

OMRON products provide various functionalities.
Choose input, logic and output

components that are suitable for the safety of machinery.

INPUT

Safety switches

Safety limit switches				
	D4N	D4F	D4B-□N	D4N-□R
	P11	P11	P11	P11
Safety Guard Lock switches				
	D41G, D41L	D4SL-N	D4JL	D4NL
	P12	P12	P12	P12
Safety Interlock switches				
	D4NS	D4GS-N	D4NH	
	P12	P12	P11	
Non-contact switches				
	D41D/ D40A/ F3S-TGR			P11
Slide keys				
	D4SL-NSK10-LK	D4NS-SK/		
			Emergency exit unit	
			D41G-A2...E1	
			P13	

Safety sensors

Single-beam sensors		Multi-beam sensors		Area-beam sensors	
	E3ZS		F3SG-SR/ PG		F3SG-SR-K
	P14		P14		P14

Emergency stops/ Control devices

Emergency stop switches			
	A22NE-PD/A22NE-PI/A22E	A165E	ER
	P15	P15	P15
Safety switches			
	A4EG	A4E	
	P15	P15	

LOGIC

Safety controllers

Controllers for small applications			
	G9SR	G9SE	G9SB
	P16	P16	P16
Programmable			
	G9SP	WS02-G9SP□□□□	
Controllers for large applications	EtherNet/IP(CIP-Safety) NX series		
	NX-CSG	NX-SL5	
	P17	P17	
	EtherCAT (FSoE) NX series		
	NX102-CPU	NX-SL5/SL3	
	P17	P17	
	NX-ECC	NX-SL3	
P17	P17		
GI-SMD/SID	NX-SI/SO		
P17	P17		
Automation Software SysmacStudio			
SYSMAC-□□			
P16			

OUTPUT

Output Safety Relays and Contactors

Safety relays			Contactors	
	G7SA	P7SA-PU		J7KC
	P18	P18		P18

Inverters and Servo-drives

AC Servomotor/Servo Drive			Inverter		
	R88M-1A□/R88D-1SA□-ECT	R88M-1□/R88D-1SN□-ECT		3G3M1	3G3RX2
	P18	P18		P18	P18

Product Application Examples

OMRON safety components help improve machine safety

1

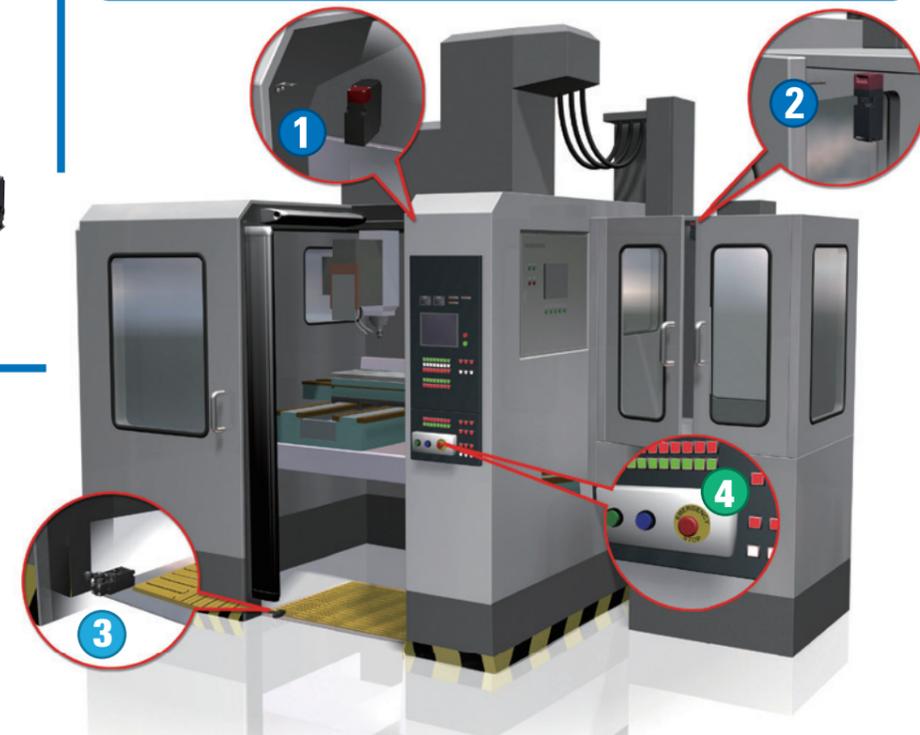
Door locking to protect operators
Safety Guard Lock Switch
D4SL-N/D4JL/D4NL P12



2

Door monitoring
Slim Safety Interlock Switch
D4GS-N P12
Safety Interlock Switch
D4NS P12





3

Door position and open/close detection
Safety Limit Switch
D4B-□N P11
Small Safety Limit Switch D4N/D4F P11



4

Emergency machine stop
Emergency Stop Switch
A165E P15
A22NE-PD/A22NE-P/
A22E P15



5

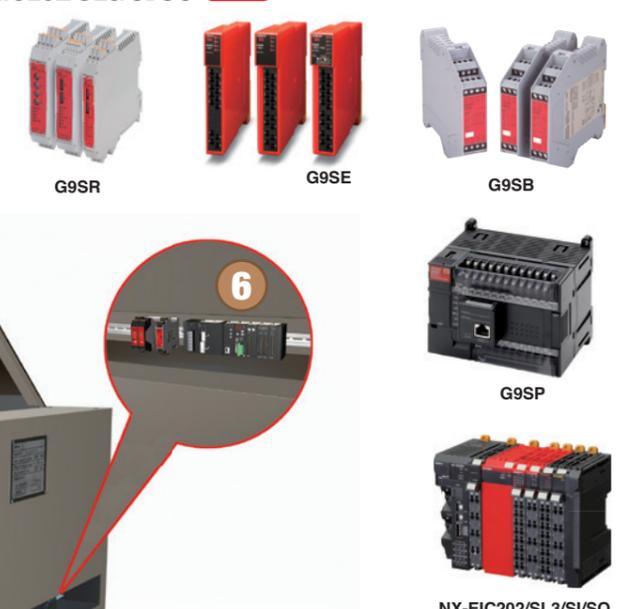
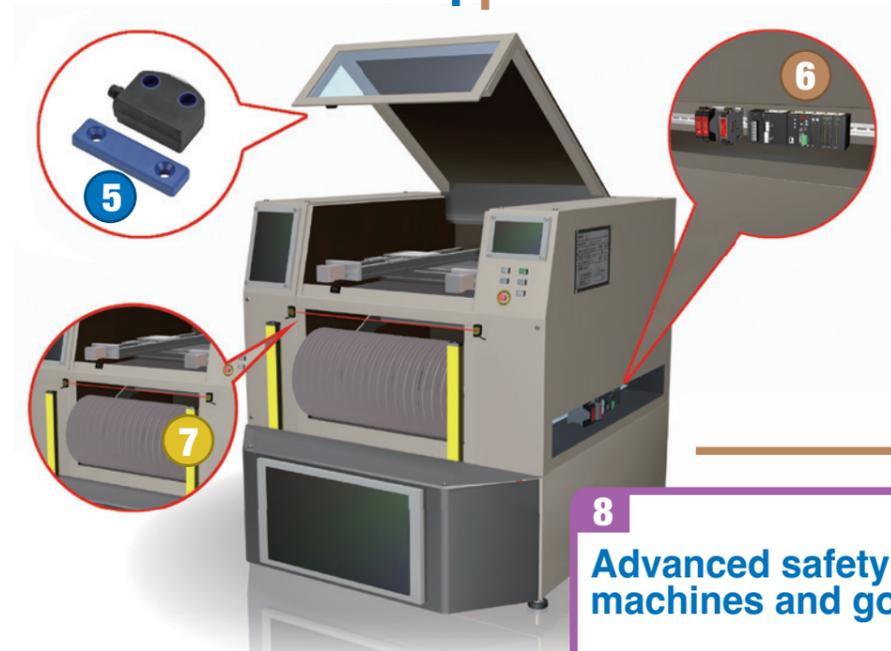
Non-contact door monitoring
Non-contact Safety Door Switch
D41D/ D40A/ F3S-TGR P11



6

Standalone operation
Safety Relay Unit G9SR/G9SE/G9SB P16
Safety Controller G9SP P16

NX Series Stand-alone System
NX-EIC202/SL3/SI/SO P16

7

Ensuring the safety of openings
Safety Light Curtain
F3SG-SR P14
Single-beam Safety Sensor
E3ZS P14



8

Advanced safety control of people, machines and goods

AC Servo System with Safety Functionality 1S series
R88M-1A□/R88D-1SN□-ECT P18

Safe machine shutdown
AC Servo System 1S Series
R88M-1□/
R88D-1SN□-ECT P18
Multi-function Compact Inverter
3G3M1 P18
High-function General-purpose Inverter 3G3RX2 P18



Product Application Examples

OMRON safety components help protect operators at manufacturing sites

1

Intrusion detection for frequently accessed areas or wide openings
 Safety Light Curtain
 F3SG-SR P14



F3SG-SR

2

Prevent collisions and trapping by detecting platform positioning and human presence
 Single-beam Safety Sensor
 E3ZS P14
 Safety Laser Scanner
 OS32C P14



E3ZS
OS32C

3

Expanding safety I/O through networks
 NX Series Communication Control Unit NX-CSG P17
 Safety CPU Unit NX-SL5 P17
 Safety I/O Terminal GI-SMD/SID P17



NX-CSG
NX-SL5/SI/SO
GI-SMD/SID

4

Invasion detection around the equipment
 Safety Multi-Light Beam
 F3SG-PG P14



F3SG-PG

5

Emergency stop of machinery
 Emergency Stop Switch A22NE P15
 Compact rope pull Switch ER5018 P15



A22NE
ER5018

6

Presence detection in hazardous areas
 Safety Laser Scanner OS32C P14



OS32C

7

Emergency stop during teaching in hazardous areas
 Enabling Grip Switch A4EG P15
 Enabling Switch A4E P15



A4E
A4EG

8

Door open/close detection and locking
 High-Coded Safety Guard Lock Switch
 D41G P12
 Safety Guard Lock Switch
 D4SL-N P12
 Safety-door Hinge Switch
 D4NH P12



D41G
D4SL-N
D4NH

Actuators with Emergency Exit Unit for D41G
 D41G-A2□-E1(T) P13

D4SL-N-mounting Slide Key
 D4SL-NSK10-LK P13



D41G-A2□-E1(T)
D4SL-NSK10-LK□

Safety Application Examples

Applications by industry

1. Automotive

1
Presence detection in hazardous areas
Safety Laser Scanner OS32C P14

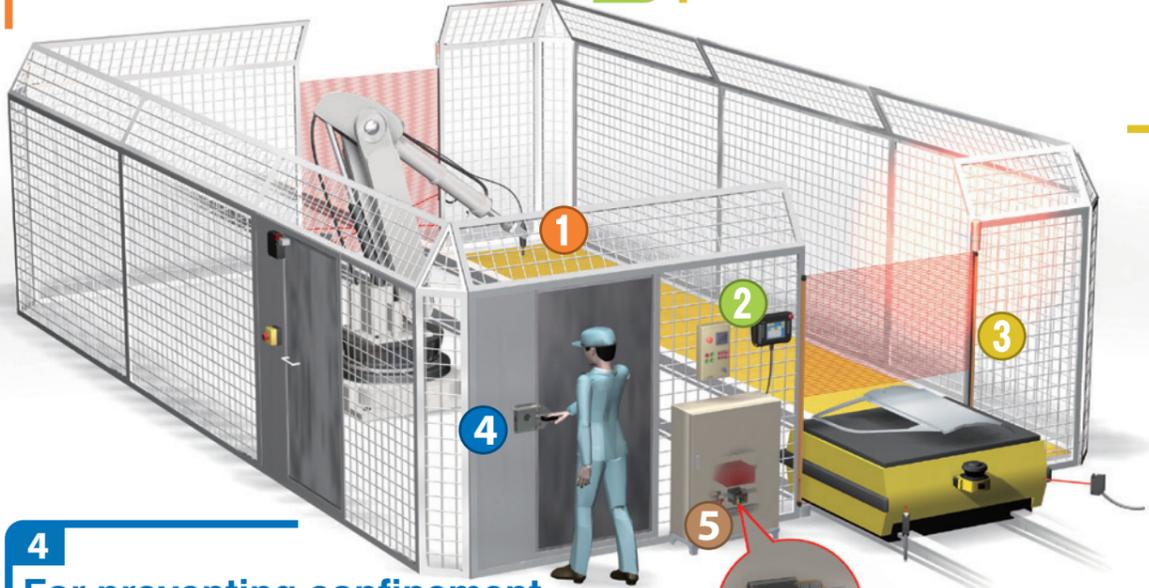


2
Emergency stop during teaching in hazardous areas
Enabling Grip Switch A4EG P15



3
Intrusion detection in harsh environments
Safety Light Curtain F3SG-SR P14





4
For preventing confinement in hazardous areas
High-Coded Safety Guard Lock Switch D41G P12



Actuators with Emergency Exit Unit for D41G D41G-A2□-E1(T) P13



Safety Guard Lock Switch D4JL P12



D4JL-mounting Slide Key D4JL-SK40 P13



5
Programming for safety control
NX Series Communication Control Unit NX-CSG P17



Safety CPU Unit NX-SL5 P17



Safety I/O Terminal GI-SMD/SID P17



Applications by industry

2. Machine tool

1
Door position and open/close detection
Safety Limit Switch D4B-□N P11
Small Safety Limit Switch D4N/D4F P11



2
For preventing access to inertial hazards
Safety Guard Lock Switch D4SL-N/D4NL P12





3
For preventing confinement inside the equipment
High-Coded Safety Guard Lock Switch D41G P12



Actuators with Emergency Exit Unit for D41G D41G-A2□-E1(T) P13



Safety Guard Lock Switch D4JL P12



4
Standalone operation
Safety relay Unit G9SR P16



Safety Controller G9SP P16



Output safety relays and contactors
Safety relay and Socket G7SA/P7SA P18



Contactor J7KC P18



Safety Application Examples

Applications by industry 3. Food production equipment



1

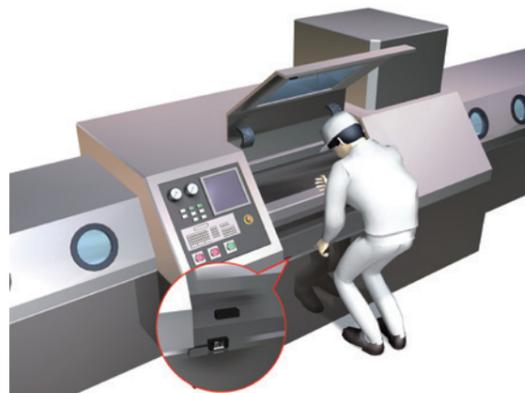
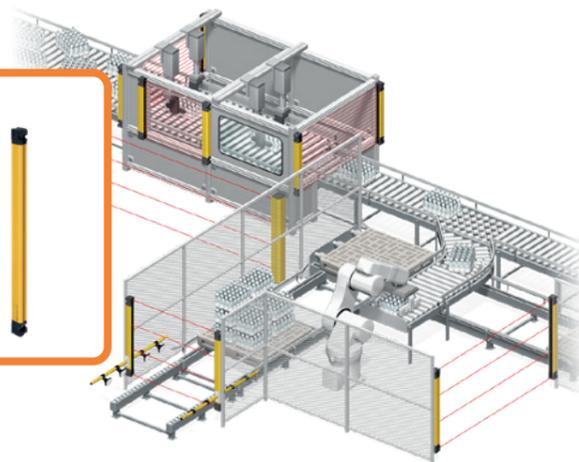
Protection in wash-down environments
Safety Light Curtain
F3SG-SR/
F3SG-SR-K P14

F3SG-SR-K
-IP69K model

2

Invasion detection around the equipment
Safety Multi-Light Beam
F3SG-PG P14

F3SG-PG



3

Non-contact door monitoring and locking in wash-down environments
Non-contact Safety Door Switch
D41D/D40A/
F3SG-TGR P11

D41D D40A F3SG-TGR

High-Coded Safety Guard Lock Switch (ECOLAB)
D41L P12

D41L

Product Lineup - Inputs

■ Safety limit switches

Model	Appearance	Features
D4N Small Safety Limit Switch		<ul style="list-style-type: none"> Plastic housing M12 connector type for quick wiring and easy replacement Gold-plated contacts provide high contact reliability both standard loads and microloads
D4F Small Safety Limit Switch		<ul style="list-style-type: none"> An incredibly small limit switch with a direct opening mechanism High sensitivity 2 and 4 contact types IP67 protection
D4B-□N Safety Limit Switch		<ul style="list-style-type: none"> Rugged metal housing Mechanism that indicates the applicable operating zone Direct opening mechanism (NC contacts only) opens contacts when faults occur Head seal structure strengthened to improve seal properties IP67
D4N-□R Pull-reset Safety Limit Switch		<ul style="list-style-type: none"> Plastic housing with manual reset M12 connector type for quick wiring and easy replacement Gold-plated contacts provide high contact reliability both standard loads and microloads

■ Safety door switches

Safety-door Hinge Switches

Model	Appearance	Features
D4NH Safety-door Hinge Switch		<ul style="list-style-type: none"> Designed to save space by integrating it in the guard protection of the machine Shaft or arm lever actuator with direct opening mechanism M12-connector models to set up easy installation and simplify maintenance

Non-contact Switches

Model	Appearance	Features
D41D High-Coded Non-Contact Safety Door Switch		<ul style="list-style-type: none"> Compact design and three types of actuators to fit in narrow spaces and corners Easy and quick pairing by teach-in procedure Smart diagnostic by means of 3-color LED Complies with ISO 14119 (Type 4/High Coded), ISO 13849-1 (PLe/ Cat. 4)
D40A Non-contact Safety Door Switch		<ul style="list-style-type: none"> Reversible switch provides flexibility in installation for hinge and sliding guards Connect up to 30 non-contact door switches series wiring Two color LED indicator for easy maintenance Complies with ISO 13849-1 up to PLe/ Category 4
F3S-TGR Non-contact Safety Door Switch		<ul style="list-style-type: none"> Stainless-steel housing and Hygienic designed versions Designed models suitable for high pressure cleaning processes Designed models suitable for explosive atmospheres (gas and dust) Complies with ISO 14119 (Type 4/High Coded), ISO 13849-1 (PLe/ Cat. 4)

Product Lineup - Inputs

■ Safety door switches

Interlock Switches

Model	Appearance	Features
D4NS Safety Interlock Switch		<ul style="list-style-type: none"> ● Compact size for saving space and high mounting versatility with 4-head orientation ● Wide variety of operation keys (tongues) and accessories to be fixed on the guard protection ● M12-connector models to set up easy installation and simplify maintenance
D4GS-N Slim Safety Interlock Switch		<ul style="list-style-type: none"> ● Slim housing with only 17 mm of width (half size as standard models) to save space ● Operation Key with rubber mounting hole to absorb vibration and shock ● Made with rust-resistant materials to avoid issues caused by water (IP67)

Guard Lock Switches

Model	Appearance	Features
D41G High-Coded Safety Guard Lock Switch		<ul style="list-style-type: none"> ● Vertical design to be easily mounted on 40 x 40 mm frames ● Actuators adapted for hinged left and right and sliding guards ● High holding force prevents even heavy guards from opening inadvertently ● Complies with ISO 14119 (Type 4/High Coded)
D41L High-Coded Safety Guard Lock Switch		<ul style="list-style-type: none"> ● Hygiene-compliant design with ECOLAB certification (IP66, IP67 and IP69) ● Excellent versatility of mounting with same actuator for left, right hinged and sliding guard protection ● Rear lever release version to mechanically unlock the switch and escape from the hazardous area ● Complies with ISO 14119 (Type 4/High Coded)
D4SL-N Safety Guard Lock Switch		<ul style="list-style-type: none"> ● Vertical design to be easily mounted on 40 x 40 mm frames ● Simplify installation by changing the operation key insertion point without detaching the head ● Wiring time is reduced by two types of wiring methods: one-touch attachment and removal
D4JL Safety Guard Lock Switch		<ul style="list-style-type: none"> ● High robustness with holding force up to 3000 N prevents heavy guards from opening inadvertently ● 2 safety circuits and 2 monitor contacts for various monitoring patterns ● Models with trapped keys prevent operator from being locked in hazardous areas ● Rear release version to unlock the switch and escape from hazardous area
D4NL Safety Guard Lock Switch		<ul style="list-style-type: none"> ● Models including metallic head version to increase robustness against shocks ● Operation key compatible with D4NS models to increase installation flexibility ● Release key version to unlock the switch in case of emergency or if the power supply stops

■ Safety door switches

Mounting brackets(Slide Key) and door handles for access doors to hazardous areas are available.

Model	Appearance	Features
D41G-A2□-E(T) D41G-actuators With door-handle Emergency exit unit		<ul style="list-style-type: none"> ● Integrated door handle structure reduces guarding design time ● Integrated handle's smooth operation enables quick emergency exit ● Switch can be unlocked when power supply is unavailable to avoid being trapped inside
D4SL-NSK10-LK□ D4SL-N-mounting Slide Key		<ul style="list-style-type: none"> ● Lockout key prevents operators from getting trapped inside hazardous areas ● Vertical D4SL-N Guard Lock Safety-door Switch can be easily mounted on a 40 x 40 mm aluminum frame ● Plastic housing suitable for lightweight doors
D4NS-SK D4JL-SK D4NS/D4JL-mounting Slide Key		<ul style="list-style-type: none"> ● Door switch attachments for doors in various sizes from 20 x 20 mm aluminum frames to large guards around robots ● Shortens design time for door switch mounting part

Product Lineup - Inputs

■ Safety sensors

Safety Light Curtains

Model	Appearance	Features
F3SG-SR Safety Light Curtain		<ul style="list-style-type: none"> Increased design flexibility with the broadest product line-up from finger protection to body protection Quick installation and diagnostics by area beam and status indicators Machine downtime reduction thanks to IO-Link communication Environmental resistance and rugged structure for use in any environment (IP67, IP67G)
F3SG-PG Safety Multi-Light Beam		
F3SG-SR-K Safety Light Curtain IP69K model		<ul style="list-style-type: none"> Protection for high-pressure wash-down applications (IP69K)
E3ZS Single-beam Safety Sensor		<ul style="list-style-type: none"> For hazardous gaps in machines Sensing distance: 3 m Used together with G9SP Safety Controller For hazardous gaps in machines Complies with EN and IEC standards

Safety Laser Scanners

Model	Appearance	Features
OS32C Safety Laser Scanner		<ul style="list-style-type: none"> Highest robustness for operation in harsh environments Easy zone configuration by using PC and sculpting functions Quick diagnostics by Area Beam Indicator and Error code display Easy maintenance and monitoring thanks to Ethernet/IP connection

■ Emergency stop switches

Emergency stop pushbutton switch

Model	Appearance	Features
A165E Emergency Stop Switch (16-dia.)		<ul style="list-style-type: none"> Direct opening mechanism opens contacts in emergencies Safety lock mechanism prevents misuse Modular construction; easy installation using snap-in switch 3 contacts built into a single block (A165E-U)
A22NE-PD Emergency Stop Pushbutton Switch (22-dia. or 25-dia.)		<p>Push-in Plus Terminal Block Model with Lock-lever-linked Contact Function</p> <ul style="list-style-type: none"> Lock-lever-linked Contact function detects improper installation of switch unit Compact design and changed wiring direction reduce control panel size Push-in plus terminals provide vibration resistant connections, reducing maintenance work Lineup with up to 4 contacts IP65 oil-resistant (non-lighted)/IP65 (lighted)/IP69K for high-temperature, high-pressure washdown (pull-reset)
A22NE-P Emergency Stop Pushbutton Switch (22-dia. or 25-dia.)		<p>Push-in Plus Terminal Block Model</p> <ul style="list-style-type: none"> Compact design and changed wiring direction reduce control panel size Push-in plus terminals provide vibration resistant connections, reducing maintenance work Lock lever for easy mounting Lineup with up to 6 contacts P65 oil-resistant (non-lighted)/IP65 (lighted)/IP69K for high-temperature, high-pressure washdown (pull-reset)
A22E Emergency Stop Pushbutton Switch (22-dia. or 25-dia.)		<p>Screw Terminal Block Model</p> <ul style="list-style-type: none"> Increased wiring efficiency with 3-row mounting of switch blocks (Non-lighted model: 3 switch blocks can be mounted for multiple contacts) Round or forked crimp terminals can be used for installation IP65 oil-resistant (non-lighted)/IP65 (lighted) Bundled lock plate fixes lever to prevent operation unit and switch blocks from separating

Rope pull Emergency stop switch

Model	Appearance	Features
ER Rope pull Emergency Stop Switch		<ul style="list-style-type: none"> Heavy-duty housing for high demanding applications Vibration tolerant and long-life contact switches for reliable operation Easy to set up and maintenance by using rope tension indicator Compact design with Emergency stop and reset button integrated Minimum machine downtime by LED indicator visible from long distances

■ Enabling devices

Model	Appearance	Features
A4EG Enabling Grip Switch		<ul style="list-style-type: none"> High durability and robustness as built with high-resistance materials Single-hand operation with ergonomic and sensitive feedback Models with emergency stop or momentary operation switch available Easy installation by using a holding key accessory for interlock switch
A4E Enabling Switch		<ul style="list-style-type: none"> 3-position switch with clicking feel Complies with American national standard ANSI/RIA R15.06-1999 Can be mounted in two directions

Product Lineup - Logic

■ Safety relay units

Model	Appearance	Features
G9SR Safety Relay Unit		<ul style="list-style-type: none"> ● Easy adaptation to multiple safety functions enabling stock reduction ● Detailed LED indications enable comprehensive diagnosis ● Optimized implementation by two types of outputs (solid-state and relay) ● Increased flexibility with expandable safety relay units with timing function ● Compact size saving control panel space in small machines ● Removable spring-type terminals for quick installation and replacement
G9SE Safety Relay Unit		<ul style="list-style-type: none"> ● 17.5 or 22.5 mm width to save mounting space ● Simple wiring using Push-In Plus terminal block ● Easy maintenance with status indicators ● One unit for various safety devices, from contact input to PNP input
G9SB Safety Relay Unit		<ul style="list-style-type: none"> ● 17.5 mm- and 22.5 mm-wide housing ● Connectable with safety area sensors ● Fast response time: 10 ms ● Operating status indicators ● Finger protection construction

■ Safety Controllers

G9SP Compact Safety controller

Model	Appearance	Features
G9SP Safety Controller		<ul style="list-style-type: none"> ● Easy programming for complex safety control ● Unique programming software to support easy design and verification ● Memory cassette for easy duplication of configuration
WS02-G9SP□□-V□ G9SP Configurator		G9SP configuration tool <ul style="list-style-type: none"> ● Easy setup and configuration ● Simulation for easy verification ● User-defined Function Blocks greatly reduce design time

NX series Stand-alone System

Model	Appearance	Features
NX-EIC202/SL3/SI/SO EtherNet/IP Coupler Unit, Safety Control Units		<ul style="list-style-type: none"> ● Up to 63 NX-IO Units can be connected to one EtherNet/IP Coupler Unit. ● Standard and high-performance units can be mixed1. * ● Each Coupler plus its I/O form just a single EtherCAT node on the network. ● I/O control and safety control can be integrated by connecting Units for safety. ● The IP address can be found on the label on the Unit, without using software. ● Slave configuration by Sysmac Studio can be done centrally via the controller, or on-the-spot using the Coupler's built-in USB port. <p>* Input per Coupler Unit: Maximum 504 bytes, Output per Coupler Unit: Maximum 504 bytes</p>
SYSMAC-SE/NE/FE Automation Software Sysmac Studio		<ul style="list-style-type: none"> ● One software for motion, logic, safety, drives, vision and HMI ● Fully compliant with open standard IEC 61131-3 and Japanese standard JIS B3503 ● Supports Ladder, Structured Text and Function Block programming with a rich instruction set ● CAM editor for easy programming of complex motion profiles ● One simulation tool for sequence and motion in a 3D environment ● Advanced security function with 32 digit security password

■ Safety Network Controller NX Series EtherNet/IP (CIP-Safety)

Model	Appearance	Features
NX-CSG320/SL5/SI/SO Communication Control Unit/ Safety CPU Unit/ Safety Input Unit/ Safety Output Unit		<ul style="list-style-type: none"> ● CIP Safety on EtherNet/IP Is Supported ● Feature EtherNet/IP Communications Port ● The Standard Unit of NX-series Available ● Excellent Connectivity with OMRON Safety I/O Devices ● Support for the IEC 61131-3 Programming Environment ● Program Languages Based on the IEC 61131-3 International Standard ● Programming with Variables ● Complete Advanced Validation ● Checking Safety Programs and Safety Parameters ● Debugging
GI-SMD/SID Safety I/O Terminal GI-S Series		<ul style="list-style-type: none"> ● Support for CIP Safety on EtherNet/IP ● Standard-feature EtherNet/IP port ● Easy programming with Sysmac Studio

NX Series EtherCAT (FSoE) + EtherNet/IP (CIP-Safety)

Model	Appearance	Features
NX102-□□□□ NX1 CPU Unit NX-SL5 Safety CPU Unit SL5 NX-SI/SO Safety Input Unit/ Safety Output Unit		<ul style="list-style-type: none"> ● Fast and accurate control by synchronizing all machine devices with the PLC and Motion Engines ● Three built-in industrial Ethernet ports ● OPC UA server functionality ● Up to 12 axes of control via EtherCAT ● Up to 32 local NX I/O Units ● DC power supply without battery backup ● Fully conforms to IEC 61131-3 standard programming ● PLCopen Function Blocks for Motion Control allow users to create complex programs quickly and easily ● Direct connection to a database,

NX Series EtherCAT (FSoE)

Model	Appearance	Features
NX102/SL3/SI/SO NX1 CPU Unit, Safety Control Units		<ul style="list-style-type: none"> ● Support for the IEC 61131-3 Programming Environment ● Program Languages Based on the IEC 61131-3 International Standard ● Programming with Variables ● Complete Advanced Validation ● Checking Safety Programs and Safety Parameters ● Debugging
NX701/102-, NJ501/301/101-CPU NX/NJ Series CPU Unit NX-ECC/SL3/SI/SO EtherCAT Coupler Unit, Safety Control Units	 	<ul style="list-style-type: none"> ● Integrated safety into machine automation possible by connecting with the NX-series EtherCAT Coupler. ● The Safety CPU Unit controls up to 128 Safety I/O Units. ● 4 or 8 points per Safety Input Unit. The 4-point Safety Input Unit can be directly connected with OMRON Non-contact Switches and Singlebeam Sensors. ● 2 or 4 points per Safety Output Unit. The 2-point Safety Output Unit is characterized by large output breaking current of 2.0 A. ● The Safety Units can be freely allocated in any combination with standard NX I/O. ● Compliant with IEC61131-3 ● Safety programs can be standardized and reused efficiently by using POU's for design and operation.
SYSMAC-SE/NE/FR Automation Software Sysmac Studio		<ul style="list-style-type: none"> ● One software for motion, logic, safety, drives, vision and HMI ● Fully compliant with open standard IEC 61131-3 and Japanese standard JIS B3503 ● Supports Ladder, Structured Text and Function Block programming with a rich instruction set ● CAM editor for easy programming of complex motion profiles ● One simulation tool for sequence and motion in a 3D environment ● Advanced security function with 32 digit security password

Would you like to know more?

OMRON EUROPE

 +31 (0) 23 568 13 00

 industrial.omron.eu

Sales & Support Offices

Austria

Tel: +43 (0) 2236 377 800
industrial.omron.at

Belgium

Tel: +32 (0) 2 466 24 80
industrial.omron.be

Czech Republic

Tel: +420 234 602 602
industrial.omron.cz

Denmark

Tel: +45 43 44 00 11
industrial.omron.dk

Finland

Tel: +358 (0) 207 464 200
industrial.omron.fi

France

Tel: +33 (0) 1 56 63 70 00
industrial.omron.fr

Germany

Tel: +49 (0) 2173 680 00
industrial.omron.de

Hungary

Tel: +36 1 399 30 50
industrial.omron.hu

Italy

Tel: +39 02 326 81
industrial.omron.it

Netherlands

Tel: +31 (0) 23 568 11 00
industrial.omron.nl

Norway

Tel: +47 22 65 75 00
industrial.omron.no

Poland

Tel: +48 22 458 66 66
industrial.omron.pl

Portugal

Tel: +351 21 942 94 00
industrial.omron.pt

Russia

Tel: +7 495 648 94 50
industrial.omron.ru

South Africa

Tel: +27 (0)11 579 2600
industrial.omron.co.za

Spain

Tel: +34 902 100 221
industrial.omron.es

Sweden

Tel: +46 (0) 8 632 35 00
industrial.omron.se

Switzerland

Tel: +41 (0) 41 748 13 13
industrial.omron.ch

Turkey

Tel: +90 (216) 556 51 30
industrial.omron.com.tr

United Kingdom

Tel: +44 (0) 1908 258 258
industrial.omron.co.uk

**More OMRON
representatives**

industrial.omron.eu