diode (DC coil)	□	□	□	□	□	□	□	Optional for socket	Optional for socket	–
	Varistor (AC coil)	–	–	–	–	–	□	□	–	–	–
	CR network (AC coil)	–	□	□	–	–	–	–	–	–	–
Wiring to socket	Screw (plate clamp)	□	□	□	□	□	□	□	□	□	□
	Screw (box clamp)	–	–	–	–	–	□	□	–	–	–
	Screw-less clamp	–	–	–	–	–	–	–	–	–	–
	Page/Quick Link	360/R224					361/R235		R234		

■ Standard

□ Available

– No/not available



The only truly industrial 6 mm relay

Having been designed from first principles, instead of being adapted from a PCB relay, Omron's G2RV series is the only genuine slim industrial relay on the market. As a result, the G2RV offers a wide array of benefits to machine manufacturers and panel builders. Just 6mm wide, the relay is ideal for compact panels and equipment, yet it offers all of the durability and reliability required for industrial applications.

- Lockable test switch models available
- Large plug-in pins – excellent connection
- LED/mechanical flag – check operation
- Transparent housing – check condition
- Slim outline – space saving
- Push-in/accessories – simple wiring
- Special input type with gold plated contacts
- G3RV compatible

Ordering information

Relay	Input voltage	Order code	
		Screw terminals	Push-in terminals
Standard type without lockable test switch	12 VDC	G2RV-SL700 DC12	G2RV-SL500 DC12
	24 VDC	G2RV-SL700 DC24	G2RV-SL500 DC24
	24 VAC/VDC	G2RV-SL700 AC/DC24	G2RV-SL500 AC/DC24
	48 VAC/VDC	G2RV-SL700 AC/DC48	G2RV-SL500 AC/DC48
	110 VAC	G2RV-SL700 AC110	G2RV-SL500 AC110
	230 VAC	G2RV-SL700 AC230	G2RV-SL500 AC230
Standard type with lockable test switch	24 VDC	G2RV-SL701 DC24	G2RV-SL501 DC24
	24 VAC/VDC	G2RV-SL701 AC/DC24	G2RV-SL501 AC/DC24
Input type	12 VDC	G2RV-SL700-AP DC12	G2RV-SL500-AP DC12
	24 VDC	G2RV-SL700-AP DC24	G2RV-SL500-AP DC24
	24 VAC/VDC	G2RV-SL700-AP AC/DC24	G2RV-SL500-AP AC/DC24
	48 VAC/VDC	G2RV-SL700-AP AC/DC48	G2RV-SL500-AP AC/DC48
	110 VAC	G2RV-SL700-AP AC110	G2RV-SL500-AP AC110
	230 VAC	G2RV-SL700-AP AC230	G2RV-SL500-AP AC230

Accessories

Type	Description	Order code
Cross bar	2-pole	P2RVM-020_
Cross bar	3-pole	P2RVM-030_
Cross bar	4-pole	P2RVM-040_
Cross bar	10-pole	P2RVM-100_
Cross bar	20-pole	P2RVM-200_
PLC interface	Connect 8 relays and PLC output	P2RVC-8-O-F
PLC interface	Connect 8 relays and PLC input	P2RVC-8-I-F
Label	Plastic, for mounting on socket	R99-15 for G2RV
Label (Sticker)	Paper for mounting on socket or relay	R99-16 for G2RV
Separating plate	Provides isolation between adjacent relays to achieve 400 V isolation	P2RV-S
Relay only	Maintenance part for G2RV-SL_00-series 12 VDC	G2RV-1-S DC11
Relay only	Maintenance part for G2RV-SL_00-series 24 VDC and 24 VAC/VDC	G2RV-1-S DC21
Relay only	Maintenance part for G2RV-SL_00-series 48 VAC/VDC and 110, 230 VAC	G2RV-1-S DC48
Relay only	Maintenance part for G2RV-SL_01-series 24 VDC and 24 VAC/VDC	G2RV-1-SI SC21
Relay only	Maintenance part for G2RV-SL-AP series 12 VDC	G2RV-1-S-AP DC11
Relay only	Maintenance part for G2RV-SL-AP series 24 VDC and 24 VAC/VDC	G2RV-1-S-AP DC21
Relay only	Maintenance part for G2RV-SL-AP series 48 VAC/VDC and 110, 230 VAC	G2RV-1-S-AP DC48

Note: _ Select color: R=Red, S=Blue, B=Black

Interface cables

PLC brand	PLC type	Number of I/O	I/O type	Cable length	Order code
Omron	CJ1	32	Digital Output (MIL)	1.0 m	P2RV-4-100C
				2.0 m	P2RV-4-200C
				3.0 m	P2RV-4-300C
				5.0 m	P2RV-4-500C
			Digital Input (Fujitsu)	1.0 m	P2RV-4-100IFC
				2.0 m	P2RV-4-200IFC
				3.0 m	P2RV-4-300IFC
				5.0 m	P2RV-4-500IFC
			Digital Input (MIL)	1.0 m	P2RV-4-100IMC
				2.0 m	P2RV-4-200IMC
				3.0 m	P2RV-4-300IMC
				5.0 m	P2RV-4-500IMC
	GRT1 SmartSlice	8	Digital Output	0.5 m	P2RV-A050C-OMR GRT1
				1.0 m	P2RV-A100C-OMR GRT1
			Digital Input	0.5 m	P2RV-A050IC-OMR GRT1
				1.0 m	P2RV-A100IC-OMR GRT1
	NX	8	Digital Output	0.5 m	P2RV-A050C-OMR NX
				1.0 m	P2RV-A100C-OMR NX
			Digital Input	0.5 m	P2RV-A050IC-OMR NX
				1.0 m	P2RV-A100IC-OMR NX
Siemens	S7/300	32	Digital Input and Digital Output	2.0 m	P2RV-200C-SIM S7/300
				2.5 m	P2RV-250C-SIM S7/300
				3.0 m	P2RV-300C-SIM S7/300
				5.0 m	P2RV-500C-SIM S7/300
	S7/400	32	Digital Input and Digital Output	2.0 m	P2RV-200C-SIM S7/400
				2.5 m	P2RV-250C-SIM S7/400
				3.0 m	P2RV-300C-SIM S7/400
				5.0 m	P2RV-500C-SIM S7/400
Multi purpose (flying leads)	All	8	Digital Input and Digital Output	1.0 m	P2RV-A100C
				2.0 m	P2RV-A200C
				3.0 m	P2RV-A300C
				5.0 m	P2RV-A500C

Specifications

Coil ratings

Item	Standard type	Input type ^{*1}
Contact form	SPDT	
Input voltage	12, 24 VDC, 24, 48 VAC/VDC, 110, 230 VAC	
Rated load	6 A at 250 VAC 6 A at 30 VDC	50 mA at 30 VAC 50 mA at 36 VDC
Max. switching voltage	400 VAC, 125 VDC	30 VAC, 36 VDC
Max. switching current	6 A	50 mA
Max. switching power	1,500 VA/180 W (resistive load)	
Min. permissible load	10 mA at 5 VDC	1 mA at 100 mVDC
Mechanical durability	5 Million operations min.	
Electrical durability (rated load)	100 K operations (typical)	5 Million operations min.
Dielectric strength	4,000 VAC, 50/60 Hz for 1 min between coil and contacts; 1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity	
Ambient temperature	-40 to 55°C	
Approved standards	UL, IEC/VDE, Lloyd's, and CE marking	
Size in mm (H×W×D)	92.7×106.3×6.2 (push-in type) 97.4×106.3×6.2 (screw type)	

^{*1} If a gold layer is destroyed, contact ratings of standard type are applicable



Plug-in relay with enhanced features covers a wide range of applications

G2RS series, which comes as standard with a mechanical indicator and nameplate covering a wide range of interface applications.

Optionally available with gold clad contacts and diode, whilst the socket and crossbar range offer maximum flexibility during installation.

- SPDT type 10A / DPDT type 5 A
- Mechanical Flag, LED indicator and momentary / lockable testbutton optional
- Transparent housing
- Screwless clamp terminal sockets available
- Space saving – 16 mm width (including sockets)

Ordering information

Contact form	Diode	LED indicator	Test button	Gold clad 3 μm	Order code			
					(___ = coil voltage + AC/DC)	Common coil voltages *1		
						DC	AC	
SPDT (1-pole)	no	no	no	no	G2R-1-S___ (S)	24	230	
		yes			G2R-1-SN___ (S)	12, 24	24, 110, 230	
			yes		G2R-1-SNI___ (S)	12, 24	12, 24, 110, 230	
			yes	G2R-1-SNI-AP3___ (S)	–	230		
	yes		no	no	G2R-1-SND___ (S)	12, 24	–	
		yes			G2R-1-SNDI___ (S)	24	–	
DPDT (2-pole)	no	no	no	no	G2R-2-S___ (S)	24	24, 110, 240	
		yes			G2R-2-SN___ (S)	12, 24, 48	24, 110, 230	
			yes		G2R-2-SN-AP3___ (S)	24	–	
		yes	no		G2R-2-SNI___ (S)	12, 24	12, 24, 110, 230	
			yes		G2R-2-SNI-AP3___ (S)	–	230	
	yes	no	no	no	G2R-2-SD___ (S)	–	–	
		yes			G2R-2-SND___ (S)	12, 24	–	
			yes		G2R-2-SND-AP3___ (S)	24	–	
			yes	no		G2R-2-SNDI___ (S)	12, 24	–
				yes		G2R-2-SNDI-AP3___ (S)	24	–

^{*1} Other coil voltages available. Please see specifications.

Sockets & accessories

For type	Order code									
	DIN rail									
	Screwless clamp					Screw (plate clamp)		Screw (box clamp)		
	Socket	Clip	Cross bar AC type	Cross bar DC type	Name plate	Socket	Socket	Clip	Name plate	Socket
G2R-1-S	P2RF-05-S	P2CM-S	P2RM-SR	P2RM-SB	R99-11	P2RF-05-E	P2RF-05-ESS	P2CM-ESS	PYC-TR	P2R-05P
G2R-2-S	P2RF-08-S	P2CM-S	P2RM-SR	P2RM-SB	R99-11	P2RF-08-E	P2RF-08-ESS	P2CM-ESS	PYC-TR	P2R-08P

Specifications

Coil ratings

Rated voltage		Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
		% of rated voltage			
AC	24 V, 110 V, 120 V, 230 V, 240 V	80% max.	30% max.	110%	0.9 VA (60 Hz)
DC	6 V, 12 V, 24 V, 48 V	70% max.	15% max.	110%	0.53 W

Contact ratings

Number of poles	1-pole		2-pole	
Load	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)
Rated load	10 A at 250 VAC 10 A at 30 VDC	7.5 A at 250 VAC 5 A at 30 VDC	5 A at 250 VAC 5 A at 30 VDC	2 A at 250 VAC 3 A at 30 VDC
Rated carry current	10 A		5 A	
Max. switching voltage	440 VAC, 125 VDC		380 VAC, 125 VDC	
Max. switching current	10 A		5 A	
Max. switching power	2,500 VA, 300 W	1,875 VA, 150 W	1,250 VA, 150 W	500 VA, 90 W
Failure rate (reference value)	100 mA at 5 VDC		10 mA at 5 VDC	
Mechanical life	AC: 10,000,000 operations min., DC: 20,000,000 operations min.			
Electrical life	100,000 operations min.			

Technical data

Item	1-pole	2-pole
Contact material	AgSnIn	
Operating time	15 ms max.	15 ms max.
Release time	AC: 10 ms max., DC: 5 ms max.	AC: 15 ms max., DC: 10 ms max.
Dielectric strength	5,000 VAC (coil-contact)	5,000 VAC (coil-contact)
Ambient temperature	Operating: -40 to 70°C (no icing or condensation)	
Size in mm (H×W×D)	35.5×13×29	



Versatile plug-in relay that sets the standard

Over 1 billion pieces of this mini power relay have been manufactured since its introduction and have successfully been used in many different applications. Bifurcated contacts are optionally available to achieve reliable low current switching during the entire electrical life. Full range of sockets covering mounting by screw, box clamp and screw-less clamp method.

- DPDT type 10 A / 4PDT type 5 A
- Mechanical flag, LED indicator and momentary / lockable testbutton optional
- Transparent housing
- Low power switching (1 mA at 5 VDC) / Bifurcated 4PDT (0.1 mA at 1 VDC)
- Screw-less clamp terminal sockets available

Ordering information

Contact form	Diode	LED indicator	Lockable test button	Order code (___ = coil voltage + AC/DC)				Common coil voltages *1	
								DC	AC
DPDT	no	no	no	MY2___ (S)	—	12, 24	12, 24, 48/50, 110/120, 220/240		
DPDT		yes		MY2N___ (S)	—	12, 24	24, 110/120, 220/240		
DPDT	yes			MY2N-D2___ (S)	—	24	—		
DPDT	no		yes	MY2IN___ (S)	—	12, 24, 48	12, 24, 110/120, 220/240		
DPDT				—	MY2IN1___ (S)	12, 24	—		
DPDT	yes			MY2IN-D2___ (S)	—	24	—		
DPDT				—	MY2IN1-D2___ (S)	24	—		
4PDT	no	no	no	MY4___ (S)	—	12, 24, 48, 100/110, 125	12, 24, 48/50, 110/120, 220/240		
4PDT		yes		MY4N___ (S)	—	12, 24, 48, 100/110	24, 110/120, 220/240		
4PDT	yes			MY4N-D2___ (S)	—	12, 24	—		
4PDT	no		yes	MY4IN___ (S)	—	12, 24, 48	12, 24, 48/50, 110/120, 220/240		
4PDT				—	MY4IN1___ (S)	12, 24, 48	—		
4PDT	yes			MY4IN-D2___ (S)	—	24	—		
4PDT				—	MY4IN1-D2___ (S)	24, 48	—		

*1 Other coil voltages available. Please see specifications.

- Note**
- MY4 also available with bifurcated contacts => example MY4Z
 - MY2 and MY4 AC 110/120, 220/240 types also available with suppression => example MY4N-CR

Sockets & accessories

Input terminals separated from output terminals

	Order code					Box clamp			
	Screw-less clamp								
For type	Socket	Clip	Cross bar AC type	Cross bar DC type	Name plate	Socket	Metal spring clip	Plastic holding clip	Label
MY2	PYF08S	PYCM-08S	PYDM-08SR	PYDM-08SB	R99-11	PYF14-ESS	PYC-0	PYC-35	PYCTR1
MY4	PYF14S	PYCM-14S	PYDM-14SR	PYDM-14SB	R99-11	PYF14-ESS	PYC-0	PYC-35	PYCTR1

Combined input/output terminals

Order code	Order code			Box clamp			
	Screw terminal						
	Socket	Clip (set = 2 pcs)	Clip for MY2IN (set = 2 pcs)	Socket	Metal spring clip	Plastic holding clip	Label
MY2	PYF08A-N	PYC-A1	PYC-E1	PYF14-ESN	PYC-0	PYC-35	PYCTR1
MY4	PYF14A-N	PYC-A1		PYF14-ESN	PYC-0	PYC-35	PYCTR1

Specifications

Coil ratings

Rated voltage	Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
	% of rated voltage			
AC 6 V, 12 V, 24 V, 48/50 V 110/120 V, 220/240 V	80% max		110%	1.0 to 1.2 VA (60 Hz)
				0.9 to 1.1 VA (60 Hz)
DC 6 V, 12 V, 24 V, 48 V, 100/110 V	10% min.			0.9 W

Contact ratings

Item	2-pole		4-pole		4-pole (bifurcated)	
	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)
Rated load	5 A at 250 VAC	2 A at 250 VAC	3 A at 250 VAC	0.8 A at 250 VAC	3 A at 250 VAC	0.8 A at 250 VAC
	5 A at 30 VDC	2 A at 30 VDC	3 A at 30 VDC	1.5 A at 30 VDC	3 A at 30 VDC	1.5 A at 30 VDC
Rated carry current	10 A		5 A			
Max. switching voltage	250 VAC, 125 VDC		250 VAC, 125 VDC			
Max. switching current	10 A		5 A			
Max. switching power	2,500 VA, 300 W	1,250 VA, 300 W	1,250 VA, 150 W	500 VA, 150 W	1,250 VA, 150 W	500 VA, 150 W
Failure rate (reference value)	5 VDC at 1 mA		1 VDC at 1 mA		1 VDC at 100 µA	
Mechanical life	AC: 50,000,000 operations min., DC: 100,000,000 operations min.					20,000,000 operations min.
Electrical life	500,000 operations min.		200,000 operations min.		100,000 operations min.	

Technical data

Item	2-pole	4-pole
Contact Material:	Ag	AgNi + Au
Operating time	20 ms max.	
Release time	20 ms max.	
Dielectric strength	2,000 VAC	
Ambient temperature	Operating: -55 to 70°C (no icing)	
Size in mm (H×W×D)	28×21.5×36	

Dimension relay + socket

Type	Size in mm (H×W×D)
PYF08S + MYS	90×23.2×38.2
PYF08A-E + MYS	76×23×31
PYF08A-N + MYS	73×22×30
PYF14S + MYS	89.2×31×36.5
PYF14A-E + MYS	76×29.5×31
PYF14A-N + MYS	73×29.5×30
PYF14-ESN + MYS	82×27×80 (incl. plastic holding clip PYC-35)
PYF14-ESS + MYS	83×27×82 (inc. plastic holding clip PYC-35)



Miniature 15 A power relay

LY-series comes in SPDT, DPDT, 3PDT and 4PDT types covering depending on the number of poles 10 or even 15A rated load. Bifurcated contacts available for DPDT configuration only, whilst the optional Diodes for DC and CR circuit for AC coils are available for all plug-in types.

- SPDT type 15 A / DPDT, 3PDT and 4PDT type 10 A
- Led indicator optional
- Transparent housing
- Suppression by optional Built-in Diodes (DC only) or CR network (AC-types)
- DIN rail mounting by socket. PCB and Flange mounting available

Ordering information

Contact form	LED indicator	Diode	Terminals			Order code ^{*1} (___ = coil voltage + AC/DC)	Common coil voltages ^{*2}	
			Plug-in/solder	PCB	Upper-mounting plug-in/solder		DC	AC
SPDT (1 pole)	no	no	yes	no	no	LY1___	24	–
SPDT (1 pole)	yes	yes				LY1N-D2___	24	–
DPDT (2 pole)	no	no				LY2___	12, 24, 100/110	24, 100/110, 110/120, 220/240
DPDT (2 pole)			no		yes	LY2F___	–	220/240
DPDT (2 pole)	yes	yes	yes		no	LY2N-D2___	24	–
3PDT (3 pole)	no	no				LY3___	24	–
4PDT (4 pole)						LY4___	12, 24, 100/110, 125	24, 100/110, 230
4PDT (4 pole)	yes	yes				LY4N-D2___	24	–

^{*1} For other options like CR suppression, please see specifications.

^{*2} Other coil voltages available. Please see specifications.

Sockets & accessories

	Order code			
	DIN rail		PCB	
	Screw		Soldering	
For type	Socket	Clip (set = 2 pcs)	Socket	Clip (set = 2 pcs.)
LY1/LY2	PTF08A-E	PYC-A1	PT08-0	PYC-P
LY2 CR-type	PTF08A-E	Y92H-3	PT08-0	PYC-1
LY3	PTF11A-E	PYC-A1	PT11-0	PYC-P
LY4	PTF14A-E	PYC-A1	PT14-0	PYC-P

Dimension relay & socket

Type	Size in mm (H×W×D)
PTF08A-E + LY	78.5×28.5×71
PTF11A-E + LY	78.5×37×71
PTF14A-E + LY	78.5×45.5×71

Specifications

Coil ratings

Poles	Rated voltage		Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
1 or 2	AC	6 V, 12 V, 24 V, 50 V	80% max.	30% min.	110%	1.0 to 1.2 VA (60 Hz)
		100/110 V, 110/120 V, 200/220 V, 220/240 V				0.9 to 1 VA (60 Hz)
	DC	6 V, 12 V, 24 V, 48 V, 100/110 V				0.9 W
3	AC	6 V, 12 V, 24 V, 50 V, 100/110 V, 200/220 V	80% max.	30% min.	110%	1.6 to 2.0 VA (60 Hz)
	DC	6 V, 12 V, 24 V, 48 V, 100/110 V				1.4 W
4	AC	6 V, 12 V, 24 V, 50 V, 100/110 V, 200/220 V	80% max.	30% min.	110%	1.95 to 2.5 VA (60 Hz)
	DC	6 V, 12 V, 24 V, 48 V, 100/110 V				1.5 W

Technical data

Contact material	AgSnIn
Operating time	25 ms max.
Release time	25 ms max.
Dielectric strength	1,000 VAC
Ambient temperature ^{*1}	–25 to 70°C

^{*1} See datasheet for more details.

Contact ratings

Relay	Single contact 1-pole		Single contact 2-, 3- or 4-pole		Bifurcated contacts 2-pole	
Load	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)	Resistive load (cosφ = 1)	Inductive load (cosφ = 0.4; L/R = 7)
Rated load	110 VAC at 15 A	110 VAC at 10 A	110 VAC at 10 A	110 VAC at 7.5 A	110 VAC at 5 A	110 VAC at 4 A
	24 VDC at 15 A	24 VDC at 7 A	24 VDC at 10 A	24 VDC at 5 A	24 VDC at 5 A	24 VDC at 4 A
Rated carry current	15 A		10 A		7 A	
Max. switching voltage	250 VAC, 125 VDC		250 VAC, 125 VDC		250 VAC, 125 VDC	
Max. switching current	15 A		10 A		7 A	
Max. switching power	1,700 VA	1,100 VA	1,100 VA	825 VA	550 VA	440 VA
	360 W	170 W	240 W	120 W	120 W	100 W
Failure rate (reference value)	100 mA at 5 VDC		100 mA at 5 VDC		10 mA at 5 VDC	
Mechanical life	AC: 50,000,000 operations min., DC: 100,000,000 operations min.					
Electrical life	1-, 3-, 4-pole: 200,000 operations min., 2-pole: 500,000 operations min.					



Exceptionally reliable general purpose relay with 8 or 11 plug-in pins for round sockets

MK relay breaks compared to its size relatively large currents. The AgSnIn contacts ensure long electrical lifetime (min. 100,000 operations). Wide switching range from 10 mA at 1 VDC upto 10 A at 250 VAC.

- 8-pin DPDT and 11-pin 3PDT contact types
- Switching current up to 10 A
- Lockable test button for easy testing
- Temperature rating from -40°C up to 60°C

Ordering information

Contact form	Mechanical indicator & lockable test button	LED indicator	Diode	Order code *1 (___ = coil voltage + AC/DC)	Common coil voltages *2	
					DC	AC
DPDT (2-pole)	yes	no	no	MKS2PI	12, 24, 110	24, 110, 230
		yes		MKS2PIN	24	24, 230
3PDT (3-pole)		no	yes	MKS3PI-5	12, 24, 48, 110	12, 24, 110, 230
				MKS3PI-D-5	24	N/A
		yes	no	MKS3PIN-5	12, 24	24, 110, 230
		yes	MKS3PIN-D-5	24	N/A	

^{*1} Many various terminal arrangements possible, please see specifications.

^{*2} Other coil voltages available. Please see specifications.

Sockets & accessories

For type	Order code			
	DIN rail			
	Screw		Box clamp	
	Socket	Clip (set= 2 pcs.)	Socket	
MKS2	PF083A-E	PFC-A1	–	PF083A-D
MKS3	PF113A-E	PFC-A1	PF113A-N	PF113A-D

Specifications

Coil ratings

Rated voltage		Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
		% of rated voltage			
AC	6 V, 12 V, 24 V, 100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V	80% max.	30% min.	110%	2.3 VA (60 Hz)
DC	6 V, 12 V, 24 V, 48 V, 100 V, 110 V		15% min.		1.4 W

Contact ratings

Load	2- or 3-pole	
	Resistive load ($\cos\phi = 1$)	Inductive load ($\cos\phi = 0.4$; L/R = 7)
Contact material	AgSnIn	
Rated load	NO: 10 A at 250 VAC NC: 5 A at 30 VDC	7 A at 250 VAC
Rated carry current	10 A	
Max. switching voltage	250 VAC, 250 VDC	
Max. switching current	10 A	
Max. switching power	2,500 VA/ 300 W	1,250 VA/150 W
Mechanical life	5,000,000 operations min.	
Electrical life	100,000 operations min.	

Technical data

Operating time	AC: 20 ms max., DC: 30 ms max.
Release time	20 ms max. (40 ms max. for built-in Diode relays)
Dielectric strength	2,500 VAC (coil-contact)
Ambient temperature	Operating: -40 to 60°C (with no icing or condensation)
Size in mm (H×W×D)	34.5×34.5×53.3

Dimension relay & socket

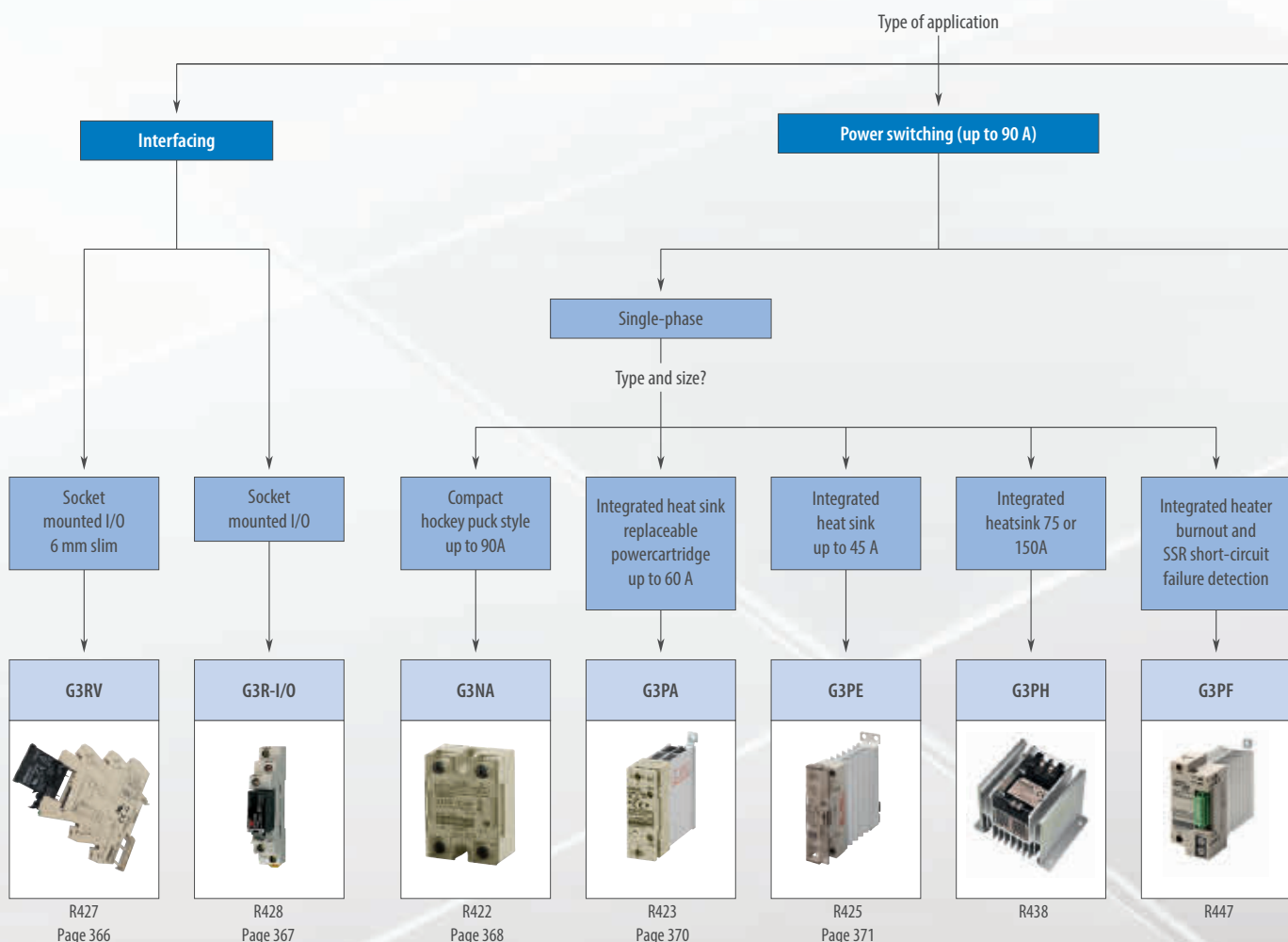
Type	Size in mm (H×W×D)
PF083A-E + MKS	56×41×77.8 (incl. clip)
PF113A-E + MKS	56×42.8×87.8 (incl. clip)
PF___A-D + MKS	65×38×80.3

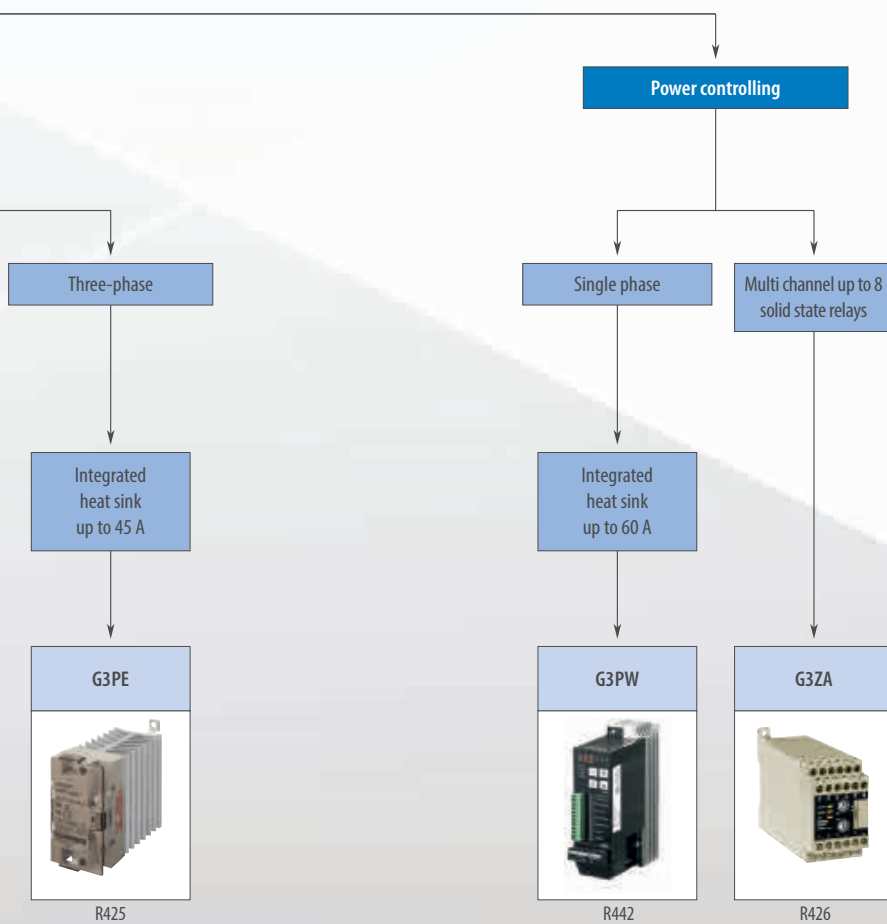
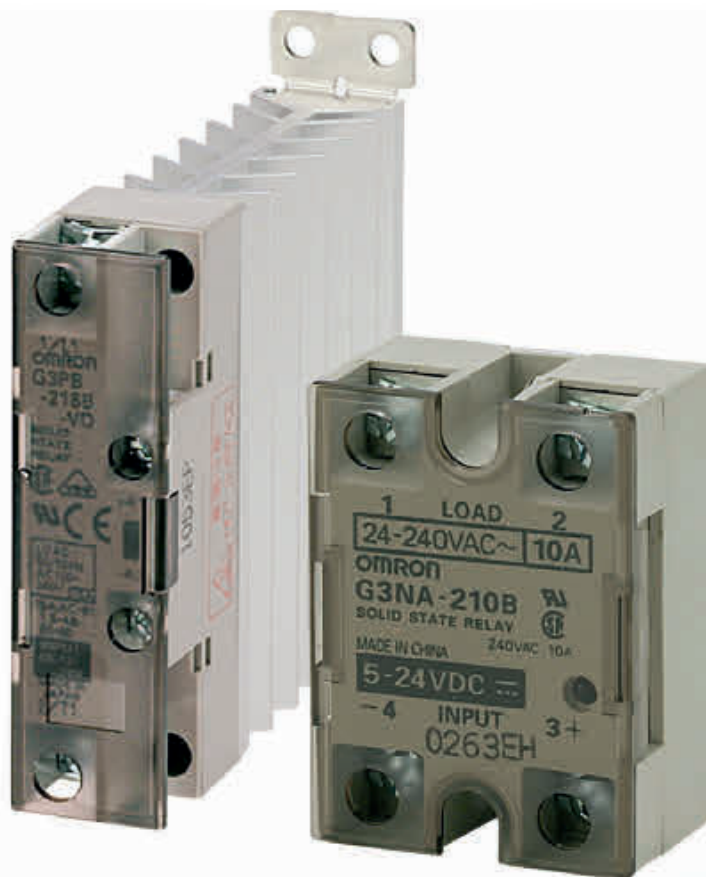
COMPACT SOLID STATE RELAYS

G3_ series – Reliable interfacing and power switching

With a wide variety of output currents and voltages, our control-panel mounted types of power switching SSRs are available with (G3PE & G3PH) and without (G3NA) built-in heat-sink. The compact SSRs for I/O Interfacing G3RV & G3R offer high-speed models (G3R).

- Industrial 6 mm 'slim' SSR which is G2RV compatible (G3RV)
- G2RS compatible high-speed interface solutions (G3R-I/O)
- G3NA with 5-90 A output current, G3PB up to 45 A
- Output voltages up to 480 VAC / 200 VDC available on G3NA
- Effectively absorbing of external surge thanks to the built-in varistor





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Selection table

Category		Control panel mounting type			
					
Model		G3RV	G3R-I/O	G3NA	G3PA
Selection criteria	Type of load	Output module (interface)	Input Module (interface)	Output Module (interface)	Normal resistive heaters Motor control
	1-phase control	—	—	—	■
	2-phase control	—	—	—	—
	3-phase control	—	—	—	—
	Function	Signal switching	Signal switching	Signal switching	Heater control, motor control
	Max. current rating	2 A (AC); 3 A (DC)	100 mA	2 A	90 A
Load voltage/ current [VAC]	24 to 240	—	—	—	■
	100 to 240	■	—	■	—
	200 to 480	—	—	—	■
Load voltage/ current [VDC]	5 to 200	3 to 26.4	4 to 32	■	—
Input voltages [VDC or VAC]	5 to 24 VDC	—	■	■	■
	12 to 24 VDC	12 VDC ±10%; 24 VDC ±10%	■	—	■
	24 VAC	■ 24 VAC/DC ±10%	—	—	■
	100 to 120 VAC	■ 110 VAC ±10%	■	■	—
	200 to 240 VAC	■ 230 VAC ±10%	■	■	—
	Analog input	—	—	—	—
Features	Built-in heat sink	—	—	—	■
	Zero-cross	□	—	□	■
	Built-in varistor	—	—	—	■
	LED operation indicator	■	■	■	■
	Protective cover	NA	NA	NA	■
	3-phase loads via 3 single-phase SSRs	NA	NA	NA	■
	Replaceable power cartridge	—	—	—	■
	Alarm output	NA	NA	NA	—
	Built-in failure detection	NA	NA	NA	—
	SSR open circuits detection	NA	NA	NA	—
	SSR short circuits detection	NA	NA	NA	—
Mounting	DIN-rail	■	—	■	■
	Screw	—	—	■	■
	Mounting socket	■	■	—	—
Page/Quick Link		366/R427	367/R428	368/R422	370/R423

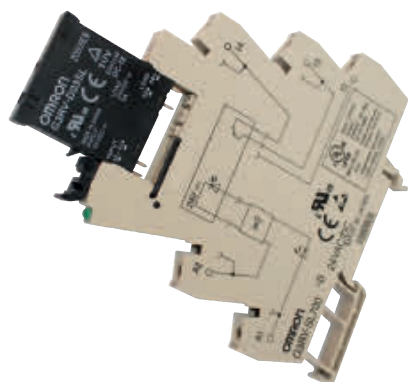
Control panel mounting type				Power regulator	
					
G3PE	G3PE	G3PH	G3PF	G3PW	G3ZA
Normal resistive heaters	Normal resistive heaters	Normal resistive & lamp heaters	Normal resistors	Alloy heater Pure metal heater, nonmetal heater (Constant-current models recommended.)	Depends on the SSR used Distributes loop/control output levels (mV%) to SSRs
■	–	■	■	■	Depends on the SSR used
–	■	–	–	–	Depends on the SSR used
–	■	–	–	–	Depends on the SSR used
Heater control	Heater control	(Lamp) heater control	Heater control and diagnostics	Single-phase power control	Intelligent power control
45 A	45 A	150 A	35 A	60 A	Depends on the SSR used
–	–	–	–	–	–
■	■	■	■	■	■
■	■	■ (180 to 480)	■	–	■ 400 to 480
–	–	–	–	–	–
–	–	■	–	–	–
■	■	–	■	–	–
–	–	–	–	–	–
–	–	■ (100 to 240 VAC)	–	–	–
–	–	■ (100 to 240 VAC)	–	–	–
–	–	–	–	4 to 20 mA DC, 1 to 5 VDC	–
■	□	■	■	■	–
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371/R425		R438	R447	R442	R426

■ Standard

□ Available

– No/not available

NA Not applicable



Industrial 6 mm “slim” SSR which is G2RV compatible

As well as being slim and thus saving panel space, G3RV relays are very strong, have a large contact area and non-bendable pins. Connection to a PLC is easy and achieved faultlessly in a few seconds via click connectors. In addition, power switching in G3RV relays with DC outputs is managed by a MOSFET in the output, which has ideal heat dissipation characteristics.

- G2RV compatible
- LED indicator built in SSR
- Push-in terminals and accessories for easy wiring

Ordering information

Zero cross function	Input Rated voltage (operating voltage)	Rated current			Must operate voltage	Must release voltage	Output			Type of connection	Order code
		AC		DC			Rated load voltage (load voltage range)	Load current	Inrush current		
		50 Hz	60Hz								
-	24 VAC/DC (21.6 to 26.4 VAC/DC)	10.7 mA	11.1 mA	4.3 mA	21.6 V	1 V	5 to 24 VDC (3 to 26.4 VDC)	100 µA to 3 A	30 A (60 Hz, 1 cycle)	Screw	G3RV-SL700-D AC/DC24
-	24 VAC/DC (21.6 to 26.4 VAC/DC)	10.7 mA	11.1 mA	4.3 mA	21.6 V	1 V	5 to 24 VDC (3 to 26.4 VDC)	100 µA to 3 A	30 A (60 Hz, 1 cycle)	Push-in	G3RV-SL500-D AC/DC24
Yes	24 VAC/DC (21.6 to 26.4 VAC/DC)	20 mA	21 mA	11 mA	21.6 V	1 V	100 to 240 VAC (75 to 264 VAC)	0.1 A to 2 A	30 A (60 Hz, 1 cycle)	Screw	G3RV-SL700-A AC/DC24
Yes	24 VAC/DC (21.6 to 26.4 VAC/DC)	20 mA	21 mA	11 mA	21.6 V	1 V	100 to 240 VAC (75 to 264 VAC)	0.1 A to 2 A	30 A (60 Hz, 1 cycle)	Push-in	G3RV-SL500-A AC/DC24
-	230 VAC (207 to 253 VAC)	6.8 mA	8.1 mA	-	207 V	1 V	5 to 24 VDC (3 to 26.4 VDC)	100 µA to 3 A	30 A (60 Hz, 1 cycle)	Screw	G3RV-SL700-D AC230
-	230 VAC (207 to 253 VAC)	6.8 mA	8.1 mA	-	207 V	1 V	5 to 24 VDC (3 to 26.4 VDC)	100 µA to 3 A	30 A (60 Hz, 1 cycle)	Push-in	G3RV-SL500-D AC230

Note: Ratings at an ambient temperature of 25°C

Accessories

Type	Description	Order code
Cross bar	2-pole	P2RVM-020_
Cross bar	3-pole	P2RVM-030_
Cross bar	4-pole	P2RVM-040_
Cross bar	10-pole	P2RVM-100_
Cross bar	20-pole	P2RVM-200_
PLC interface	Connect 8 relays and PLC output	P2RVC-8-O-F
Label	Plastic, for mounting on socket	R99-15 for G2RV
Label (Sticker)	Paper for mounting on socket or relay	R99-16 for G2RV
Separating plate	Provides isolation between adjacent relays to achieve 400 V isolation	P2RV-S

Note: _ Select color: R=Red, S=Blue, B=Black

Specifications

Order code		G3RV-SL700/500-A	G3RV-SL700/500-D
Isolation		Triac	Mosfet
Output ON voltage drop		1.6 V rms max.	0.9 V max.
Leakage current		5 mA max. (at 200 VAC 50/60 Hz)	10 µA max. (at 24 VDC)
Operating indicator		Yes	
Ambient temperature	Storage	-30~+100°C (with no icing or condensation)	
	Operating	-30~+55°C (with no icing or condensation)	



Compact SSR for I/O interface with high dielectric strength requirements

High-speed models with optimum input ratings for a variety of sensors are available, as well as input and output modules that can be used instead of the G2RS. Use a coupler conforming to VDE 0884 and assuring an I/O dielectric strength of 4,000V.

- 1.5 and 2A output current
- 5 to 200VDC/100 to 240VAC output voltages
- Compatible with G2RS electromechanical relays
- DIN-rail mounting via sockets
- Operation indicator to confirm input

Ordering information

Input module

Response speed	Input	Input current	Must operate voltage	Must release voltage	Output	Logic level supply current	Size in mm (HxWxD)	Order code
–	Rated voltage (operating voltage) 100 to 240 VAC (60 to 264 VAC)	15 mA max.	60 VAC max.	20 VAC min.	4 to 32 VDC	0.1 to 100 mA	29x13x28 (90.5x16x61 in combination with P2RF-05-E mounting socket)	G3R-IAZR1SN-UTU
High-speed (1 kHz)	5 VDC (4 to 6 VDC)	8 mA max.	4 VDC max.	1 VDC min.				G3R-IDZR1SN-UTU
	12 to 24 VDC (6.6 to 32 VDC)		6.6 VDC max.	3.6 VDC min.				
Low-speed (10 Hz)	5 VDC (4 to 6 VDC)	8 mA max.	4 VDC max.	1 VDC min.				G3R-IDZR1SN-1-UTU
	12 to 24 VDC (6.6 to 32 VDC)		6.6 VDC max.	3.6 VDC min.				

Note: Ratings at an ambient temperature of 25°C

Output module

Zero cross function	Input				Output						
	Rated voltage (operating voltage)	Input current	Must operate voltage	Must release voltage	Rated load voltage (load voltage range)	Load current* ¹	Inrush current	Size in mm (HxWxD)	Order code		
Yes	5 to 24 VDC (4 to 32 VDC)	15 mA max.	4 VDC max.	1 VDC min.	100 to 240 VAC (75 to 264 VAC)	0.05 to 2 A	30 A (60 Hz, 1 cycle)	29x13x28 (90.5x16x61 in combination with P2RF-05-E mounting socket)	G3R-OA202SZN-UTU		
No										G3R-OA202SLN-UTU	
–		8 mA max.					5 to 48 VDC (4 to 60 VDC)		0.01 to 2 A	8 A (10 ms)	G3R-ODX02SN-UTU
–							48 to 200 VDC (40 to 200 VDC)		0.01 to 1.5 A	8 A (10 ms)	G3R-OD201SN-UTU

Note: Ratings at an ambient temperature of 25°C

*1 The minimum current value is measured at 10°C min.

Socket & accessories

Order code						
DIN rail					PCB	
Screwless clamp					Screw	Soldering
Socket	Clip	Cross bar AC type	Cross bar DC type	Name plate	Socket	Socket
P2RF-05-S	P2CM-S	P2RM-SR	P2RM-SB	R99-11	P2RF-05-E	P2R-05P

Specifications

	Input module			Output module			
Order code	G3R-IAZR1SN-UTU	G3R-IDZR1SN-UTU	G3R-IDZR1SN-1-UTU	G3R-OA202SZN-UTU	G3R-OA202SLN-UTU	G3R-ODX02SN-UTU	G3R-OD201SN-UTU
Isolation	Photocoupler			Phototriac		Photocoupler	
Operate time	20 ms max.	0.1 ms max.	15 ms max.	1/2 of load power source cycle + 1 ms max.	1 ms max.	1 ms max.	1 ms max.
Release time	20 ms max.	0.1 ms max.	15 ms max.	1/2 of load power source cycle + 1 ms max.		2 ms max.	2 ms max.
Response frequency	10 Hz	1 kHz	10 Hz	20 Hz	20 Hz	100 Hz	100 Hz
Output ON voltage drop	1.6 V max.	1.6 V max.	1.6 V max.	1.6 V max.	1.6 V max.	1.6 V max.	2.5 V max.
Leakage current	5 µA max.	5 µA max.	5 µA max.	1.5 mA max.	1.5 mA max.	1 mA max.	1 mA max.
Operation indicator	Yes						
Ambient temperature	Operating: -30 to 80°C (with no icing)						



Hockey puck style SSR with 5-90 A output currents

All models feature the same compact dimensions to provide a uniform mounting pitch. A built-in varistor effectively absorbs external surges. The operation indicator enables monitoring operation.

- 5-90 A output current
- 24-480 VAC/5-200VDC output voltages
- Built-in varistor
- Operation indicator (red LED)
- Protective cover for greater safety

Ordering information

Applicable output load		Zero cross function	Isolation	Rated input voltage	Must operate voltage	Must release voltage	Load current with/without heatsink at 40 °C	Size in mm (H×W×D)	Order code	
24 to 240 VAC	5 A	Yes	Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 5 A/0.1 to 3 A	58×43×27	G3NA-205B-UTU DC5-24	
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.			G3NA-205B-UTU AC100-120	
				200 to 240 VAC	150 VAC max.	40 VAC min.			G3NA-205B-UTU AC200-240	
	10 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 10 A/0.1 to 4 A	58×43×27	G3NA-210B-UTU DC5-24	
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.			G3NA-210B-UTU AC100-120	
				200 to 240 VAC	150 VAC max.	40 VAC min.			G3NA-210B-UTU AC200-240	
	20 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 20 A/0.1 to 4 A	58×43×27	G3NA-220B-UTU DC5-24	
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.			G3NA-220B-UTU AC100-120	
				200 to 240 VAC	150 VAC max.	40 VAC min.			G3NA-220B-UTU AC200-240	
	40 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 40 A/0.1 to 6 A	58×43×27	G3NA-240B-UTU DC5-24	
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.			G3NA-240B-UTU AC100-120	
				200 to 240 VAC	150 VAC max.	40 VAC min.			G3NA-240B-UTU AC200-240	
	50 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 50 A/0.1 to 6 A	58×43×27	G3NA-250B-UTU DC5-24	
			Photocoupler	100 to 120 VAC	75 VAC max.	20 VAC min.			G3NA-250B-UTU AC100-120	
				200 to 240 VAC	150 VAC max.	40 VAC min.			G3NA-250B-UTU AC200-240	
	75 A		Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	1 to 75 A/1 to 7 A	58×43×30	G3NA-275B-UTU-2 DC5-24	
			Photocoupler	100 to 240 VAC	75 VAC max.	20 VAC min.			G3NA-275B-UTU-2 AC100-240	
			90 A	Phototriac	5 to 24 VDC	4 VDC max.	1 VDC min.	1 to 90 A/1 to 7 A	58×43×30	G3NA-290B-UTU-2 DC5-24
	Photocoupler			100 to 240 VAC	75 VAC max.	20 VAC min.	G3NA-290B-UTU-2 AC100-240			
5 to 200 VDC	10 A	No	Photocoupler	5 to 24 VDC	4 VDC max.	1 VDC min.	0.1 to 10 A/0.1 to 4 A	58×43×27	G3NA-D210B-UTU DC5-24	
200 to 480 VAC	10 A	Yes		100 to 240 VAC	75 VAC max.	20 VAC min.	0.2 to 10 A/0.2 to 4 A	58×43×27	G3NA-D210B-UTU AC100-240	
				5 to 24 VDC	4 VDC max.	1 VDC min.			G3NA-410B-UTU DC5-24	
	25 A			100 to 240 VAC	75 VAC max.	20 VAC min.	0.2 to 20 A/0.2 to 4 A	58×43×27	G3NA-410B-UTU AC100-240	
				5 to 24 VDC	4 VDC max.	1 VDC min.			G3NA-425B-UTU-2 DC5-24	
	50 A			100 to 240 VAC	75 VAC max.	20 VAC min.	0.2 to 40 A/0.2 to 6 A	58×43×30	G3NA-425B-UTU-2 AC100-240	
				5 to 24 VDC	4 VDC max.	1 VDC min.			G3NA-450B-UTU-2 DC5-24	
	75 A			100 to 240 VAC	75 VAC max.	20 VAC min.	1 to 75 A/1 to 7 A	58×43×30	G3NA-450B-UTU-2 AC100-240	
				5 to 24 VDC	4 VDC max.	1 VDC min.			G3NA-475B-UTU-2 DC5-24	
	90 A			100 to 240 VAC	75 VAC max.	20 VAC min.	1 to 90 A/1 to 7 A	58×43×30	G3NA-475B-UTU-2 AC100-240	
				5 to 24 VDC	4 VDC max.	1 VDC min.			G3NA-490B-UTU-2 DC5-24	
				100 to 240 VAC	75 VAC max.	20 VAC min.			G3NA-490B-UTU-2 AC100-240	

Accessories

Name	Applicable SSRs	Size in mm (H×W×D) ^{*1}	Order code
One-touch mounting plates	—	NA	R99-12 FOR G3NA
Mounting bracket	G3NA-240B-UTU	NA	R99-11 FOR G3NA
Slim heat sink enabling DIN-rail mounting	G3NA-205B-UTU, G3NA-210B-UTU, G3NA-D210B-UTU, G3NA-410B-UTU	100×47×51	Y92B-N50
	G3NA-220B-UTU, G3NA-425B-UTU(-2)	100×75×100	Y92B-N100
	G3NA-240B-UTU, G3NA-250B-UTU	100×104×100	Y92B-N150
	G3NA-450B-UTU(-2)	190.5×130.5×100	Y92B-P250
	G3NA-275B-UTU(-2), G3NA-290B-UTU(-2), G3NA-475B-UTU(-2), G3NA-490B-UTU(-2)	172×110×150	Y92B-P250NF
	G3NA-205B-UTU, G3NA-210B-UTU, G3NA-D210B-UTU, G3NA-220B-UTU, G3NA-410B-UTU, G3NA-425B-UTU(-2)	100×102×60	Y92B-A100
Low-cost heat sink	G3NA-240-B-UTU	150×102×60	Y92B-A150N

^{*1} Size includes heat sink + G3NA SSR

Specifications

Operating voltage range	5 to 24 VDC; 4 to 32 VDC 100 to 120 VAC; 75 to 132 VAC 200 to 240 VAC; 150 to 264 VAC
Output ON voltage drop	G3NA-2: 1.6 V (RMS) max. G3NA-4: 1.8 V (RMS) max. G3NA-D2: 1.5 V max.
Leakage current	5 mA (100 V)/10 mA (200 V) G3NA-D2: 5 mA max. (200 VDC)
Load voltage range	200 to 480 VAC; 180 to 528 VAC 24 to 240 VAC; 19 to 264 VAC 5 to 200 VDC; 4 to 220 VDC
Ambient temperature	Operating: -30 to 80°C
Operate & release time	1/2 of load power source cycle + 1 ms max. (DC input) 1/2 of load power source cycle + 1 ms max. (DC input)
G3NA-D2	1 ms max. (DC input; release 5 ms), 30 ms max. (AC input)



Solid State Relays with exchangeable power cartridge

Optimum design of the heat sink has contributed to the downsizing of this product. The power element cartridges of the G3PA are easily replaceable for easy maintenance. G3PA can be mounted on a DIN-rail or using screws.

- 10-60 A output current
- 24-480 VAC output voltages
- Applicable with 3-phase loads
- Replaceable power element cartridges

Ordering information

Rated output load		Zero cross function	Rated input voltage	Operating voltage range	Input current impedance	Voltage level		Size in mm (H×W×D)	Order code
						Must operate voltage	Must release voltage		
24 to 240 VAC	10 A	Yes	5 to 24 VDC	4 to 30 VDC	7 mA max.	4 VDC max.	1 VDC min.	100×27×100	G3PA-210B-VD DC5-24
	20 A							100×37×100	G3PA-220B-VD DC5-24
	40 A							100×47×100	G3PA-240B-VD DC5-24
	60 A							100×110×100	G3PA-260B-VD DC5-24
	10 A		24 VAC	19.2 to 26.4 VAC	1.4 kΩ ±20%	19.2 VAC max.	4.8 VAC min.	100×27×100	G3PA-210B-VD AC24
	20 A							100×37×100	G3PA-220B-VD AC24
	40 A							100×47×100	G3PA-240B-VD AC24
	60 A							100×110×100	G3PA-260B-VD AC24
180 to 400 VAC	20 A	Yes	12 to 24 VDC	9.6 to 30 VDC	7 mA max.	9.2 VDC max.	1 VDC min.	100×37×100	G3PA-420B-VD DC12-24
	30 A							100×47×100	G3PA-430B-VD DC12-24
200 to 480 VAC	20 A							100×37×100	G3PA-420B-VD-2 DC12-24
	30 A							100×47×100	G3PA-430B-VD-2 DC12-24
	30 A							100×47×100	G3PA-430B-VD-2 DC12-24
	50 A							100×110×100	G3PA-450B-VD-2 DC12-24

Accessories

Replacement parts: Power device cartridges			
Load voltage range	Carry current	Applicable SSR	Order code
19 to 264 VAC	10 A	G3PA-210B-VD DC5-24	G32A-A10-VD DC5-24
		G3PA-210B-VD AC24	G32A-A10-VD AC24
	20 A	G3PA-220B-VD DC5-24	G32A-A20-VD DC5-24
		G3PA-220B-VD AC24	G32A-A20-VD AC24
	40 A	G3PA-240B-VD DC5-24	G32A-A40-VD DC5-24
		G3PA-240B-VD AC24	G32A-A40-VD AC24
	60 A	G3PA-260B-VD DC5-24	G32A-A60-VD DC5-24
		G3PA-260B-VD AC24	G32A-A60-VD AC24
150 to 440 VAC	20 A	G3PA-420B-VD DC12-24	G32A-A420-VD DC12-24
	30 A	G3PA-430B-VD DC12-24	G32A-A430-VD DC12-24
180 to 528 VAC	20 A	G3PA-420B-VD-2 DC12-24	G32A-A420-VD-2 DC12-24
	30 A	G3PA-430B-VD-2 DC12-24	G32A-A430-VD-2 DC12-24
	50 A	G3PA-450B-VD-2 DC12-24	G32A-A450-VD-2 DC12-24

G32A-D__ enables 2 line switching of 3 phase configurations		
Current flow	Applicable SSR	Order code
10 A	G3PA-210B-VD, G3PA-210BL-VD, G3PA-220B-VD, G3PA-220BL-VD, G3PA-420B-VD, G3PA-420BL-VD-2	G32A-D20
20 A		
30 A	G3PA-430B-VD, G3PA-430BL-VD-2, G3PA-240B-VD, G3PA-240BL-VD	G32A-D40
40 A		

Specifications

Isolation	Phototriac coupler
Indicator	Yes
Ambient temperature	Operating: -30 to 80°C
Load voltage range	200 to 480 VAC: 180 to 528 VAC 24 to 240 VAC: 19 to 264 VAC 180 to 400 VAC: 150 to 440 VAC
Output ON drop	1.6 V (RMS) max.
Operate time	0.5 of load power source cycle + 1 ms max. (DC input, -B models) 1.5 of load power source cycle + 1 ms max. (AC input) 1 ms max. (-BL models)
Release time	0.5 of load power source cycle + 1 ms max. (DC input) 1.5 of load power source cycle + 1 ms max. (AC input)



Omron's G3PE compact industrial SSR with outstanding surge endurance

The G3PE features an original surge-pass circuit that gives outstanding surge endurance and protects the semiconductor device against voltages in excess of 30 kV.

- Single and three phase, 15–45 A output current
- 100–240 VAC and 200–480 VAC output voltages
- Models available without zero cross
- Improved surge dielectric strength for output circuits
- Terminal cover with finger protection
- Mount to DIN track or with screws

Ordering information

Phases	Rated voltage (operating voltage)	Rated output load	Permissible I^2t (half 60 Hz wave)	Applicable heater capacity AC1: resistive load	Size in mm (H×W×D)	Number of poles	Order code
1	100 to 240 VAC (75 to 264 VAC)	15 A (at 40°C)	121 A ² s	3 kW (at 200 VAC)	100×22.5×100	1	G3PE-215B DC12-24
		25 A (at 40°C)	260 A ² s	5 kW (at 200 VAC)		1	G3PE-225B DC12-24
		35 A	1,260 A ² s	7 kW (at 200 VAC)	100×44.5×100	1	G3PE-235B DC12-24
		45 A		9 kW (at 200 VAC)		1	G3PE-245B DC12-24
	200 to 480 VAC (180 to 528 VAC)	15 A (at 40°C)	128 A ² s	6 kW (at 400 VAC)	100×22.5×100	1	G3PE-515B DC12-24
		25 A (at 40°C)	1,350 A ² s	10 kW (at 400 VAC)		1	G3PE-525B DC12-24
		35 A		14 kW (at 400 VAC)	100×44.5×100	1	G3PE-535B DC12-24
		45 A	6,600 A ² s	18 kW (at 400 VAC)		1	G3PE-545B DC12-24
3	200 to 480 VAC (180 to 528 VAC)	15 A (at 40°C)	260 A ² s	12.5 kW (at 480 VAC)	100×80×155	3	G3PE-515B-3N DC12-24
						2	G3PE-515B-2N DC12-24
		25 A (at 40°C)		20.7 kW (at 480 VAC)	120×80×155	3	G3PE-525B-3N DC12-24
					100×80×155	2	G3PE-525B-2N DC12-24
		35 A	1,260 A ² s	29 kW (at 480 VAC)	140×80×155	3	G3PE-535B-3N DC12-24
					120×80×155	2	G3PE-535B-2N DC12-24
		45 A		37.4 kW (at 480 VAC)	140×110×155	3	G3PE-545B-3N DC12-24
					140×80×155	2	G3PE-545B-2N DC12-24

Specifications

Rated input voltage	12 to 24 VDC
Operating voltage range	9.6 to 30 VDC
Rated input current (impedance)	7 mA max. (zero cross models); 15 mA max. (models without zero cross)
Zero cross function	Yes
Must operate voltage	9.6 VDC max.
Must release voltage	1 VDC min.
Isolation method	Phototriac coupler
Operation indicator	Yes (yellow)
Load voltage range	200 to 480 VAC models: 180 to 528 VAC 100 to 240 VAC models: 75 to 264 VAC
Operate time	1/2 of load power source cycle +1 ms max.
Release time	1/2 of load power source cycle +1 ms max.
Leakage current	10 mA (at 200 VAC)
Ambient temperature	Operating: –30 to 80°C

Low voltage switchgear

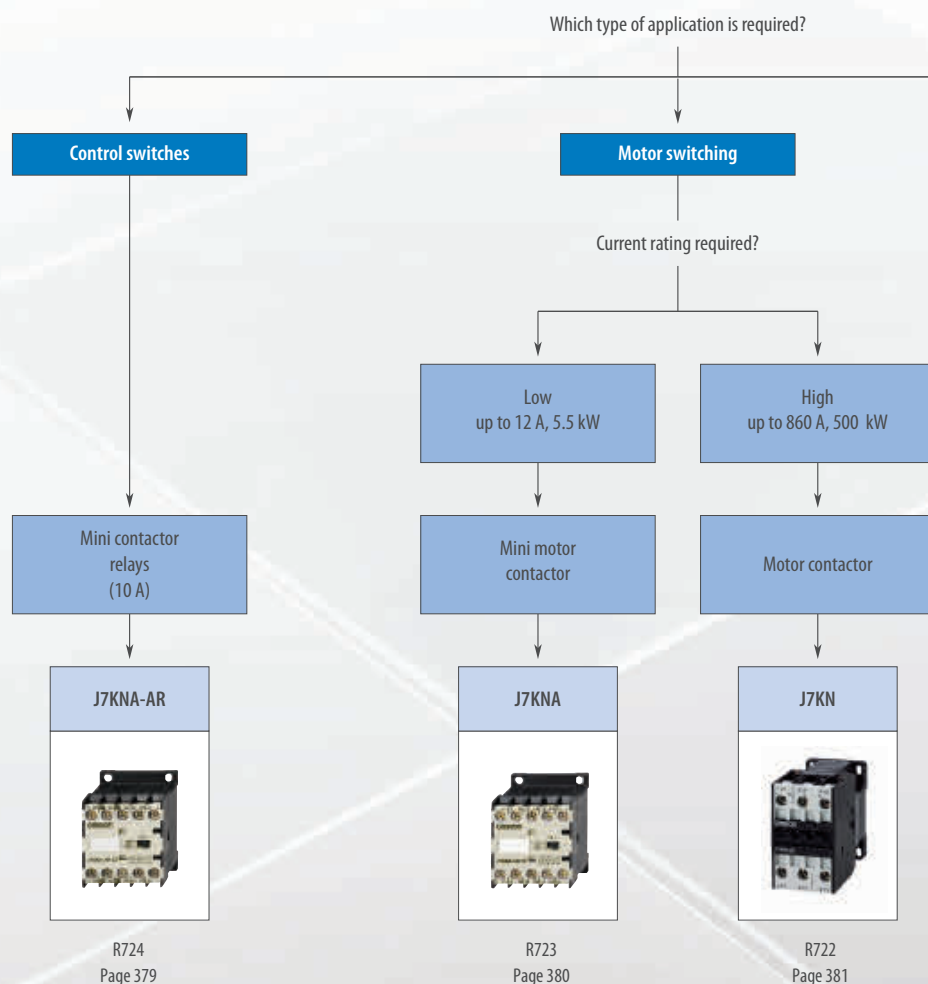
J7KN MOTOR CONTACTOR

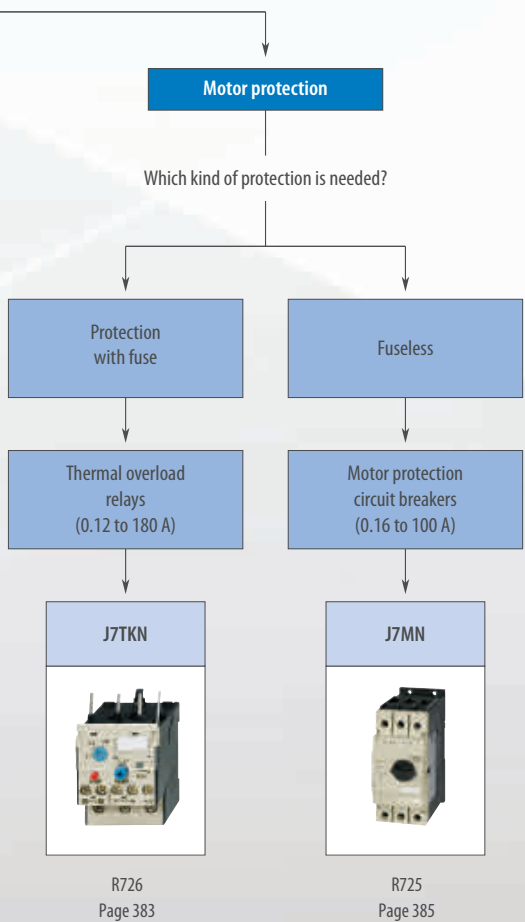
J7KN – Motor contactors

The popular J7KN series offers many outstanding benefits, such as space-saving, small footprint, great reliability, and an ambient temperature rating up to +90°C. But now we've replaced it with a completely new design that extends its application range and will make your life even easier.

The new J7KN 10D to 22D series has the same footprint and severe ambient temperature rating, but has an improved design affording better protection, easier maintenance plus an integrated auxiliary double contact suitable for switching electronic circuits (17 V, 5 mA).

- Basic units can be combined with auxiliary contacts (top/side mounting)
- 3-main-pole and 4-main-pole versions are possible
- The power range covers 4 to 500 kW
- Different coil voltages (AC and DC)
- J7KN-10D to J7KN-22D models have integrated auxiliary contact for electronic circuits (3-pole versions)

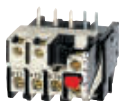




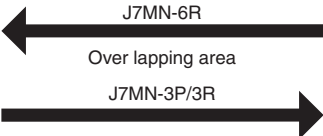
Selection table

Category		Motor protection circuit breaker
MPCB		
	Type	J7MN-3P/3R
	Setting range current	0.16 - 32 A
	Number of ranges	16
	Auxiliary contact external	front 1 NO and 1 NC or 2 NO, side 1 NO and NC or 2 NO or 2 NC
	Page/Quick Link	385/R725

Category			Contactors					
Contactors								
	Type		J7KNA-AR	J7KNA-09/12	J7KN(G)-10(D)	J7KN(G)-14(D)	J7KN(G)-18(D)	J7KN(G)-22(D)
	Maximum power AC3-380/415 V		–	4 kW or 5 kW	4 kW	5.5 kW	7.5 kW	11 kW
	Rated current AC3-380/415 V		10 A th	9/12 A	10 A	14 A	18 A	22 A
	Main contacts		4 in 4 configurations	3 or 4	3 or 4			
	Auxiliary contacts	Included	–	1	1 NO or 1 NC			
		External	4 in different combinations		4 contacts ^{*1}			
	Page/Quick Link		379/R724	380/R723	381/R722		381/R722	

Category		Thermal overload	
Thermal overload			
	Type	J7TKN-A	J7TKN-B
	Setting range D.O.L.	0.12 - 14 A	0.12 - 32 A
	Number of ranges	13	16
	Auxiliary contacts included	1 NO and 1 NC	1 NO and 1 NC
	Page/Quick Link	383/R726	383/R726

^{*1} Using J7KN with DC double wiring coils results in 1 aux. less

Motor protection circuit breaker		
		
	J7MN-6R	J7MN-9R
	26 - 63 A	63 - 100 A
	5	4
front 1 NO and 1 NC or 2 NO, side 1 NO and NC or 2 NO or 2 NC		
385/R725		

Contactors							
							
J7KN(G)-24	J7KN(G)-32	J7KN(G)-40	J7KN-50	J7KN-62	J7KN-74	J7KN-90	J7KN-115
11 kW	15 kW	18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW
24 A	32 A	40 A	50 A	62 A	74 A	90 A	115 A
3			3			3	
–			–			–	
front and side 8-contacts ^{*1}			front and side 8-contacts ^{*1}			front and side 11-contacts	
381/R722			381/R722			381/R722	

Thermal overload		
		
J7TKN-C	J7TKN-D	J7TKN-E
28 - 42 A	40 - 74 A	60 - 120 A
1	3	2
1 NO and 1 NC	1 NO and 1 NC	1 NO and 1 NC
383/R726	383/R726	383/R726

^{*1} Using J7KN with DC double wiring coils results in 1 aux. less

Selection table

Category			Contactors			
Contactors						
	Type		J7KN-151	J7KN-176	J7KN-210	J7KN-260
	Maximum power AC3-380/415 V		75 kW	90 kW	110 kW	132 kW
	Rated current AC3-380/415 V		150 A	175 A	210 A	260 A
	Main contacts		3 or 4		3	
	Auxiliary contacts	Included	–		–	
		External	front and side 6-contacts		front and side 8-contacts	
Page/Quick Link		381/R722				

Category		Thermal overload			
Thermal overload					
	Type		J7TKN-E	J7TKN-F	J7TKN-G
	Setting range D.O.L.		60 - 120 A	120 - 180 A	144 - 320 A
	Number of ranges		2	1	2
	Auxiliary contacts included		1 NO and 1 NC	1 NO and 1 NC	1 NO and 1 NC
	Page/Quick Link	383/R726			

Contactors



J7KN-316	J7KN-450-22	J7KN-550-22	J7KN-700-22	J7KN-860-22
160 kW	250 kW	300 kW	400 kW	500 kW
315 A	450 A	550 A	700 A	860 A
3	3	3	3	3
–	4	4	4	4
front and side 8-contacts	front 4-contacts	front 4-contacts	front 4-contacts	front 4-contacts
381/R722				

Thermal overload



J7TKN-G	J7TKN-H
144 - 320 A	240 - 800 A
2	3
1 NO and 1 NC	1 NO and 1 NC
383/R726	



Main mini contactor relay, 4-pole

Three basic units can be combined with different additional auxiliary contacts. 4-pole, 6-pole and 8-pole versions in different configurations are possible as well as different coil voltages (AC and DC). Accessories such as suppressors are available.

- Mirror contacts
- Screw fixing and snap fitting (35 mm DIN-rail)
- Rated current = 10 A (I_{th})
- Suitable for electronic devices (DIN 19240)
- Finger proof (BGV A2)

Ordering information

Operation	Contacts		Distinctive number according to DIN EN 50011	Ratings		Thermal rated current I_{th} , A	Order code	Coil voltage *1, replace __ with:					
	NO	NC		AC15 230 V A	400 V A								
4-pole, with screw terminals								VAC			VDC		
AC	4	0	40 E	3	2	10	J7KNA-AR-40 ____	24	110	230	–	–	
	3	1	31 E	3	2	10	J7KNA-AR-31 ____	24	110	230	–	–	
	2	2	22 E	3	2	10	J7KNA-AR-22 ____	24	110	230	–	–	
DC solenoid	4	0	40 E	3	2	10	J7KNA-AR-40 ____	–	–	–	24D	110D	
	3	1	31 E	3	2	10	J7KNA-AR-31 ____	–	–	–	24D	110D	
	2	2	22 E	3	2	10	J7KNA-AR-22 ____	–	–	–	24D	110D	
DC solenoid with diode	4	0	40 E	3	2	10	J7KNA-AR-40 _____	–	–	–	24VS	–	
	3	1	31 E	3	2	10	J7KNA-AR-31 _____	–	–	–	24VS	–	
	2	2	22 E	3	2	10	J7KNA-AR-22 _____	–	–	–	24VS	–	

*1 Other coil voltages available on request

Accessories

Contacts		Ratings		Thermal rated current	Order code
NO	NC	AC15 230 V A	400 V A	I _{thr} A	
1	1	3	2	10	J73KN-A-11
0	2	3	2	10	J73KN-A-02
4	0	3	2	10	J73KN-A-40
2	2	3	2	10	J73KN-A-22
0	4	3	2	10	J73KN-A-04

Specifications

Suffix to contactor type e.g. J7KNA-09-10-24	Voltage marking at the coil for		Rated control voltage U _s range for			
	50 Hz V	60 Hz V	50 Hz min. V max. V		60 Hz min. V max. V	
24	24	24	22	24	24	24
110	110 to 115	120 to 125	110	115	120	125
230	220 to 230	240	220	230	240	250



Motor contactors from 4 to 5.5 kW for normal duty switching

This modular system consists of main contactors and additional contact blocks. The basic units can be combined with auxiliary contacts (top mounting). Reversed versions, including integrated mechanical interlock, are available as well as 3-main-pole and 4-main-pole versions.

- 4 kW and 5.5 kW versions are available
- Different coil voltages (AC and DC)
- Mini and normal-size versions are available
- The contactors can be mounted with screw fixing and snap fitting on a DIN-rail
- All components are finger proof

Ordering information

Operation	Poles	Rating AC2, AC3			Rated current		Auxiliary contact		Overload relay	Size in mm (H×W×D)	Order code	Coil voltage ^{*1} , replace ___ with:				
		380 V 400 V 415 V kW	500 V kW	660 V 690 V kW	AC3 400 V A	AC1 690 V A						VAC				
							NO	NC				VDC				
AC/DC solenoid	3	4	4	4	9	20	1	0	J7TKN-A	57.5×45×49	J7KNA-09-10_ _ _ _	24	110	230	400	24D
							0	1	J7TKN-A		J7KNA-09-01_ _ _ _	24	110	230	400	24D
		5.5	5.5	5.5	12	20	1	0	J7TKN-A		J7KNA-12-10_ _ _ _	24	110	230	400	24D
							0	1	J7TKN-A		J7KNA-12-01_ _ _ _	24	110	230	400	24D
DC solenoid with diode	3	4	4	4	9	20	0	0	J7TKN-A	57.5×45×49	J7KNA-09-4_ _ _ _	24	110	230	400	24D
							1	0	J7TKN-A		J7KNA-09-10_ _ _ _	—	—	—	—	24VS
		5.5	5.5	5.5	12	20	1	0	J7TKN-A		J7KNA-09-01_ _ _ _	—	—	—	—	24VS
							0	1	J7TKN-A		J7KNA-12-10_ _ _ _	—	—	—	—	24VS
AC/DC solenoid reversing contactors	3	4	4	4	9	20	0	1	J7TKN-A	57.5×94.5×50	J7KNA-12-01_ _ _ _	—	—	—	—	24VS
		5.5	5.5	5.5	12	20	0	1	J7TKN-A		J7KNA-09-01 R_ _ _ _	24	110	230	400	24D
		4	4	4	9	20	0	1	J7TKN-A		J7KNA-12-01 R_ _ _ _	24	110	230	400	24D
		5.5	5.5	5.5	12	20	0	1	J7TKN-A		J7KNA-09-01 R_ _ _ _	—	—	—	—	24VS
DC solenoid with diode	3	4	4	4	9	20	0	1	J7TKN-A	57.5×94.5×50	J7KNA-12-01 R_ _ _ _	—	—	—	—	24VS
		5.5	5.5	5.5	12	20	0	1	J7TKN-A		J7KNA-09-01 R_ _ _ _	—	—	—	—	24VS
							1	0	J7TKN-A		J7KNA-12-01 R_ _ _ _	—	—	—	—	24VS
							0	1	J7TKN-A		J7KNA-09-01 R_ _ _ _	—	—	—	—	24VS

^{*1} Other coil voltages available on request

Accessories

Auxiliary contacts				
Contacts		Rated current		Order code
NO	NC	AC15 230 V	400 V	
1	1	3 A	2 A	J73KN-AM-11
0	2	3 A	2 A	J73KN-AM-02
2	2	3 A	2 A	J73KN-AM-22
Auxiliary contacts for reversing contactors				
1	1	3 A	2 A	J73KN-AM-11V
1	1	3 A	2 A	J73KN-AM-11X
Link modules between MPCB & contactors				
For MPCB J7MN-3P/J7MN-3R				J77MN-VKA-3
Insulated wiring system for J7KNA-09-01-R...(D) and J7KNA-12-01-R...(D)				
Reversing Starter Connector for Mini Reversing Contactors, mechanical interlocked				J74-WKR-A

Specifications

Suffix to contactor type e.g. J7KNA-09-10-24	Voltage marking at the coil for		Rated control voltage U _s range for			
	50 Hz V	60 Hz V	50 Hz min. V	max. V	60 Hz min. V	max. V
24	24	24	22	24	24	24
110	110 to 115	120 to 125	110	115	120	125
230	220 to 230	240	220	230	240	250

Main contacts		J7KNA-09- _ _ _ _	J7KNA-12- _ _ _ _
Rated insulation voltage U _i		690 VAC	690 VAC
Making capacity I _{eff}	at U _e = 690 VAC	165 A	165 A
Breaking capacity I _{eff} cosφ = 0.65	400 VAC	100 A	100 A
	500 VAC	90 A	90 A
	690 VAC	80 A	80 A
Mechanical life AC operated		5 × 10 ⁶	5 × 10 ⁶
DC operated		15 × 10 ⁶	15 × 10 ⁶
Short time current	10 s current	96 A	120 A



Motor contactors from 4–500 kW for normal and heavy-duty switching

This modular system consists of main contactors and additional contact blocks. The basic units can be combined with auxiliary contacts. DC-DC versions, integrated mechanical interlock, are available as well as 3-main-pole and 4-main-pole versions.

- Basic units can be combined with auxiliary contacts (top/side mounting)
- 3-main-pole and 4-main-pole versions are possible
- The power range covers 4 to 500 kW
- Different coil voltages (AC and DC)
- J7KN-10D to J7KN-22D models have integrated auxiliary contact for electronic circuits (3-pole versions)

Ordering information

Operation	Poles	AC3 400 V rated motor current	Rating AC2, AC3			Rated current	Auxiliary contact		Overload relay	Size in mm (H × W × D)	Order code	Coil voltage*1, replace ____ with:							
			380 V 400 V 415 V kW	500 V kW	660 V 690 V kW							AC1 690 V A	VAC			VDC			
			NO	NC															
AC or DC	3	10 A	4	5.5	5.5	25	1	0	J7TKN-B	67 × 45 × 82.5	J7KN-10D-10____	24	110	230	400	24D	110D		
			4	5.5	5.5	25	0	1			J7KN-10D-01____	24	110	230	400	24D	110D		
		14 A	5.5	7.5	7.5	25	1	0			J7KN-14D-10____	24	110	230	400	24D	110D		
			5.5	7.5	7.5	25	0	1			J7KN-14D-01____	24	110	230	400	24D	110D		
		18 A	7.5	10	10	32	1	0			J7KN-18D-10____	24	110	230	400	24D	110D		
			7.5	10	10	32	0	1			J7KN-18D-01____	24	110	230	400	24D	110D		
		22 A	11	10	10	32	1	0			J7KN-22D-10____	24	110	230	400	24D	110D		
			11	10	10	32	0	1			J7KN-22D-01____	24	110	230	400	24D	110D		
		24 A	11	15	15	50	0	0	J7TKN-C	78 × 45 × 104.5	J7KN-24____	24	110	230	400	24D	110D		
		32 A	15	18.5	18.5	65	0	0			J7KN-32____	24	110	230	400	24D	110D		
		40 A	18.5	18.5	18.5	80	0	0			J7KN-40____	24	110	230	400	24D	110D		
		AC and DC*2		50 A	22	30	30	110	0	0	J7TKN-D	112 × 60 × 113	J7KN-50____	24	110	230	400	24D	110D
				62 A	30	37	37	120	0	0			J7KN-62____	24	110	230	400	24D	110D
				74 A	37	45	45	130	0	0			J7KN-74____	24	110	230	400	24D	110D
90 A	45			55	55	160	0	0	J7TKN-E	155 × 90 × 136	J7KN-90____*2	24	110	230	400	24	110		
115 A	55			75	55	200	0	0			J7KN-115____*2	24	110	230	400	24	110		
150 A	75			75	75	230	0	0	J7TKN-F	290 × 110 × 162	J7KN-151____*2	24	110	230	400	24	110		
175 A	90			90	90	250	0	0			J7KN-176____*2	24	110	230	400	24	110		
210 A	110			160	160	350	0	0	J7TKN-G	200 × 145 × 208	J7KN-210____*2	24	110	230	400	24	110		
260 A	132			210	210	450	0	0			J7KN-260____*2	24	110	230	400	24	110		
315 A	160			250	250	500	0	0			J7KN-316____*2	24	110	230	400	24	110		
450 A	250			375	375	600	2	2	J7TKN-H	258 × 220 × 225	J7KN-450-22____*2	24	110	230	400	24	110		
550 A	300			475	475	760	2	2			J7KN-550-22____*2	24	110	230	400	24	110		
700 A	400			630	630	1000	2	2		310 × 280 × 291	J7KN-700-22____*2	24	110	230	400	24	110		
860 A	500			700	700	1100	2	2		361 × 280 × 291	J7KN-860-22____*2	24	110	230	400	24	110		
DC operated solenoid motor contactor		10 A	4	5.5	5.5	25	1	0	J7TKN-B	67 × 45 × 82.5	J7KNG-10-10____	–	–	–	–	24D	110D		
			4	5.5	5.5	25	0	1			J7KNG-10-01____	–	–	–	–	24D	110D		
		14 A	5.5	7.5	7.5	25	1	0			J7KNG-14-10____	–	–	–	–	24D	110D		
			5.5	7.5	7.5	25	0	1			J7KNG-14-01____	–	–	–	–	24D	110D		
		18 A	7.5	10	10	32	1	0			J7KNG-18-10____	–	–	–	–	24D	110D		
			7.5	10	10	32	0	1			J7KNG-18-01____	–	–	–	–	24D	110D		
		22 A	11	10	10	32	1	0			J7KNG-22-10____	–	–	–	–	24D	110D		
			11	10	10	32	0	1			J7KNG-22-01____	–	–	–	–	24D	110D		
		24 A	11	15	15	50	0	0	J7TKN-B	78 × 45 × 104.5	J7KNG-24____	–	–	–	–	24D	110D		
		32 A	15	18.5	18.5	65	0	0	J7TKN-C		J7KNG-32____	–	–	–	–	24D	110D		
40 A	18.5	18.5	18.5	80	0	0	J7KNG-40____	–	–		–	–	24D	110D					

^{*1} Other coil voltages available on request

^{*2} Universal current (AC and DC)

Operation	Poles	AC3 400 V rated motor current	Rating AC2, AC3		Rated current	Auxiliary contact		Overload relay	Size in mm (H × W × D)	Order code	Coil voltage ^{*1} , replace ___ with:					
			380 V 400 V 415 V kW	AC1 400 V kW		NO	NC				VAC				VDC	
AC	4	10 A	4	17.5	25	0	0	–	67 × 45 × 82.5	J7KN-10D-4_ _ _ _	24	110	230	400	–	
		14 A	5.5	17.5	25	0	0			J7KN-14D-4_ _ _ _	24	110	230	400		
		18 A	7.5	22	32	0	0			J7KN-18D-4_ _ _ _	24	110	230	400		
		22 A	11	22	32	0	0			J7KN-22D-4_ _ _ _	24	110	230	400		
DC solenoid mo- tor contactor	4	10 A	4	17.5	25	0	0	–	67 × 45 × 82.5	J7KNG-10-4_ _ _ _	–				24D	110D
		14 A	5.5	17.5	25	0	0			J7KNG-14-4_ _ _ _					24D	110D
		18 A	7.5	22	32	0	0			J7KNG-18-4_ _ _ _					24D	110D
		22 A	11	22	32	0	0			J7KNG-22-4_ _ _ _					24D	110D
AC and DC ^{*2}	4	150 A	75	159	230	0	0	–	170 × 110 × 162	J7KN-151-4_ _ _ _ ^{*2}	24	110	230	400	24	110
		175 A	90	173	250	0	0			J7KN-176-4_ _ _ _ ^{*2}	24	110	230	400	24	110

^{*1} Other coil voltages available on request

^{*2} Universal current (AC and DC)

Accessories

Auxiliary contact blocks	Rated operational current			Contacts		Order code
Suitable for:	AC15 230 V A	AC15 400 V A	AC1 690 V A	NO	NC	
J7KN-10D... to -74...	3	2	10	1	–	J73KN-B-10
	3	2	10	–	1	J73KN-B-01
	3	2	10	1	–	J73KN-B-10U
	3	2	10	–	1	J73KN-B-01U
	6	4	25	1	–	J73KN-B-10A
	6	4	25	–	1	J73KN-B-01A
J7KN-24... to -115...	3	3	10	1	1	J73KN-C-11S
J7KN-151... to -316...	3	2	10	1	1	J73KN-D-11F
	3	2	10	2	2	J73KN-D-22F
	3	2	10	1	1	J73KN-D-11S
J7KN-450... to -860...	3	2	10	2	2	J73KN-E-22F

Pneumatic timers	Function		Time range	Contacts		Order code
Suitable for:						
J7KN-10D... to -74...	3	2	10	1	–	J73KN-B-10
	3	2	10	–	1	J73KN-B-01
	3	2	10	1	–	J73KN-B-10U
	3	2	10	–	1	J73KN-B-01U
	6	4	25	1	–	J73KN-B-10A
	6	4	25	–	1	J73KN-B-01A
J7KN-24... to -115...	3	3	10	1	1	J73KN-C-11S
J7KN-151... to -316...	3	2	10	1	1	J73KN-D-11F
	3	2	10	2	2	J73KN-D-22F
	3	2	10	1	1	J73KN-D-11S
J7KN-450... to -860...	3	2	10	2	2	J73KN-E-22F

Mechanical interlocks	Interlocks contactor with contactor	Order code
Mounting	Order code + Order code	
Horizontal	J7KN(G)-10D to -40 + J7KN(G)-10D to -40	J74KN-B-ML
	J7KN-24 to -74 + J7KN-24 to -74	J74KN-C-ML
	J7KN-90 to -115 + J7KN-90 to -115	J74KN-D2-ML
	J7KN-151 to -316 + J7KN-151 to -316	J74KN-E-ML

Suppressor units	Type		Applicable coil voltage	Order code
Suitable for contactors				
J7KNA(-AR)	AC/DC	RC-unit snap-on contactor	12 to 48 V	J74KN-D-RC24
	AC/DC		48 to 127 V	J74KN-D-RC110
	AC/DC		110 to 250 V	J74KN-D-RC230
J7KN-10D to -74	AC/DC	RC-unit snap-on contactor	12 to 48 V	J74KN-C2-RC24
	AC/DC		48 to 127 V	J74KN-C2-RC110
	AC/DC		110 to 230 V	J74KN-C2-RC230
	AC/DC		230 to 415 V	J74KN-C2-RC400

Additional terminals single pole	Cable cross-sections to clamp (mm ²)			Order code	
	Suitable for contactors	Solid or stranded	Flexible Flexible with multi-core cable end		
J7KN-50 to -74		4 to 35	6 to 25	4 to 25	J74KN-LG-9030
J7KN-151 to -176		16 to 120	–	16 to 95	J74KN-LG-11224

Terminal covers	Specification	Order code
Suitable for contactors		
J7KN-151 to -176	One unit for 3 terminals, 2 units for one contactor	J74KN-LG-10404
J7KN-210 to -316		J74KN-LG-11457

Marking systems	Specification	Order code
Description		
Marking plate	2-section without marking, divisible	J74KN-P487-1
Marking plate	4-section without marking, divisible	J74KN-P245-1

Insulated wiring systems	Suitable for contactors	Max. current (A)	Order code
Function			
For reversing contactors (2 parts)	J7KN-10D to -22D	22	J74-WKR-B2
	J7KN-24 to -40	40	J74-WKR-C
For star-delta combination (4 parts)	J7KN-10D to -22D	22	J74-WKSD-B2
	J7KN-24 to -40	40	J74-WKSD-C

Specifications

Coil voltages	Suffix to contactor type:						
Contactor type	24	48	110	180	230	400	500
J7KN-10D to J7KN-74	yes	yes	yes	yes	yes	yes	yes
J7KN-90 to J7KN-860	yes	yes	yes	–	yes	yes	–



Thermal overload relays for J7KN(A) contactors

J7TKN relays protect motors against thermal overload. They can be mounted on the contactor or separately. The relays comply with IEC 60947 (single-phase sensitivity).

- Series of overload relays covering a setting range from 0.12 A to 800 A (D.O.L.)
- Manual and/or auto reset models available

Ordering information

Applicable contactors	Setting range		Size in mm (H × W × D) (incl. standard J7KN[A] contactor)	Order code
	D.O.L. (A)	Star-delta (A)		
J7KNA-09..., J7KNA-12...	0.12 to 0.18	–	95 × 48.5 × 77	J7TKN-A-E18
	0.18 to 0.27	–		J7TKN-A-E27
	0.27 to 0.4	–		J7TKN-A-E4
	0.4 to 0.6	–		J7TKN-A-E6
	0.6 to 0.9	–		J7TKN-A-E9
	0.8 to 1.2	–		J7TKN-A-1E2
	1.2 to 1.8	–		J7TKN-A-1E8
	1.8 to 2.7	–		J7TKN-A-2E7
	2.7 to 4	–		J7TKN-A-4
	4 to 6	7 to 10.5		J7TKN-A-6
	6 to 9	10.5 to 15.5		J7TKN-A-9
	8 to 11	14 to 19		J7TKN-A-11
J7KN-10D... to J7KN-40...	10 to 14	18 to 24	126.5 × 45 × 70 (J7KN-10D to J7KN-22D); 141.5 × 45 × 87.5 (J7KN-24 to J7KN-40)	J7TKN-A-14
	0.12 to 0.18	–		J7TKN-B-E18
	0.18 to 0.27	–		J7TKN-B-E27
	0.27 to 0.4	–		J7TKN-B-E4
	0.4 to 0.6	–		J7TKN-B-E6
	0.6 to 0.9	–		J7TKN-B-E9
	0.8 to 1.2	–		J7TKN-B-1E2
	1.2 to 1.8	–		J7TKN-B-1E8
	1.8 to 2.7	–		J7TKN-B-2E7
	2.7 to 4	–		J7TKN-B-4
	4 to 6	7 to 10.5		J7TKN-B-6
	6 to 9	10.5 to 15.5		J7TKN-B-9
	8 to 11	14 to 19		J7TKN-B-11
	10 to 14	18 to 24		J7TKN-B-14
J7KN-24... to J7KN-40...	13 to 18	23 to 31		J7TKN-B-18
	17 to 24	30 to 41		J7TKN-B-24
	23 to 32	40 to 55		J7TKN-B-32
	28 to 42	48 to 73		J7TKN-B-42
J7KN-50... to J7KN-74...	40 to 52	70 to 90	136 × 67 × 96.5	J7TKN-C-42
	52 to 65	90 to 112		J7TKN-D-52
	60 to 74	104 to 128		J7TKN-D-65
J7KN-90... to J7KN-115...	80 to 120	140 to 207	180 × 69 × 108	J7TKN-D-74
	120 to 180	208 to 312		J7TKN-E-90
J7KN-151... to J7KN-176...	144 to 216	250 to 374	260 × 107 × 120	J7TKN-E-120
J7KN-210... to J7KN-316...	216 to 320	374 to 554		J7TKN-F-180
J7KN-450... to J7KN-860...	240 to 360	416 to 623	290 × 110 × 162	J7TKN-G-216
	360 to 540	623 to 935		J7TKN-G-320
	540 to 800	935 to 1385		J7TKN-H-360
				J7TKN-H-540
			372 × 1246 × 1225 (J7KN-450)	J7TKN-H-800
			395 × 1246 × 1225 (J7KN-550)	
			487 × 1280 × 1291 (J7KN-700)	
			540 × 1280 × 1291 (J7KN-860)	

Accessories

Sets for single mounting

For overload relays	Cable cross-section to clamp (mm ²)			Order code
	Solid or stranded	Flexible	Flexible with multi-core cable	
J7TKN-AB	0.75 to 6	0.75 to 4	0.5 to 4	J74TK-M-AB
J7TKN-B	0.75 to 6	0.75 to 4	0.5 to 4	J74TK-SM

Busbar sets for thermal overload relays

For overload relays	For motor contactors	Order code
J7TKN-H-360/540	J7KN-450/550	J74TK-SU-550
J7TKN-H-540/800	J7KN-700/860	J74TK-SU-860

Specifications

Type		J7TKN-A	J7TKN-B	J7TKN-C	J7TKN-D	J7TKN-E	J7TKN-F	J7TKN-G	J7TKN-H
Rated insulation voltage U _i		690 VAC				750 VAC	1000 VAC		
Permissible ambient temperature	Operation	-25 to 60°C							-25 to 55°C
	Storage	-50 to 70°C							-40 to 70°C
Trip class according to IEC 947-4-1		10 A				20 A	10 A		
Cable cross-section	Solid or stranded mm ²	0.75 to 6 0.75 to 2.5	0.75 to 6	0.75 to 10	4 to 35	Without terminals, suitable for bushing one connector 70 mm ² (stranded) per phase	Busbar 18×4 Screw M8	Busbar 25×6 Screw M10	See accessories
Main connector	Flexible mm ²	0.75 to 4 0.5 to 2.5	1 to 4	0.75 to 6	6 to 25				
	Flexible with multi-core cable end mm ²	0.5 to 2.5 0.5 to 1.5	0.75 to 4	0.75 to 6	4 to 25				
Cables per clamp	Number	1 + 1	2	2	1	–	1	1	1
Auxiliary connector	Solid mm ²	0.75 to 2.5							1 to 2.5
	Flexible mm ²	0.5 to 2.5							1 to 2.5
	Flexible with multi-core cable end mm ²	0.5 to 1.5							1 to 2.5
Cables per clamp	Number	2							
Auxiliary contacts									
Rated insulation voltage U _i	same potential	690 VAC							500 VAC
	different potential	440 VAC			250 VAC		440 VAC		
Rated operational current I _e Utilization category AC15	24 V	5 A	3 A	4 A		5 A	3 A		4 A
	230 V	3 A	2 A	2.5 A	2.5 A	3 A	2 A		2.5 A
	400 V	2 A	1 A	1.5 A	1.5 A	2 A	1 A		1.5 A
	690 V	0.6 A	0.5 A	0.6 A			0.5 A		0.6 A
Rated operational current I _e Utilization category DC13	24 V	1.2 A	1 A	1.2 A					
	110 V	0.15 A							
	220 V	0.1 A							
Short circuit protection (without welding 1 kA)	Highest fuse rating gL (gG)	6 A	4 A	6 A			4 A		6 A
Setting range		to 23 A	All	28 to 42 A	52 to 65 A	All	–	–	–
Power loss per current path (max.)	Minimum setting value	1.1 W	1.1 W	1.3 W	2.9 W	1.1 W	–	–	–
	Maximum setting value	2.3 W	2.3 W	3.3 W	4.5 W	2.5 W	–	–	–



J7MN motor protection circuit breakers from 0.10 A to 100 A

J7MN starters protect motors against thermal overload and short circuit. The J7MN can be equipped with additional auxiliary contacts, tripping indicator (alarm), undervoltage release and/or shunt release. All models can be locked for safe maintenance.

- Rated operational currents of 32 A for the rocker type
- Rated operational currents of 32 A, 63 A and 100 A for the rotary types
- Switching capacity is 100 kA/415 V up-to 13 A and 50 kA/415 V up-to 100 A
- Electrical/mechanical link modules available up-to 11 kW motor protection units
- All components are finger proof

Ordering information

Rated current in A	Suitable for motors 3 ~ 400 V kW	Current setting range		Short-circuit breaking capacity at 3 ~ 400 V kA	Size in mm (H × W × D)	Order code
		Thermal overload release A	Instantaneous short-circuit release A			
0.16	–	0.10–0.16	2.1	100	98 × 45 × 75	J7MN-3P-E16
0.25	0.06	0.16–0.25	3.3	100		J7MN-3P-E25
0.4	0.09	0.25–0.4	5.2	100		J7MN-3P-E4
0.63	0.18	0.4–0.63	8.2	100		J7MN-3P-E63
1	0.25	0.63–1	13	100		J7MN-3P-1
1.6	0.55	1–1.6	20.8	100		J7MN-3P-1E6
2.5	0.75	1.6–2.5	32.5	100		J7MN-3P-2E5
4	1.5	2.5–4	52	100		J7MN-3P-4
6	2.2	4–6	78	100		J7MN-3P-6
8	3	5–8	104	100		J7MN-3P-8
10	4	6–10	130	50		J7MN-3P-10
13	5.5	9–13	169	50		J7MN-3P-13
17	7.5	11–17	221	20		J7MN-3P-17
22	7.5	14–22	286	15		J7MN-3P-22
26	11	18–26	338	15		J7MN-3P-26
32	15	22–32	416	15		J7MN-3P-32
0.16	–	0.10–0.16	2.1	100	98 × 45 × 100	J7MN-3R-E16
0.25	0.06	0.16–0.25	3.3	100		J7MN-3R-E25
0.4	0.09	0.25–0.4	5.2	100		J7MN-3R-E4
0.63	0.18	0.4–0.63	8.2	100		J7MN-3R-E63
1	0.25	0.63–1	13	100		J7MN-3R-1
1.6	0.55	1–1.6	20.8	100		J7MN-3R-1E6
2.5	0.75	1.6–2.5	32.5	100		J7MN-3R-2E5
4	1.5	2.5–4	52	100		J7MN-3R-4
6	2.2	4–6	78	100		J7MN-3R-6
8	3	5–8	104	100		J7MN-3R-8
10	4	6–10	130	100		J7MN-3R-10
13	5.5	9–13	169	100		J7MN-3R-13
17	7.5	11–17	221	50		J7MN-3R-17
22	7.5	14–22	286	50		J7MN-3R-22
26	11	18–26	338	50		J7MN-3R-26
32	15	22–32	416	50		J7MN-3R-32
26	12.5	18–26	338	50	140 × 55 × 144	J7MN-6R-26
32	15	22–32	416	50		J7MN-6R-32
40	18.5	28–40	520	50		J7MN-6R-40
50	22	34–50	650	50		J7MN-6R-50
63	30	45–63	819	50	165 × 70 × 171	J7MN-6R-63
63	30	45–63	819	50		J7MN-9R-63
75	37	55–75	975	50		J7MN-9R-75
90	45	70–90	1170	50		J7MN-9R-90
100	–	80–100	1300	50		J7MN-9R-100

Accessories

Description	Version	For circuit breaker	Order code	
Transverse auxiliary contact block				
Contact block	1 NO + 1 NC	All	J77MN-11F	
	2NO		J77MN-20F	
	2NC		J77MN-02F	
Auxiliary contact block for left hand side mounting (max. 2 pc. per circuit breaker)				
Contact block (9 mm)	1 NO + 1 NC	All	J77MN-11S	
	2NO		J77MN-20S	
	2NC		J77MN-02S	
Signalling switch for left hand side mounting (max. 1 pc. per circuit breaker)				
Signalling switch (18 mm)	1 NO + 1 NC any tripping condition	J7MN-3P/-3R	J77MN-TA-11S	
		J7MN-6R/-9R	J77MN-TB-11S	
	1 NO + 1 NC short circuit tripping condition	All	J77MN-T-11S	
Undervoltage releases for right hand side mounting (max 1 pc. per circuit breaker)				
Trips the circuit breaker when the voltage is interrupted. Prevents the motor from being restarted accidentally when the voltage is restored, suitable for EMERGENCY STOP according to VDE 0113	AC 50 Hz	AC 60 Hz		
	24 V	28 V	All	J77MN-U-24
	110–127 V	120 V		J77MN-U-110
	220–230 V	240–260 V		J77MN-U-230
	240 V	277 V		J77MN-U-240
	380–400 V	440–460 V		J77MN-U-400
	415–440 V	460–480 V		J77MN-U-415
	Shunt releases for right hand side mounting (max 1 pc. per circuit breaker)			
Trips the circuit breaker when the release coil is energized	AC 50 Hz	AC 60 Hz		
	24 V	28 V	All	J77MN-S-24
	110–127 V	120 V		J77MN-S-110
	220–230 V	240–260 V		J77MN-S-230
	240 V	277 V		J77MN-S-240
	380–400 V	440–460 V		J77MN-S-400
	415–440 V	460–480 V		J77MN-S-415
Terminal block				
Terminal block	Up to 600 V according to UL 489 not for transverse auxiliary contact block	J7MN-3R	J77MN-TB32	
		J7MN-9R	J77MN-TB100	

Insulated 3-Phase Busbar System IP20

Description	Connection type	Version	For Units (MPCB)	Order code
3-phase busbars; modular spacing = 45 mm	Spade	for 2 units	J7MN-3P; J7MN-3R	J77MN-CPM-3-45-2S
		for 3 units		J77MN-CPM-3-45-3S
		for 4 units		J77MN-CPM-3-45-4S
		for 5 units		J77MN-CPM-3-45-5S
Line side terminal 3-pole, connection from above; conductor cross-section solid or stranded 6–25 mm ² with end sleeve 4–16 mm ²	Spade	acc. IEC/EN 60947-1, 60947-2, 60947-4-1 and VDE 0660	J7MN-3P; J7MN-3R	J77MN-BTC-63-SE
Line side terminal 3-pole, connection from above; conductor cross-section solid or stranded 6–25 mm ² with end sleeve 4–16 mm ²	Spade	up to 600 V acc. UL 489	J7MN-3P; J7MN-3R	J77MN-BTC-63-SEV
Shrouds for unused terminals on busbar system	Spade		J7MN-3P; J7MN-3R	J77MN-TA-63S

Specifications

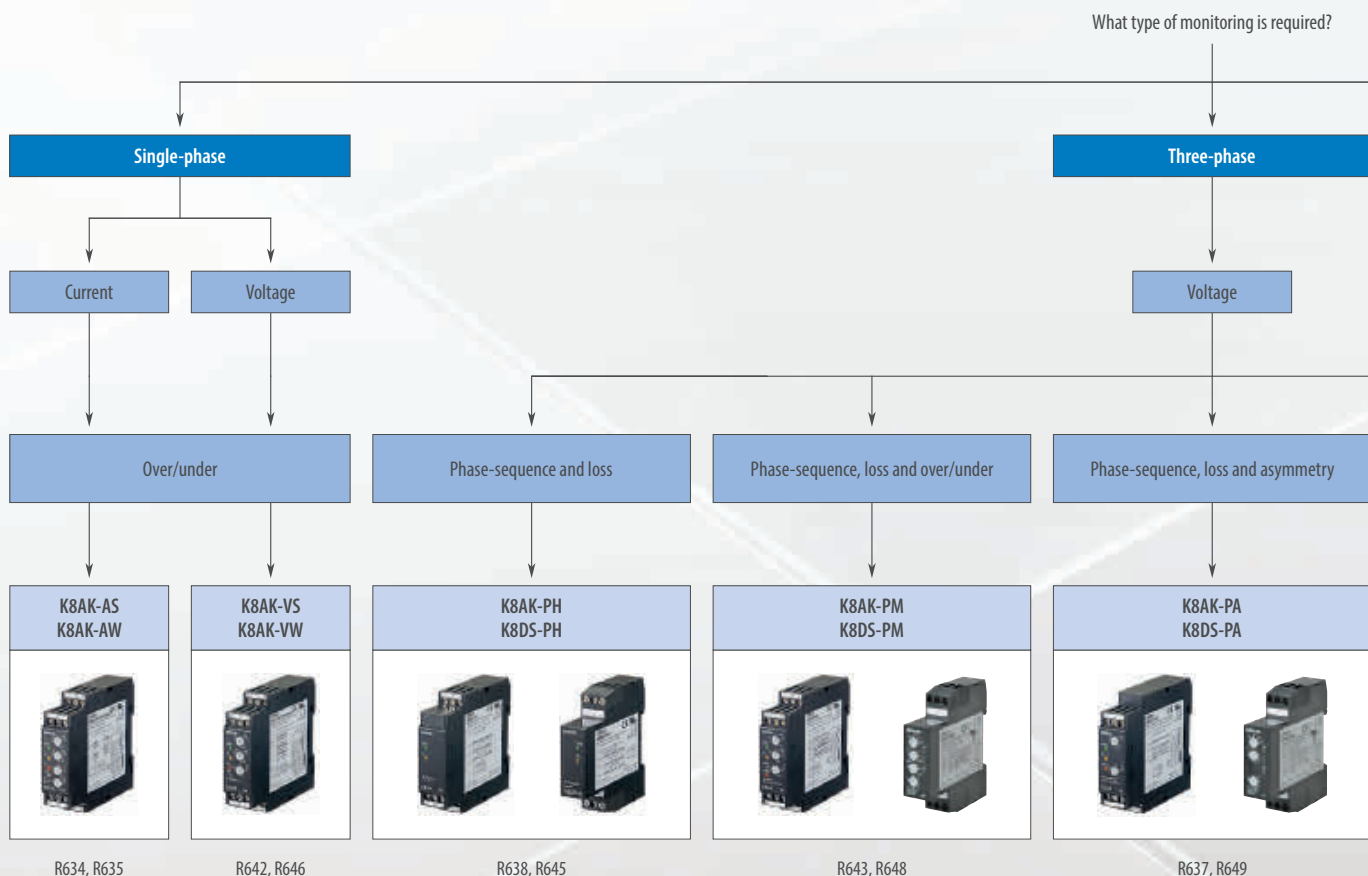
Type		J7MN-3P	J7MN-3R	J7MN-6R	J7MN-9R
Number of poles		3	3	3	3
Max. rated current I_{nmax} (= max. rated operational current I_e)	A	32	32	63	100
Permissible ambient temperature	Storage/transport	-50 to 80°C			
	Operation	-20 to 60°C			
Rated operational voltage U_e	V	690			
Rated frequency	Hz	50/60			
Rated insulation voltage U_i	V	690			
Rated impulse withstand voltage U_{imp}	kV	6			
Utilization category	IEC 60 947-2 (circuit breaker)	A			
	IEC 60 947-4-1 (motor starter)	AC-3			
Class	According to IEC 60 947-4-1	10			
Degree of protection	According to IEC 60 529	IP20	IP20	IP20	IP20
Phase failure sensitivity	According to IEC 60 947-4-1	Yes			
Explosion protection	According to EC Directive 94/19/EC	Yes			
Isolator characteristics	According to IEC 60 947-3	Yes			
Main and EM. STOP switch characteristics	According to IEC 60 204-1 (VDE113)	Yes			
Safe isolation between main and auxiliary circuits According to DIN VDE 0106 Part 101	Up to 400 V + 10%	Yes			
	Up to 415 V + 5%	Yes			
Mechanical endurance	Operating cycles	100,000	100,000	50,000	50,000
Electrical endurance		100,000	100,000	25,000	25,000
Max. operating frequency per hour (motor starts)	1/h	25	25	25	25

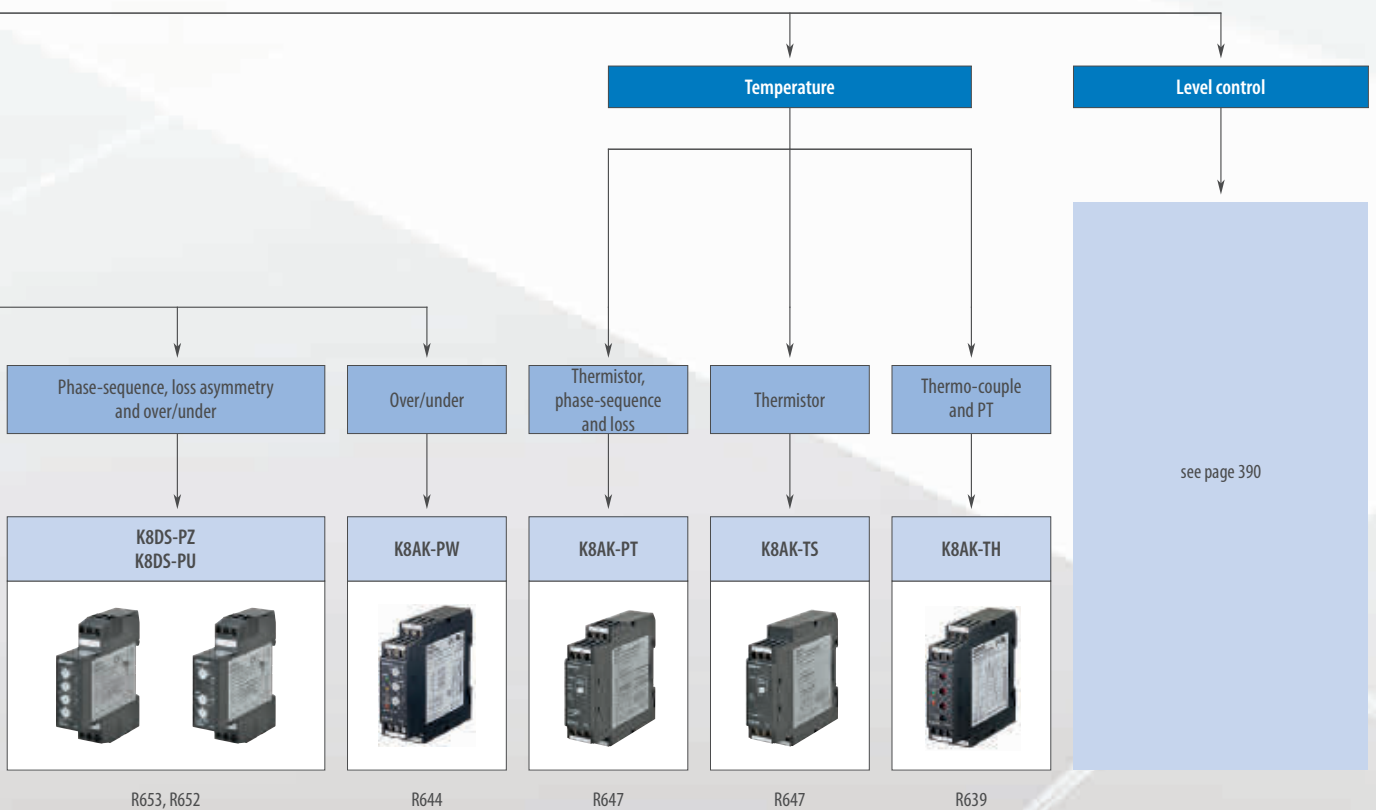
THE COMPLETE MONITORING RANGE

K8 series – The smart way to protect your system

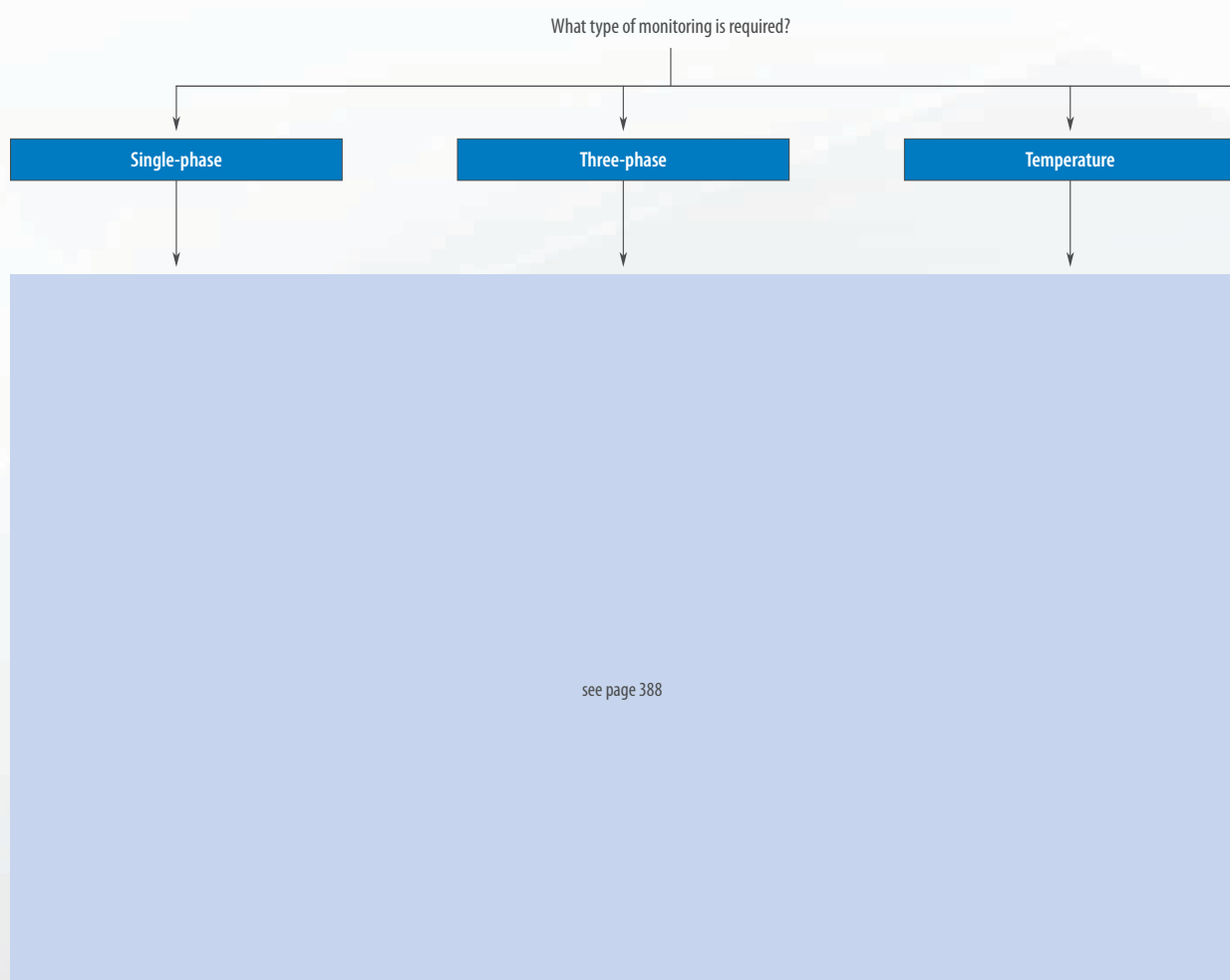
The K8 series offers you a flexible and complete one-stop shopping solution!
This monitoring range can be split into models for single-phase current and single-phase voltage, three-phase voltage, conductive level and a temperature alarm unit.

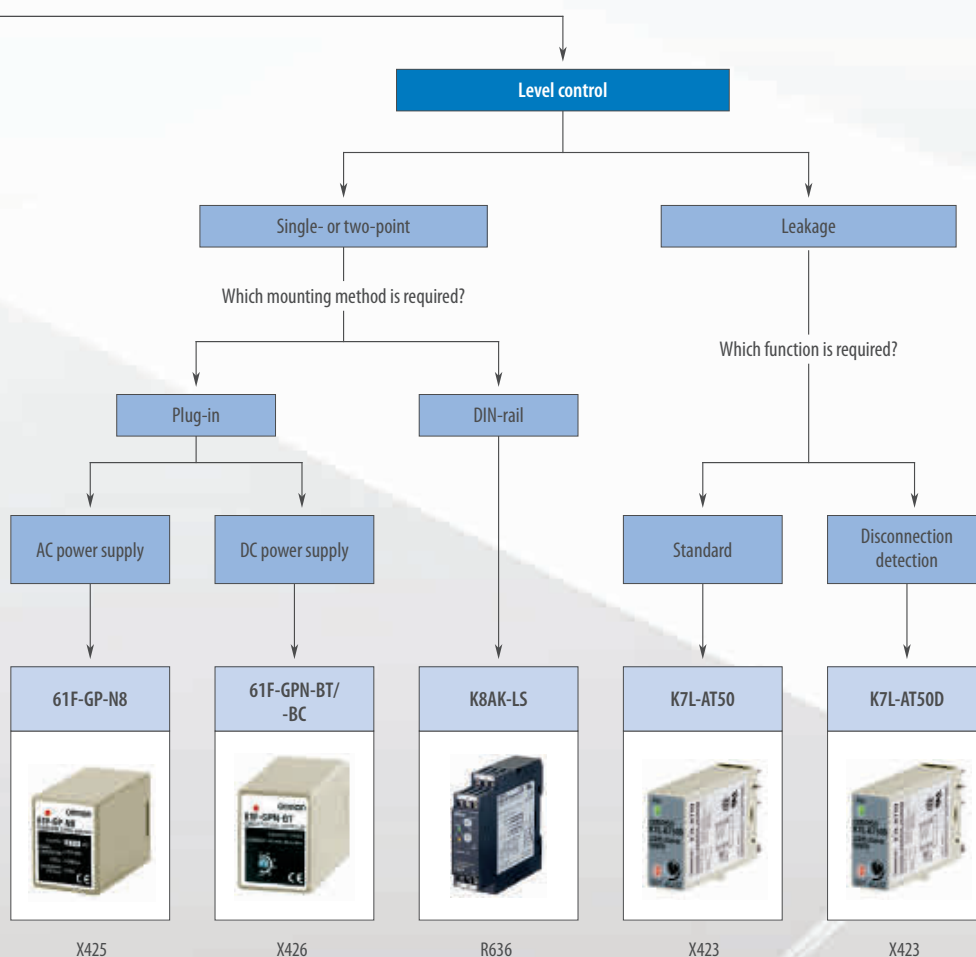
- 1-phase: full-span of range setting, all models with timer function
- 3-phase: wide range of global voltage settings
- Temperature monitoring relay: wide temperature range with precision increased
- Easy-to-set parameters





Monitoring products





Selection table

Category		1-phase current		1-phase voltage		3-phase voltage phase-sequence/phase-loss		3-phase voltage phase-sequence/phase-loss over/under	
									
Model		K8AK-AS	K8AK-AW	K8AK-VS	K8AK-VW	K8AK-PH	K8DS-PH	K8AK-PM	K8DS-PM
Selection criteria	Specialty	Ideal for current monitoring for industrial heaters and motors.		Ideal for voltage monitoring for industrial facilities and equipment.		Ideal for phase-sequence and phase-loss monitoring for industrial facilities and equipment.		Ideal for monitoring 3-phase power supplies for industrial facilities and equipment.	
	Sensing range (configurable)	20 mA to 8 A, 100 or 200 A with current transformer		1 to 600 V		Same as supply voltage			
Supply voltage AC	24 VAC	■	■	■	■	—	—	—	—
	100 VAC	—	—	—	—	—	—	—	—
	110 VAC	—	—	—	—	—	—	—	—
	115 VAC	—	—	—	—	—	—	—	—
	120 VAC	—	—	—	—	—	—	—	—
	200 VAC	—	—	—	—	—	—	—	—
	220 VAC	—	—	—	—	—	—	—	—
	230 VAC	—	—	—	—	—	—	—	—
	240 VAC	—	—	—	—	—	—	—	—
	100 to 240 VAC	■	■	■	■	—	—	—	—
	200 to 480 VAC	—	—	—	—	■	■	—	—
	200 to 240 VAC	—	—	—	—	—	—	■ (-PM1, 3-wire)	■
	115 to 138 VAC	—	—	—	—	—	—	■ (-PM1, 4-wire)	—
	380 to 480 VAC	—	—	—	—	—	—	■ (-PM2, 3-wire)	■
220 to 277 VAC	—	—	—	—	—	—	■ (-PM2, 4-wire)	—	
Supply voltage DC	24 VDC	■	■	■	■	—	—	—	—
	12 to 24 VDC	—	—	—	—	—	—	—	—
Control output	Transistor NPN	—	—	—	—	—	—	—	—
	Transistor PNP	—	—	—	—	—	—	—	—
	Relay	■ (1 SPDT)	■ (2 SPDT)	■ (1 SPDT)	■ (2 SPDT)	■ (1 DPDT)	■ (1 SPDT)	■ (2 SPDT)	■ (1 SPDT)
Features	LED operation indicator	■	■	■	■	■	■	■	■
	Adjustable sensitivity	—	—	—	—	—	—	—	—
	Electrode types	—	—	—	—	—	—	—	—
Page/Quick Link		R634	R635	R642	R646	R638	R645	R643	R648

3-phase voltage phase-sequence, loss and asymmetry		3-phase voltage phase-sequence, loss, asymmetry and over/under		3-phase voltage over/under	Temperature thermistor, phase- sequence and loss	Temperature thermistor	Temperature thermo-couple and PT
							
K8AK-PA	K8DS-PA	K8DS-PZ	K8DS-PU	K8AK-PW	K8AK-PT	K8AK-TS	K8AK-TH
Ideal for 3-phase voltage asymmetry monitoring for industrial facilities and equipment.		Ideal for monitoring 3-phase power supplies for industrial facilities and equipment		Ideal for monitoring 3-phase power supplies for industrial facilities and equipment.	Monitor temperature rise through internal motor		Compact and slim relay ideal for temperature alarms and monitoring
Same as supply voltage					100 to 240 VAC 24 VAC/DC		100 to 240 VAC 24 VAC/DC
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■ Standard

□ Available

— No/not available

Category		Conductive level controller				Liquid leakage sensor amplifier	
							
Model		61F-GP-N8	61F-GPN-BT	61F-GPN-BC	K8AK-LS	K7L-AT50	K7L-AT50D
Selection criteria	Specialty	Single or two-point	AC sine wave between electrodes for stable detection with no electrolysis	AC sine wave between electrodes for stable detection with no electrolysis	Ideal for level control for industrial facilities and equipment	Sensor amplifier, AC sine wave between electrodes for stable detection with no electrolysis	Sensor amplifier with disconnection detection function
	Sensing range (configurable)	4 to 50 kΩ	0 to 100 kΩ	1 to 100 kΩ	10 to 100 kΩ	0 to 50 MΩ	1 to 50 MΩ
Supply voltage AC	24 VAC	☐	—	—	☐	—	—
	100 VAC	☐	—	—	—	—	—
	110 VAC	☐	—	—	—	—	—
	115 VAC	—	—	—	—	—	—
	120 VAC	☐	—	—	—	—	—
	200 VAC	☐	—	—	—	—	—
	220 VAC	☐	—	—	—	—	—
	230 VAC	☐	—	—	—	—	—
	240 VAC	☐	—	—	—	—	—
	100 to 240 VAC	—	—	—	■	—	—
	200 to 480 VAC	—	—	—	—	—	—
	200 to 240 VAC	—	—	—	—	—	—
	115 to 138 VAC	—	—	—	—	—	—
	380 to 480 VAC	—	—	—	—	—	—
	220 to 277 VAC	—	—	—	—	—	—
Supply voltage DC	24 VDC	—	■	■	☐	—	—
	12 to 24 VDC	—	—	—	—	☐	☐
Control output	Transistor NPN	—	—	■	—	■	■
	Transistor PNP	—	—	—	—	■	■
	Relay	■	■	■	■ (1 SPDT)	—	—
Features	LED operation indicator	■	■	■	■	■	■
	Adjustable sensitivity	—	■	■	—	■	■
	Electrode types	Electrode holder: PS-S, PS-31, BF-1 and BS-1				Liquid leakage sensor band F03-16PE	
Page/Quick Link		X425	X426	R636		X423	

■ Standard

□ Available

— No/not available

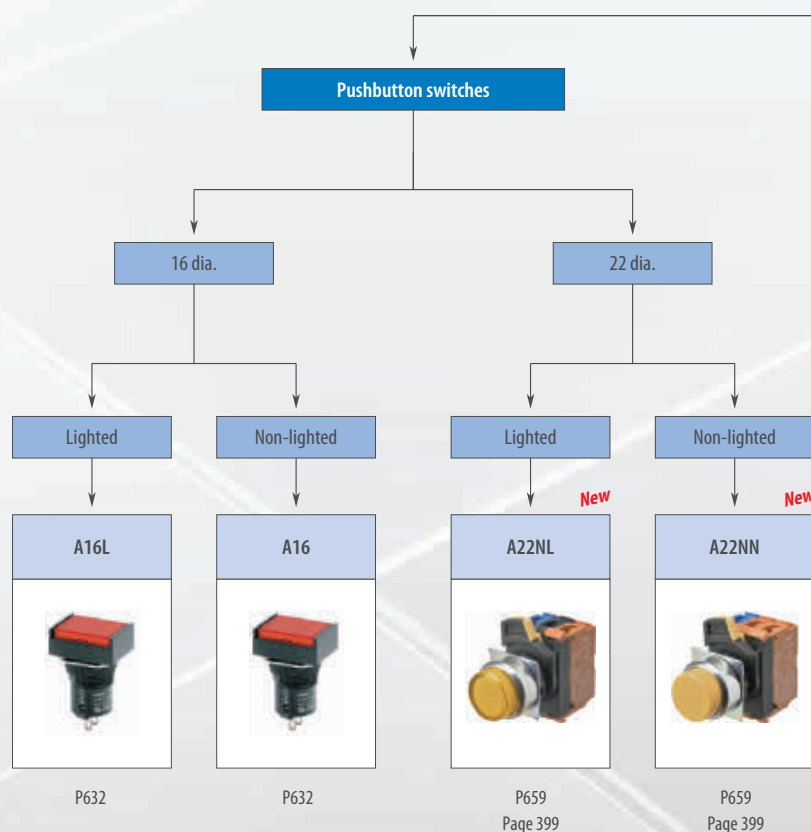
Pushbutton switches

FULL RANGE OF 16 AND 22 MM ASSEMBLED AND SUB-ASSEMBLED PUSHBUTTON SWITCHES AND INDICATORS

A22N pushbuttons with round plastic, brushed metal or metal bezels

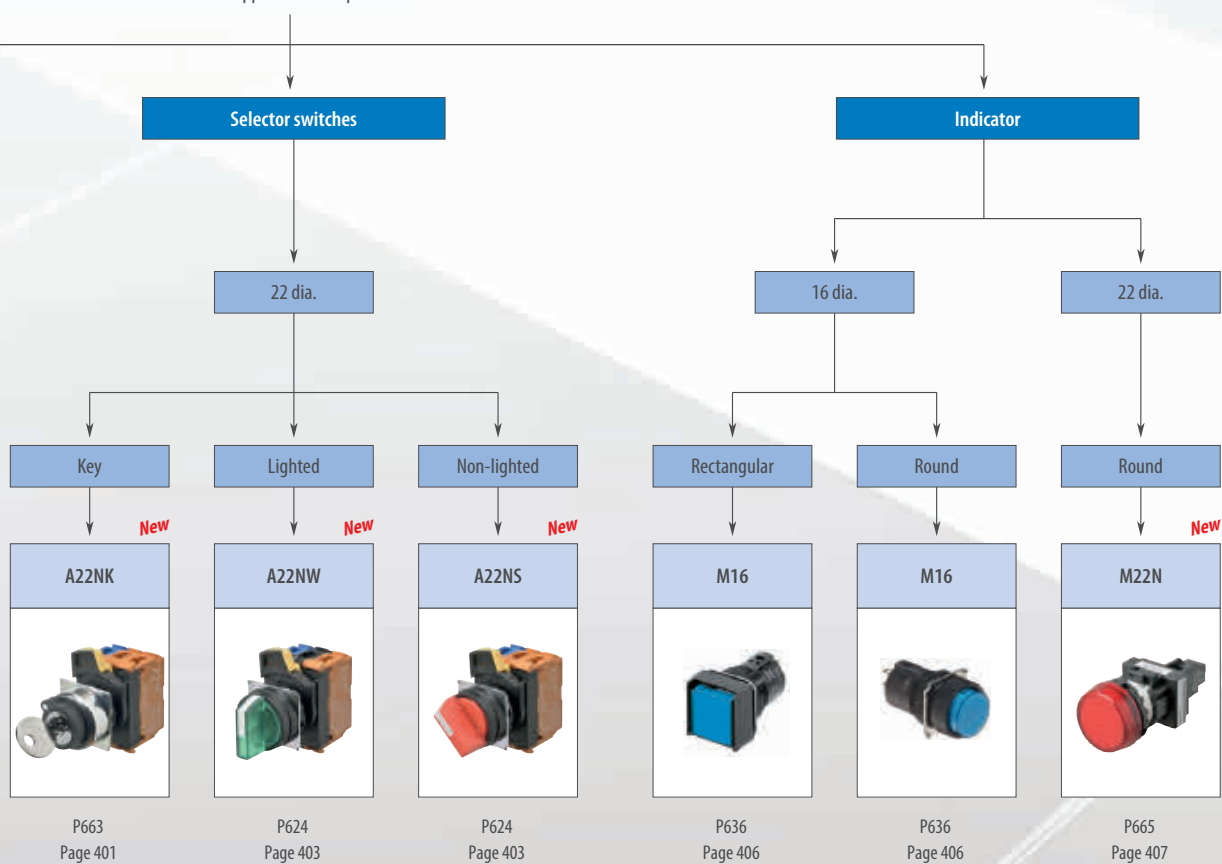
Complete line of 22 mm pushbuttons, selectors, keyed selectors and indicator lights. These reliable switches are offered in a wide range of shapes and colors

- Aesthetic design
- Reduced mounting depth
- Quick, easy and tool-free assembly





Which application is required?



Category		Pushbutton switch		Indicator	
					
Model		A16	A22N	M16	M22N
Selection criteria	Mounting	Nut-mounting			
	Size	16 mm	22 mm	16 mm	22 mm
	Shape				
Pushbutton color	Incandescent lamp-lighted	Red	■	—	—
		Yellow	■	—	—
		Green	■	—	—
		White	■	—	—
		Blue	■	—	—
	LED-lighted	Red	■	■	■
		Yellow	■	■	■
		Green	■	■	■
		White	■	■	■
		Blue	■	■	■
	Non-lighted	Red	■	—	—
		Yellow	■	—	—
		Green	■	—	—
		White	■	—	—
		Blue	■	—	—
		Black	■	—	—
Features	Momentary operation	■	■	—	—
	Self-holding	■	■	—	—
	Number of contacts	2	6	—	—
	IP rating	IP40, IP65	IP66	IP40, IP65	IP66
	Legend plate	■	■	■	■
Switch ratings [A]	125 VAC	5	10	—	—
	250 VAC	3	6	—	—
	30 VDC	3	10	—	—
	Rated resistive load	5 A at 125 VAC, 3 A at 250 VAC, 3 A at 30 VDC	10 A at 120 VAC 6 A at 240 VAC	—	—
Terminals	Solder	■	—	■	—
	PCB	—	—	■	—
	Screw-less Clamp	—	—	■	—
Operating voltage	5 VDC	■	■	■	■
	12 VDC	■	■	■	■
	24 VDC	■	■	■	■
	120/240 VAC	—	■	—	■
Form	SPDT	■	—	—	—
	DPDT	■	—	—	—
	SPST-NO	—	■	—	—
	SPST-NC	—	■	—	—
	SPST-NO + SPST-NC	—	■	—	—
	DPST-NO	—	■	—	—
	DPST-NC	—	■	—	—
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■ Standard

□ Available

— No/not available



22-mm Pushbutton switches with universal design

- Round pushbutton switches available with a choice of plastic, brushed metal and metal bezels for both lighted and non-lighted options. Emphasis on color coding, workability and design.
- Variety of bezel and color options with aesthetic design
 - Mounting depth less than 46.8 mm below panel
 - Up to 6 contact blocks (3 contact blocks across and 2 rows deep)
 - Symmetrical contact block
 - Snap-in switch unit for quick and easy mounting
 - RoHS compliant

Ordering information

Lighted/ Non-Lighted	Bezel material	Top shape	Contacts group 102*1	LED	Color	Order code	
						Operational mode	
						Momentary	Alternate
Lighted	Plastic	Full guard	1NO 1NC	24V	Green	A22NL-BGM-TGA-G102-GC	A22NL-BGA-TGA-G102-GC
		Flat	1NO 1NC	200-240 VAC	Red	A22NL-BNM-TRA-G102-RE	A22NL-BNA-TRA-G102-RE
	Metal	Flat	1NO 1NC	24V	Green	A22NL-RNM-TGA-G102-GC	A22NL-RNA-TGA-G102-GC
		Projected	1NO 1NC	200-240 VAC	Red	A22NL-RPM-TRA-G102-RE	A22NL-RPA-TRA-G102-RE
	Brushed metal	Full guard	1NO 1NC	24V	Green	A22NL-MGM-TGA-G102-GC	A22NL-MGA-TGA-G102-GC
		Projected	1NO 1NC	200-240 VAC	Red	A22NL-MPM-TRA-G102-RE	A22NL-MPA-TRA-G102-RE
Non-lighted	Plastic	Flat	1NO 1NC	–	Red	A22NN-BNM-NRA-G102-NN	A22NN-BNA-NRA-G102-NN
		Projected	1NO 1NC	–	Black	A22NN-BPM-NBA-G102-NN	A22NN-BPA-NBA-G102-NN
	Metal	Flat	1NO 1NC	–	Green	A22NN-RNM-NGA-G102-NN	A22NN-RNA-NGA-G102-NN
		Projected	1NO 1NC	–	Red	A22NN-RPM-NRA-G102-NN	A22NN-RPA-NRA-G102-NN
	Brushed metal	Flat	1NO 1NC	–	White	A22NN-MNM-NWA-G102-NN	A22NN-MNA-NWA-G102-NN
		Projected	1NO 1NC	–	Yellow	A22NN-MPM-NYA-G102-NN	A22NN-MPN-NYA-G102-NN

*1 Contacts

Code	Contact blocks		Unit position					
			Non-lighted			Lighted		
	NO	NC	(1)	(2)	(3)	(1)	(2)	(3)
100	1	0	NO	–	–	NO	Lighting Unit	–
002	0	1	–	–	NC	–	Lighting Unit	NC
101	2	0	NO	–	NO	NO	Lighting Unit	NO
102	1	1	NO	–	NC	NO	Lighting Unit	NC
202	0	2	NC	–	NC	NC	Lighting Unit	NC

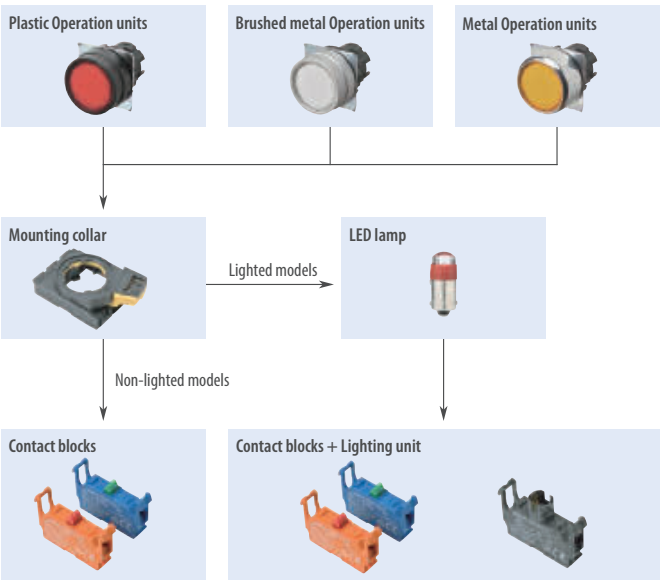
List of models

	Plastic bezels	Brushed Metal bezels	Metal bezels
Flat			
Projected			
Full guard			

Subassemblies

Switch structure

You can order Operation units, LED lamp, Mounting collars, and Contact blocks individually. Use them in combination for models that are not available as assembled switches. They can also be used as inventory for maintenance parts.



Reference for:	A22NL-BGM-TGA-G102-G Momentary	A22NL-BGA-TGA-G102-GC Alternate
Operational unit	A22NZ-BNM-TRA	A22NZ-BNA-TRA
Mounting collar	A22NZ-H-01	
Contact block SPST-NO	A22NZ-S-G1A	
Contact block SPST-NC	A22NZ-S-G1B	
Lighting unit 24 VAC/VDC	A22NZ-T-C	
LED lamp 24 VAC/DC	A22NZ-L-RC	



Operational units

Lighted/ Non-Lighted	Bezel material	Shape	Color	Order code	
				Momentary	Alternate
Lighted	Plastic	Full guard	Green	A22NZ-BGM-TGA	A22NZ-BGA-TGA
		Flat	Red	A22NZ-BNM-TRA	A22NZ-BNA-TRA
	Metal	Flat	Green	A22NZ-RNM-TGA	A22NZ-RNA-TGA
		Projected	Red	A22NZ-RPM-TRA	A22NZ-RPA-TRA
	Brushed metal	Projected	Yellow	A22NZ-MPM-TYA	A22NZ-MPA-TYA
		Full guard	Blue	A22NZ-MGM-TAA	A22NZ-MGA-TAA
Non-lighted	Plastic	Flat	Red	A22NZ-BNM-NRA	A22NZ-BNA-NRA
		Projected	Black	A22NZ-BPM-NBA	A22NZ-BPA-NBA
	Metal	Flat	Green	A22NZ-RNM-NGA	A22NZ-RNA-NGA
		Projected	Red	A22NZ-RPM-NRA	A22NZ-RPA-NRA
	Brushed metal	Flat	White	A22NZ-MNM-NWA	A22NZ-MNA-NWA
		Projected	Yellow	A22NZ-MPM-NYA	A22NZ-MPA-NYA

Mounting collar

Appearance	Order code
	A22NZ-H-01

Contact blocks

Appearance	Contacts	Order code
	SPST-NO (blue)	A22NZ-S-G1A
	SPST-NC (orange)	A22NZ-S-G1B

Lighting units

Appearance	Applied voltage	Order code
	24 VAC/DC	A22NZ-T-C
	100/110/120 VAC	A22NZ-T-D
	200/220/230/240 VAC	A22NZ-T-E

LED lamp

Appearance	Color	Order code		
		24 VAC/DC	100/110/120 VAC	200/220/230/ 240 VAC
	Red	A22NZ-L-RC	A22NZ-L-RD	A22NZ-L-RE
	Green	A22NZ-L-GC	A22NZ-L-GD	A22NZ-L-GE
	Yellow	A22NZ-L-YC	A22NZ-L-YD	A22NZ-L-YE
	White	A22NZ-L-WC	A22NZ-L-WD	A22NZ-L-WE
	Blue	A22NZ-L-AC	A22NZ-L-AD	A22NZ-L-AE
	Orange	A22NZ-L-OC	A22NZ-L-OD	A22NZ-L-OE

Accessories (Order separately)

Item	Appearance	Description	Order code
Reinforce- ment plate		Used to insure robustness or when the second of third level of contact blocks are attached.	A22NZ-A-C01
Tightening wrench		Used to tighten mounting nuts from the back of the panel.	A22NZ-A-301
LED lamp ex- tractor		Made of rubber and used to easily remove and attach LED lamps.	A22NZ-A-302
Control Box		Used to install of one pushbutton.	A22NZ-A-B01Y

Item	Appearance	Description	Order code
Legend plate frame		Legend Plate with no text on black background included. For 22.3-mm panel hole diameter	A22NZ-A-50103
Legend plates		Without text	White A22Z-3443W Black A22Z-3443B Transparent A22Z-3443C
		White text on red background	"STOP" A22Z-3443R-4
		White text on black background	"START" A22Z-3443B-3

Specifications

Contacts (Standard load)

Rated insulation voltage		600 V				
Rated carry current		10 A				
Applied voltage		24 V	120 V	240 V	380 V	440 V
AC at 50/60 Hz	Resistive load (AC-12)	10 A	10 A	6 A	2 A	2 A
	Inductive load (AC-15)	10 A	6 A	3 A	1.9 A	1.6 A
DC	Resistive load (DC-12)	8 A	2.2 A	1.1 A	—	—
	Inductive load (DC-13)	4 A	1.1 A	0.55 A	—	—

- Note**
- The above ratings were obtained by conducting tests under the following conditions.
 - (1) Ambient temperature: $20 \pm 2^\circ\text{C}$
 - (2) Ambient humidity: $65\% \pm 5\% \text{ RH}$
 - (3) Operating frequency: 30 operations/minute
 - Minimum applicable load: 10 mA at 5 VDC.



22 mm dia., round plastic, brushed metal, and metal bezels for keyed selector switches

- These reliable keyed switches are offered in a full range of 2 or 3 released positions with either manual or auto reset operations.
- Extra security available with keyed selector switches, only authorized key-holders can change settings
 - 2- and 3-position switches with manual or automatic reset
 - Mounting depth less than 46.8 mm behind panel
 - Up to 6 contact blocks (3 contact blocks across and 2 rows deep)
 - Symmetrical contact block
 - Snap-in switch unit for quick and easy mounting
 - RoHS compliant

Ordering information

Bezel material	Reset	Release position	Contacts group 102 ^{*1}	Order code	
				Operational mode (Positions)	
				2 positions	3 positions
Plastic	Manual	All	1NO 1NC	A22NK-2BM-01AA-G102	A22NK-3BM-01AA-G102
	Auto reset on left	Left	1NO 1NC	A22NK-2BL-01BA-G102	A22NK-3BL-01BA-G102
Metal	Manual	All	1NO 1NC	A22NK-2RM-01AA-G102	A22NK-3RM-01AA-G102
	Auto reset on left	Left	1NO 1NC	A22NK-2RL-01BA-G102	A22NK-3RL-01BA-G102
Brushed metal	Manual	All	1NO 1NC	A22NK-2MM-01AA-G102	A22NK-3MM-01AA-G102
	Auto reset on left	Left	1NO 1NC	A22NK-2ML-01BA-G102	A22NK-3ML-01BA-G102

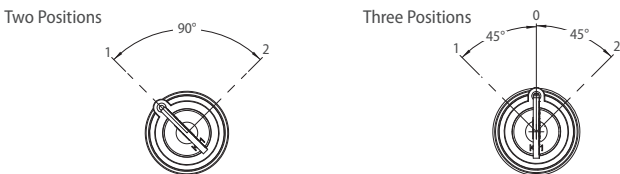
^{*1} Contacts

Code	Contact blocks		Unit position			Two positions	Three positions
	NO	NC	1	2	3		
100	1	0	NO	–	–	Yes	–
002	0	1	–	–	NC	Yes	–
101	2	0	NO	–	NO	Yes	Yes
102	1	1	NO	–	NC	Yes	Yes
201	1	1	NC	–	NO	–	Yes
202	0	2	NC	–	NC	Yes	Yes
110	2	0	NO	NO	–	–	Yes
111	3	0	NO	NO	NO	Yes	Yes
112	2	1	NO	NO	NC	Yes	Yes
210	1	1	NC	NO	–	–	Yes
211	2	1	NC	NO	NO	–	Yes

List of models

	Plastic bezels	Brushed metal bezels	Metal bezels
2 positions			
3 positions			

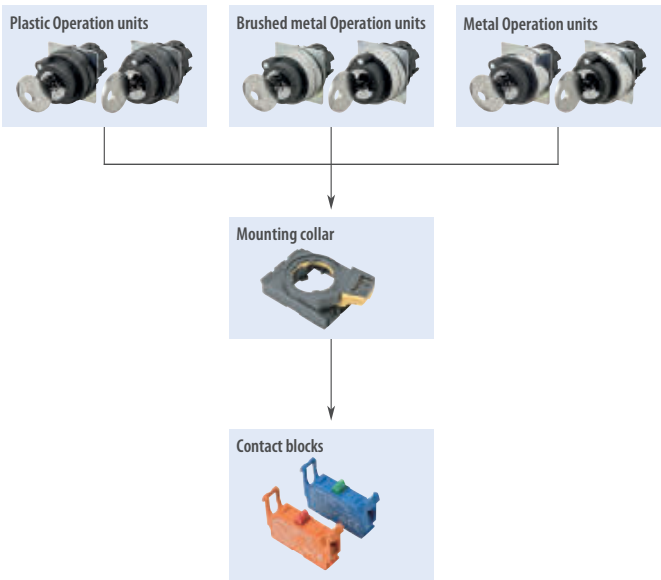
Operation angle



Subassemblies

Switch structure

You can order Operation Units, Mounting Collars, and Contact Blocks individually. Use them in combination for models that are not available as assembled Switches. They can also be used as inventory for maintenance parts



Reference for:	A22NK-2BM-01AA-G122 2 positions Manual	A22NK-2ML-01BA-G122 2 positions Auto reset on Left	A22NK-3RB-01DA-G122 3 positions Auto reset on L/R
	Plastic	Brushed metal	Metal
Release position	All	Left	Center
Operational unit	A22NZ-2BM-01AA	A22NZ-2ML-01BA	A22NZ-3RB-01DA
Mounting Collar	A22NZ-H-01		
Contact block SPST-NO	A22NZ-S-G1A		
Contact block SPST-NC × 2	A22NZ-S-G1B		



Pushbutton switches

Operational units

Bezel material	Reset	Release position	Order code	
			Operational mode (Positions)	
			2 positions	3 positions
Plastic	Manual	All	A22NZ-2BM-01AA	A22NZ-3BM-01AA
	Auto reset on left	Left	A22NZ-2BL-01BA	A22NZ-3BL-01BA
Metal	Manual	All	A22NZ-2RM-01AA	A22NZ-3RM-01AA
	Auto reset on left	Left	A22NZ-2RL-01BA	A22NZ-3RL-01BA
Brushed metal	Manual	All	A22NZ-2MM-01AA	A22NZ-3MM-01AA
	Auto reset on left	Left	A22NZ-2ML-01BA	A22NZ-3ML-01BA

Mounting collar

Appearance	Order code
	A22NZ-H-01

Contact blocks

Appearance	Contacts	Order code
	SPST-NO (blue)	A22NZ-S-G1A
	SPST-NC (orange)	A22NZ-S-G1B

Accessories (Order separately)

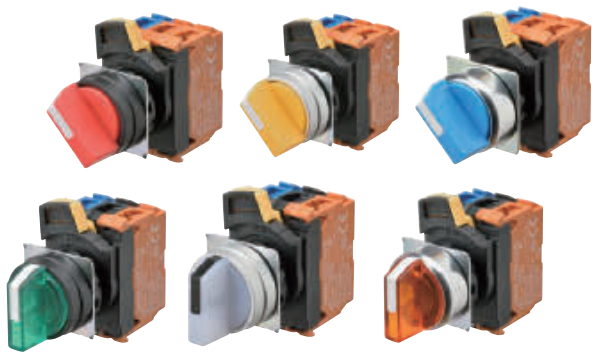
Item	Appearance	Description	Order code
Reinforcement plate		Used to insure robustness or when the second of third level of contact blocks are attached.	A22NZ-A-C01
Tightening wrench		Used to tighten mounting nuts from the back of the panel.	A22NZ-A-301
Key		Up to 6 different keys	A22NZ-K-01
Control Box		Used to install of one pushbutton.	A22NZ-A-B01Y

Item	Appearance	Description		Order code
Legend plate frame		Legend Plate with no text on black background included. For 22.3-mm panel hole diameter		A22NZ-A-50103
Legend plates		Without text	White	A22Z-3443W
			Black	A22Z-3443B
			Transparent	A22Z-3443C
		White text on red background	"STOP"	A22Z-3443R-4
		White text on black background	"START"	A22Z-3443B-3

Specifications

Key-type selector switches

Item		Switches with 2 positions	Switches with 3 positions
Allowable operating frequency	Mechanical	30 operations/min max.	
	Electrical	30 operations/min max.	
Insulated resistance		100 MΩ min. (at 500 VDC)	
Insulated resistance		100 mΩ min. (initial value)	
Dielectric strength	Between terminals of same polarity	2,500 VAC at 50/60 Hz for 1 min	
	Between each terminal and ground	2,500 VAC at 50/60 Hz for 1 min	
Vibration resistance	Malfuction	10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms)	
Shock resistance	Malfuction	1,000 m/s ² max. (malfunction within 1 ms)	
Durability	Mechanical	500,000 operations min.	300,000 operations min.
	Electrical	500,000 operations min.	300,000 operations min.



Selector switches with universal design, with emphasis on color coding, workability and safety

Complete line of 22 mm selectors. These reliable switches are offered in a wide range of colors and bezel material.

- Knob style selector switches provide users with a reliable way to start or choose between machine operations
- 2- and 3-position switches with manual or automatic reset
- Mounting depth less than 46.8 mm behind panel
- Up to 6 contact blocks (3 contact blocks across and 2 rows deep)
- Symmetrical contact block
- Snap-in switch unit for quick and easy mounting
- RoHS compliant

Ordering information

Lighted/ Non-Lighted	Bezel material	Reset	Contacts group 102 ^{*1}	LED	Color	Order code	
						Operational mode (Positions)	
						2 positions	3 positions
Lighted	Plastic	Manual	1NO 1NC	24 VDC	Green	A22NW-2BM-TGA-G102-GC	A22NW-3BM-TGA-G102-GC
		Auto reset on Left	1NO 1NC	200 to 240 VAC	Red	A22NW-2BL-TRA-G102-RE	A22NW-3BL-TRA-G102-RE
	Metal	Manual	1NO 1NC	24 VDC	Green	A22NW-2RM-TGA-G102-GC	A22NW-3RM-TGA-G102-GC
		Auto reset on Left	1NO 1NC	200 to 240 VAC	Red	A22NW-2RL-TRA-G102-RE	A22NW-3RL-TRA-G102-RE
	Brushed metal	Manual	1NO 1NC	24 VDC	Green	A22NW-2MM-TGA-G102-GC	A22NW-3MM-TGA-G102-GC
		Auto reset on Left	1NO 1NC	200 to 240 VAC	Red	A22NW-2ML-TRA-G102-RC	A22NW-3ML-TRA-G102-RC
Non-lighted	Plastic	Manual	1NO 1NC	–	Green	A22NS-2BM-NGA-G102-NN	A22NS-3BM-NGA-G102-NN
		Auto reset on Left	1NO 1NC	–	Red	A22NS-2BL-NRA-G102-NN	A22NS-3BL-NRA-G102-NN
	Metal	Manual	1NO 1NC	–	Yellow	A22NS-3BL-NRA-G102-NN	A22NS-3RM-NYA-G102-NN
		Auto reset on L/R	1NO 1NC	–	Black	–	A22NS-3RB-NBA-G102-NN
	Brushed metal	Manual	1NO 1NC	–	Green	A22NS-2MM-NGA-G102-NN	A22NS-3MM-NGA-G102-NN
		Auto reset on L/R	1NO 1NC	–	Red	–	A22NS-3MB-NRA-G102-NN

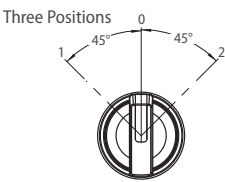
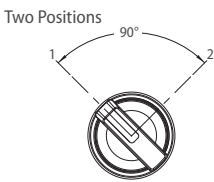
^{*1} Contacts

Code	Contact blocks		Non-lighted						Lighted					
			Unit position			No. of positions			Unit position			No. of positions		
	NO	NC	(1)	(2)	(3)	Two positions	Three positions		(1)	(2)	(3)	Two positions	Three positions	
100	1	0	NO	–	–	Yes	–	NO	Lighting unit	–	–	Yes	–	
002	0	1	–	–	NC	Yes	–	–	Lighting unit	NC	–	Yes	–	
101	2	0	NO	–	NO	Yes	Yes	NO	Lighting unit	NO	–	Yes	Yes	
102	1	1	NO	–	NC	Yes	Yes	NO	Lighting unit	NC	–	Yes	Yes	
201	1	1	NC	–	NO	–	Yes	NC	Lighting unit	NO	–	–	Yes	
202	0	2	NC	–	NC	Yes	Yes	NC	Lighting unit	NC	–	Yes	Yes	

List of models

	Plastic bezels	Brushed metal bezels	Metal bezels
2 positions			
3 positions			

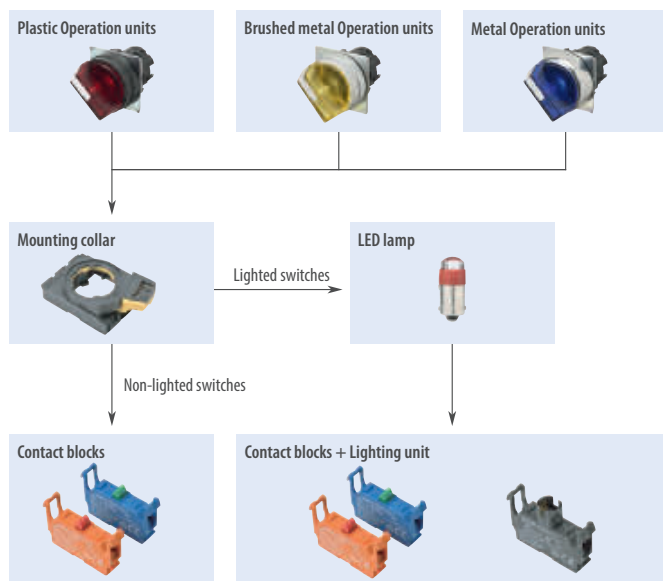
Operation angle



Subassemblies

Switch structure

You can order Operation units, LED lamp, Mounting collars, and Contact blocks individually. Use them in combination for models that are not available as assembled switches. They can also be used as inventory for maintenance parts.



Reference for:	A22NW-2BM-TGA-G102-GC 2 positions Manual	A22NW-3BB-TGA-G102-GC 3 positions Auto reset on L/R
Operational unit	A22NZ-2BM-TGA	A22NZ-3BB-TGA
Mounting collar	A22NZ-H-01	
Contact block SPST-NO	A22NZ-S-G1A	
Contact block SPST-NC	A22NZ-S-G1B	
Lighting unit 24 VAC/VDC	A22NZ-T-C	
LED lamp 24 VAC/DC	A22NZ-L-GC	



Operational units

Lighted/ Non-Lighted	Bezel material	Reset	Color	Order code	
				Operational mode (Positions)	
				2 positions	3 positions
Lighted	Plastic	Manual	Green	A22NZ-2BM-TGA	A22NZ-3BM-TGA
		Auto reset on Left	Red	A22NZ-2BL-TRA	A22NZ-3BL-TRA
	Metal	Manual	Green	A22NZ-2RM-TGA	A22NZ-3RM-TGA
		Auto reset on Left	Red	A22NZ-2RL-TRA	A22NZ-3RL-TRA
	Brushed metal	Manual	Green	A22NZ-2MM-TGA	A22NZ-3MM-TGA
		Auto reset on Left	Red	A22NZ-2ML-TRA	A22NZ-3ML-TRA
Non-lighted	Plastic	Manual	Green	A22NZ-2BM-NGA	A22NZ-3BM-NGA
		Auto reset on Left	Red	A22NZ-2BL-NRA	A22NZ-3BL-NRA
	Metal	Manual	Yellow	A22NZ-2RM-NYA	A22NZ-3RM-NYA
		Auto reset on L/R	Black	—	A22NZ-3RB-NBA
	Brushed metal	Manual	Green	A22NZ-2MM-NGA	A22NZ-3MM-NGA
		Auto reset on L/R	Red	—	A22NZ-3MB-NRA

Contact blocks

Appearance	Contacts	Order code
	SPST-NO (blue)	A22NZ-S-G1A
	SPST-NC (orange)	A22NZ-S-G1B

Lighting units

Appearance	Applied voltage	Order code
	24 VAC/DC	A22NZ-T-C
	100/110/120 VAC	A22NZ-T-D
	200/220/230/240 VAC	A22NZ-T-E

LED lamp

Appearance	Color	Order code		
		24 VAC/DC	100/110/120 VAC	200/220/230/240 VAC
	Red	A22NZ-L-RC	A22NZ-L-RD	A22NZ-L-RE
	Green	A22NZ-L-GC	A22NZ-L-GD	A22NZ-L-GE
	Yellow	A22NZ-L-YC	A22NZ-L-YD	A22NZ-L-YE
	White	A22NZ-L-WC	A22NZ-L-WD	A22NZ-L-WE
	Blue	A22NZ-L-AC	A22NZ-L-AD	A22NZ-L-AE
	Orange	A22NZ-L-OC	A22NZ-L-OD	A22NZ-L-OE

Mounting collar

Appearance	Order code
	A22NZ-H-01

Accessories (Order separately)

Item	Appearance	Description	Order code
Reinforce-ment plate		Used to insure robustness or when the second of third level of contact blocks are attached.	A22NZ-A-C01
Tightening wrench		Used to tighten mounting nuts from the back of the panel.	A22NZ-A-301
LED lamp ex-tractor		Made of rubber and used to easily re-move and attach LED lamps.	A22NZ-A-302
Control Box		Used to install of one pushbutton.	A22NZ-A-B01Y

Item	Appearance	Description	Order code
Legend plate frame		Legend Plate with no text on black background included. For 22.3-mm panel hole diameter	A22NZ-A-50103
Legend plates		Without text	White A22Z-3443W Black A22Z-3443B Transparent A22Z-3443C
		White text on red background	"STOP" A22Z-3443R-4
		White text on black background	"START" A22Z-3443B-3

Specifications

Selector switches			
Item		Non-lighted models	Lighted models
Allowable operating frequency	Mechanical	30 operations/min max.	
	Electrical	30 operations/min max.	
Insulated resistance		100 MΩ min. (at 500 VDC)	
Dielectric strength	Between terminals of same polarity	2,500 VAC at 50/60 Hz for 1 min	
	Between each terminal and ground	2,500 VAC at 50/60 Hz for 1 min	
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms)	
Shock resistance	Malfunction	1,000 m/s ² max. (malfunction within 1 ms)	
Durability	Mechanical	500,000 operations min. (3 positions: 300,000 operations min.)	
	Electrical	500,000 operations min. (3 positions: 300,000 operations min.)	



Indicators with a mounting aperture of 16 mm

The M16 series of nut-mounted indicators comes in rectangular, square and round versions. Due to its modular construction, assembly is quick and easy. M16 comes in a wide variety of control and signal devices with a wide range of switching capacities, from general load to micro load.

- LED, incandescent and neon lamp
- Snap-in switch unit
- Short mounting depth, less than 28.5 mm below panel
- High reliability, IP65
- UL, CSA and VDE approved, conforms to EN60947-5-1

Ordering information

Pushbutton

Type	Display color	Order code		
		IP65 oil-resistant		
		Rectangular	Square	Round
LED Incandescent lamp	Red	A165L-JR	A165L-AR	A165L-TR
	Yellow	A165L-JY	A165L-AY	A165L-TY
	Pure yellow	A165L-JPY	A165L-APY	A165L-TPY
	White	A165L-JW	A165L-AW	A165L-TW
	Blue	A165L-JA	A165L-AA	A165L-TA
LED Incandescent lamp	Green	A165L-JGY	A165L-AGY	A165L-TGY
	Green	A165L-JG	A165L-AG	A165L-TG

Lamp

Type	Color	Order code		
		Operating voltage		
		5 VDC	12 VDC	24 VDC
LED	Red	A16-5DSR	A16-12DSR	A16-24DSR
	Yellow	A16-5DSY	A16-12DSY	A16-24DSY
	Green	A16-5DSG	A16-12DSG	A16-24DSG
	White	A16-5DSW	A16-12DSW	A16-24DSW
	Blue	A16-5DA	A16-12DA	A16-24DA
Type		5 VAC/VDC	12 VAC/VDC	24 VAC/VDC
Incandescent lamp		A16-5	A16-12	A16-24

Case

Classification		Order code
IP65 oil-resistant	Rectangular	A165-CJM
	Square	A165-CAM
	Round	A165-CTM

Socket

Classification			Order code
Solder terminals			M16-0
PCB terminals			M16-0P
Screw-less clamp			M16-S
Solder terminals	Voltage-reduction lighting	100 V	M16-T1
Screw-less clamp		100 V	M16-T1-S
		200 V	M16-T2-S

Specifications

Allowable operating frequency	Mechanical	Momentary operation: 120 operations/minute max., alternate operation: 60 operations/minute max.
	Electrical	20 operations/minute max.
Durability	Mechanical	Momentary operation: 2,000,000 operations min., alternate operation: 200,000 operations min.
	Electrical	100,000 operations min.
Degree of contamination	3 (IEC947-5-1)	
Ambient temperature	Operating: -10 to 55°C (with no icing or condensation) Storage: -25 to 65°C (with no icing or condensation)	
Weight	Approx. 10 g (in the case of a lighted DPDT switch with solder terminals)	
Size in mm	Round/square: 18Hx18Wx28.5D rectangular: 18Hx24Wx28.5D	

Agency	Standards	File number
UL, cUL	UL508	E41515

Ratings

Superbright LED			
Rated voltage	Rated current	Operating voltage	Built-in limiting resistance
5 VDC	30 mA (15 mA)	5 VDC ±5%	33 Ω (68 Ω)
12 VDC	15 mA	12 VDC ±5%	270 Ω (560 Ω)
24 VDC	10 mA	24 VDC ±5%	1,600 Ω (2,000 Ω)

Incandescent lamp		
Rated voltage	Rated current	Operating voltage
6 VAC/VDC	60 mA	5 VAC/VDC
14 VAC/VDC	40 mA	12 VAC/VDC
28 VAC/VDC	24 mA	24 VAC/VDC



22 mm IP66 indicator lights show status of machinery and processes on control panels.

Complete line of 22 mm pushbuttons, selectors, keyed selectors and indicators. These reliable switches are offered in a wide range of shapes and colors.

- The bright LED light source is easy to see under most lighting conditions
- Variety of model and color options
- Easy mounting and removal of socket unit
- Short mounting depth, less than 49.2 mm behind panel

Ordering information

Material	Appearance	Operating voltage	Order code			
			Red	Green	Yellow	Blue
Plastic	Flat	24 VAC/DC	M22N-BN-TRA-RC	M22N-BN-TGA-GC	M22N-BN-TYA-YC	M22N-BN-TAA-AC
		100, 110, 120 VAC	M22N-BN-TRA-RD	M22N-BN-TGA-GD	M22N-BN-TYA-YD	M22N-BN-TAA-AD
		200, 220, 230, 240 VAC	M22N-BN-TRA-RE	M22N-BN-TGA-GE	M22N-BN-TYA-YE	M22N-BN-TAA-AE
	Projected	24 VAC/DC	M22N-BP-TRA-RC	M22N-BP-TGA-GC	M22N-BP-TYA-YC	M22N-BP-TAA-AC
		100, 110, 120 VAC	M22N-BP-TRA-RD	M22N-BP-TGA-GD	M22N-BP-TYA-YD	M22N-BP-TAA-AD
		200, 220, 230, 240 VAC	M22N-BP-TRA-RE	M22N-BP-TGA-GE	M22N-BP-TYA-YE	M22N-BP-TAA-AE
	Semi-spherical	24 VAC/DC	M22N-BG-TRA-RC	M22N-BG-TGA-GC	M22N-BG-TYA-YC	M22N-BG-TAA-AC
		100, 110, 120 VAC	M22N-BG-TRA-RD	M22N-BG-TGA-GD	M22N-BG-TYA-YD	M22N-BG-TAA-AD
		200, 220, 230, 240 VAC	M22N-BG-TRA-RE	M22N-BG-TGA-GE	M22N-BG-TYA-YE	M22N-BG-TAA-AE
	Flat etched	24 VAC/DC	M22N-BC-TRA-RC	M22N-BC-TGA-GC	M22N-BC-TYA-YC	M22N-BC-TAA-AC
		100, 110, 120 VAC	M22N-BC-TRA-RD	M22N-BC-TGA-GD	M22N-BC-TYA-YD	M22N-BC-TAA-AD
		200, 220, 230, 240 VAC	M22N-BC-TRA-RE	M22N-BC-TGA-GE	M22N-BC-TYA-YE	M22N-BC-TAA-AE

List of models

Plastic flat	Plastic projected	Plastic semi-spherical	Plastic flat etched
M22N-BN 	M22N-BP 	M22N-BG 	M22N-BC 

Specifications

Characteristics

Item	Type	Indicator
Insulation resistance		100 M Ω min. (at 500 VDC)
Dielectric strength	Between terminals of same polarity	2,500 VAC at 50/60 Hz for 1 min
	Between each terminal and ground	2,500 VAC at 50/60 Hz for 1 min
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Malfunction	1,000 m/s ² max.
Ambient operating temperature ^{*1}		–25 to 55°C
Ambient operating humidity		35% to 85% RH
Ambient storage temperature ^{*1}		–40 to 80°C
Degree of protection ^{*2}		IP66, NEMA 4X, NEMA13
Electric shock protection class		Class II

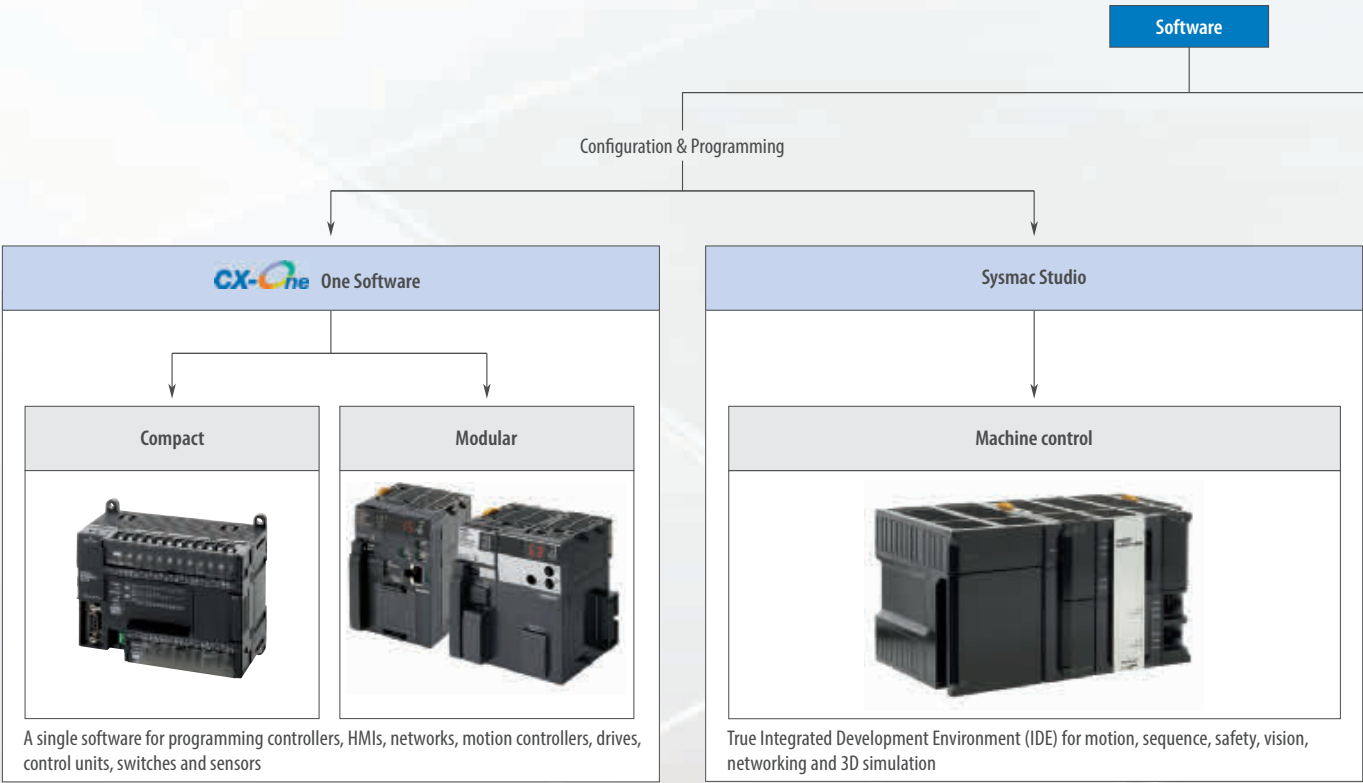
^{*1} With no icing or condensation.

^{*2} Degree of protection from the front of the panel.

ONE SOFTWARE-ONE CONNECTION-ONE MINUTE

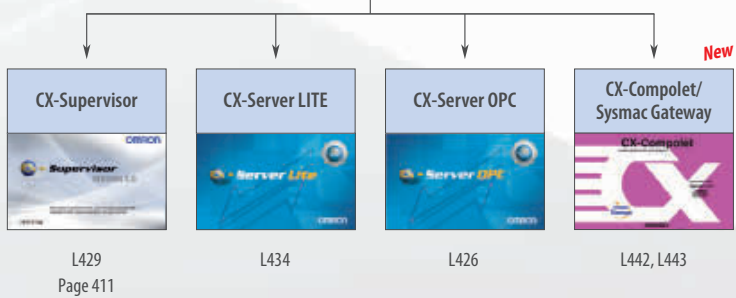
One software for all your automation needs

“One Software” is a key component of the overall architecture of Omron software. Whether for our Compact & Modular range or our new Sysmac platform, integration of software technologies brings value direct to the customer. These softwares integrate configuration, programming and monitoring in packages designed for those platforms. Integrated software gives you the power and efficiency to develop and create like never before.





Visualisation





Integrated “One software” that covers all your requirements for complete machine automation

This single programming and configuration environment is an integrated software management tool called CX-One that enables the user to build, configure and program networks, PLCs, HMIs, motion control systems, drives, temperature controllers and sensors. The result of a single software is to reduce complexity of the configuration and allow automation systems to be programmed or configured with minimal training.

By registering a licence number at www.omron-industrial.com, users can benefit from free updates to their version of CX-One for 12 months free of charge. An automatic update service can notify users as soon as relevant updates are available.

CX-One is available as two types. FULL supporting all PLCs or LITE designed for our compact PLC range. Thus our integrated “One Software” applies to our complete portfolio.

Ordering information

CX-One FULL	Media	Order code
Single licence	Licence Only	CXONE-AL01-EV_
Three user licence	Licence Only	CXONE-AL03-EV_
Ten user licence	Licence Only	CXONE-AL010-EV_
Thirty user licence	Licence Only	CXONE-AL030-EV_
Fifty user licence	Licence Only	CXONE-AL050-EV_
Site licence	Licence Only	CXONE-AL0XX-EV_
Software on CDs	CD	CXONE-CD-EV_
Software on a DVD	DVD	CXONE-DVD-EV_
CX-One LITE	Media	Order code
Single user licence	Licence Only	CXONE-LT01-EV_
Software on CD	CD	CXONE-LTCD-EV_

Specifications

Subject	Indicator	Description
Programming	CX-Programmer	CX-Programmer provides one common PLC software platform for all types of Omron PLC controllers – from micro PLC's up to Duplex processor systems. It allows easy conversion and re-use of PLC code between different PLC types, and the full re-use of control programs created by older generation PLC programming software.
	CX-Simulator	A debugging environment equivalent to the actual PLC system environment can be achieved by simulating the operation of a CS/CJ Series PLC with a virtual PLC in the computer. CX-Simulator makes it possible to evaluate program operation, check the cycle time and reduce debugging time before the actual equipment is assembled.
	CX-Designer	CX-Designer is used to create screen data for NS-series Programmable Terminals. CX-Designer can also check the operation of the created screen data on the computer. CX-Designer enables efficient development process for screen creation, simulation and project deployment. Users can develop screens more efficiently with Easy-to-use Support Software. CX-Designer has about 1,000 standard functional objects with associated graphics and advanced functions, so even first-time users can create screens easily just by arranging functional objects in a screen.
Networks	CX-Integrator	CX-Integrator is the main configuration software for CX-One. It enables easy performance of many operations, such as monitoring the connection status of various networks, setting parameters, and diagnosing networks.
	CX-ConfiguratorFDT	Based on FDT/DTM technology, CX-ConfiguratorFDT can be used to configure devices from any vendor connected to a PROFIBUS network. This concept will later be expanded to support many more networks using this technology.
Motion & Drives	CX-Motion	CX-Motion can be used to create, edit, and print the various parameters, position data, and motion control programs (G code) required to operate Motion Controllers, transfer the data to the Motion Control units, and monitor operation of the Motion Control units. Increase productivity in every step of the motion control process, from development of the motion control program to system operation.
	CX-Drive	The complete current range of Omron Yaskawa inverters and servos is covered in this software with full access to all parameters (with 3 different operator levels available). An easy overview of parameters is also included which includes filters to show values that are: different from default, different from inverter, invalid setting. Graphical overviews are available to further assist with configuration of some more detailed parameters such as jump frequencies, v/f profiles and analog setting.
	CX-Position	CX-Position simplifies every aspect of position control, from creating/editing the data used in Position Control units (NC units) to communicating online and monitoring operation. The software is equipped with functions that can improve productivity, such as automatically generating project data and reusing existing data.
Regulation and Switching	CX-Thermo	Omron's CX-Thermo support software has been specially developed for use with the company's E5CN, E5EN, E5GN, E5AN, E5CN-H, E5EN-H, E5AN-H, E5ZN, E5AR, E5ER and CelciuX [®] temperature controllers. CX-Thermo enables faster parameter set-up, easier device adjustment and simpler maintenance. It dramatically reduces the time and effort needed to set and manage temperature control parameters.
	CX-Process	CX-Process simplifies every aspect of loop control, from creating/transferring function blocks to running the Boards/units and debugging (tuning PID parameters, etc.) operation. Function block programs can be created easily by pasting function blocks in the window and making software connections with the mouse.
Sensing	CX-Sensor	CX-Sensor allows configuration and monitoring of Omron's ZX range of sensors via a series of easy to use displays. The graphing dialog allows the outputs from several sensors to be reviewed and compared simultaneously, allowing configuration of complex processes. The software also includes a driver that allows sensor data to be accessed via an Omron serial control unit (SCU) and from other Omron applications such as CX-Supervisor. With the aid of Omron's CX-Server OPC application it is even possible to monitor sensor data in real time from Microsoft Excel.



CX-Supervisor now comes in two editions:

CX-Supervisor Machine Edition is the perfect choice for almost all machine visualization requirements. Supporting connection of up to 15 devices and up to 500 user definable points (array = 1 point), it is flexible and powerful enough for the control and supervision of a complete machine or an entire manufacturing process. And its easy-to-use Windows® Explorer-style development environment makes building the most sophisticated graphic interfaces simple.

Powerful Machine Visualisation

CX-Supervisor is dedicated to the design and operation of PC visualisation and machine control. It is not only simple to use for small supervisory and control tasks, but also offers a wealth of power for the design of the most sophisticated applications. CX-Supervisor boasts powerful functions for a wide range of PC based HMI requirements. Simple applications can be created rapidly with the aid of a large number of predefined functions and libraries, and even very complex applications can be generated with a powerful programming language or VBScript™. CX-Supervisor has an extremely simple, intuitive handling and high user friendliness. Importing ActiveX components makes it possible to create flexible applications and extend functionality.

CX-Supervisor PLUS is for those exceptional cases where an application demands a higher number of devices or points than can be handled by CX-Supervisor Machine Edition. It otherwise shares all of the same power and features.

Ordering information

Description	Media	Order code
Developer & runtime (no protection included)	CD	CX-SUPERVISOR-V_ _ _
Developer upgrade (no protection included, requires licence of previous version)	CD	CX-SUPERVISOR-UPGR-V_ _ _
Machine Edition runtime including USB dongle protection	CD	CX-SUPERVISOR-RUN-ME-V_ _ _
PLUS Edition runtime including USB dongle protection	CD	CX-SUPERVISOR-RUN-PLUS-V_ _ _

Specifications

Feature	Supervisor	
	Machine Edition	Plus
ActiveX	Yes	Yes
VBScript	Yes	Yes
Recipes	Yes	Yes
Alarms	300	3000
Animation	Yes	Yes
Max Devices (PLCs etc)	20	256
OPC Connections	Yes	Yes
Max Points	500	8000
Max Regular Interval Scripts	10	100
Max Num Pages	100	500
Databases supported	MS Access	MS Access SQL, ODBC, MS Access, MS Excel, dBase, CSV

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