OMRON

Panel Builder Guide 2015

Components for panels and cabinets

industrial.omron.eu

Welcome to our world

Our best-in-class devices for your panels and cabinets

Welcome to Omron's world of advanced industrial automation. The PANEL BUILDER GUIDE is your essential tool to pre-select instrumentation for panels and cabinets. It highlights our experience in manufacturing a wide range of products with leading technology that offers multiple benefits to panel builders and their customers.

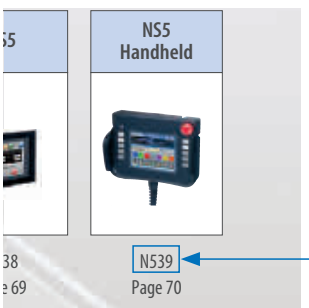
Of course, Omron offers a much larger range of products than you can find in this guide. For more information on services and company competence visit our website.

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.



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Panel Builder Guide 2015

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

Kazuma Tateisi, founder of Omron

Omron at a glance

Listed in Top 2000 largest companies of the globe
Omron Corporation NASDAQ: OMRNY
Top ranking in Dow Jones Sustainability Index
Thomson Reuters Top 100 Global Innovators

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

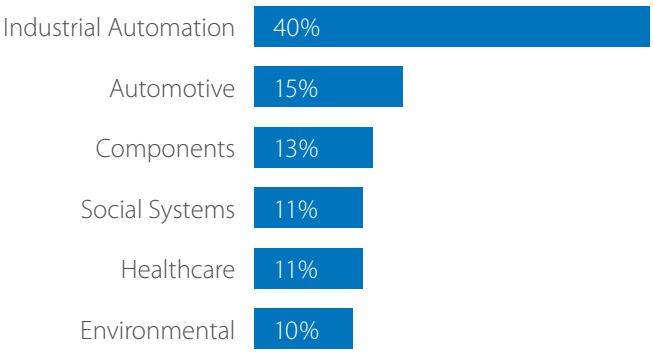
Top 150 global patent assignee
1.200 employees dedicated to R&D
11.000 + issued and pending patents

36.500
Employees worldwide

210
Locations worldwide

22
Countries in EMEA

Working for the benefit of society



Sysmac Automation Platform

- One control for the entire machine or production cell
- Harmony between machine and people
- Open communication and open programming standards

SYSMAC
always in control

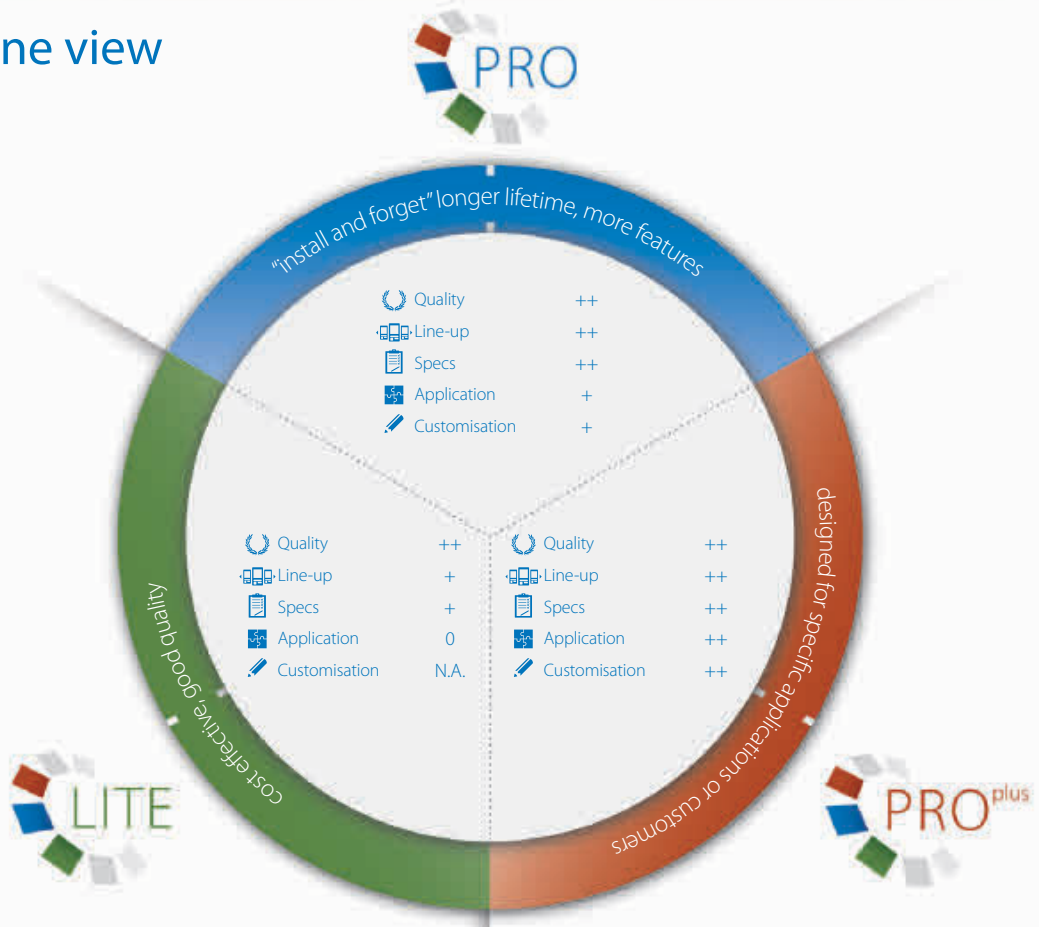
Your needs, our focus

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



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 PRO^{plus} products are designed for specific applications or customer demands.

The extra degree of advantage

Three distinct lines of sensors and components

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".

'Quality' refers to the standard of manufacturing and the materials used – this translates into reliability.

'Line-up' refers to the number of model types.

'Specs' refers to the choice of performance levels.

'Application' indicates the complexity of the automation.

'Customization' is the possibility to modify the product.

Omron on EPLAN

Efficient panel engineering

Accurate product information – including 2D and 3D representations – is essential for efficient planning and control of panel building, right up to the virtual 3D panel layout. It also ensures effective cross-discipline data exchange, improves overall project quality, and speeds up the engineering process.

However, creating documentation to support complex equipment can be a major challenge – especially when you're working to a tight budget. It's even more of an issue if you trade internationally, and you need to produce documentation that requires careful and accurate translation.

That's why Omron is now offering macros for the EPLAN system. This enables you to drag and drop pre-drawn components into your own document or project, to create accurate and up to date documentation for your Omron powered panels and machines.

With Omron on EPLAN, you can put documentation issues to one side, and concentrate on what you do best: designing and building superbly engineered panels and machines.

Omron on EPLAN

A vast number of macros are available via industrial.omron.eu/eplan for PLCs, I/Os, drives, relays, power supplies, temperature controllers, timers, counters and monitoring products as well as devices for the Sysmac automation platform. Additional macro's are planned to be added in the near future.

EPLAN Data Portal:
your online documentation advantage

The EPLAN Data Portal gives you online access to drawings and documentation which can be dragged and dropped into a project. You don't need to worry about configuration or formatting – the system does all of the work for you, increasing the quality of your system documentation, cutting costs, and saving time. This can help reduce time to market, as well as providing a standard source for data which enables documents and plans to be read quicker and more easily.

Component drawings and documents are inserted into a project on an as-required, just-in-time basis, so users can be assured that they have the latest information. This reduces or eliminates the need for amendments during the production process. Component selection is simplified, because users can choose devices and components easily without looking through large catalogues or websites.

Product selection table

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26 Solid state relays

36 Low voltage switchgear

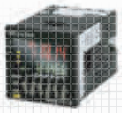
52 Monitoring products

Control components

94 Temperature controllers

118 Power supplies

134 Timers

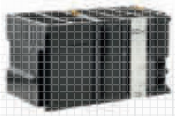


144 Counters

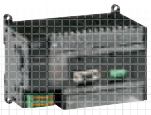
Safety

166 Safety control systems

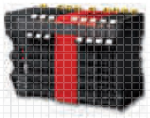
Automation systems



184 Machine automation controller



188 Programmable logic controllers (PLC)



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Motion & Drives

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204 Servo systems

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Switching components

Find information fast!

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Content

Switching components

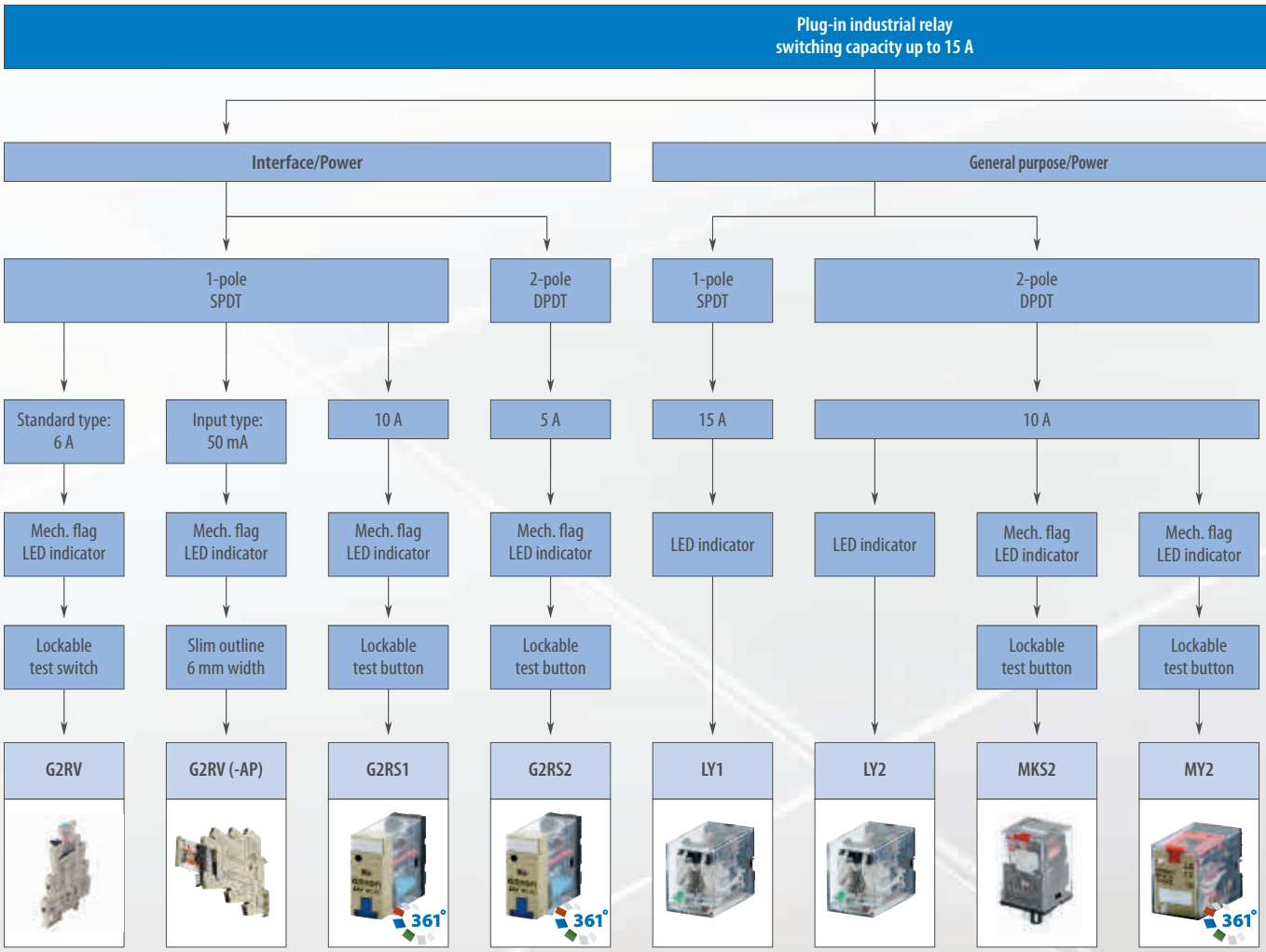
UNIQUE!

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



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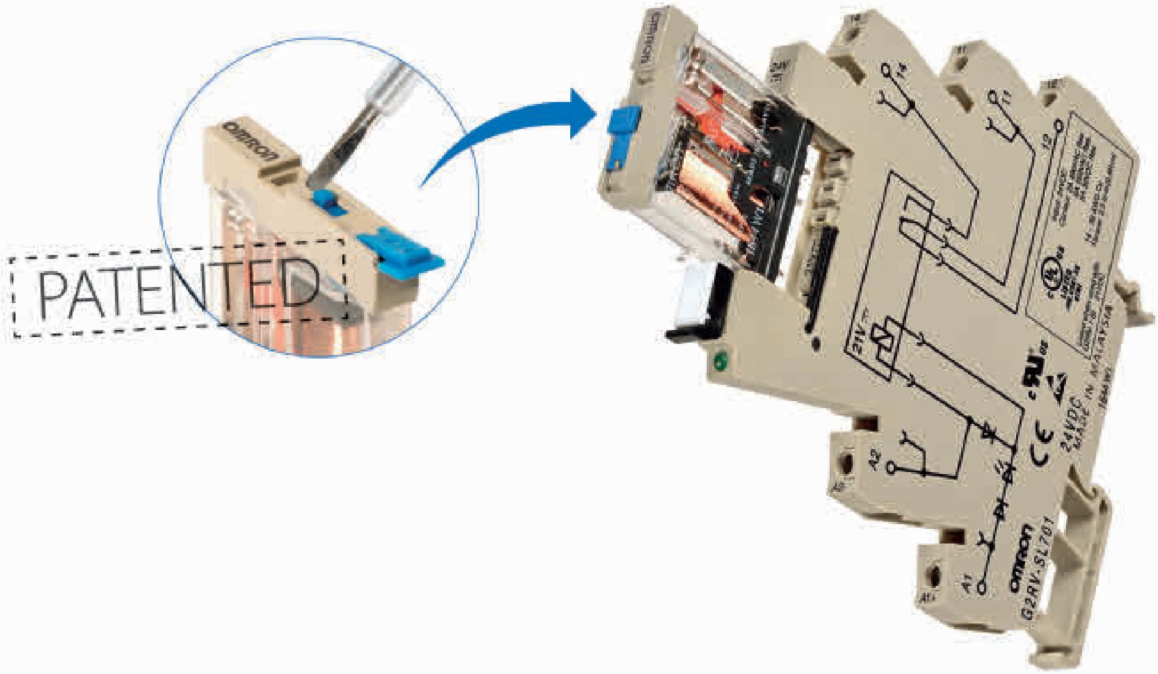
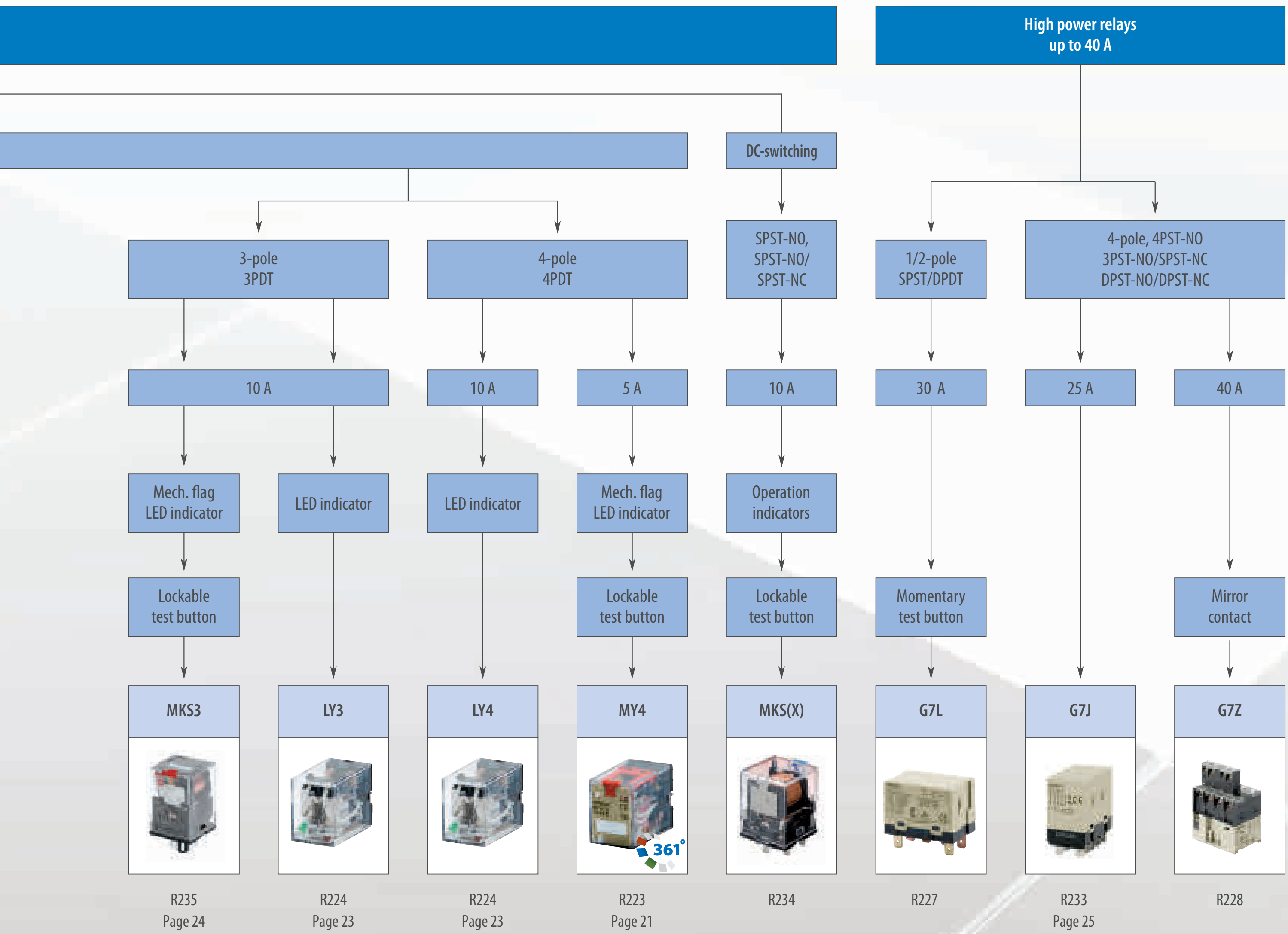

PATENTED


High power relays
up to 40 A
DC-switching
3-pole
3PDT
4-pole
4PDT
SPST-NO,
SPST-NO/
SPST-NC
1/2-pole
SPST/DPDT
4-pole, 4PST-NO
3PST-NO/SPST-NC
DPST-NO/DPST-NC
10 A
10 A
5 A
10 A
30 A
25 A
40 A
Mech. flag
LED indicator
LED indicator
LED indicator
Mech. flag
LED indicator
Operation
indicators
Lockable
test button
Lockable
test button
Lockable
test button
Momentary
test button
Mirror
contact
MKS3
LY3
LY4
MY4
MKS(X)
G7L
G7J
G7Z
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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	17		19		21		

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
	Auxilary contact block mirror contact	–	–	–	–	–	–	■	■	■
	Momentary testbutton	–	–	–	–	□	□	–	–	–
Relay terminals	Screw	□	□	□	□	□	□	□	□	□
	Quick-connect	□	□	□	□	□	□	–	–	–
	PCB terminals	□	□	□	□	□	□	–	–	–
Mounting	Screw	–	–	–	–	–	–	□	□	□
	DIN rail	–	–	–	–	–	–	□	□	□
	Clip (screw)	□	□	□	□	□	□	–	–	–
	Flange (screw)	□	□	□	□	□	□	–	–	–
	DIN rail (adapter)	–	–	–	–	□	□	–	–	–
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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
	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	–	–	–	–	–	–	–	–	–
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■ 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 are offering a maximum of 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	–
				yes	G2R-1-SNDI-AP3___(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									PCB
	Screwless clamp					Screw (plate clamp)	Screw (box clamp)			Soldering
	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 optionally are 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)			
				⊖ ⊕ 13 14 A1 A2	⊕ ⊖ 13 14 A1 A2	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								
	Screw-less clamp					Box 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						
	Screw terminal			Box clamp			
Order code	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	80% max	30% min.	110%	1.0 to 1.2 VA (60 Hz)
	110/120 V, 220/240 V				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.)
			% of rated voltage			
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		10% min.		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		10% min		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		10% min		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		MKS3PI-5	12, 24, 48, 110	12, 24, 110, 230
			yes	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)
					2.7 VA (50 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 (cosφ = 1)	Inductive load (cosφ = 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

High capacity, high dielectric strength 4 pole power relay

G7J series developed for switching resistive, inductive as well as motor loads.
No contact chattering for momentary voltage drops up to 50% of rated voltage.
High dielectric strength (4KV) between coil and contacts as well as between different polarity contacts.

- 25 A Rated current
- 4PST-NO, 3PST-NO / SPST-NC or DPST-NO / DPST-NC
- Bifurcated contacts optional
- Terminals: Screw, Quick-connect or PCB pins
- Mounting by insertion into a clip or just by screws (flange type)

Ordering information

Contact form	Mounting		Terminal			Order code *1 (_ _ _ = coil voltage + AC/DC)	Common coil voltages *2	
	PCB	W-bracket mounting	PCB	Quick-connect	Screw		DC	AC
4PST-NO	yes	no	yes	no	no	G7J-4A-P_ _ _	12, 24	200/240
	no	yes	no		yes	G7J-4A-B_ _ _	24	–
				yes	no	G7J-4A-T_ _ _	12, 24	200/240
3PST-NO/SPST-NC	yes	no	yes	no		G7J-3A1B-P_ _ _	24	–
	no	yes	no		yes	G7J-3A1B-B_ _ _	24	–
DPST-NO/SPST-NC				yes	no	G7J-3A1B-T_ _ _	24	200/240
DPST-NO/DPST-NC	yes	no	yes	no		G7J-2A2B-P_ _ _	24	–

*1 For other options like bifurcated contacts, please see specifications.
*2 Other coil voltages available. Please see specifications.

Accessories

For type	Order code
	W-bracket
G7J Screw terminal type	R99-04 for G5F
G7J Quick Connect type	

Specifications

Coil ratings

Rated voltage		Must operate voltage	Must release voltage	Max. voltage	Power consumption (approx.)
		% of rated voltage			
AC	24, 50, 100 to 120, 200 to 240	75% max.	15% min.	110%	1.8 to 2.6 VA
DC	6, 12, 24, 48, 100		10% min.		2.0 W

Contact ratings

Item	4-pole		
	Resistive load cosφ = 1	Inductive load cosφ = 0.4	Resistive load
Rated load	NO: 25 A at 220 VAC (24 A at 230 VAC) NC: 8 A at 220 VAC (7.5 A at 230 VAC)		NO: 25 A at 30 VDC NC: 8 A at 30 VDC
Rated carry current	NO: 25 A (1 A), NC: 8 A (1 A)		
Max. switching voltage	250 VAC		125 VDC
Max. switching current	NO: 25 A (1 A), NC: 8 A (1 A)		
Mechanical life	1,000,000 operations min.		
Electrical life	100,000 operations min.		

Note: Values between () indicate bifurcated contact specification.

Technical data

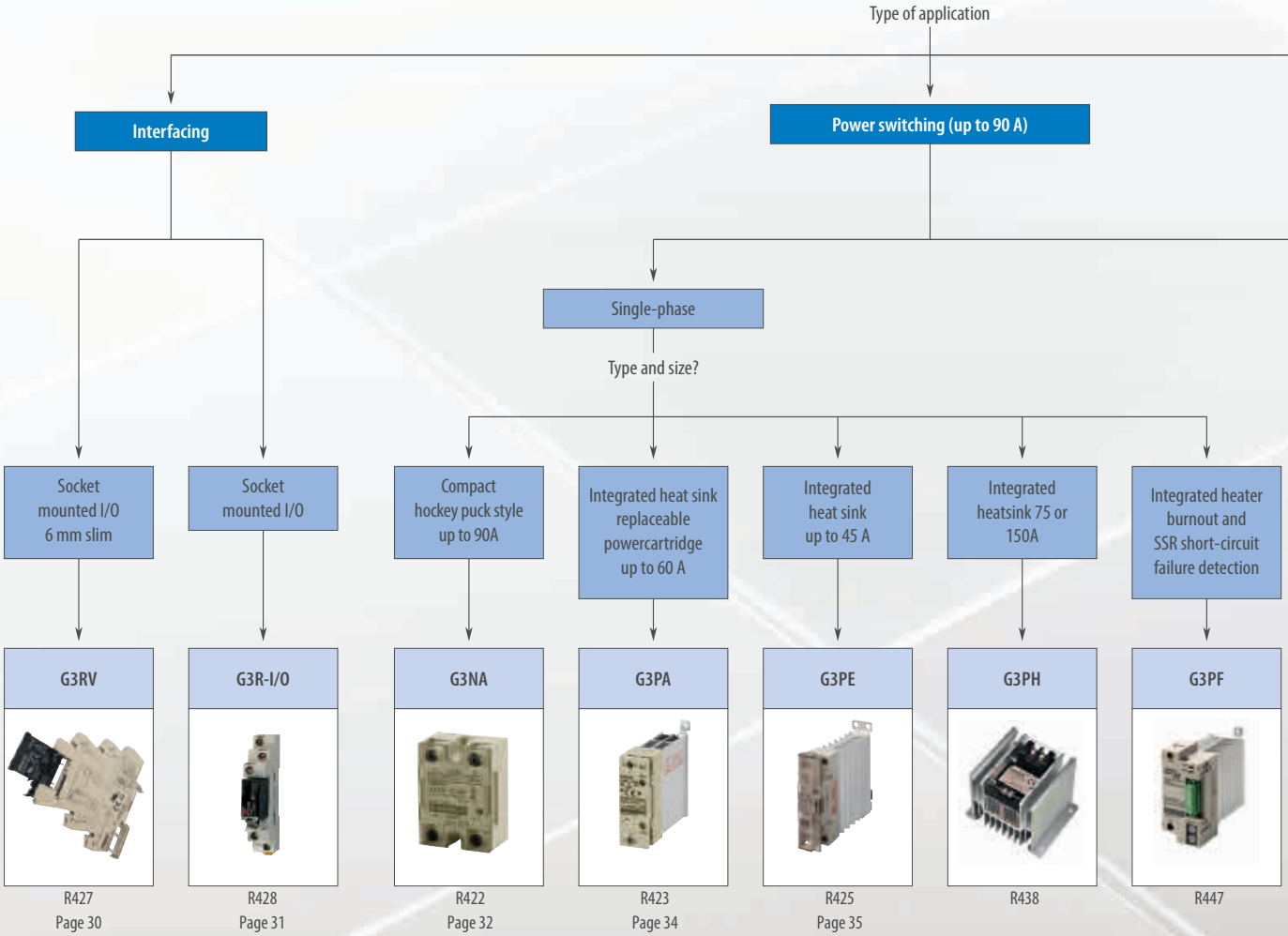
Contact material	Ag alloy
Operating time	50 ms max.
Release time	50 ms max.
Dielectric strength	4,000 VAC
Ambient temperature	Operating: -25 to 60°C (no icing)

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



Power controlling

- **Three-phase**
  - Integrated heat sink up to 45 A
    - **G3PE**

R425
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- **Single phase**
  - Integrated heat sink up to 60 A
    - **G3PW**

R442

- **Multi channel up to 8 solid state relays**
  - **G3ZA**

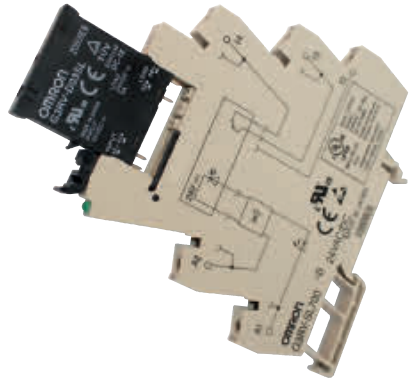
R426

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	Normal resistive heaters
	1-phase control	–	–	–	■	■
	2-phase control	–	–	–	–	–
	3-phase control	–	–	–	–	–
	Function	Signal switching	Signal switching	Signal switching	Heater control, motor control	Heater control
	Max. current rating	2 A (AC); 3 A (DC)	100 mA	2 A	90 A	60 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	30	31		32	34

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	–
■	□	■	■	■	–
□	■	□	■	□	–
–	–	–	–	–	–
■	■	■	■	■	■
■	■	■	■	■	–
■	–	–	–	–	–
–	–	■	–	–	–
–	–	–	■	■	■
–	–	–	■	■	■
–	–	–	–	■	■
–	–	–	■	■	■
■	■	–	■	–	■
■	■	■	■	■	■
–	–	–	–	–	–
35		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				Must operate voltage	Must release voltage	Output			Type of connection	Order code
	Rated voltage (operating voltage)	Rated current					Rated load voltage (load voltage range)	Load current	Inrush current		
		AC		DC							
		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				Output			
	Rated voltage (operating voltage)	Input current	Must operate voltage	Must release voltage	Logic level supply voltage	Logic level supply current	Size in mm (HxWxD)	Order code
–	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)		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
				100 to 240 VAC	75 VAC max.	20 VAC min.			G3NA-D210B-UTU AC100-240
200 to 480 VAC	10 A	Yes		5 to 24 VDC	4 VDC max.	1 VDC min.	0.2 to 10 A/0.2 to 4 A	58×43×27	G3NA-410B-UTU DC5-24
				100 to 240 VAC	75 VAC max.	20 VAC min.			G3NA-410B-UTU AC100-240
	25 A			5 to 24 VDC	4 VDC max.	1 VDC min.	0.2 to 20 A/0.2 to 4 A	58×43×27	G3NA-425B-UTU-2 DC5-24
				100 to 240 VAC	75 VAC max.	20 VAC min.			G3NA-425B-UTU-2 AC100-240
	50 A			5 to 24 VDC	4 VDC max.	1 VDC min.	0.2 to 40 A/0.2 to 6 A	58×43×30	G3NA-450B-UTU-2 DC5-24
				100 to 240 VAC	75 VAC max.	20 VAC min.			G3NA-450B-UTU-2 AC100-240
	75 A			5 to 24 VDC	4 VDC max.	1 VDC min.	1 to 75 A/1 to 7 A	58×43×30	G3NA-475B-UTU-2 DC5-24
				100 to 240 VAC	75 VAC max.	20 VAC min.			G3NA-475B-UTU-2 AC100-240
	90 A			5 to 24 VDC	4 VDC max.	1 VDC min.	1 to 90 A/1 to 7 A	58×43×30	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
Low-cost heat sink	G3NA-205B-UTU, G3NA-210B-UTU, G3NA-D210B-UTU, G3NA-220B-UTU, G3NA-410B-UTU, G3NA-425B-UTU(-2)	100×102×60	Y92B-A100
	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		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
	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-420B-VD-2	G32A-D20
20 A		
30 A	G3PA-430B-VD, G3PA-430B-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^2s	3 kW (at 200 VAC)	100×22.5×100	1	G3PE-215B DC12-24
		25 A (at 40°C)	260 A^2s	5 kW (at 200 VAC)		1	G3PE-225B DC12-24
		35 A	1,260 A^2s	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^2s	6 kW (at 400 VAC)	100×22.5×100	1	G3PE-515B DC12-24
		25 A (at 40°C)	1,350 A^2s	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^2s	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^2s	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^2s	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

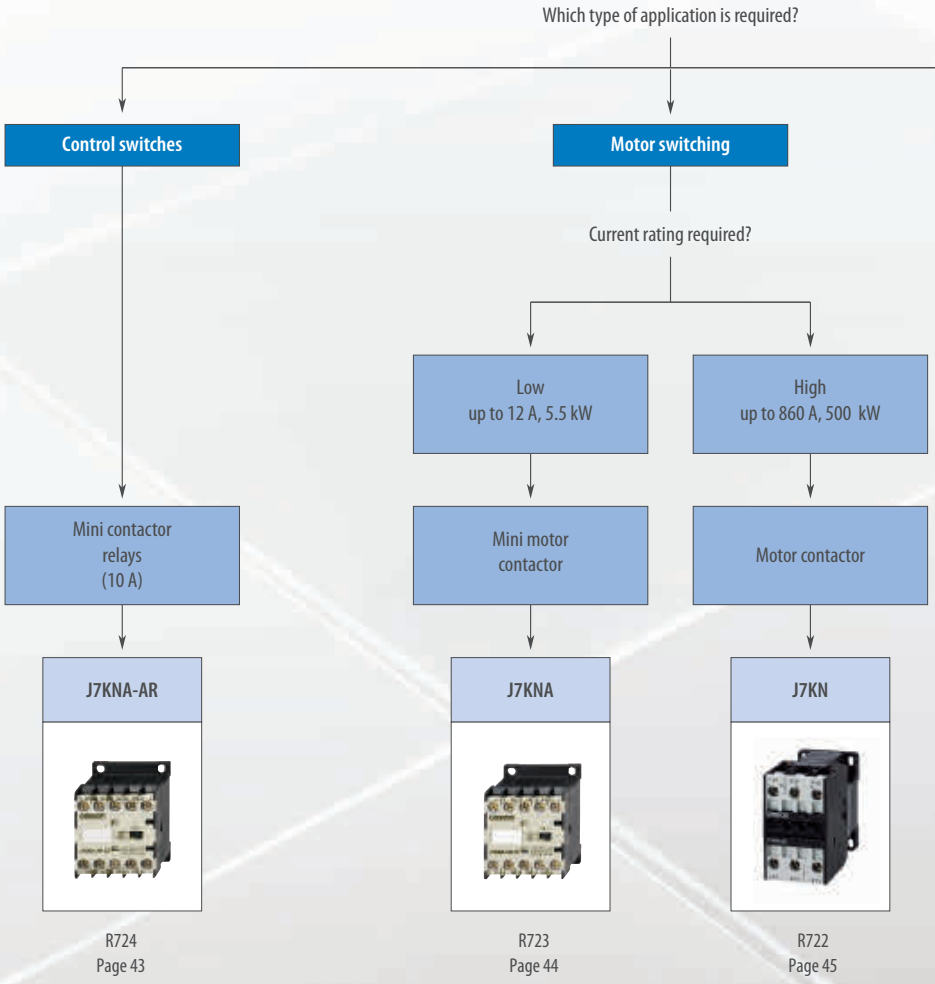
J7KN MOTOR CONTACTOR

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)






Motor protection

Which kind of protection is needed?

Protection with fuse	Fuseless
Thermal overload relays (0.12 to 180 A)	Motor protection circuit breakers (0.16 to 100 A)
J7TKN	**J7MN**
	
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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
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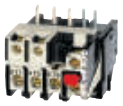
	Category		Contactors					
Contactors								
	Type		J7KNA-AR	J7KNA-09/12	J7KN(G)-10(D)	J7KN(G)-14(D)	J7KN(G)-18(D)	J7KN(G)-22(D)
	Maximum power AC3-380/415 V		–	4 kW or 5 kW	4 kW	5.5 kW	7.5 kW	11 kW
	Rated current AC3-380/415 V		10 A th	9/12 A	10 A	14 A	18 A	22 A
	Main contacts		4 in 4 configurations	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		43	44	45		45	

	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		47	47

[*1] Using J7KN with DC double wiring coils results in 1 aux. less

	Motor protection circuit breaker	
J7MN-6R Over lapping area J7MN-3P/3R		
	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		
	49	

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	
45			45			45	

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
47	47	47

[*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		45			

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	47		

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
45				

Thermal overload

J7TKN-G	J7TKN-H
144 - 320 A	240 - 800 A
2	3
1 NO and 1 NC	1 NO and 1 NC
47	

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	Order code	Coil voltage *1, replace ___ with:				
	NO	NC		AC15 230 V A	400 V A	I_{th}, 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_{th}, 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	60 Hz	50 Hz		60 Hz	
	V	V	min. V	max. V	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	NO	NC				VAC				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
	4	4	4	4	9	20	0	0	J7TKN-A		J7KNA-09-4___	24	110	230	400	24D
DC solenoid with diode	3	4	4	4	9	20	1	0	J7TKN-A		J7KNA-09-10___	–	–	–	–	24VS
							0	1	J7TKN-A		J7KNA-09-01___	–	–	–	–	24VS
		5.5	5.5	5.5	12	20	1	0	J7TKN-A		J7KNA-12-10___	–	–	–	–	24VS
							0	1	J7TKN-A		J7KNA-12-01___	–	–	–	–	24VS
AC/DC solenoid	3 reversing contactors	4	4	4	9	20	0	1	J7TKN-A	57.5×94.5×50	J7KNA-09-01 R___	24	110	230	400	24D
		5.5	5.5	5.5	12	20	0	1	J7TKN-A		J7KNA-12-01 R___	24	110	230	400	24D
DC solenoid with diode		4	4	4	9	20	0	1	J7TKN-A		J7KNA-09-01 R___	–	–	–	–	24VS
		5.5	5.5	5.5	12	20	0	1	J7TKN-A		J7KNA-12-01 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	60 Hz	50 Hz		60 Hz	
	V	V	min. V	max. V	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 Ieff	at U_e = 690 VAC	165 A	165 A
Breaking capacity I_{eff} $\cos\phi$ = 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 × 106	5 × 106
DC operated		15 × 106	15 × 106
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	NO	NC				VAC				VDC	
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
		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
AC and DC[*2]		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 J7TKN-C	78 × 45 × 104.5	J7KNG-24___	–	–	–	–	24D	110D
		32 A	15	18.5	18.5	65	0	0			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	AC1 690 V A	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 motor contactor		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		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 (mm²)			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
	10 to 14	18 to 24		J7TKN-A-14
J7KN-10D… to J7KN-40…	0.12 to 0.18	–	126.5 × 45 × 70 (J7KN-10D to J7KN-22D); 141.5 × 45 × 87.5 (J7KN-24 to J7KN-40)	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
	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
J7KN-24… to J7KN-40…	28 to 42	48 to 73	136 × 67 × 96.5	J7TKN-C-42
J7KN-50… to J7KN-74…	40 to 52	70 to 90	180 × 69 × 108	J7TKN-D-52
	52 to 65	90 to 112		J7TKN-D-65
	60 to 74	104 to 128		J7TKN-D-74
J7KN-90… to J7KN-115…	60 to 90	104 to 156	260 × 107 × 120	J7TKN-E-90
	80 to 120	140 to 207		J7TKN-E-120
J7KN-151… to J7KN-176…	120 to 180	208 to 312	290 × 110 × 162	J7TKN-F-180
J7KN-210… to J7KN-316…	144 to 216	250 to 374	362 × 145 × 208	J7TKN-G-216
	216 to 320	374 to 554		J7TKN-G-320
J7KN-450… to J7KN-860…	240 to 360	416 to 623	372 × 1246 × 1225 (J7KN-450) 395 × 1246 × 1225 (J7KN-550) 487 × 1280 × 1291 (J7KN-700) 540 × 1280 × 1291 (J7KN-860)	J7TKN-H-360
	360 to 540	623 to 935		J7TKN-H-540
	540 to 800	935 to 1385		J7TKN-H-800

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 Main connector	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
	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			500 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		J7MN-6R-63
63	30	45–63	819	50	165 × 70 × 171	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	J7MN-11F
	2NO			J7MN-20F
	2NC			J7MN-02F
Auxiliary contact block for left hand side mounting (max. 2 pc. per circuit breaker)				
Contact block (9 mm)	1 NO + 1 NC		All	J7MN-11S
	2NO			J7MN-20S
	2NC			J7MN-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	J7MN-TA-11S
			J7MN-6R/-9R	J7MN-TB-11S
	1 NO + 1 NC short circuit tripping condition		All	J7MN-T-11S
Undervoltage releases for right hand side mounting (max 1 pc. per circuit breaker)				
	AC 50 Hz	**AC 60 Hz**		
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	24 V	28 V	All	J7MN-U-24
	110–127 V	120 V		J7MN-U-110
	220–230 V	240–260 V		J7MN-U-230
	240 V	277 V		J7MN-U-240
	380–400 V	440–460 V		J7MN-U-400
	415–440 V	460–480 V		J7MN-U-415
Shunt releases for right hand side mounting (max 1 pc. per circuit breaker)				
	AC 50 Hz	**AC 60 Hz**		
Trips the circuit breaker when the release coil is energized	24 V	28 V	All	J7MN-S-24
	110–127 V	120 V		J7MN-S-110
	220–230 V	240–260 V		J7MN-S-230
	240 V	277 V		J7MN-S-240
	380–400 V	440–460 V		J7MN-S-400
	415–440 V	460–480 V		J7MN-S-415
Terminal block				
Terminal block	Up to 600 V according to UL 489 not for transverse auxiliary contact block		J7MN-3R	J7MN-TB32
			J7MN-9R	J7MN-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	J7MN-CPM-3-45-2S
		for 3 units		J7MN-CPM-3-45-3S
		for 4 units		J7MN-CPM-3-45-4S
		for 5 units		J7MN-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	J7MN-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	J7MN-BTC-63-SEV
Shrouds for unused terminals on busbar system	Spade		J7MN-3P; J7MN-3R	J7MN-TA-63S

Specifications

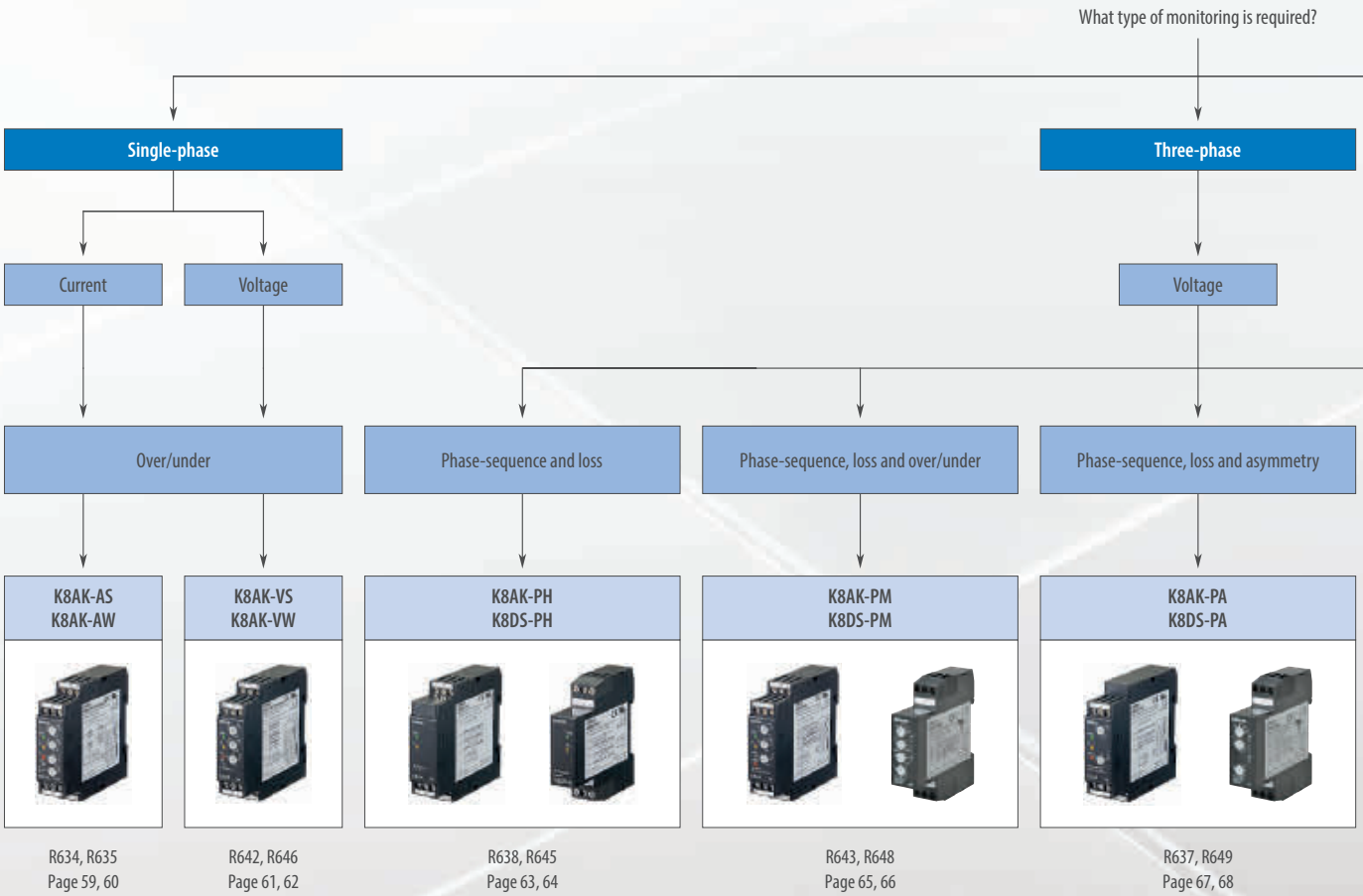
Type		J7MN-3P	J7MN-3R	J7MN-6R	J7MN-9R
Number of poles		3	3	3	3
Max. rated current Inmax (= max. rated operational current I_e)	A	32	32	63	100
Permissible ambient temperature	Storage/transport	–50 to 80°C			
	Operation	–20 to 60°C			
Rated operational voltage U_e	V	690			
Rated frequency	Hz	50/60			
Rated 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 94191EC	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

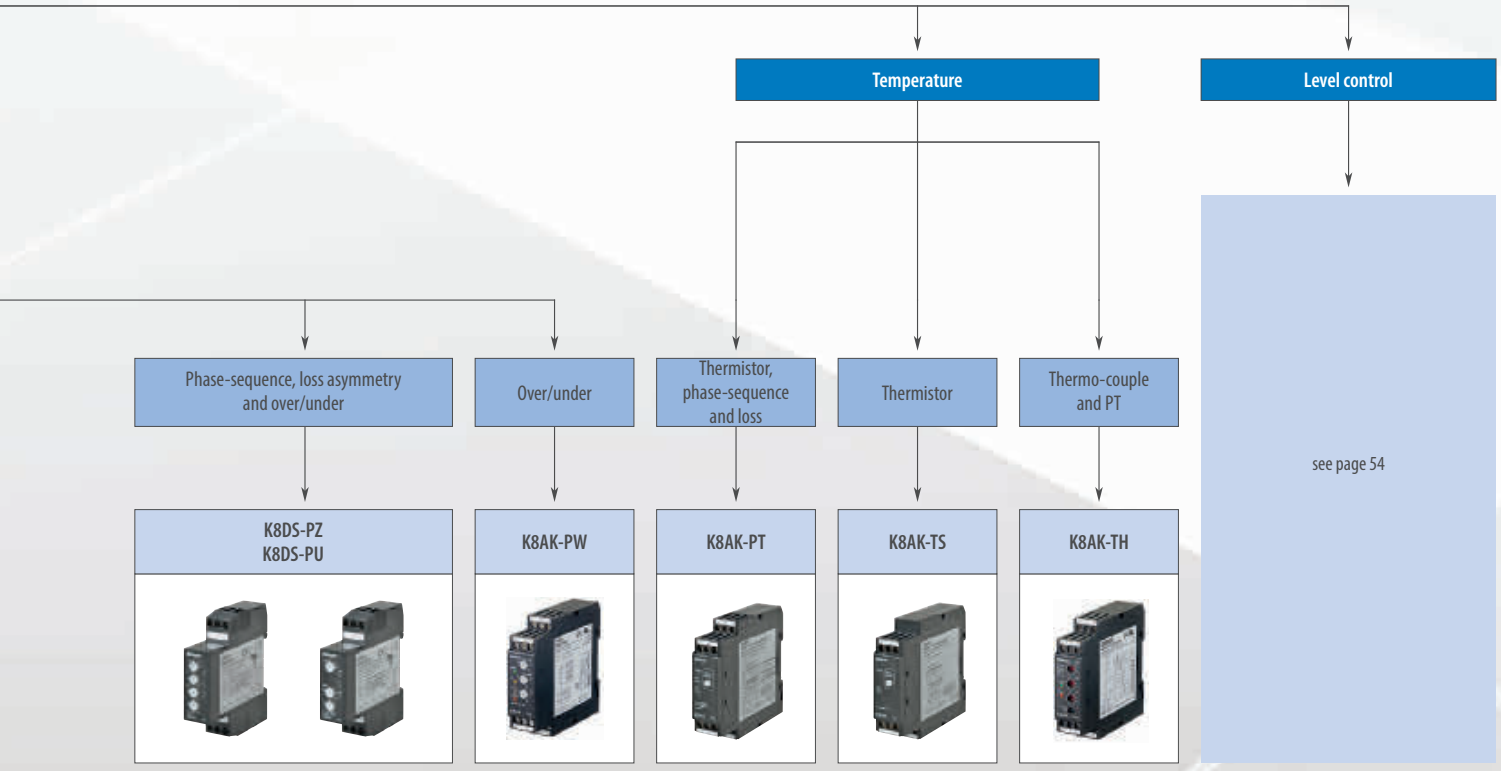
K8 series – The smart way to protect your system

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




K8AK AS
K8AK AW
K8AK VS
K8AK VW
K8AK PH
K8AK PM
K8AK PA
K8AK PW
K8AK LS
K8AK TH11
K8DS PH


Temperature
Level control
Phase-sequence, loss asymmetry and over/under
Over/under
Thermistor, phase-sequence and loss
Thermistor
Thermo-couple and PT
see page 54
K8DS-PZ
K8DS-PU
K8AK-PW
K8AK-PT
K8AK-TS
K8AK-TH
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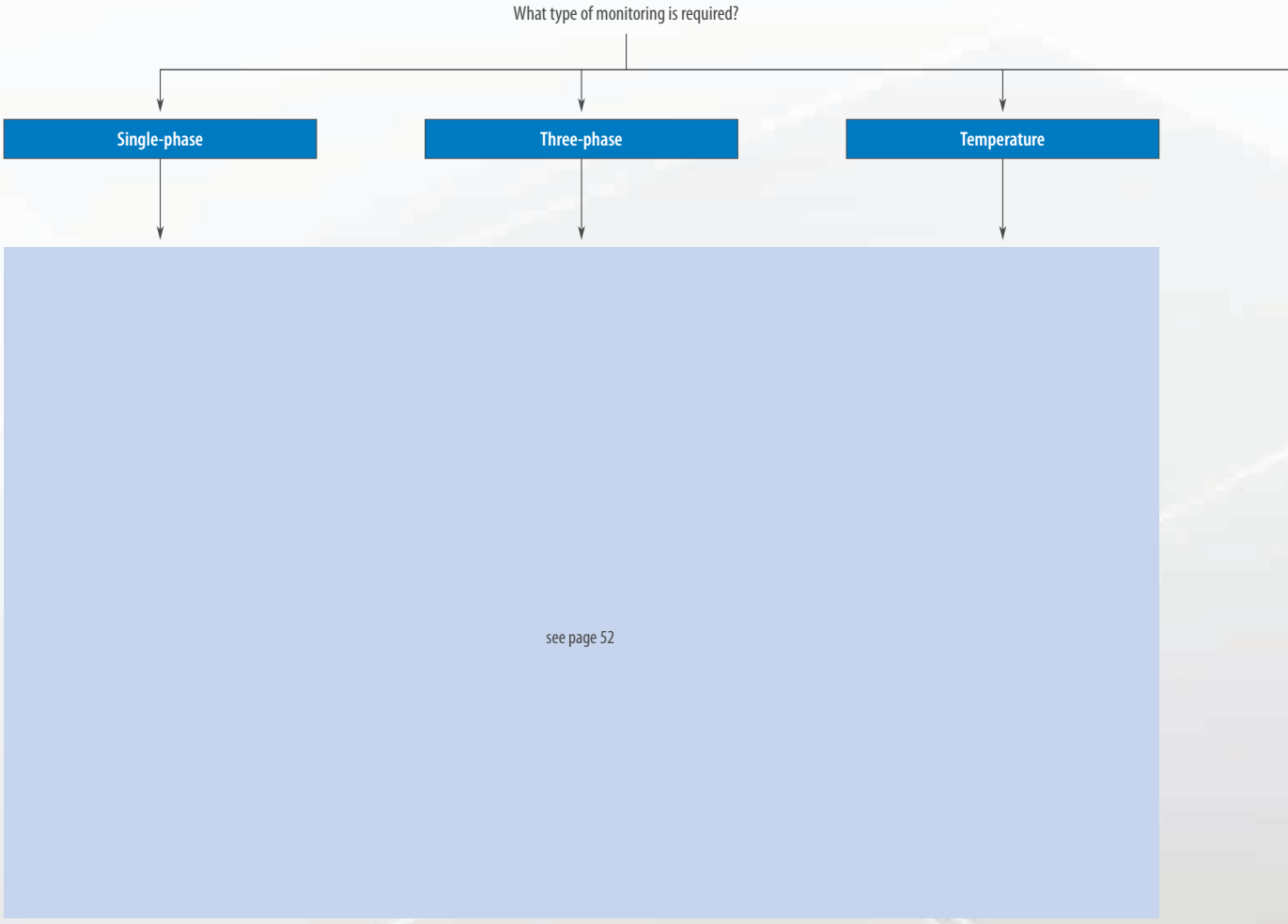
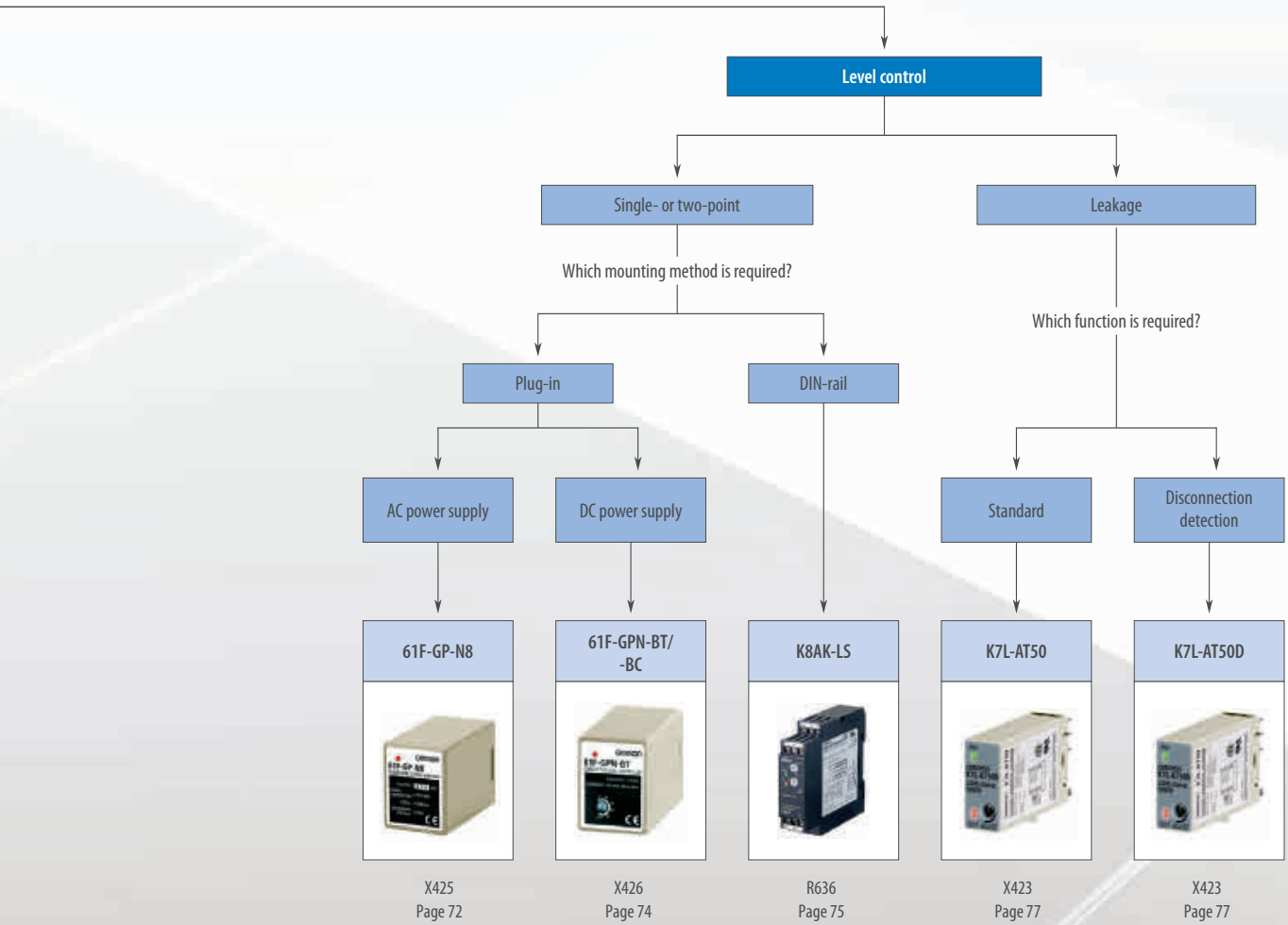
Monitoring products





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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	59	60	61	62	63	64	65	66

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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–	–	–	–	–	■	■	■
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■ (-PA1, 3-wire)	■	■	■	■ (-PW1, 3-wire)	–	–	–
■ (-PA1, 4-wire)	–	–	–	■ (-PW1, 4-wire)	–	–	–
■ (-PA2, 3-wire)	■	■	■	■ (-PW2, 3-wire)	–	–	–
■ (-PA2, 4-wire)	–	–	–	■ (-PW2, 4-wire)	–	–	–
–	–	–	–	–	■	■	■
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
■ (1 SPDT)	■ (1 SPDT)	■ (1 SPDT)	■ (1 SPDT)	■ (2 SPDT)	■ (1 SPDT)	■ (1 SPDT)	■ (1 SPDT)
■	■	■	■	■	■	■	■
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
67	68	69	70	71	78	78	79

■ Standard □ Available – No/not available

Conductive level controller				Liquid leakage sensor amplifier	
					
61F-GP-N8	**61F-GPN-BT**	**61F-GPN-BC**	**K8AK-LS**	**K7L-AT50**	**K7L-AT50D**
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
4 to 50 kΩ	0 to 100 kΩ	1 to 100 kΩ	10 to 100 kΩ	0 to 50 MΩ	1 to 50 MΩ
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	–	–	–	■	■
■	■	■	■ (1 SPDT)	–	–
■	■	■	■	■	■
–	■	■	–	■	■
Electrode holder: PS-_S, PS-31, BF-1 and BS-1			–	Liquid leakage sensor band F03-16PE	
72	74		75	77	

■ Standard ☐ Available – No/not available

Single-phase current relay

These single-phase current relays monitor over- and undercurrents. Manual resetting and automatic resetting are supported by one relay. The start-up lock and operating time can be set separately. The relay warning status is easily monitored with the LED indicator.

- Single-phase current relay
- In 22.5 mm wide industrial housing
- Under or over control
- Supply voltages: 24 VAC/DC, 100 to 240 VAC
- Easy wiring with ferrules

Ordering information

Measuring current	Supply voltage	Order code
2 to 20 mA AC/DC, 10 to 100 mA AC/DC, 50 to 500 mA AC/DC	24 VAC/DC	K8AK-AS1 24 VAC/DC
	100 to 240 VAC	K8AK-AS1 100-240 VAC
0.1 to 1 A AC/DC, 0.5 to 5 A AC/DC, 0.8 to 8 A AC/DC	24 VAC/DC	K8AK-AS2 24 VAC/DC
	100 to 240 VAC	K8AK-AS2 100-240 VAC
10 to 100 A AC, 20 to 200 A AC	24 VAC/DC	K8AK-AS3 24 VAC/DC
	100 to 240 VAC	K8AK-AS3 100-240 VAC

Accessories

Current transformer	Input range	Applicable relay	Order code
	10 to 100 A AC, 20 to 200 A AC	K8AK-AS3	K8AC-CT200L

Note: The K8AK-AS3 is designed to be used in combination with the K8AC-CT200L (direct input not possible)

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Operating voltage range		85% to 110% of rated operating voltage
Rated power supply frequency		50/60 Hz±5 Hz (AC power supply)
Output relays (1 × SPDT, normally closed operation)	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
Mechanical life		10,000,000 operations
Electrical life		50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS
Weight		Approx. 150 g
Operating power	Isolated power supply	2.0 VA/1.1 W max. at 24 VAC/DC, 4.6 VA max. at 100 to 240 VAC
Operate (SV)	Operating value setting range	10% to 100% of maximum measuring current
	Operating value	100% operation at set value
Reset (HYS.)	Hysteresis	5% to 50% of operating value
	Resetting method	Manual reset/automatic reset (switchable) Manual reset: Turn OFF operating power for 1 s or longer
Operating time (T)		0.1 to 30 s
Operating power ON lock (LOCK)		0 to 30 s (The startup lock timer starts when the input has reached approximately 30% or more of the set value.) Note: Enabled only for overcurrent operation
Repeat error	Operating value	±0.5% full scale (at 25°C and 65% humidity, rated power supply voltage, DC or 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Input frequency range	K8AK-AS1/-AS2	DC input or AC input (45 to 65 Hz)
	K8AK-AS3	AC input (45 to 65 Hz)
Overload capacity	K8AK-AS1/-AS2	Continuous input at 120% of maximum input, 1 s at 150%
	K8AK-AS3	Continuous input at 120%, 30 s at 200%, and 1 s at 600% with an OMRON CT (K8AC-CT200L)
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM): Red LED
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

Single-phase current relay, window type

These single-phase current relays monitor over- and undercurrents. Manual resetting and automatic resetting are supported by one relay. The start-up lock and operating time can be set separately. The relay warning status is easily monitored with the LED indicator.

- Single-phase current window relay
- In 22.5 mm wide industrial housing
- Under and over control
- Supply voltages: 24 VAC/DC, 100 to 240 VAC
- Easy wiring with ferrules

Ordering information

Measuring current	Supply voltage	Order code
2 to 20 mA AC/DC, 10 to 100 mA AC/DC, 50 to 500 mA AC/DC	24 VAC/DC	K8AK-AW1 24 VAC/DC
	100 to 240 VAC	K8AK-AW1 100-240 VAC
0.1 to 1 A AC/DC, 0.5 to 5 A AC/DC	24 VAC/DC	K8AK-AW2 24 VAC/DC
	100 to 240 VAC	K8AK-AW2 100-240 VAC
10 to 100 A AC, 20 to 200 A AC	24 VAC/DC	K8AK-AW3 24 VAC/DC
	100 to 240 VAC	K8AK-AW3 100-240 VAC

Accessories

Current transformer	Input range	Applicable relay	Order code
	10 to 100 A AC, 20 to 200 A AC	K8AK-AW3	K8AC-CT200L

Note: The K8AK-AW3 is designed to be used in combination with the K8AC-CT200L (direct input not possible)

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Operating voltage range		85% to 110% of rated operating voltage
Rated power supply frequency		50/60 Hz±5 Hz (AC power supply)
Output relays (1 × SPDT, normally closed operation)	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
Mechanical life		10,000,000 operations
Electrical life		50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS
Weight		Approx. 150 g
Operating power	Isolated power supply	2.0 VA/1.1 W max. at 24 VAC/DC, 4.6 VA max. at 100 to 240 VAC
Operate (SV)	Operating value setting range	10% to 100% of maximum measuring current
	Operating value	100% operation at set value
Reset (HYS.)	Hysteresis	5% of operating value (fixed)
	Resetting method	Manual reset/automatic reset (switchable) Manual reset: Turn OFF operating power for 1 s or longer
Operating time (T)		0.1 to 30 s
Operating power ON lock (LOCK)		0 to 30 s (The startup lock timer starts when the input has reached approximately 30% or more of the set value.) Note: Enabled only for overcurrent operation
Repeat error	Operating value	±0.5% full scale (at 25°C and 65% humidity, rated power supply voltage, DC or 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Input frequency range	K8AK-AW1/-AW2	DC input or AC input (45 to 65 Hz)
	K8AK-AW3	AC input (45 to 65 Hz)
Overload capacity	K8AK-AW1/-AW2	Continuous input at 120% of maximum input, 1 s at 150%
	K8AK-AW3	Continuous input at 120%, 30 s at 200%, and 1 s at 600% with an OMRON CT (K8AC-CT200L)
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM): Red LED
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

Single-phase voltage relay

These single-phase voltage relays are for monitoring over- and undervoltages. Manual resetting and automatic resetting are supported by one relay. Relay warning status can easily be monitored using the LED indicator.

- Single-phase voltage relay
- In 22.5 mm wide industrial housing
- Under or over control
- Supply voltages: 24 VAC/DC, 100 to 240 VAC
- Easy wiring with ferrules

Ordering information

Measuring current	Supply voltage	Order code
1 to 10 VAC/DC, 3 to 30 VAC/DC, 15 to 150 VAC/DC	24 VAC/DC	K8AK-VS2 24 VAC/DC
	100 to 240 VAC	K8AK-VS2 100-240 VAC
20 to 200 VAC/DC, 30 to 300 VAC/DC, 60 to 600 VAC/DC	24 VAC/DC	K8AK-VS3 24 VAC/DC
	100 to 240 VAC	K8AK-VS3 100-240 VAC

Specifications

Ambient operating temperature		−20 to 60°C (with no condensation or icing)
Storage temperature		−25 to 65°C (with no condensation or icing)
Operating voltage range		85% to 110% of rated operating voltage
Rated power supply frequency		50/60 Hz±5 Hz (AC power supply)
Output relays (1 × SPDT, normally closed operation)	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS
Weight		Approx. 150 g
Operating power	Isolated power supply	2.0 VA/1.1 W max. at 24 VAC/DC, 4.6 VA max. at 100 to 240 VA
Operate (SV)	Operating value setting range	10% to 100% of maximum measuring voltage
	Operating value	100% operation at set value
Reset (HYS.)	Hysteresis	5% to 50% of operating value
	Resetting method	Manual reset/automatic reset (switchable) Manual reset: Turn OFF operating power for 1 s or longer
Operating time (T)		0.1 to 30 s
Power ON lock (LOCK)		1 s or 5 s (Switched using DIP switch) (value when input rapidly changes from 0 to 100%. The operating time is the shortest at this point)
Repeat accuracy	Operating value	±0.5% full scale (at 25°C and 65% humidity, rated power supply voltage, DC or 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Input frequency		40 to 500 Hz
Overload capacity		Continuous input at 115% of maximum input, 10 s at 125% (up to 600 VAC)
Indicators		LED power (PWR): Green LED, relay output (RY): Yellow LED, alarm output (ALM): Red LED
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

Single-phase voltage relay, window type

For monitoring over- and undervoltages simultaneously. Manual resetting and automatic resetting are supported by one relay. Separate settings and outputs are supported for over- and undervoltages. Relay warning status can easily be monitored with the LED indicator.

- Single-phase voltage window relay
- In 22.5 mm wide industrial housing
- Under and over, low/low or high/high control
- Supply voltages: 24 VAC/DC, 100 to 240 VAC
- Easy wiring with ferrules

Ordering information

Measuring current	Supply voltage	Order code
1 to 10 VAC/DC, 3 to 30 VAC/DC, 15 to 150 VAC/DC	24 VAC/DC	K8AK-VW2 24 VAC/DC
	100 to 240 VAC	K8AK-VW2 100-240 VAC
20 to 200 VAC/DC, 30 to 300 VAC/DC, 60 to 600 VAC/DC	24 V AC/DC	K8AK-VW3 24 VAC/DC
	100 to 240 VAC	K8AK-VW3 100-240 VAC

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Operating voltage range		85% to 110% of rated operating voltage
Rated power supply frequency		50/60 Hz±5 Hz (AC power supply)
Output relays (2 × SPDT, normally closed operation)	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS
Weight		Approx. 150 g
Operating power	Isolated power supply	2.0 VA/1.1 W max. at 24 VAC/DC, 4.6 VA max. at 100 to 240 VAC
Operation (AL1 and AL2)	Operating value setting range	10% to 100% of maximum measuring voltage
	Operating value	100% operation at set value
Reset (HYS.)	Hysteresis	5% of operating value (fixed)
	Resetting method	Manual reset/automatic reset (switchable) Manual reset: Turn OFF operating power for 1 s or longer
Operating time (T)		0.1 to 30 s
Power ON lock (LOCK)		1 s or 5 s (Switched using DIP switch)
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM 1/2): Red LED
Repeat accuracy	Operating value	±0.5% full scale (at 25°C and 65% humidity, rated power supply voltage, DC or 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Input frequency		40 to 500 Hz
Overload capacity		Continuous input at 115% of maximum input, 10 s at 125% (up to 600 VAC)
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

3-phase sequence, phase loss relay

The K8AK-PH1 monitoring relay is designed to monitor 3-phase 3-wire supplies. It simultaneously monitors phase sequence and phase loss during start up as well as phase loss during operation. The output relay releases when alarm conditions are detected, and the warning status can easily be monitored using the LED indicator. Suitable for industrial facilities and equipment.

- Monitors phase sequence and phase-loss simultaneously
- Measuring range: 200 to 480 VAC
- Power supply voltage is the same as measuring voltage
- Operation reaction time: 0.1 s maximum

Ordering information

Rated input voltage	Order code
200 to 480 VAC	K8AK-PH1

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Altitude		2,000 m max.
Input frequency		50/60 Hz (AC power supply)
Output relays (1 × DPDT, normally closed operation)	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS
Weight		Approx. 130 g
Rated input voltage		Three-phase, three-wire mode, 200 to 480 VAC
Reversed phase and phase loss operating time		0.1 s max.
Resetting method		Automatic reset
Overload capacity		Continuous input: 528 VAC
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

3-phase voltage, phase-sequence/phase loss relay

The K8DS-PH1 is a monitoring relay designed at 17.5 mm slim by simplified functions for 3-phase 3 wire supplies. It simultaneously monitors phase sequence and phase loss during start up as well as phase loss during operation. The output relay releases when alarm conditions are detected, and the warning status can easily be monitored using the LED indicator.

- Monitors phase sequence and phase-loss simultaneously
- Measuring range: 200 to 480 VAC
- Power supply voltage is the same as measuring voltage
- Operation reaction time: 0.1 s maximum

Ordering information

Rated input voltage	Order code
200 to 480 VAC	K8DS-PH1

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Altitude		2,000 m max.
Input frequency		50/60 Hz (AC power supply)
Output relays (1 × SPDT, normally closed operation)	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC UL 94 V-0
Weight		Approx. 60 g
Rated input voltage		Three-phase, three-wire mode, 200 to 480 VAC
Reversed phase and phase loss operating time		0.1 s max.
Resetting method		Automatic reset
Overload capacity		Continuous input: 500 VAC
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size (H × W × D)		80 × 17.5 × 74 mm

3-phase voltage, phase sequence, phase loss relay

K8AK-PM monitors overvoltages, undervoltages, phase sequence and phase loss for 3-phase, 3-wire or 4-wire power supplies, in one unit. This relay features a switch setting for 3-phase, 3-wire or 3-phase, 4-wire power supply.

- Worldwide power specifications supported by one unit
- Phase sequence, phase loss: Operation reaction time 0.1 s maximum
- Overvoltages or undervoltages: Operation time setting from 0.1 to 30 s
- Relay warning status can easily be monitored using the LED indicator
- Easy wiring with ferrules

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8AK-PM1
3-phase 4-wire mode	115, 127, 133, 138 VAC	
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8AK-PM2
3-phase 4-wire mode	220, 230, 240, 277 VAC	

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Input frequency		50/60 Hz (AC power supply)
Output relays (2 × SPDT, normally closed operation)	**Resistive load**	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS
Weight		Approx. 150 g
Rated input voltage	**K8AK-PM1**	3-phase, 3-wire mode: 200, 220, 230, 240 VAC, 3-phase, 4-wire mode: 115, 127, 133, 138 VAC
	K8AK-PM2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC, 3-phase, 4-wire mode: 220, 230, 240, 277 VAC
Operation (overvoltage or undervoltage)	**Operating value setting range**	Overvoltage = –30% to 25% of maximum rated input voltage[*1] Undervoltage = –30% to 25% of maximum rated input voltage[*1]
	Operating value	100% operation at set value
Reset (HYS.)	**Hysteresis**	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	**Overvoltage/undervoltage**	0.1 to 30 s
	Phase-sequence, phase-loss	0.1 s max.
Power ON lock (LOCK)		1 s or 5 s (Changed with the DIP switch)
Overload capacity		Continuous input at 115% of maximum input, 10 s at 125% (up to 600 VAC)
Repeat accuracy	**Operating value**	±0.5% full scale (at 25°C and an ambient humidity of 65% at the rated power supply voltage, DC or 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM 1/2): Red LED
Applicable standards	**Conforming standards**	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

[*1] The rated input voltage is switched with a switch

3-Phase voltage, phase sequence, phase-loss and over-/undervoltage relay

The K8DS-PM is the simplified 3-phase monitoring relay, 3-wire circuits with one unit. It can monitor undervoltages, overvoltages, phase sequence and phase-loss.

- Greater resistance to inverter noise
- One SPDT output relay, 5 A at 250 VAC (resistive load)
- World-wide power specifications supported by one unit (Set with a rotary switch)
- Relay status can be monitored using LED indicator

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8DS-PM1
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8DS-PM2

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Input frequency		50/60 Hz (AC power supply)
Output relays (1 × SPDT, normally closed operation)	**Resistive load**	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC
Degree of protection		Terminal section: IP20
Case material		PC UL94 V-0
Weight		Approx. 65 g
Rated input voltage	**K8DS-PM1**	3-phase, 3-wire mode: 200, 220, 230, 240 VAC
	K8DS-PM2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC
Operation (overvoltage or undervoltage)	**Operating value setting range**	Overvoltage = –30% to 25% of maximum rated input voltage Undervoltage = –30% to 25% of maximum rated input voltage
	Operating value	100% operation at set value
Reset (HYS.)	**Hysteresis**	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	**Overvoltage/undervoltage**	0.1 to 30 s
	Phase-sequence, phase-loss	0.1 s max.
Power ON lock (LOCK)		1 s ±0.5 s
Overload capacity		Continuous input: 500 V
Repeat accuracy	**Operating value**	±0.5% full scale (at 25°C and an ambient humidity of 65% at the rated power supply voltage, 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Indicators		Power (PWR): Green, Relay output (RY): Yellow LED, OVER/UNDER: Red
Applicable standards	**Conforming standards**	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		80 × 17.5 × 74

3-phase asymmetry, phase sequence, phase loss relay

Monitors voltage asymmetry, phase sequence and phase loss for 3-phase 3-wire or 4-wire power supplies, in one unit.

- Worldwide power specifications supported by one unit
- Phase sequence, phase loss: Operation reaction time 0.1 s maximum
- Asymmetry: Operation time setting from 0.1 to 30 s
- Reset method: Automatic
- Power ON lock: 1 s or 5 s

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8AK-PA1
3-phase 4-wire mode	115, 127, 133, 138 VAC	
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8AK-PA2
3-phase 4-wire mode	220, 230, 240, 277 VAC	

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Altitude		2,000 m max.
Input frequency		50/60 Hz (AC power supply)
Output relays (1 × SPDT, normally closed operation)	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS
Weight		Approx. 130 g
Rated input voltage	K8AK-PA1	3-phase, 3-wire mode: 200, 220, 230, 240 VAC, 3-phase, 4-wire mode: 115, 127, 133, 138 VAC
	K8AK-PA2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC, 3-phase, 4-wire mode: 220, 230, 240, 277 VAC
Asymmetry operation (ASY.)	Operating value setting range	Asymmetry rate: 2% to 22%
	Operating value	100% operation at set value Asymmetry operating value = rated input voltage x asymmetry set value [%] The asymmetry operation will function when the difference between the highest and lowest voltage phases equals or exceeds the asymmetry operating value
Reset (HYS.)	Hysteresis	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	Asymmetry	0.1 s to 30 s
	Phase-sequence, phase-loss	0.1 s max.
Power ON lock (LOCK)		1 s or 5 s (Changed with the DIP switch)
Overload capacity		Continuous input at 115% of maximum input, 10 s at 125% (up to 600 VAC)
Repeat accuracy	Operating value	±0.5% full scale (at 25°C and an ambient humidity of 65% at the rated power supply voltage, DC or 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM 1/2): Red LED
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

3-Phase voltage, phase sequence, loss and asymmetry

The K8DS-PA is the simplified 3-phase monitoring relay, 3-wire circuits with one unit. It can monitor voltage asymmetry with 3-phase sequence and loss at the same time.

- Greater resistance to inverter noise
- One SPDT output relay, 5 A at 250 VAC (resistive load)
- World-wide power specifications supported by one unit (Set with a rotary switch)
- Relay status can be monitored using LED indicator

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8DS-PA1
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8DS-PA2

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Altitude		2,000 m max.
Input frequency		50/60 Hz (AC power supply)
Output relays (1 × SPDT, normally closed operation)	**Resistive load**	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC UL94 V-0
Weight		Approx. 65 g
Rated input voltage	**K8DS-PA1**	3-phase, 3-wire mode: 200, 220, 230, 240 VAC
	K8DS-PA2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC
Asymmetry operation (ASY.)	**Operating value setting range**	Asymmetry rate: 2% to 22%
	Operating value	100% operation at set value Asymmetry operating value = rated input voltage x asymmetry set value [%] The asymmetry operation will function when the difference between the highest and lowest voltage phases equals or exceeds the asymmetry operating value
Reset (HYS.)	**Hysteresis**	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	**Asymmetry**	0.1 to 30 s
	Phase-sequence	0.1 s ±0.5 s
	Phase-loss	0.1 s max.
Power ON lock (LOCK)		1 s ±0.5 s
Overload capacity		Continuous input: 500 V
Repeat accuracy	**Operating value**	±0.5% full scale (at 25°C and an ambient humidity of 65% at the rated power supply voltage, 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Indicators		Power (PWR): Green, Relay output (RY): Yellow, Alarm outputs (ALM): Red
Applicable standards	**Conforming standards**	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA: C22.2 No. 14, CCC: GB14048.5
Size (H × W × D)		80 × 17.5 × 74 mm

3-Phase asymmetry, phase sequence, phase-loss and over-/undervoltage relay

The K8DS-PZ is the simplified 3-phase monitoring relay, 3-wire circuits with one unit. It can monitor undervoltages, overvoltages, voltage asymmetry, phase sequence and phase-loss.

- Greater resistance to inverter noise
- One SPDT output relay, 5 A at 250 VAC (resistive load)
- World-wide power specifications supported by one unit (Set with a rotary switch)
- Relay status can be monitored using LED indicator

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8DS-PZ1
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8DS-PZ2

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Altitude		2,000 m max.
Input frequency		50/60 Hz (AC power supply)
Output relays (1 × SPDT, normally closed operation)	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC
Degree of protection		Terminal section: IP20
Case material		PC UL94 V-0
Weight		Approx. 65 g
Rated input voltage	K8DS-PZ1	3-phase, 3-wire mode: 200, 220, 230, 240 VAC
	K8DS-PZ2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC
Operation (overvoltage or undervoltage)	Operating value setting range	Overvoltage/undervoltage: 2% to 30% of rated input voltage
	Operating value	100% operation at set value
Asymmetry operation (ASY.)	Operating value setting range	Asymmetry rate: 5% to 22%
	Operating value	100% operation at set value Asymmetry operating value = rated input voltage x asymmetry set value [%] The asymmetry operation will function when the difference between the highest and lowest voltage phases equals or exceeds the asymmetry operating value
Reset (HYS.)	Hysteresis	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	Asymmetry	0.1 to 30 s
	Overvoltage/undervoltage	0.1 to 30 s
	Phase-sequence, phase-loss	0.1 s ±0.05 s, 0.1 s max.
Power ON lock (LOCK)		1 s ±0.5 s
Overload capacity		Continuous input: 500 V
Repeat accuracy	Operating value	±0.5% full scale (at 25°C and an ambient humidity of 65% at the rated power supply voltage, 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Indicators		Power (PWR): Green, Relay output (RY): Yellow LED, Alarm output: Red LED
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA: C22.2 No.14
Size in mm (H × W × D)		80 × 17.5 × 74

3-phase voltage asymmetry, phase-sequence, phase-loss and undervoltage relay

The K8DS-PU is the simplified 3-phase monitoring relay, 3-wire circuits with one unit. It can monitor undervoltages, asymmetry, phase sequence and phase loss.

- Greater resistance to inverter noise
- One SPDT output relay, 5 A at 250 VAC (resistive load)
- World-wide power specifications supported by one unit (Set with a rotary switch)
- Relay status can be monitored using LED indicator

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8DS-PU1
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8DS-PU2

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Altitude		2,000 m max.
Voltage fluctuation range (UNDER)		Undervoltage 30 to 25% of rated input voltage
Input frequency		50/60 Hz (AC power supply)
Output relays (1× SPDT, normally closed operation)	**Resistive load**	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC
Degree of protection		Terminal section: IP20
Case material		PC UL94 V-0
Weight		Approx. 65 g
Rated input voltage	**K8DS-PU1**	3-phase, 3-wire mode: 200, 220, 230, 240 VAC
	K8DS-PU2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC
Operation (overvoltage or undervoltage)	**Operating value setting range**	Undervoltage = –30% to 25% of maximum rated input voltage
	Operating value	100% operation at set value
Reset (HYS.)	**Hysteresis**	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	**Asymmetry**	0.1 to 30 s
	Phase-sequence	0.1 s ±0.5 s
	Phase-loss	0.1 s ±0.05 s
Power ON lock (LOCK)		0.1 s ±0.5 s
Overload capacity		Continuous input: 500 V
Repeat accuracy	**Operating value**	±0.5% full scale (at 25°C and an ambient humidity of 65% at the rated power supply voltage, 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, UNDER: Red
Applicable standards	**Conforming standards**	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		80 × 17.5 × 74

3-phase voltage relay

Monitors overvoltages and undervoltages for 3-phase 3-wire or 4-wire power supplies, in one unit. Switch setting for 3-phase 3-wire or 3-phase 4-wire power supply.

- Overvoltages or undervoltages: Operation time setting from 0.1 to 30 s
- Relay warning status can easily be monitored using the LED indicator
- Separate outputs possible for overvoltages and undervoltages
- Reset method: Automatic
- Power ON lock: 1 s or 5 s

Ordering information

Rated input		Order code
3-phase 3-wire mode	200, 220, 230, 240 VAC	K8AK-PW1
3-phase 4-wire mode	115, 127, 133, 138 VAC	
3-phase 3-wire mode	380, 400, 415, 480 VAC	K8AK-PW2
3-phase 4-wire mode	220, 230, 240, 277 VAC	

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Altitude		2,000 m max.
Voltage fluctuation rang		85% to 110% of rated input voltage
Input frequency		50/60 Hz (AC power supply)
Output relays (2 × SPDT, normally closed operation)	**Resistive load**	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS
Weight		Approx. 150 g
Rated input voltage	**K8AK-PW1**	3-phase, 3-wire mode: 200, 220, 230, 240 VAC, 3-phase, 4-wire mode: 115, 127, 133, 138 VAC
	K8AK-PW2	3-phase, 3-wire mode: 380, 400, 415, 480 VAC, 3-phase, 4-wire mode: 220, 230, 240, 277 VAC
Operation (overvoltage and undervoltage)	**Operating value setting range**	Overvoltage = –30% to 25% of maximum rated input voltage[*1] Undervoltage = –30% to 25% of maximum rated input voltage[*1]
	Operating value	100% operation at set value
Reset (HYS.)	**Hysteresis**	5% of operating value (fixed)
	Resetting method	Automatic reset
Operating time (T)	**Overvoltage/undervoltage**	0.1 to 30 s
Power ON lock (LOCK)		1 s or 5 s (Changed with the DIP switch)
Overload capacity		Continuous input at 115% of maximum input, 10 s at 125% (up to 600 VAC)
Repeat accuracy	**Operating value**	±0.5% full scale (at 25°C and an ambient humidity of 65% at the rated power supply voltage, DC or 50/60 Hz sine wave input)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)
Indicators		Power (PWR): Green LED, relay output (RY): Yellow LED, alarm outputs (ALM 1/2): Red LED
Applicable standards	**Conforming standards**	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

[*1] The rated input voltage is switched with a switch

Compact plug-in (8-pin) level controller

The 61F-GP-N8 can be used for single- or two-point level control of conductive materials, both liquids and solids. These products are equipped with a red LED operation indicator.

- Low-voltage (AC) electrodes (8 VAC or 24 VAC)
- Operation range: 4 to 15 kΩ, 70 to 300 kΩ
- Detection method: Conductive
- Probes need to be ordered separately
- Conforms to EMC and LVD directives, UL/CSA approved

Ordering information

Application	Type		Order code
Ordinary purified water or sewage water	General purpose type		61F-GP-N8 24AC
			61F-GP-N8 110AC
			61F-GP-N8 230AC
Ordinary purified water, where the distance between sewage pumps and water tanks or between receiver tanks and supply tanks is long or where remote control is required	Long-distance type	2 km	61F-GP-N8L 24AC 2KM
			61F-GP-N8L 110AC 2KM
			61F-GP-N8L 230AC 2KM
		4 km	61F-GP-N8L 24AC 4KM
			61F-GP-N8L 110AC 4KM
			61F-GP-N8L 230AC 4KM
Liquids with high specific resistance such as distilled water	High sensitivity type		61F-GP-N8H 24AC
			61F-GP-N8H 110AC
			61F-GP-N8H 230AC
Liquids with low specific resistance such as salt water, sewage water, acid chemicals, alkali chemicals	Low sensitivity type		61F-GP-N8D 24AC
			61F-GP-N8D 110AC
			61F-GP-N8D 230AC
Ordinary purified or sewage water, with two-wired-type electrode holder (incorporating a resistor of 6.8 kΩ)	Two-wired type		61F-GP-N8R 24AC
			61F-GP-N8R 110AC
			61F-GP-N8R 230AC
DIN-rail mounting socket			PF083A-E
Back-connecting socket			PL08

Accessories

Electrode holders

Applications	Mounting style	Insulator material	Max. temperature	Number of electrodes	Order code
For city water and other general use. Easy-to-replace separate versions for maintenance.	Flange	Phenol resin	70°C	3	PS-3S
When mounting space is limited. Special 3-pole holder of small size and light weight.	Screw	Phenol resin		3, 300 mm 3, 1,000 mm	PS-31-300MM PS-31-1000MM
Use for sewage, sea water, etc., having a low specific resistance.	Flange	PPS	150°C (without water drips or vapour on the electrode holder surface)	1	BF-1
For resistance to high pressure. Use in tanks with high temperature or pressure.	Screw	PFA	250°C (without water drips or vapour on the surface of the electrode holder)	1	BS-1

Electrode separators

Number of electrodes	Order code
1	F03-14 1P
3	F03-14 3P

Electrodes, connecting, and lock nuts

Applicable liquids	Material	Component	Indication mark	Inscription	Order code
Purified city water, industrial water, sewage	Equivalent to SUS 304 (AISI-304)	Electrode (1 m long)	1 line	–	F03-01 SUS201
		Connecting nut	–	–	F03-02 SUS201
		Lock nut	–	–	F03-03 SUS201
Purified city water, industrial water, sewage, dilute alkaline solution	SUS316 (AISI-316)	Electrode (1 m long)	2 lines	–	F03-01 SUS316
		Connecting nut	–	6	F03-02 SUS316
		Lock nut	–	316	F03-03 SUS316

Specifications

Item	61F-GP-N8	61F-GP-N8L	61F-GP-N8H	61F-GP-N8D	61F-GP-N8R
Supply voltage	24, 100, 110, 120, 200, 220, 230 or 240 VAC; 50/60 Hz				
Operating voltage range	85 to 110% of rated voltage				
Interelectrode voltage	8 VAC		24 VAC	8 VAC	
Interelectrode current	Approx. 1 mA AC max.		Approx. 0.4 mA AC max.	Approx. 1 mA AC max.	
Power consumption	Approx. 3.5 VA max.				
Response time	Operate: 80 ms max., release: 160 ms max.				
Cable length	1 km max.	2 km max. 4 km max.	50 m max.	1 km max.	800 m max.
Control output	1 A, 250 VAC (inductive load: Cosϕ = 0.4), 3 A, 250 VAC (resistive load)				
Ambient temperature	Operating: -10 to 55°C				
Life expectancy	Electrical: 100,000 operations min., mechanical: 5,000,000 operations min				
Size in mm (HxWxD)	49.9x38x70				

Compact plug-in (11-pin) level controller (DC supply)

This controller is for single- or two-point level control. 24 VDC supply allows for usage in locations without AC power supply. Relay contact chattering usually caused by waves has been eliminated by using open collector output, reducing contact wear.

- Adjustable sensitivity: Operation range: 0 to 100 kΩ
- Red LED for operation indicator
- Conforms to EMC and LVD directives
- UL/CSA approved
- Probes need to be ordered separately

Ordering information

Product name	Output	Order code
Conductive level controller	Open collector (NPN)	61F-GPN-BT 24VDC
	Relay contact (SPST-NO)	61F-GPN-BC 24VDC
Front socket		PF113A-E

Accessories

Electrode holders

Applications	Mounting style	Insulator material	Max. temperature	Number of electrodes	Order code
For city water and other general use. Easy-to-replace separate versions for maintenance.	Flange	Phenol resin	70°C	3	PS-3S
When mounting space is limited. Special 3-pole holder of small size and light weight.	Screw	Phenol resin		3, 300 mm 3, 1000 mm	PS-31-300MM PS-31-1000MM
Use for sewage, sea water, etc., having a low specific resistance.	Flange	PPS	150°C (without water drips or vapour on the electrode holder surface)	1	BF-1
For resistance to high pressure. Use in tanks with high temperature or pressure.	Screw	PFA	250°C (without water drips or vapour on the surface of the electrode holder)	1	BS-1

Electrode separators	Number of electrodes	Order code
	1	F03-14 1P
	3	F03-14 3P

Electrodes, connecting, and lock nuts

Applicable liquids	Material	Component	Indication mark	Inscription	Order code
Purified city water, industrial water, sewage	Equivalent to SUS 304 (AISI-304)	Electrode (1 m long)	1 line	–	F03-01 SUS201
		Connecting nut	–	–	F03-02 SUS201
		Lock nut	–	–	F03-03 SUS201
Purified city water, industrial water, sewage, dilute alkaline solution	SUS316 (AISI-316)	Electrode (1 m long)	2 lines	–	F03-01 SUS316
		Connecting nut	–	6	F03-02 SUS316
		Lock nut	–	316	F03-03 SUS316

Specifications

Item	61F-GPN-BT	61 F-GPN-BC
Rated voltage	24 VDC	
Allowable voltage range	85 to 110% of the rated voltage	
Interelectrode voltage	5 VAC max.	
Error	For scale of 0: +10 kΩ, for scale of 100: ±10 kΩ	
Release resistance	200% max. of the operation resistance	
Switching between supply and drainage	Terminals 7 and 8 open: Automatic drainage operation; terminals 7 and 8 shorted: Automatic supply operation	
Output specifications	Open collector (NPN) 30 VDC, 100 mA max.	SPST-NO; 5 A, 240 VAC (resistive load) 2 A, 240 VAC (inductive load: cosϕ = 0.4)
Life expectancy	–	Electrical: 100,000 operations min. Mechanical: 20,000,000 operations min.
Wiring distance	100 m max.	
Ambient operating temperature	–10 to 55°C	
Response time	Operating: 1.5 s max., releasing: 3.0 s max.	
Size in mm (HxWxD)	49.9x38x70	

22.5 mm wide conductive level controller

The K8AK-LS1 is a conductive level controller in a 22.5 mm wide industrial housing. Via DIP switches its function (supply or drainage) can be selected. This product is for single- or two-point level control.

- Time delay function up to 10 s
- Supply voltages: 24 VAC/DC and 100 to 240 VAC
- Control output: Relay 5 A at 250 VAC resistive load
- Probes cable length: Max. 100 m from controller
- LED indicator: Green for power ON, yellow for output relay

Ordering information

Supply voltage	Order code
24 VAC/VDC	K8AK-LS1 24VAC/DC
100 to 240 VAC	K8AK-LS1 100-240 VAC

Accessories

Electrode holders

Applications	Mounting style	Insulator material	Max. temperature	Number of electrodes	Order code
For city water and other general use. Easy-to-replace separate versions for maintenance.	Flange	Phenol resin	70°C	3	PS-3S
When mounting space is limited. Special 3-pole holder of small size and light weight.	Screw	Phenol resin		3, 300 mm 3, 1000 mm	PS-31-300MM PS-31-1000MM
Use for sewage, sea water, etc., having a low specific resistance.	Flange	PPS	150°C (without water drips or vapour on the electrode holder surface)	1	BF-1
For resistance to high pressure. Use in tanks with high temperature or pressure.	Screw	Fluoro resin	250°C (without water drips or vapour on the surface of the electrode holder)	1	BS-1

Electrode separators

Number of electrodes	Order code
1	F03-14 1P
3	F03-14 3P

Electrodes, connecting, and lock nuts

Applicable liquids	Material	Component	Indication mark	Inscription	Order code
Purified city water, industrial water, sewage	Equivalent to SUS304 (AISI-304)	Electrode (1 m long)	1 line	–	F03-01 SUS201
		Connecting nut	–	–	F03-02 SUS201
		Lock nut	–	–	F03-03 SUS201
Purified city water, industrial water, sewage, dilute alkaline solution	SUS316 (AISI-316)	Electrode (1 m long)	2 lines	–	F03-01 SUS316
		Connecting nut	–	6	F03-02 SUS316
		Lock nut	–	316	F03-03 SUS316

Specifications

Item		K8AK-LS
Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Operating voltage range		85% to 110% of rated operating voltage
Rated power supply frequency		50/60 Hz (AC power supply)
Output relays	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS
Weight		Approx. 150 g
Operating resistance		10 kΩ to 100 kΩ (variable)
Reset resistance		250 kΩ max.
Response time		Approx. 0.1 to 10 s (variable)
Cable length		100 m max. with completely insulated (600 V) cabtire cable with 3 conductors (0.75 mm^2)
Indicators		Green LED: Power, Yellow LED: Control output
Applicable standards	Conforming standards	EN 61010-1 Installation environment (pollution level 2, installation category II)
	EMC	EN 61326-1
	Safety standards	EN 60664-1UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

Ultra-miniature liquid leakage sensor amplifier

This very compact plug-in leakage controller fits into Omron's G2R 8-pin sockets (P2RF-08-E). K7L detects a wide variety of liquids, ranging from water to liquid chemicals with low conductivity.

- Operation range: Up to 50 MΩ
- Four sensing ranges available
- Detection method: Conductive
- Two LEDs: Green for power supplied, red for output indication
- Conforms to EMC and LVD Directives, UL/CSA approved

Ordering information

Product name	Characteristics	Order code
Liquid leakage sensor amplifier	Standard	K7L-AT50
	With disconnection function set	K7L-AT50D
	With disconnection function sensor amplifier only	K7L-AT50D-S

Product name		Characteristics	Order code
Sensors	Sensing band	Standard model (material: Polyethylene)	F03-16PE 5M
		For temperature and chemical resistance (material: Polyethylene PTFE)	F03-16PT 5M
		For flexibility and superior workability (material: Plastic fiber braided cable)	F03-16SF 5M
		For flexibility and visual confirmation of leakage (material: Plastic fiber braided cable)	F03-16SFC 5M
	Point sensor	Easier to wipe off than the band type	F03-16PS
		Electrodes have PTFE coating to resist chemicals	F03-16PS-F

Accessories

Product name	Characteristics	Order code
Terminal blocks (10 pcs)		F03-20
DIN-rail mounted socket	With finger protection	P2RF-08-E
	Without finger protection	P2RF-08

Product name		Characteristics	Order code
Mounting brackets and stickers	Sensing band stickers	Used for F03-16SF(C)	F03-25
		Used for F03-16PE (adhesive tape)	F03-26PES
		Used for F03-16PE (screws) (30 pcs)	F03-26PEN
		Used for F03-16PT (screws)	F03-26PTN
	Point sensor mounting brackets	Used for F03-16PS	F03-26PS

Specifications

Rated power supply voltage	12 to 24 VDC (allowable voltage fluctuation range: 10 to 30 VDC)
Operate resistance	0 Ω to 50 MΩ, variable Range 0: 0 to 250 kΩ Range 1: 0 to 600 kΩ Range 2: 0 to 5 MΩ Range 3: 0 to 50 MΩ
Release resistance	105% min. of operate resistance
Output configuration	NPN open-collector transistor output with 100 mA at 30 VDC max.
Wiring distance	Connecting cable: 50 m max. Sensing band length: 10 m max.
Ambient temperature	Operating: –10 to 55°C
Power consumption	1 W max.
Response time	Operate: 800 ms max., release: 800 ms max.
Weight	Approx. 14 g
Disconnection detection function (K7L-AT50D & K7L-AT50D-S only)	Detection signal: 10 VDC max., 200 ms, detection time: 10 s max. Release: By resetting the power supply
Size in mm (H×W×D)	28.8×12.8×46

Thermistor motor protection relay

The K8AK-TS is the temperature monitoring relay based on the thermistor detection and can protect the motor from overheating.
The K8AK-PT gives further functionalities such as temperature, 3-phase sequence and loss monitoring and contributes to the overall safety 3-phase motor's operation.

- DIN 22.5-mm-sized K8AK-PT relays
- Side-by-side mounting of K8AK-PT relays
- Specially designed for internal motor monitoring, no setting required
- Test/Reset button for confirmation of output operation
- Monitoring also performed for thermistor disconnections and short circuits
- Manual or automatic resetting with the same relay

Ordering information

Rated input		Order code
Temperature monitoring	24 VAC/DC	K8AK-TS1 24 VAC/DC
Phase sequence, phase loss and temperature monitoring	100 to 240 VAC	K8AK-PT1 100-240 VAC
		K8AK-TS1 100-240 VAC

Specifications

Ambient operating temperature		–20 to 60°C (with no condensation or icing)
Storage temperature		–25 to 65°C (with no condensation or icing)
Input frequency		50/60 Hz (AC power supply)
Output relays (2 × SPDT, normally closed operation)	**Resistive load**	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
	Maximum contact current	5 A
	Maximum switching capacity	1,250 VA, 150 W
	Mechanical life	10,000,000 operations
	Electrical life	50,000 operations at 250 VAC or 30 VDC
Degree of protection		Terminal section: IP20
Case material		PC and ABS UL94 V-0
Weight		Approx. 150 g
Rated input voltage		3-phase, 3-wire mode: 200 to 480 VAC
Reset method		Manual reset/automatic reset (switchable)*1
Operating time (T)	**Phase-sequence on three-phase voltage input**	0.1 s ±0.05 s
	Phase loss on three-phase voltage input	0.1 s max. (when the voltage changes rapidly from 100 to 0% of rated voltage)
	PTC thermistor input	0.2 s max.
Overload capacity		Continuous input: 528 V
Indicators		Power (PWR): Green, PH alarm outputs (ALM): Red, TS alarm outputs (ALM): Red
Applicable standards	**Conforming standards**	EN 60947-5-1 Installation environment (pollution level 2, installation category III)
	EMC	EN 60947-5-1
	Safety standards	UL 508 (Recognition), Korean Radio Waves Act (Act 10564), CSA and CCC
Size in mm (H × W × D)		90 × 22.5 × 100

*1 Manual reset method: Press the TEST/RESET button.

Protect your heating application

This temperature monitoring relay was designed specially for monitoring abnormal temperatures to prevent excessive temperature increase and to protect equipment. K8AK-TH provides temperature monitoring in a slim design with a width of just 22.5 mm.

- Simple function settings using DIP switch
- Selectable alarm latch and SV setting protection
- Multi-input support for thermocouple or Pt100 and Pt1000 sensor input
- Changeover relay: fail-safe selectable
- Alarm status identification with LED

Ordering information

Input type	Temperature setting range	Setting unit	Supply voltage	Size in mm (H×W×D)	Order code
Thermocouple/ Pt100 and Pt1000	0 to 999°C/F	1°C/F	100 to 240 VAC	90×22.5×100	K8AK-TH11S AC100-240
			24 VAC/VDC		K8AK-TH11S AC/DC24
Thermocouple	0 to 1,800°C 0 to 3,200 °F *1	10°C/F	100 to 240 VAC		K8AK-TH12S AC100-240
			24 VAC/VDC		K8AK-TH12S AC/DC24

*1 Setting range depending on sensor type selected

Specifications

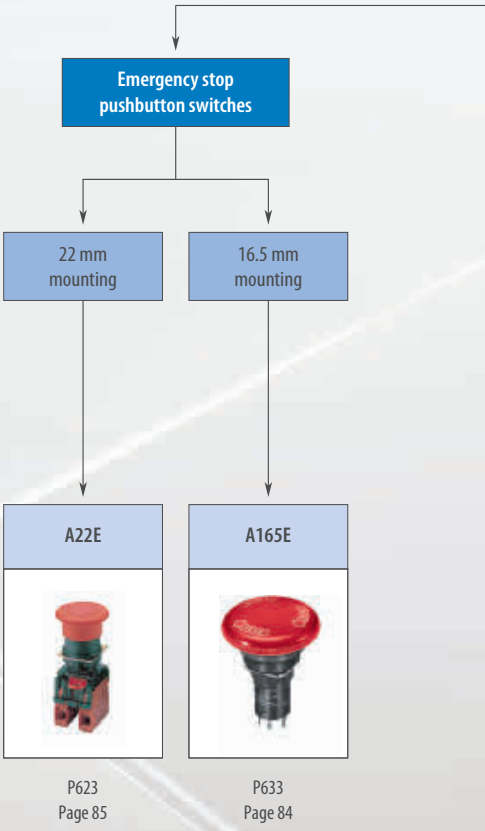
Item		100 to 240 VAC 50/60 Hz	24 VAC 50/60 Hz or 24 VDC
Allowable voltage range		85 to 110% of power supply voltage	
Power consumption		5 VA max.	2 W max. (24 VDC), 4 VA max. (24 VAC)
Sensor inputs	K8AK-TH11S	Thermocouple: K, J, T, E; platinum-resistance thermometer: Pt100, Pt1000	
	K8AK-TH12S	Thermocouple: K, J, T, E, B, R, S, PLII	
Output relay		One SPDT relay (5 A at 250 VAC, resistive load)	
External inputs (for latch setting)	Contact input	ON: 1 kΩ max., OFF: 100 kΩ min.	
	Non-contact input	ON residual voltage: 1.5 V max., OFF leakage current: 0.1 mA max.	
		Leakage current: Approx. 10 mA	
Setting method		Rotary switch setting (set of three switches)	
Indicators		Power (PWR): Green LED, relay output (ALM): Red LED	
Other functions		Alarm mode (upper limit/lower limit), output normally ON/OFF selection, output latch, setting protection, fail-safe operation selectable, temperature unit °C/°F	
Ambient operating temperature		–20 to 55°C (with no condensation or icing)	
Storage temperature		–25 to 65°C (with no condensation or icing)	
Setting accuracy		±1% of full scale	
Hysteresis width		2°C	
Output relays (1 × SPDT, normally closed operation)	Resistive load	5 A at 250 VAC or at 30 VDC	
	Maximum contact voltage	250 VAC or 30 VDC	
	Maximum contact current	5 A	
	Maximum switching capacity	1,250 VA, 150 W	
	Mechanical life	10,000,000 operations	
	Electrical life	50,000 operations at 5 A, 250 VAC or 30 VDC	
Sampling cycle		100 ms	
Weight		160 g	
Degree of protection		IP20	
Memory protection		Non-volatile memory (number or writes: 1,000,000)	
Safety standards	Approved standards	EN 61010-1 (Pollution level 2, overvoltage category II)	
	Application standards	EN 61326-1, UL 61010-1, Korean Radio Waves Act (Act 10564), CSA:CAN/CSA C22.2 No.14, CCC: GB14048.5	
Crimp terminals		Two solid wires of 2.5 mm^2 or two ferrules of 1.5 mm^2 with insulation sleeves can be tightened together	
Case material		PC and ABS	
Mounting		Mounted to DIN-rail	
Size in mm (H×W×D)		90×22.5×100	

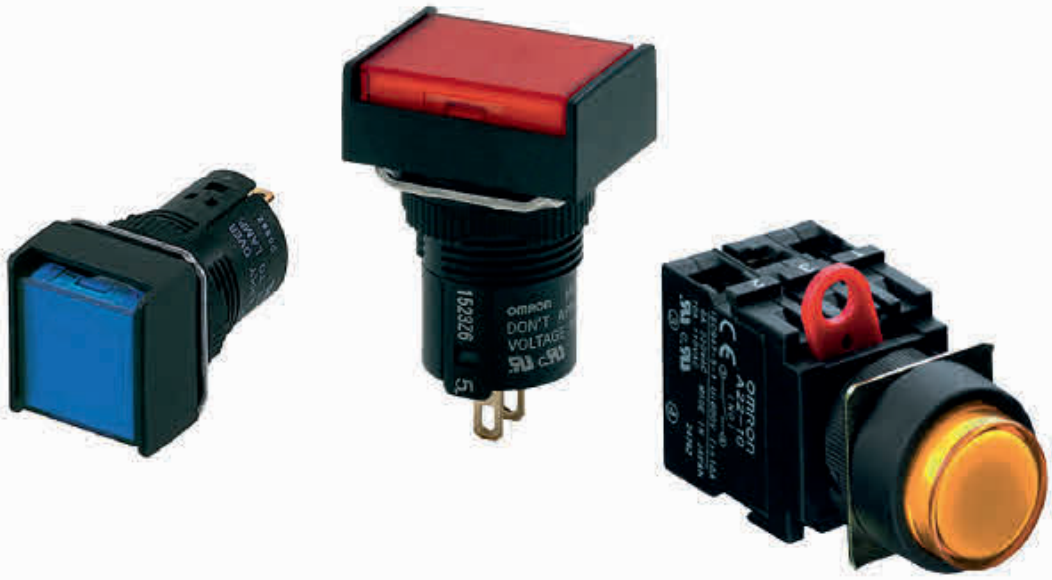
16 MM SUB-ASSEMBLED PUSHBUTTON SWITCHES

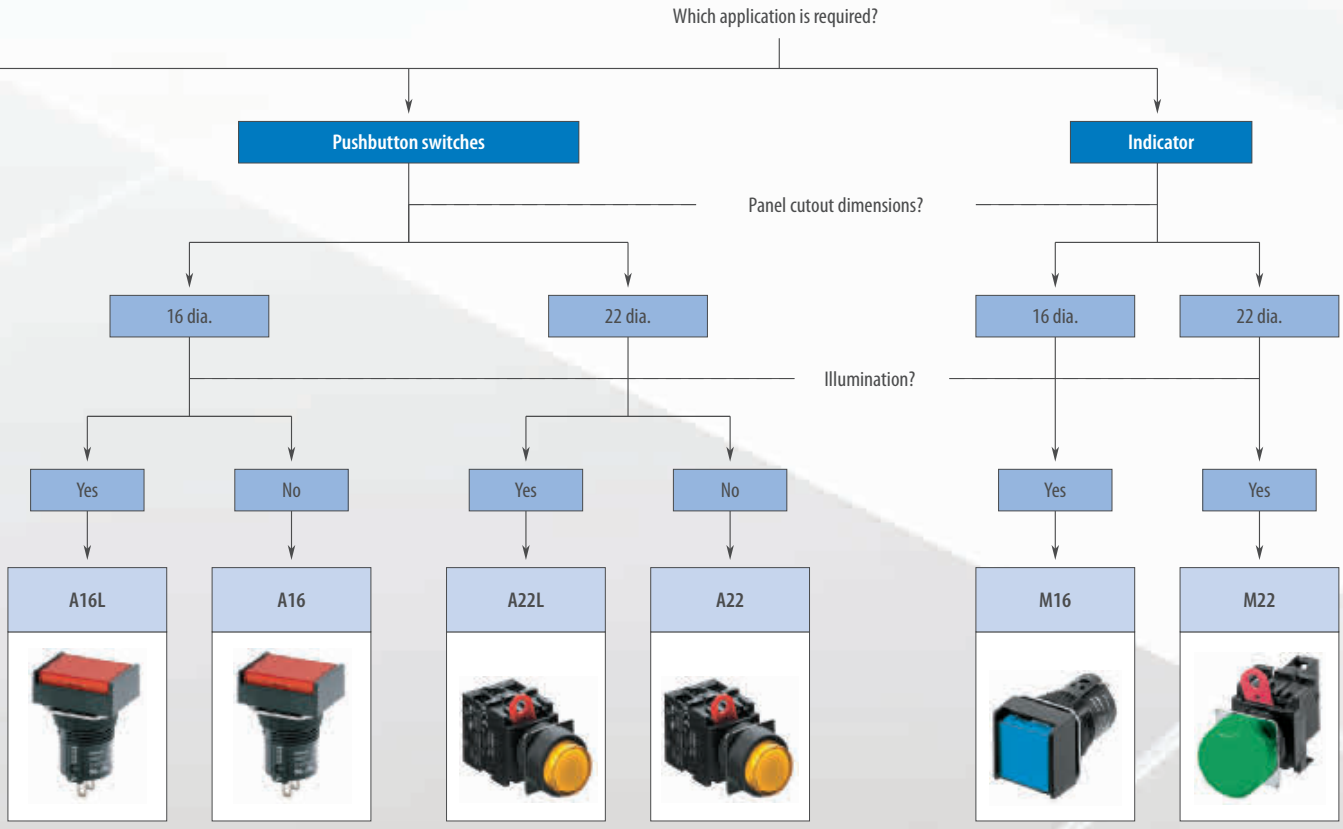
A165 – Full range with IP65 rating

All our 16 mm pushbuttons are upgraded to IP65 rating. This will increase the reliability of your application. The pushbuttons are very easy to assemble due to their modular construction: Pushbutton + case + lamp (if applicable) + switch.

- Wide range of models: rectangular, square & round
- With or without lamp
- Easy assembly and installation






Which application is required?
Pushbutton switches
Indicator
Panel cutout dimensions?
16 dia.
22 dia.
16 dia.
22 dia.
Illumination?
Yes
No
Yes
No
Yes
Yes
A16L
A16
A22L
A22
M16
M22
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Selection table

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	–	■
	Push lock – turn reset	■	
Application	E-Stop application	■	
	General safety application	■	
Contact configuration	SPST (NC)	■	
	DPST (NC)	■	
	SPST (NO) + SPST (NC)	–	■
	TPST (NC)	■	–
	Page/Quick Link	84	85

Category			Pushbutton switch		Indicator	
						
Model			A16	A22	M16	M22
Selection criteria		Mounting	Nut-mounting			
		Size	16 mm	22 mm	16 mm	22 mm
		Shape	▭ □ ○	▭ □ ○	▭ □ ○	▭ □ ○
Pushbutton color	Incandescent lamp-lighted	Red	■	■	■	■
		Yellow	■	■	■	■
		Pure yellow	■		■	–
		Green	■	■	■	■
		White	■	■	■	■
		Blue	■	■	■	■
	LED-lighted	Red	■	■	■	■
		Yellow	■	■	■	■
		Pure yellow	■		■	–
		Green	■	■	■	■
		White	■	■	■	■
		Blue	■	■	■	■
	Non-lighted	Red	■	■	–	–
		Yellow	■	■	–	–
		Green	■	■	–	–
		White	■	■	–	–
		Blue	■	■	–	–
		Black	■	■	–	–
Features		Momentary operation	■	■	–	–
		Self-holding	■	■	–	–
		Number of contacts	2	6	–	–
		IP rating	IP65			
		Legend plate	■	■	■	■
Switch ratings [A]		125 VAC	5	10	–	–
		250 VAC	3	6	–	–
		30 VDC	3	10	–	–
		Rated load	5 A at 125 VAC, 3 A at 250 VAC, 3 A at 30 VDC	10 A at 110 VAC, 6 A at 220 VAC	–	–
Terminals		Solder	■	–	■	–
		PCB	–	–	■	–
		Screw-less Clamp	–	–	■	–
Operating voltage		5 VDC	■	■	■	■
		12 VDC	■	■	■	■
		24 VDC	■	■	■	■
Form		SPDT	■	–	–	–
		DPDT	■	–	–	–
		SPST-NO	–	■	–	–
		SPST-NC	–	■	–	–
		SPST-NO + SPST-NC	–	■	–	–
		DPST-NO	–	■	–	–
		DPST-NC	–	■	–	–
		Page/Quick Link	86	88	90	91

■ 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
					DPST-NC	A165E-LS-24D-02
None	–				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
					DPST-NC	A165E-LM-24D-02
None	–				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	
	A165E series	A165E_-U series
125 VAC	5 A	1 A
250 VAC	3 A	0.5 A
30 VDC	3 A	1 A
Minimum applicable load	150 mA at 5 VDC	1 mA at 5 VDC

Features	Characteristics
Operating force (OF) max.	14.7 N
Releasing force (RF) min.	0.1 N·m
Pretravel (PT)	3.5±0.5 mm (3±0.5 mm In case of A165E_U series)

Item		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×±2°C
(2) Ambient humidity: 65%±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

16 mm pushbutton switch

These sub-assembled pushbutton switches have a modular construction: pushbutton + case + lamp (if applicable) + switch. A16 is a nut-mounted pushbutton switch with a short mounting depth of less than 28.5 mm below panel.

- Wide variety of control and signal devices: lighted, non-lighted and buzzer
- Quick and easy assembly, snap-in switch
- Wide range of switching capacity from standard load to micro load
- High reliability, IP65
- UL, cUL, CSA and VDE approved, conforms to EN60947-5-1 and IEC947-5-1

Ordering information

Type	Color	Order code		
		Degree of protection: Oil-resistant IP65		
		Rectangular	Square	Round
Non-lighted 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
Non-lighted	Black	A165L-JB	A165L-AB	A165L-TB
LED	Green	A165L-JGY	A165L-AGY	A165L-TGY
Non-lighted/incandescent lamp	Green	A165L-JG	A165L-AG	A165L-TG

Cases

Appearance	Classification		Order code
			Oil-resistant IP65
	Momentary operation	Rectangular (2-way guard)	A165-CJM
		Square	A165-CAM
		Round	A165-CTM
	Alternate operation	Rectangular (2-way guard)	A165-CJA
		Square	A165-CAA
		Round	A165-CTA

Switches

Appearance	Classification				Order code
	Lighted/ non-lighted (common use)	Standard load/ microload (common use)	SPDT	Solder terminal	A16-1
			DPDT		A16-2
			SPDT	PCB terminal	A16-1P
			DPDT		A16-2P
			DPDT	Screw-less clamp	A16-2S

Switches with reduced voltage lighting

Appearance	Classification				Order code
	100 V	Standard load/ microload (common use)	SPDT	Solder terminal	A16-T1-1
			DPDT		A16-T1-2
	100 V		DPDT	Screw-less clamp	A16-T1-2S
	200 V				A16-T2-2S

Lamps

Type	Color	Order code		
		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 *1	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

*1 Use the white LED together with white or pure yellow pushbuttons.

Accessories

Name	Appearance	Classification	Remarks	Order code
Switch guards		For rectangular models	Cannot be used with the dust cover	A16ZJ-5050
		For square and round models		A16ZA-5050
Dust covers		For rectangular models	Cannot be used with the switch guard	A16ZJ-5060
		For square models		A16ZA-5060
		For round models		A16ZT-5060
Panel plugs		For rectangular models	Used for covering the panel cutouts for future panel expansion	A16ZJ-3003
		For square models		A16ZA-3003
		For round models		A16ZT-3003

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.
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 (H×W×D)		Round/square: 18×18×28.5 rectangular: 18×24×28.5

Operating characteristics	Pushbutton switch	
	Oil-resistant IP65	
	SPDT	DPDT
Operating force (OF) max.	2.94 N	4.91 N
Releasing force (RF) min.	0.29 N	
Total travel (TT)	Approx. 3 mm	
Pretravel (PT) max.	2.5 mm	
Lock stroke (LTA) min.	0.5 mm	

Item		Screw-less clamp			
Recommended wire size		0.5 mm^2 twisted wire or 0.8 mm dia. solid wire			
Usable wires and tensile strength	**Twisted wire**	0.3 mm^2	0.5 mm^2	0.75 mm^2	1.25 mm^2
	Solid wire	0.5 mm dia.	0.8 mm dia.	1.0 mm dia.	
	Tensile strength	10 N	20 N	30 N	40 N
Length of exposed wire		10 ±1 mm			

22 mm pushbutton switch

The A22 comes in a wide variety of shapes and colors and is installable in 22-dia. or 25-dia. panel cutouts. The switch unit can be easily mounted. A22 is mounted using either open-type (fork-type) or closed-type (round-type) crimp terminals.

- Finger-protection mechanism on the switch unit are provided as a standard feature
- Increased wiring efficiency with three-row mounting of switch blocks
- IP65 oil-resistant (non-lighted models), IP65 (lighted models)
- Lighted and non-lighted, flat, projection and half- and full-guard versions
- EN60947-5-1, UL and cUL approved

Ordering information

Pushbutton

Illumination	Color	Order code							
		Flat type	Projection type	Full-guard type	Half-guard type	Square/ projection type	Square/ full-guard type	Round/ mushroom type (30-dia. head)	Round/ mushroom type (40-dia. head)
									
Non-lighted	Red	A22-FR	A22-TR	A22-GR	A22-HR	A22-CR	A22-DR	A22-SR	A22-MR
	Green	A22-FG	A22-TG	A22-GG	A22-HG	A22-CG	A22-DG	A22-SG	A22-MG
	Yellow	A22-FY	A22-TY	A22-GY	A22-HY	A22-CY	A22-DY	A22-SY	A22-MY
	White	A22-FW	A22-TW	A22-GW	A22-HW	A22-CW	A22-DW	A22-SW	A22-MW
	Blue	A22-FA	A22-TA	A22-GA	A22-HA	A22-CA	A22-DA	A22-SA	A22-MA
	Black	A22-FB	A22-TB	A22-GB	A22-HB	A22-CB	A22-DB	A22-SB	A22-MB
Lighted	Red	–	A22L-TR	A22L-GR	A22L-HR	A22L-CR	A22L-DR	–	–
	Green	–	A22L-TG	A22L-GG	A22L-HG	A22L-CG	A22L-DG	–	–
	Yellow	–	A22L-TY	A22L-GY	A22L-HY	A22L-CY	A22L-DY	–	–
	White	–	A22L-TW	A22L-GW	A22L-HW	A22L-CW	A22L-DW	–	–
	Blue	–	A22L-TA	A22L-GA	A22L-HA	A22L-CA	A22L-DA	–	–
Buttonsize in mm		29.7 dia. × 12D	29.7 dia. × 19D	29.7 dia. × 19D	29.7 dia. × 12/18.5D	29.8 mm^2 × 18D	29.8 mm^2 × 18D	30 dia. × 32D	40 dia. × 32D

Switches

Switch operation	Contacts	Oder code			
		Non-lighted models	Lighted models		
		Without voltage reduction unit		With voltage reduction unit	
				110 VAC	220 VAC
					
Momentary	SPST-NO	A22-10M	A22L-10M	A22L-10M-T1	A22L-10M-T2
	SPST-NC	A22-01M	A22L-01M	A22L-01M-T1	A22L-01M-T2
	SPST-NO + SPST-NC	A22-11M	A22L-11M	A22L-11M-T1	A22L-11M-T2
	DPST-NO	A22-20M	A22L-20M	A22L-20M-T1	A22L-20M-T2
	DPST-NC	A22-02M	A22L-02M	A22L-02M-T1	A22L-02M-T2
Alternate	SPST-NO	A22-10A	A22L-10A	A22L-10A-T1	A22L-10A-T2
	SPST-NC	A22-01A	A22L-01A	A22L-01A-T1	A22L-01A-T2
	SPST-NO + SPST-NC	A22-11A	A22L-11A	A22L-11A-T1	A22L-11A-T2
	DPST-NO	A22-20A	A22L-20A	A22L-20A-T1	A22L-20A-T2
	DPST-NC	A22-02A	A22L-02A	A22L-02A-T1	A22L-02A-T2

Switch blocks

	Standard load	Order code
Switch blocks	SPST-NO	A22-10
	SPST-NC	A22-01
	DPST-NO	A22-20
	DPST-NC	A22-02

Lamp – LED

AC/DC	LED light	Order code			
		Operating voltage			
		6 V	12 V	24 V	24 V superbright
DC	Red	A22-6DR	–	–	–
	Green	A22-6DG	–	–	–
	Yellow *1	A22-6DY	–	–	–
	Blue	A22-6DA	–	–	–
AC	Red	A22-6AR	–	–	–
	Green	A22-6AG	–	–	–
	Yellow *1	A22-6AY	–	–	–
	Blue	A22-6AA	–	–	–
AC and DC	Red	–	A22-12AR	A22-24AR	A22-24ASR
	Green	–	A22-12AG	A22-24AG	A22-24ASG
	Yellow *1	–	A22-12AY	A22-24AY	A22-24ASY
	Blue	–	A22-12AA	A22-24AA	A22-24ASA

*1 Used when the pushbutton color is yellow or white

Lamp - incandescent lamp

Order code		
Operating voltage		
5 VAC/VDC	12 VAC/VDC	24 VAC/VDC
A22-5	A22-12	A22-24

Accessories

Item				Remarks	Order code
Lamp sockets	Direct lighting			Used when changing the lighting method (LED only)	A22-TN
	Voltage-reduction lighting		220 VAC		A22-T2
Mounting latches	For momentary models			Order mounting latches only when mounting switch blocks or lamp sockets are purchased individually	A22-3200
Legend plate frames	Large size	With snap-in legend plate, without text, black		Snap-in legend plate is acrylic	A22Z-3333
		Without snap-in legend plate			A22Z-3330
Sealing caps	For projection models			Used to prevent dust or water from entering the operation unit (pushbutton, etc.), color: Opaque, material: Silicon	A22Z-3600T
Three-throw spacer				Used when mounting three non-lighted switches	A22Z-3003
Control boxes (enclosures)	Exclusively for A22		One hole	Do not use DPST-NO or DPST-NC switches, material: Polycarbonate resin	A22Z-B101
			Two holes		A22Z-B102
			Three holes		A22Z-B103
Snap-in legend plates	Standard size	Without text	White	Attached to the standard-size legend plate frame, material: Acrylic	A22Z-3443W
			Transparent		A22Z-3443C
		White text on black background	ON		A22Z-3443B-5
			OFF		A22Z-3443B-6
			DOWN		A22Z-3443B-8
			POWER ON		A22Z-3443B-9
	Large size	Without text	White	Attached to the large-size legend plate frame, material: Acrylic	A22Z-3453W
			Transparent		A22Z-3453C
	For emergency stop switch	60-dia. round plate with black letters on a yellow background		"EMERGENCY STOP" is engraved on the plate. Used as an emergency stop switch legend plate	A22Z-3466-1
		90-dia. round plate with black letters on a yellow background			A22Z-3476-1
Lamp extractor				Rubber tool used to easily replace lamps	A22Z-3901
Tightening wrench				Tool used to tighten nuts from the back of the panel	A22Z-3905

Specifications

Recognized organization	Standards	File number
UL, cUL	UL508	E41515
–	EN60947-5-1	–

Contact ratings (standard load)

Rated carry current (A)	Rated voltage	Rated current (A)			
		AC15 (inductive load)	AC12 (resistive load)	DC13 (inductive load)	DC12 (resistive load)
10	24 VAC	10	10	–	–
	110 VAC	5	10	–	–
	220 VAC	3	6	–	–
	380 VAC	2	3	–	–
	440 VAC	1	2	–	–
	24 VDC	–	–	1,5	10
	110 VDC	–	–	0,5	2
	220 VDC	–	–	0,2	0,6
	380 VDC	–	–	0,1	0,2

Contacts (microload)

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

LED indicators without voltage reduction unit

Rated voltage	Rated current	Operating voltage
6 VDC	60 mA (20 mA)	6 VDC ±5%
6 VAC	60 mA (20 mA)	6 VAC/VDC ±5%
12 VAC/VDC	30 mA (10 mA)	12 VAC/VDC ±5%
24 VAC/VDC	15 mA (10 mA)	24 VAC/VDC ±5%

Super-bright LED indicator

Rated voltage	Rated current	Operating voltage
24 VAC/VDC	15 mA	24 VAC/VDC ±5%

Incandescent lamp

Rated voltage	Rated current	Operating voltage
6 VAC/VDC	200 mA	5 VAC/VDC
14 VAC/VDC	80 mA	12 VAC/VDC
28 VAC/VDC	40 mA	24 VAC/VDC
130 VAC/VDC	20 mA	100 VAC/VDC

Voltage-reduction lighting

Rated voltage	Operating voltage	Applicable lamp (BA8S/13_ gold)
110 VAC	95 to 115 VAC	LED Lamp (A22-24A_)
220 VAC	190 to 230 VAC	

Item		Pushbutton switches		Emergency stop switches		Knob-type selector switches		Key-type selector switch
		Non-lighted	Lighted	Non-lighted	Lighted	Non-lighted	Lighted	Non-lighted
Allowable operating frequency	Mechanical	Momentary operation: 60 operations/minute max.		30 operations/minute max.		Manual release: 30 operations/minute max., automatic release: 30 operations/minute max.		
	Electrical	30 operations/minute max.				30 operations/minute max.		
Durability (number of operations min.)	Mechanical	Momentary operation: 5,000,000		Momentary operation: 300,000		500,000	100,000	500,000
	Electrical	500,000		300,000		500,000	100,000	500,000
Ambient temperature	Operating	–20 to 70°C	–20 to 55°C	–20 to 70°C	–20 to 55°C	–20 to 70°C	–20 to 55°C	–20 to 70°C
	Storage	–40 to 70°C	–40 to 70°C	–40 to 70°C	–40 to 70°C	–40 to 70°C	–40 to 70°C	–40 to 70°C
Degree of protection		IP65 (oil-resistant)	IP65	IP65 (oil-resistant)	IP65	IP65 (oil-resistant)	IP65	IP65 (oil-resistant)
Size in mm (in-panel only)		34H × 34W × 54.7D, 34H × 34W × 72.7D for DPST switches						

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

Nut-mounted, 22 mm indicator, with high visibility, illuminated buttons

The M22 series of indicators comes in 22 or 25 mm-diameter round versions.
They can be easily mounted and removal of the socket unit is also easy.
The finger protection mechanism on the lamp is provided as a standard feature.
M22 indicators can be equipped with an LED or incandescent lamp.

- Available in 5 colors
- Super-bright LEDs for all versions
- Lamp sockets with or without transformers
- UL and cUL approved

Ordering information

Display

Appearance	IP65 oil-resistant	
	Color of display	Order code
Round/flat	Red	M22-FR
	Green	M22-FG
	Yellow	M22-FY
	White	M22-FW
	Blue	M22-FA
Square/projection	Red	M22-CR
	Green	M22-CG
	Yellow	M22-CY
	White	M22-CW
	Blue	M22-CA

Socket unit

Order code	
Voltage-reduction circuits	
Without voltage reduction unit	With voltage reduction unit (220 VAC)
M22-00	M22-00-T2

Lamp

AC/DC	LED light	Operating voltage			
		6 V	12 V	24 V	24 V superbright
AC	Red	A22-6DR	–	–	–
	Green	A22-6DG	–	–	–
	Yellow	A22-6DY	–	–	–
	Blue	A22-6DA	–	–	–
DC	Red	A22-6AR	–	–	–
	Green	A22-6AG	–	–	–
	Yellow	A22-6AY	–	–	–
	Blue	A22-6AA	–	–	–
AC and DC	Red	–	A22-12AR	A22-24AR	A22-24ASR
	Green	–	A22-12AG	A22-24AG	A22-24ASG
	Yellow	–	A22-12AY	A22-24AY	A22-24ASY
	Blue	–	A22-12AA	A22-24AA	A22-24ASA

Incandescent lamp	6 VAC/VDC	12 VAC/VDC	24 VAC/VDC	100 VAC/VDC
	A22-5	A22-12	A22-24	A22-H1

Accessories

M22 uses the same accessories as A22. Please refer to the relevant information in the corresponding section for the A22.

Specifications

Recognized organization	Standards	File number
UL, cUL	UL508	E41515

LED lamp

Rated voltage	Rated current	Operating voltage
6 VDC	60 mA (20 mA)	6 VDC ±5%
6 VAC	60 mA (20 mA)	6 VAC ±5%
12 VAC/VDC	30 mA (10 mA)	12 VAC/VDC ±5%
24 VAC/VDC	15 mA (10 mA)	24 VAC/VDC ±5%

Incandescent lamp

Rated voltage	Rated current	Operating voltage
6 VAC/VDC	200 mA	5 V
14 VAC/VDC	80 mA	12 V
28 VAC/VDC	40 mA	24 V
130 VAC/VDC	20 mA	100 V

Superbright LED indicator

Rated voltage	Rated current	Operating voltage
24 VAC/VDC	15 mA	24 VAC/VDC ±5%

Voltage-reduction lighting

Rated voltage	Rated current	Operating voltage
110 VAC	95 to 115 VAC	LED lamp (A22-24_)
220 VAC	190 to 230 VAC	

Ambient temperature	Operating: –20 to 55°C, storage: –40 to 70°C
Degree of protection	IP65
Electric shock protection class	Class II
PTI (tracking characteristic)	175
Degree of contamination	3 (IEC947-5-1)
Size in mm	Button: 29.7 dia. × 16D, switch: 34H × 34W × 54.7D

Control components

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.

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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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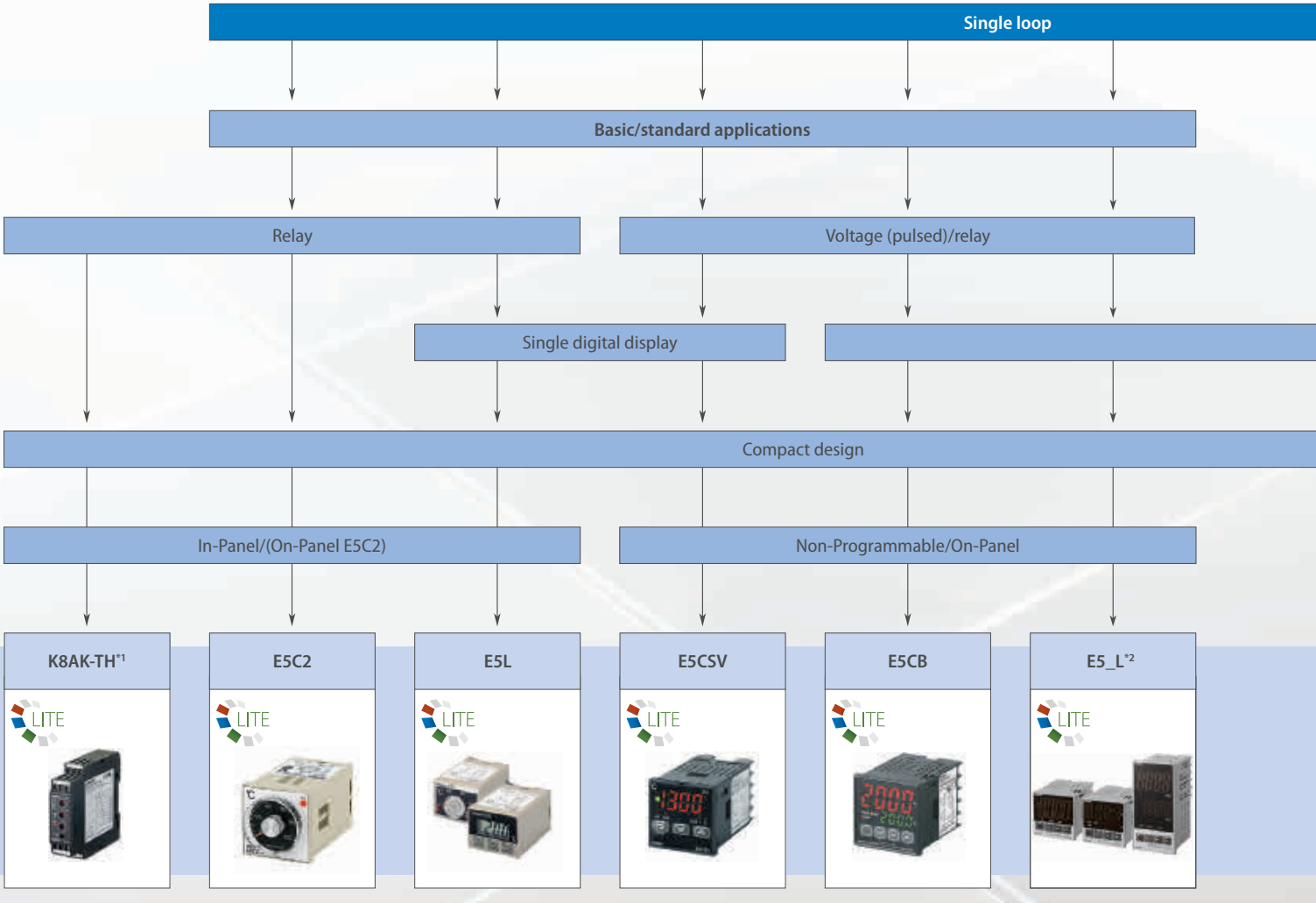

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Please contact your local representative.

Multi-loop

Advanced

Voltage (pulsed)/relay/mA linear

Dual/triple digital display

Modular design

Non-/Programmable (T)/On-Panel (E5DC In-Panel)

Programmable/ In-Panel

Temperature sensors

applicable for all temperature controller

E5_C/E5_C-T	E5_NH/E5_NH-T	E5_R/E5_R-T	CelciuX° (EJ1)	E52-E
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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
	Display	–	Analog (A)/3 digit (C)	Single 3.5 digit	Dual 4 digit	Dual 4 digit
Supply voltage	110/240 VAC	■	■	■	■	■
	24 VAC/VDC	–	–	□	□	–
Comms	RS-232 | RS-485	– | –	– | –	– | –	– | –	– | –
	Event IP	–	–	–	–	–
	QLP port	–	–	–	■[*4]	–
	DeviceNet	–	–	–	–	–
	Modbus	–	–	–	■	–
	PROFIBUS	–	–	–	–	–
	Modbus TCP	–	–	–	–	–
	ProfiNet	–	–	–	–	–
Control output	Relay | SSR	– | –	– | –	■ | –	■ | –	■ | –
	Voltage (pulse)	–	–	■	■	■
	Linear voltage	–	–	–	–	–
	Linear current	–	–	–	–	–
Input type – linear	mA	–	–	–	–	–
	mV	–	–	–	–	–
	V	–	–	–	–	–
Input type – Thermocouple	K	■	–	■	■	■
	J	■	–	■	■	■
	T	–	–	■	■	■
	E	–	–	–	–	–
	L	–	–	■	–	–
	U	–	–	■	–	–
	N	–	–	■	–	–
	R	–	–	■	■	■
	S	–	–	–	■	■
	B	–	–	–	–	–
	W	–	–	–	–	–
	PLII	–	–	–	–	–
Input type – RTD	Pt100 | JPt100 | THE	■ | – | ■	– | – | ■[*5]	■ | ■ | –	■ | – | –	■ | – | –
	Page/Quick Link	98	Please contact your local representative.	100	101	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

Digital temperature controller	Digital programmable temperature controller	Digital (programmable) temperature controller		Digital temperature/ Gradient controller
				
E5_C	**E5_C-T**	**E5_NH/E5_NH-T**	**E5_R/E5_R-T**	**CelciuX° (EJ1/-G)**
Pro line	Pro^{plus} (Lite) line – Programmable (T)	Pro^{plus} line – Programmable (T)		Pro line
On-panel/In-Panel		On-panel		In-panel
1	1	1	2/4	2/4
1/4, 1/8, 1/16, 1/32, 22,5 mm	1/4, 1/8, 1/16 DIN	1/4, 1/8, 1/16 DIN	1/4, 1/8 DIN	31 × 95.5 × 109 mm
■ | – | ■	■ | – | ■	■ | – | ■	■ | – | ■	■ | – | ■
H & C	H & C	H & C	H & C	H & C
□	□	□	□	–
±0.3%	±0.3%	±0.1%	±0.1%	±0.5%
■ | ■ | –	■ | ■ | –	■ | ■ | –	■ | – | –	■ | – | ■ (only G)
□	□	□	□	□ (only EJ1)
□	□	□	□	□
0-4	3-4	2-3	2-3	2
□*6	□*6	□*6	□*6	□
IP66	IP66	IP66	IP66	IP20
Dual/triple 4 digit	Dual/triple 4 digit	Dual/triple 5 digit	Triple 5 digit	–
■	■	■	■	–
□	□	□	□	24 VDC
– | □	– | □	□ | □	– | □	■ | ■
□	□	□	□	□
■*7	■*7	■*10	■*10	■
–	–	–	□	□
■	■	■	■	■
□*8	□*8	□*8	□*8	□*8
□*9	□*9	□*9	□*9	□*9
□*9	□*9	□*9	□*9	□*9
■ | –	■ | –	■ | ■	■ | –	– | –
■	■	■	■	■
–	–	■	–	–
■	■	■	■	■ (only EJ1)
■	■	■	■	■
–	–	–	–	–
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	–	■
■ | ■ | –	■ | ■ | –	■ | ■ | –	■ | – | –	■ | ■ | –
102	108	110	112	114

*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 EJ1N-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

LITE

The easy way to perfect temperature control

This multi-range 1/16 DIN controller with alarm function offers field-selectable PID control or ON/OFF control. The large, single display shows process value, direction of deviation from set point, output and alarm status.

- All setting fields configurable with switches
- Multi-input (Thermocouple/Pt100)
- Clearly visible 3.5 digit display with character height of 13.5 mm
- Control output: relay, voltage (for driving SSR)
- ON/OFF or 2-PID control with auto-tuning and self-tuning

Ordering information

Size in mm	Supply voltage	Number of alarm points	Control output	Order code
1/16 DIN 48H×48W×78D	100 to 240 VAC	1	Relay	E5CSV-R1T-500
			Voltage (for driving SSR)	E5CSV-Q1T-500
	24 VAC/VDC	1	Relay	E5CSV-R1TD-500
			Voltage (for driving SSR)	E5CSV-Q1TD-500

Note: Other models are available on request.

Accessories

Type	Order code
Hard protective cover	Y92A-48B

Specifications

Item		E5CSV
Supply voltage		100 to 240 VAC, 50/60 Hz or 24 VAC/VDC (depending on model)
Operating voltage range		85 to 110% of rated supply voltage
Power consumption		5 VA
Sensor input		Multi-input (thermocouple/platinum resistance thermometer): K, J, L, T, U, N, R, Pt100, JPt100
Control output	Relay output	SPST-NO, 250 VAC, 3 A (resistive load)
	Voltage output (for driving SSR)	12 VDC, 21 mA (with short-circuit protection circuit)
Control method		ON/OFF or 2-PID (with auto-tune and self-tune)
Alarm output		SPST-NO, 250 VAC, 1 A (resistive load)
Setting method		Digital setting using front panel keys (functionality set-up with DIP switch)
Indication		7-segment digital display (character height: 13.5 mm) and deviation indicators
Ambient temperature		–10 to 55°C (with no condensation or icing)
Setting/indication accuracy		±0.5% of indication value or ±1 °C, whichever is greater ±1 digit max.
Hysteresis (for ON/OFF control)		0.2% FS (0.1% FS for multi-input (thermocouple/platinum resistance thermometer) models)
Proportional band (P)		1 to 999°C (automatic adjustment using AT/ST)
Integral time (I)		0 to 1,999 s (automatic adjustment using AT/ST)
Derivative time (D)		0 to 1,999 s (automatic adjustment using AT/ST)
Control period		2/20 s
Sampling period		500 ms
Electrical life expectancy		100,000 operations min. (relay output models)
Weight		Approx. 120 g (controller only)
Degree of protection		Front panel: Equivalent to IP66; rear case: IP20; terminals: IP00
Memory protection		EEPROM (non-volatile memory) (number of writes: 1,000,000)
Size in mm (H×W×D)		48×48×78

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. But despite 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 regulate precisely 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-CIFQ2

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 you local Sales representative for further information.

PRO

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 spacing-saving housing with only 60 mm of depth.

- Fast and precise regulation: 50 ms sampling loop period time
- Easy to set up, and operate intuitively via CX-Thermo without power supply
- Best contrasty 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

Ordering information

E5CC (all models 3 auxiliary outputs)

Output	Option No.	Fixed option	Order code	
			110-240 VAC	24 VAC/VDC
Out1: Relay Out2: non	–	–	E5CC-RX3A5M-000	E5CC-RX3D5M-000
	001	Event input 2, Heater burnout SSR defect detection	E5CC-RX3A5M-001	E5CC-RX3D5M-001
	003	Communication 3-phase heater alarm	E5CC-RX3A5M-003	E5CC-RX3D5M-003
	005	Event input 4	E5CC-RX3A5M-005	E5CC-RX3D5M-005
	006	Event input 2, Transfer output	E5CC-RX3A5M-006	E5CC-RX3D5M-006
	007	Event input 2, Remote SP	E5CC-RX3A5M-007	E5CC-RX3D5M-007
Out1: Voltage (pulse) Out2: non	–	–	E5CC-QX3A5M-000	E5CC-QX3D5M-000
	001	Event input 2, Heater burnout SSR defect detection	E5CC-QX3A5M-001	E5CC-QX3D5M-001
	003	Communication 3-phase heater alarm	E5CC-QX3A5M-003	E5CC-QX3D5M-003
	005	Event input 4	E5CC-QX3A5M-005	E5CC-QX3D5M-005
	006	Event input 2, Transfer output	E5CC-QX3A5M-006	E5CC-QX3D5M-006
	007	Event input 2, Remote SP	E5CC-QX3A5M-007	E5CC-QX3D5M-007
Out1: Voltage (pulse) Out2: Voltage (pulse)	–	–	E5CC-QQ3A5M-000	E5CC-QQ3D5M-000
	001	Event input 2, Heater burnout SSR defect detection	E5CC-QQ3A5M-001	E5CC-QQ3D5M-001
	003	Communication 3-phase heater alarm	E5CC-QQ3A5M-003	E5CC-QQ3D5M-003
	005	Event input 4	E5CC-QQ3A5M-005	E5CC-QQ3D5M-005
	006	Event input 2, Transfer output	E5CC-QQ3A5M-006	E5CC-QQ3D5M-006
	007	Event input 2, Remote SP	E5CC-QQ3A5M-007	E5CC-QQ3D5M-007
Out1: Linear current Out2: non	–	–	E5CC-CX3A5M-000	E5CC-CX3D5M-000
	004	Event input 2, Communication	E5CC-CX3A5M-004	E5CC-CX3D5M-004
	005	Event input 4	E5CC-CX3A5M-005	E5CC-CX3D5M-005
	006	Event input 2, Transfer output	E5CC-CX3A5M-006	E5CC-CX3D5M-006
	007	Event input 2, Remote SP	E5CC-CX3A5M-007	E5CC-CX3D5M-007
Out1: Linear current Out2: Voltage (pulse)	–	–	E5CC-CQ3A5M-000	E5CC-CQ3D5M-000
	001	Event input 2, Heater burnout SSR defect detection	E5CC-CQ3A5M-001	E5CC-CQ3D5M-001
	003	Communication 3-phase heater alarm	E5CC-CQ3A5M-003	E5CC-CQ3D5M-003
	005	Event input 4	E5CC-CQ3A5M-005	E5CC-CQ3D5M-005
	006	Event input 2, Transfer output	E5CC-CQ3A5M-006	E5CC-CQ3D5M-006
	007	Event input 2, Remote SP	E5CC-CQ3A5M-007	E5CC-CQ3D5M-007

Note: As well as these models other models are available on request. Please contact the local sales office for special requests.

E5EC/E5AC (all models 4 auxiliary outputs)

Output	Option No	Fixed option	Order code	
			110-240 VAC	24 VAC/VDC
Out1: Relay Out2: non	–	–	E5_C-RX4A5M-000	E5_C-RX4D5M-000
	009	Event input 2, Communication 3-phase heater alarm	E5_C-RX4A5M-009	E5_C-RX4D5M-009
	010	Event input 4, Heater burnout SSR defect detection	E5_C-RX4A5M-010	E5_C-RX4D5M-010
	011	Event input 6, Remote SP Heater burnout SSR defect detection, Transfer output	E5_C-RX4A5M-011	E5_C-RX4D5M-011
Out1: Voltage (pulse) Out2: non	–	–	E5_C-QX4A5M-000	E5_C-QX4D5M-000
	009	Event input 2, Communication 3-phase heater alarm	E5_C-QX4A5M-009	E5_C-QX4D5M-009
	010	Event input 4, Heater burnout SSR defect detection	E5_C-QX4A5M-010	E5_C-QX4D5M-010
	011	Event input 6, Remote SP Heater burnout SSR defect detection, Transfer output	E5_C-QX4A5M-011	E5_C-QX4D5M-011
Out1: Relay Out2: Relay	–	–	E5_C-RR4A5M-000	E5_C-RR4D5M-000
	009	Event input 2, Communication 3-phase heater alarm	E5_C-RR4A5M-009	E5_C-RR4D5M-009
	010	Event input 4, Heater burnout SSR defect detection	E5_C-RR4A5M-010	E5_C-RR4D5M-010
	011	Event input 6, Remote SP Heater burnout SSR defect detection, Transfer output	E5_C-RR4A5M-011	E5_C-RR4D5M-011
Out1: Voltage (pulse) Out2: Voltage (pulse)	–	–	E5_C-QQ4A5M-000	E5_C-QQ4D5M-000
	009	Event input 2, Communication 3-phase heater alarm	E5_C-QQ4A5M-009	E5_C-QQ4D5M-009
	010	Event input 4, Heater burnout SSR defect detection	E5_C-QQ4A5M-010	E5_C-QQ4D5M-010
	011	Event input 6, Remote SP Heater burnout SSR defect detection, Transfer output	E5_C-QQ4A5M-011	E5_C-QQ4D5M-011
Out1: Voltage (pulse) Out2: Relay	–	–	E5_C-QR4A5M-000	E5_C-QR4D5M-000
	009	Event input 2, Communication 3-phase heater alarm	E5_C-QR4A5M-009	E5_C-QR4D5M-009
	010	Event input 4, Heater burnout SSR defect detection	E5_C-QR4A5M-010	E5_C-QR4D5M-010
	011	Event input 6, Remote SP Heater burnout SSR defect detection, Transfer output	E5_C-QR4A5M-011	E5_C-QR4D5M-011
Out1: Linear current Out2: non	–	–	E5_C-CX4A5M-000	E5_C-CX4D5M-000
	004	Event input 2, Communication	E5_C-CX4A5M-004	E5_C-CX4D5M-004
	005	Event input 4	E5_C-CX4A5M-005	E5_C-CX4D5M-005
	013	Event input 6, Remote SP, Transfer output	E5_C-CX4A5M-013	E5_C-CX4D5M-013
	014	Event input 4, Communication Remote SP, Transfer output	E5_C-CX4A5M-014	E5_C-CX4D5M-014
Out1: Linear current Out2: Linear current	–	–	E5_C-CC4A5M-000	E5_C-CC4D5M-000
	004	Event input 2, Communication	E5_C-CC4A5M-004	E5_C-CC4D5M-004
	005	Event input 4	E5_C-CC4A5M-005	E5_C-CC4D5M-005
	013	Event input 6, Remote SP Transfer output	E5_C-CC4A5M-013	E5_C-CC4D5M-013
	014	Event input 4, Communication Remote SP, Transfer output	E5_C-CC4A5M-014	E5_C-CC4D5M-014
Out1: Linear current Out2: Voltage (pulse)	–	–	E5_C-CQ4A5M-000	E5_C-CQ4D5M-000
	009	Event input 2, Communication 3-phase heater alarm	E5_C-CQ4A5M-009	E5_C-CQ4D5M-009
	010	Event input 4, Heater burnout SSR defect detection	E5_C-CQ4A5M-010	E5_C-CQ4D5M-010
	011	Event input 6, Remote SP Heater burnout SSR defect detection, Transfer output	E5_C-CQ4A5M-011	E5_C-CQ4D5M-011
Out1: Relay[*1] Out2: Relay[*1]	–	–	E5_C-PR4A5M-000	E5_C-PR4D5M-000
	004	Event input 2, Communication	E5_C-PR4A5M-004	E5_C-PR4D5M-004
	014	Event input 4, Communication Remote SP, Transfer output	E5_C-PR4A5M-014	E5_C-PR4D5M-014

[*1] Position proportional control model

E5GC (models with 0, 1 or 2 auxiliary outputs)

Output	Terminal type	Option No	Fixed option	Order code	
				110-240 VAC	24 VAC/VDC
Out 1: Relay	Screw terminals (with cover)	–	–	E5GC-RX0A6M-000	E5GC-RX0D6M-000
				E5GC-RX1A6M-000	E5GC-RX106M-000
				E5GC-RX2A6M-000	E5GC-RX206M-000
		015	Communication	E5GC-RX1A6M-015	E5GC-RX106M-015
				E5GC-RX2A6M-015	E5GC-RX206M-015
		016	Event input 1	E5GC-RX2A6M-016	E5GC-RX206M-016
		023	Heater Burnout SSR defect detection	E5GC-RX2A6M-023	E5GC-RX206M-023
		024	Event input 2	E5GC-RX1A6M-024	E5GC-RX106M-024
	Screwless clamp terminal	–	–	E5GC-RX0ACM-000	E5GC-RX0DCM-000
				E5GC-RX1ACM-000	E5GC-RX1DCM-000
				E5GC-RX2ACM-000	E5GC-RX2DCM-000
		015	Communication	E5GC-RX1ACM-015	E5GC-RX1DCM-015
				E5GC-RX2ACM-015	E5GC-RX2DCM-015
		016	Event input 1	E5GC-RX2ACM-016	E5GC-RXZDCM-016
		023	Heater Burnout SSR defect detection	E5GC-RX2ACM-023	E5GC-RXZDCM-023
		024	Event input 2	E5GC-RX1ACM-024	E5GC-RX1DCM-024
Out 1: Voltage (pulse)	Screw terminals (with cover)	–	–	E5GC-0X0A6M-000	E5GC-0X0D6M-000
				E5GC-0X1A6M-000	E5GC-0X106M-000
				E5GC-0X2A6M-000	E5GC-0X206M-000
		015	Communication	E5GC-0X1A6M-015	E5GC-0X106M-015
				E5GC-0X2A6M-015	E5GC-0X206M-015
		016	Event input 1	E5GC-0X2A6M-016	E5GC-0X206M-016
		023	Heater Burnout SSR defect detection	E5GC-0X2A6M-023	E5GC-0X206M-023
		024	Event input 2	E5GC-0X1A6M-024	E5GC-0X106M-024
	Screwless clamp terminal	–	–	E5GC-0X0ACM-000	E5GC-0X0DCM-000
				E5GC-0X1ACM-000	E5GC-0X1DCM-000
				E5GC-0X2ACM-000	E5GC-0X2DCM-000
		015	Communication	E5GC-0X1ACM-015	E5GC-0X1DCM-015
				E5GC-0X2ACM-015	E5GC-0X2DCM-015
		016	Event input 1	E5GC-0X2ACM-016	E5GC-0X2DCM-016
		023	Heater Burnout SSR defect detection	E5GC-0X2ACM-023	E5GC-0X2DCM-023
		024	Event input 2	E5GC-0X1ACM-024	E5GC-0X1DCM-024
Out 1: Liner current	Screw terminals (with cover)	–	–	E5GC-CX0A6M-000	E5GC-CX0D6M-000
				E5GC-CX1A6M-000	E5GC-CX106M-000
				E5GC-CX2A6M-000	E5GC-CX206M-000
		015	Communication	E5GC-CX1A6M-015	E5GC-CX106M-015
				E5GC-CX2A6M-015	E5GC-CX206M-015
		016	Event input 1	E5GC-CX2A6M-016	E5GC-CX206M-016
		024	Event input 2	E5GC-CX1A6M-024	E5GC-CX106M-024
	Screwless clamp terminal	–	–	E5GC-CX0ACM-000	E5GC-CX0DCM-000
				E5GC-CX1ACM-000	E5GC-CX10CM-000
				E5GC-CX2ACM-000	E5GC-CX20CM-000
		015	Communication	E5GC-CX1ACM-015	E5GC-CX10CM-015
				E5GC-CX2ACM-015	E5GC-CX20CM-015
		016	Event input 1	E5GC-CX2ACM-016	E5GC-CX20CM-016
		024	Event input 2	E5GC-CX1ACM-024	E5GC-CX10CM-024

E5DC (models with 0 or 2 auxiliary outputs)

Output	Option No	Fixed option	Order code	
			110-240 VAC	24 VAC/VDC
Out1: Relay	–	–	E5DC-RX2ASM-000	E5DC-RX2DSM-000
	002	Communication, Heater Burnout SSR defect detection	E5DC-RX2ASM-002	E5DC-RX2DSM-002
	015	Communication	E5DC-RX0ASM-015*1	E5DC-RX0DSM-015*1
	017	Event Input 1, Heater Burnout SSR defect detection	E5DC-RX2ASM-017	E5DC-RX2DSM-017
Out1: Voltage (pulse)	–	–	E5DC-QX2ASM-000	E5DC-QX2DSM-000
	002	Communication, Heater Burnout SSR defect detection	E5DC-QX2ASM-002	E5DC-QX2DSM-002
	015	Communication	E5DC-QX0ASM-015*1	E5DC-QX0DSM-015*1
	017	Event Input 1, Heater Burnout SSR defect detection	E5DC-QX2ASM-017	E5DC-QX2DSM-017
Out1: Linear curent	–	–	E5DC-CX2ASM-000	E5DC-CX2DSM-000
	015	Communication	E5DC-CX0ASM-015*1	E5DC-CX0DSM-015*1
	015	Communication	E5DC-CX2ASM-015	E5DC-CX2DSM-015
	016	Event Input 1	E5DC-CX2ASM-016	E5DC-CX2DSM-016

*1 Auxiliary outputs are not possible for these models.

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 (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 MΩ 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: (±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	SPST-NO, 250 VAC, 5 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	Output voltage: 12 VDC ±20% (PNP), max. load current: 40 mA, with short-circuit protection circuit (The maximum load current is 21 mA for models with two control outputs.)	
	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	N.O. relay outputs, 250 VAC, Models with 4 outputs: 2 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA	
Event inputs	Number of inputs	2 or 4 or 6 max (depends on the model)		
	External contact input specifications	Contact input: ON: 1 kΩ max., OFF: 100 kΩ 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 ±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.

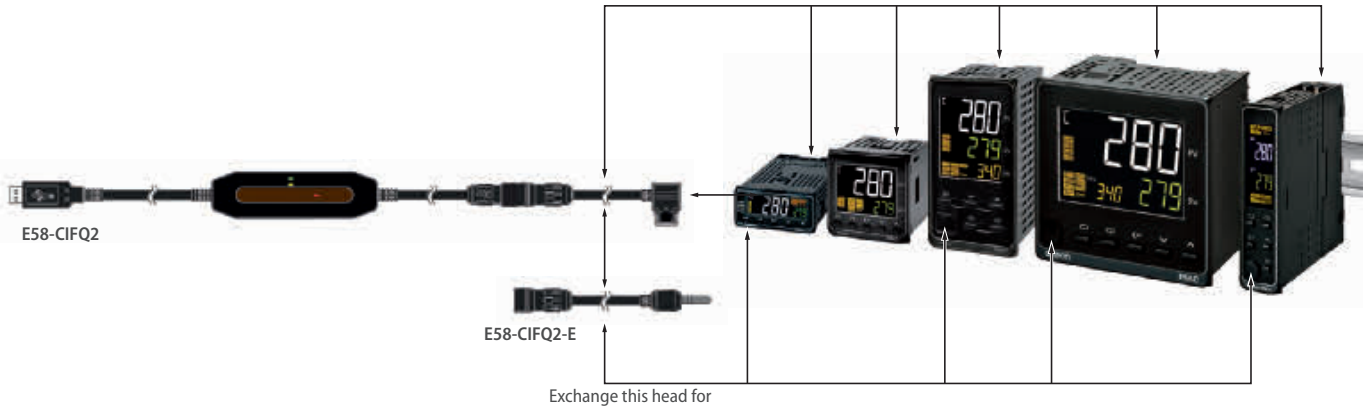
E5DC

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 MΩ 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: (±0.3% of PV or ±1°C, whichever is greater) ±1 digit max. Platinum resistance thermometer input: (±0.2% of PV 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.
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: 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
Event inputs	Number of inputs	1 (depends on model)
	External contact input specifications	Contact input: ON: 1 kΩ max., OFF: 100 kΩ 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	■	–	■	■	■



Exchange this head for
E5AC/E5DC/E5EC/E5GC adaptation.

Compact and intelligent Ramp/Soak controller

The E5_C-T Ramp/Soak temperature controllers expands 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.

Ordering information

E5CC-T

Input	Output	Alarms	HB[*1] alarm & SSR[*2] defect detection	Comm. (RS-485)	Event Input	Transfer output	Order code	
							100 to 240 VAC	24VAC/VDC
Temperature sensor/ analog	Out 1: Relay Out 2: None	3	–	–	–	–	E5CC-TRX3A5M-000	E5CC-TRX3D5M-000
			1		2		E5CC-TRX3A5M-001	E5CC-TRX3D5M-001
			2[*3]	1	–		E5CC-TRX3A5M-003	E5CC-TRX3D5M-003
			–		2		E5CC-TRX3A5M-004	E5CC-TRX3D5M-004
				–	4		E5CC-TRX3A5M-005	E5CC-TRX3D5M-005
					2	Y	E5CC-TRX3A5M-006	E5CC-TRX3D5M-006
	Out 1: Voltage (pulse) Out 2: None				–	–	E5CC-TQX3A5M-000	E5CC-TQX3D5M-000
			1		2		E5CC-TQX3A5M-000	E5CC-TQX3D5M-000
			2[*3]	1	–		E5CC-TQX3A5M-003	E5CC-TQX3D5M-003
			–		2		E5CC-TQX3A5M-004	E5CC-TQX3D5M-004
				–	4		E5CC-TQX3A5M-005	E5CC-TQX3D5M-005
					2	Y	E5CC-TQX3A5M-006	E5CC-TQX3D5M-006
	Out 1: Current linear Out 2: None				–	–	E5CC-TCX3A5M-000	E5CC-TCX3D5M-000
				1	2		E5CC-TCX3A5M-004	E5CC-TCX3D5M-004
				–	4		E5CC-TCX3A5M-005	E5CC-TCX3D5M-005
					2	Y	E5CC-TCX3A5M-006	E5CC-TCX3D5M-006
	Out 1: Voltage (pulse) Out 2: Voltage (pulse)				–	–	E5CC-TQQ3A5M-000	E5CC-TQQ3D5M-000
			1		2		E5CC-TQQ3A5M-001	E5CC-TQQ3D5M-001
			2[*3]	1	–		E5CC-TQQ3A5M-003	E5CC-TQQ3D5M-003
			–		2		E5CC-TQQ3A5M-004	E5CC-TQQ3D5M-004
				–	4		E5CC-TQQ3A5M-005	E5CC-TQQ3D5M-005
					2	Y	E5CC-TQQ3A5M-006	E5CC-TQQ3D5M-006
	Out 1: Current linear Out 2: Voltage (pulse)				–	–	E5CC-TCQ3A5M-000	E5CC-TCQ3D5M-000
				1	2		E5CC-TCQ3A5M-004	E5CC-TCQ3D5M-004
				–	4		E5CC-TCQ3A5M-005	E5CC-TCQ3D5M-005
					2	Y	E5CC-TCQ3A5M-006	E5CC-TCQ3D5M-006

[*1] HB = Heater burnout
[*2] SSR = Solid state relay
[*3] 3-Phase heater burnout alarm

E5AC-T/E5EC-T

Input	Output	Alarms	HB[*1] alarm & SSR[*2] defect detection	Comm. (RS-485)	Event Input	Transfer output	Order code[*3]	
							Model: 100 to 240 VAC	Model: 24VAC/VDC
Temperature sensor/ analog	Out 1: Relay Out 2: None	4	–	–	–	–	E5_C-TRX4A5M-000	E5_C-TRX4D5M-000
			1	1	2		E5_C-TRX4A5M-008	E5_C-TRX4D5M-008
				–	4		E5_C-TRX4A5M-010	E5_C-TRX4D5M-010
					6	Y	E5_C-TRX4A5M-019	E5_C-TRX4D5M-019
	Out 1: Voltage (pulse) Out 2: None		–		–	–	E5_C-TQX4A5M-000	E5_C-TQX4D5M-000
			1	1	2		E5_C-TQX4A5M-008	E5_C-TQX4D5M-008
				–	4		E5_C-TQX4A5M-010	E5_C-TQX4D5M-010
					6	Y	E5_C-TQX4A5M-019	E5_C-TQX4D5M-019
	Out 1: Current linear Out 2: None		–		–	–	E5_C-TCX4A5M-000	E5_C-TCX4D5M-000
				1	2		E5_C-TCX4A5M-004	E5_C-TCX4D5M-004
				–	4		E5_C-TCX4A5M-005	E5_C-TCX4D5M-005
					6	Y	E5_C-TCX4A5M-021	E5_C-TCX4D5M-021
				1	4	Y	E5_C-TCX4A5M-022	E5_C-TCX4D5M-022

[*1] HB = Heater burnout
[*2] SSR = Solid state relay
[*3] Replace "_" with "A" for E5AC or "E" for E5EC

E5AC-T/E5EC-T

Input	Output	Alarms	HB*1 alarm & SSR*2 defect detection	Comm. (RS-485)	Event Input	Transfer output	Order code*3	
							Model: 100 to 240 VAC	Model: 24VAC/VDC
Temperature sensor/ analog	Out 1: Current linear Out 2: Current linear	4	–	–	–	–	E5_C-TCC4A5M-000	E5_C-TCC4D5M-000
				1	2		E5_C-TCC4A5M-004	E5_C-TCC4D5M-004
				–	4		E5_C-TCC4A5M-005	E5_C-TCC4D5M-005
					6	Y	E5_C-TCC4A5M-021	E5_C-TCC4D5M-021
				1	4	Y	E5_C-TCC4A5M-022	E5_C-TCC4D5M-022
	Out 1: Relay Out 2: Relay			–	–	–	E5_C-TRR4A5M-000	E5_C-TRR4D5M-000
			1	1	2		E5_C-TRR4A5M-008	E5_C-TRR4D5M-008
				–	4		E5_C-TRR4A5M-010	E5_C-TRR4D5M-010
					6	Y	E5_C-TRR4A5M-019	E5_C-TRR4D5M-019
	Out 1: Voltage (pulse) Out 2: Voltage (pulse)		–		–	–	E5_C-TQQ4A5M-000	E5_C-TQQ4D5M-000
			1	1	2		E5_C-TQQ4A5M-008	E5_C-TQQ4D5M-008
				–	4		E5_C-TQQ4A5M-010	E5_C-TQQ4D5M-010
					6	Y	E5_C-TQQ4A5M-019	E5_C-TQQ4D5M-019
	Out 1: Voltage (pulse) Out 2: Relay		–		–	–	E5_C-TQR4A5M-000	E5_C-TQR4D5M-000
			1	1	2		E5_C-TQR4A5M-008	E5_C-TQR4D5M-008
				–	4		E5_C-TQR4A5M-010	E5_C-TQR4D5M-010
					6	Y	E5_C-TQR4A5M-019	E5_C-TQR4D5M-019
	Out 1: Current linear Out 2: Voltage (pulse)		–		–	–	E5_C-TCQ4A5M-000	E5_C-TCQ4D5M-000
			1	1	2		E5_C-TCQ4A5M-008	E5_C-TCQ4D5M-008
				–	4		E5_C-TCQ4A5M-010	E5_C-TCQ4D5M-010
					6	Y	E5_C-TCQ4A5M-019	E5_C-TCQ4D5M-019
	Out 1: Relay Out 2: Relay (Valve control)		–		–	–	E5_C-TPR4A5M-000	E5_C-TPR4D5M-000
				1	2		E5_C-TPR4A5M-004	E5_C-TPR4D5M-004
					4	Y	E5_C-TPR4A5M-022	E5_C-TPR4D5M-022

*1 HB = Heater burnout
*2 SSR = Solid state relay
*3 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		

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

Universal compact digital process controllers

The E5_N-H series of process controllers take the proven concept of the general purpose E5_N series to a process level. Main features of the E5_N-H series are universal inputs, process outputs and options such as transfer output, remote setpoint and set-value programmer.

- Control mode: ON/OFF or 2-PID, Valve control on EN-H/AN-H
- Control output: relay, voltage (pulse), SSR, linear current and voltage
- Power supply: 100/240 VAC or 24 VDC/VAC
- Easy PC connection for parameter cloning, setting and tuning
- Clear and intuitive set-up and operation

Ordering information

Type	Input	Output	Fixed option	Alarms	Order code	
					48x48 mm model (includes supply voltage indication)	
On-panel	Universal TC/Pt/mV mA/V	Relay output	–	3 software alarms 2 SUB outputs	E5CN-HR2M-500 AC100-240	E5CN-HR2MD-500 AC/DC24
		Voltage (pulse)			E5CN-HQ2M-500 AC100-240	E5CN-HQ2MD-500 AC/DC24
		Current output			E5CN-HC2M-500 AC100-240	E5CN-HC2MD-500 AC/DC24
		Linear voltage output			E5CN-HV2M-500 AC100-240	E5CN-HV2MD-500 AC/DC24
		Relay output	SV programmer (8 programs of 32 segments)		E5CN-HTR2M-500 AC100-240	E5CN-HTR2MD-500 AC/DC24
		Voltage (pulse)			E5CN-HTQ2M-500 AC100-240	E5CN-HTQ2MD-500 AC/DC24
		Current output			E5CN-HTC2M-500 AC100-240	E5CN-HTC2MD-500 AC/DC24
		Linear voltage output			E5CN-HTV2M-500 AC100-240	E5CN-HTV2MD-500 AC/DC24

Note: - Output and Alarm Relays: 3 A/250 VAC, electrical life: 100,000 operations
- Output voltage (pulse): 12 V, 21 mA (ie. to drive solid state relays)
- Linear current: 0(4) to 20 mA
- Linear voltage output: 0 to 10 V

Accessories

E5CN-H option boards

(One slot available in each instrument)

Option				Order code
Event inputs				E53-CNBN2
Event inputs	Control output 2 Voltage (for driving SSR)			E53-CNQBN2
Event inputs			Heater burnout/SSR failure/Heater overcurrent detection	E53-CNHBN2
Event inputs		Transfer output		E53-CNBFN2
Communications RS-232C	Control output 2 Voltage (for driving SSR)			E53-CN01N2
Communications RS-232C				E53-CNQ01N2
Communications RS-232C			Heater burnout/SSR failure/Heater overcurrent detection	E53-CNH01N2
Communications RS-485				E53-CN03N2
Communications RS-485	Control output 2 Voltage (for driving SSR)			E53-CNQO3N2
Communications RS-485			Heater burnout/SSR failure/Heater overcurrent detection	E53-CNH03N2
Communications RS-485			3-phase heater burnout/SSR failure/ Heater overcurrent detection	E53-CNHH03N2
	Control output 2 Voltage (for driving SSR)	Transfer output		E53-CNQFN2
	Control output 2 Voltage (for driving SSR)		Heater burnout/SSR failure/Heater overcurrent detection	E53-CNQHN2
	Control output 2 Voltage (for driving SSR)		3-phase heater burnout/SSR failure/ Heater overcurrent detection	E53-CNQHHN2

Control method	Auxiliary output	Control output 1/2	Heater burnout	Transfer output	Order code (includes supply voltage indication)	
					96 × 96 mm model	48 × 96 mm model
Basic	2 alarm relays	none fitted, 2 slots	1-phase		E5AN-HAA2HBM-500 AC100-240	E5EN-HAA2HBM-500 AC100-240
		none fitted, 2 slots			E5AN-HAA2HBMD-500 AC/DC24	E5EN-HAA2HBMD-500 AC/DC24
		2 SSR output fitted			E5AN-HSS2HBM-500 AC100-240	E5EN-HSS2HBM-500 AC100-240
		2 SSR output fitted			E5AN-HSS2HBMD-500 AC/DC24	E5EN-HSS2HBMD-500 AC/DC24
		none fitted, 2 slots	3-phase	4 to 20 mA output	E5AN-HAA2HHBFM-500 AC100-240	E5EN-HAA2HHBFM-500 AC100-240
		none fitted, 2 slots			E5AN-HAA2HHBFMD-500 AC/DC24	E5EN-HAA2HHBFMD-500 AC/DC24
		2 SSR output fitted			E5AN-HSS2HHBFM-500 AC100-240	E5EN-HSS2HHBFM-500 AC100-240
		2 SSR output fitted			E5AN-HSS2HHBFMD-500 AC/DC24	E5EN-HSS2HHBFMD-500 AC/DC24
	3 alarm relays	none fitted, 2 slots			E5AN-HAA3BFM-500 AC100-240	E5EN-HAA3BFM-500 AC100-240
		none fitted, 2 slots			E5AN-HAA3BFMD-500 AC/DC24	E5EN-HAA3BFMD-500 AC/DC24
		2 SSR output fitted			E5AN-HSS3BFM-500 AC100-240	E5EN-HSS3BFM-500 AC100-240
		2 SSR output fitted			E5AN-HSS3BFMD-500 AC/DC24	E5EN-HSS3BFMD-500 AC/DC24
Valve controller	2 alarm relays	2 relay output fitted			E5AN-HPRR2BM-500 AC100-240	E5EN-HPRR2BM-500 AC100-240
					E5AN-HPRR2BMD-500 AC/DC24	E5EN-HPRR2BMD-500 AC/DC24
				4 to 20 mA output	E5AN-HPRR2BFM-500 AC100-240	E5EN-HPRR2BFM-500 AC100-240
					E5AN-HPRR2BFMD-500 AC/DC24	E5EN-HPRR2BFMD-500 AC/DC24
SV programmer (8 programs of 32 segments	2 alarm relays	none fitted, 2 slots	1-phase		E5AN-HTAA2HBM-500	E5EN-HTAA2HBM-500 AC100-240
					E5AN-HTAA2HBMD-500	E5EN-HTAA2HBMD-500 AC/DC24
			3-phase	4 to 20 mA output	E5AN-HTAA2HHBFM-500	E5EN-HTAA2HHBFM-500
					E5AN-HTAA2HHBFMD-500	E5EN-HTAA2HHBFMD-500
	3 alarm relays				E5AN-HTAA3BFM-500	E5EN-HTAA3BFM-500
					E5AN-HTAA3BFMD-500	E5EN-HTAA3BFMD-500
SV programmer and valve controller	2 alarm relays	2 relay output fitted			E5AN-HTPRR2BM-500	E5EN-HTPRR2BM-500
					E5AN-HTPRR2BMD-500	E5EN-HTPRR2BMD-500
				4 to 20 mA output	E5AN-HTPRR2BFM-500	E5EN-HTPRR2BFM-500
					E5AN-HTPRR2BFMD-500	E5EN-HTPRR2BFMD-500

Note: - All E5EN-H/AN-H have 2 event inputs
- All E5EN-H/AN-H have Remote Setpoint 4 to 20 mA input

Specifications E5CN-H/EN-H/AN-H

	E5CN-H(T)	E5EN-H(T)	E5AN-H(T)
Supply voltage	100 to 240 VAC 50/60 Hz or 24 VAC, 50/60Hz; 24 VDC		
Sensor input	Thermocouple: K, J, T, E, L, U, N, R, S, B, W or PL II		
	Platinum resistance thermometer: Pt100 or JPt100		
	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	ON/OFF, 2-PID and valve (PRR)		
Accuracy	Thermocouple: (± 0.1% of indicated value or ±1°C, whichever is greater) ± digit max. Platinum resistance thermometer: (± 0.1% of indicated value or ± 0.5°C, whichever is greater) ± 1 digit max. Analog input: ± 0.1% FS ± 1 digit max.		
Auto-tuning	yes, 40% and 100% MV output limit selection. When using Heat/Cool: automatic cool gain adjustment		
Self-tuning	yes		
RS-232C/RS-422/RS-485	optional, CompowayF or Modbus selectable		
Event input	Optional (Standard 2 event input in EN-H/AN-H)		
QLP port (USB connection PC)	yes		
Ambient temperature	–10 to 55°C		
IP Rating front panel	IP66		
Sampling period	60 ms		
Sizes[*1] in mm (W × H × D)	48×48×76.5	48×96×77.2	96×96×77.2

[*1] With mounted terminal cover

E5AN-H/EN-H output option boards

(2 slots available in E5_N-HAA__-500 models: SS models have 2 fixed SSR output modules)

Option	Order code
Relay	E53-RN
Voltage (pulse) PNP 12 VDC	E53-QN
Voltage (pulse) NPN 24 VDC	E53-Q3
Voltage (pulse) PNP 24 VDC	E53-Q4
Linear 4 to 20 mA	E53-C3N
Linear 0 to 20 mA	E53-C3DN
Linear 0 to 10 V	E53-V34N
Linear 0 to 5 V	E53-V35N

E5AN-H/EN-H option boards

(one slot available in each instrument)

Option	Order code
RS-232C communications (CompoWay/F/Modbus)	E53-EN01
RS-422 communications (CompoWay/F/Modbus)	E53-EN02
RS-485 communications (CompoWay/F/Modbus)	E53-EN03
Event input	E53-AKB

E5AN-H/EN-H series optional tools

Option		Order code
USB PC based configuration cable		E58-CIFQ1
PC based configuration and tuning software	CX-Thermo	EST2-2C-MV4

Fast, accurate and equipped for application specific needs

The E5_R series provides you with high accuracy inputs (0.01°C for Pt100) and a 50 ms sample and control cycle for all four loops. Its unique Disturbance Overshoot Reduction Adjustment ensures solid, robust control.

- Easy and clear read-out thanks to bright Liquid Crystal Display
- Exceptional versatility – multi-loop control, cascade control, and valve control
- Easy integration with DeviceNet, PROFIBUS or Modbus
- SV programmer optional, 32 programs with up to 256 segments

Ordering information

Function	Loops	Input analog	Event Inputs	Number of outputs	Outputs	AUX outputs	Communication	Order code (96 × 96 mm)	
								100 to 240 VAC	24 VAC/DC
standard	1	1	2	2	QC,Q	4R	–	E5AR-Q4B AC100-240	E5AR-Q4B AC/DC24
standard	1	1	2	2	QC,Q	4R	RS-485	E5AR-Q43B-FLK AC100-240V	
standard	1	1	6	2	QC,Q	4R	RS-485	E5AR-Q43DB-FLK AC100-240V	
standard	1	1	6	4	QC,Q,C,C	4R	RS-485	E5AR-QC43DB-FLK AC100-240	E5AR-QC43DB-FLK AC/DC24
standard	max 2	2	4	2	QC,Q	4R	RS-485	E5AR-Q43DW-FLK AC100-240V	
standard	max 2	2	4	4	QC,Q,QC,Q	4R	RS-485	E5AR-QQ43DW-FLK AC100-240	E5AR-QQ43DW-FLK AC/24
standard	max 4	4	4	4	QC,Q,QC,Q	4R	RS-485	E5AR-QQ43DWW-FLK AC100-240V	
standard	1	1	2	2	C,C	4R	–	E5AR-C4B AC100-240	E5AR-C4B AC/DC24
standard	1	1	2	2	C,C	4R	RS-485	E5AR-C43B-FLK AC100-240V	
standard	1	1	6	2	C,C	4R	RS-485	E5AR-C43DB-FLK AC100-240V	
standard	max 2	2	4	2	C,C	4R	RS-485	E5AR-C43DW-FLK AC100-240V	
standard	max 4	4	4	4	C,C,C,C	4R	RS-485	E5AR-CC43DWW-FLK AC100-240	E5AR-CC43DWW-FLK AC/DC24
valve	1	1 + pot	4	2	R,R	4R	–	E5AR-PR4DF AC100-240	E5AR-PR4DF AC/DC24
valve	1	1 + pot	4	4	R,R,QC,Q	4R	RS-485	E5AR-PRQ43DF-FLK AC100-240	E5AR-PRQ43DF-FLK AC/DC24
standard	1	1	2	2	QC,Q	4R	DeviceNet	E5AR-Q4B-DRT AC100-240V	E5AR-Q4B-DRT AC24V
standard	1	1	2	4	QC,Q,C,C	4R	DeviceNet	E5AR-QC4B-DRT AC100-240V	E5AR-QC4B-DRT AC24V
standard	max 2	2	–	4	QC,Q,QC,Q	4R	DeviceNet	E5AR-QQ4W-DRT AC100-240V	E5AR-QQ4W-DRT AC24V
standard	1	1	2	2	C,C	4R	DeviceNet	E5AR-C4B-DRT AC100-240V	E5AR-C4B-DRT AC24V
standard	max 4	4	–	4	C,C,C,C	4R	DeviceNet	E5AR-CC4WW-DRT AC100-240V	
valve	1	1 + pot	–	2	R,R	4R	DeviceNet	E5AR-PR4F-DRT AC100-240V	E5AR-PR4F-DRT AC24V
valve	1	1 + pot	–	4	R,R,QC,Q	4R	DeviceNet	E5AR-PRQ4F-DRT AC100-240V	E5AR-PRQ4F-DRT AC24V
SV programmer	1	1	2	2	QC,Q	4R	–	E5AR-TQ4B AC100-240	E5AR-TQ4B AC/DC24
SV programmer	1	1	2	2	C,C	4R	–	E5AR-TC4B AC100-240	E5AR-TC4B AC/DC24
SV programmer	1	1	2	2	QC,Q	4R	RS-485	E5AR-TQ43B-FLK AC100-240	
SV programmer	1	1	2	2	C,C	4R	RS-485	E5AR-TC43B-FLK AC100-240	
SV programmer	1	1	10	2	QC,Q	10T	RS-485	E5AR-TQE3MB-FLK AC100-240	
SV programmer	1	1	10	2	C,C	10T	RS-485	E5AR-TCE3MB-FLK AC100-240	
SV programmer	1	1	10	4	QC,Q,C,C	10T	RS-485	E5AR-TQCE3MB-FLK AC100-240V	E5AR-TQCE3MB-FLK AC/DC24
SV programmer	max 2	2	4	2	QC,Q	4R	RS-485	E5AR-TQ43DW-FLK AC100-240	
SV programmer	max 2	2	4	2	C,C	4R	RS-485	E5AR-TC43DW-FLK AC100-240	
SV programmer	max 2	2	8	4	QC,Q,QC,Q	10T	RS-485	E5AR-TQQE3MW-FLK AC100-240	E5AR-TQQE3MW-FLK AC/DC24
SV programmer	max 4	4	8	2	C,C,C,C	10T	RS-485	E5AR-TCCE3MWW-FLK AC100-240	E5AR-TCCE3MWW-FLK AC/DC24
SV programmer	max 4	4	8	4	QC,Q,QC,Q	10T	RS-485	E5AR-TQQE3MWW-FLK AC100-240	
SV programmer + valve	1	1 + pot	4	2	R,R	4R	–	E5AR-TPR4DF AC100-240	E5AR-TPR4DF AC/DC24
SV programmer + valve	1	1 + pot	8	4	R,R,QC,Q	10T	RS-485	E5AR-TPRQE3MF-FLK AC100-240	E5AR-TPRQE3MF-FLK AC/DC24

Note
- Standard = heat and/or cool PID control, valve = valve positioning (relay up/down) (PRR)
- max 2 = 2 loops heat and/or cool or 1 loop cascade, ratio or remote SP
- max 4 = 4 loops heat and/or cool
- 1, 2 or 4 = number of analog universal input 1 + pot = 1 universal and 1 slide wire feedback from valve
- QC = voltage (pulse) or current (switch), Q = voltage (pulse), C = current, 4R = 4 two pole relay, 2T = two transistor output NPN

Function	Loops	Input analog	Event Inputs	Number of outputs	Outputs	AUX outputs	Communication	Order code (48 × 96 mm)	
								100 to 240 VAC	24 VAC/DC
standard	1	1	2	2	QC+Q	4R	–	E5ER-Q4B AC100-240	E5ER-Q4B AC/DC24
standard	1	1	2	2	QC+Q	4R	RS-485	E5ER-Q43B-FLK AC100-240V	
standard	1	1	2	4	QC+Q+C+C	4R	RS-485	E5ER-QC43B-FLK AC100-240	E5ER-QC43B-FLK AC/DC24
standard	1	1	6	2	QC+Q	2T	RS-485	E5ER-QT3DB-FLK AC100-240V	
standard	max 2	2	4	2	QC+Q	2T	RS-485	E5ER-QT3DW-FLK AC100-240	E5ER-QT3DW-FLK AC/DC24
standard	1	1	2	2	C+C	4R	–	E5ER-C4B AC100-240	E5ER-C4B AC/DC24
standard	1	1	2	2	C+C	4R	RS-485	E5ER-C43B-FLK AC100-240V	
standard	1	1	6	2	C+C	2T	RS-485	E5ER-CT3DB-FLK AC100-240V	
standard	max 2	2	4	2	C+C	2T	RS-485	E5ER-CT3DW-FLK AC100-240	E5ER-CT3DW-FLK AC/DC24
valve	1	1 + pot	4	2	R+R	2T	–	E5ER-PRTDF AC100-240	E5ER-PRTDF AC/DC24
valve	1	1 + pot	–	4	R+R+QC+Q	4R	RS-485	E5ER-PRQ43F-FLK AC100-240	E5ER-PRQ43F-FLK AC/DC24
standard	1	1	2	2	QC+Q	2T	DeviceNet	E5ER-QTB-DRT AC100-240V	E5ER-QTB-DRT AC24V
standard	max 2	2	–	2	QC+Q	2T	DeviceNet	E5ER-QTW-DRT AC100-240V	E5ER-QTW-DRT AC24V
standard	1	1	2	2	C+C	2T	DeviceNet	E5ER-CTB-DRT AC100-240V	E5ER-CTB-DRT AC24V
standard	max 2	2	–	2	C+C	2T	DeviceNet	E5ER-CTW-DRT AC100-240V	E5ER-CTW-DRT AC24V
valve	1	1 + pot	–	2	R+R	2T	DeviceNet	E5ER-PRTF-DRT AC100-240V	E5ER-PRTF-DRT AC24V
SV programmer	1	1	2	2	QC+Q	4R	–	E5ER-TQ4B AC100-240	E5ER-TQ4B AC/DC24
SV programmer	1	1	2	2	C+C	4R	–	E5ER-TC4B AC100-240	E5ER-TC4B AC/DC24
SV programmer	1	1	2	2	QC+Q	4R	RS-485	E5ER-TQC43B-FLK AC100-240	E5ER-TQC43B-FLK AC/DC24
SV programmer	max 2	2	4	2	QC+Q	2T	RS-485	E5ER-TQT3DW-FLK AC100-240	E5ER-TQT3DW-FLK AC/DC24
SV programmer	max 2	2	4	2	C+C	2T	RS-485	E5ER-TCT3DW-FLK AC100-240	E5ER-TCT3DW-FLK AC/DC24
SV programmer + valve	1	1 + pot	4	2	R+R	2T	–	E5ER-TPRTDF AC100-240	E5ER-TPRTDF AC/DC24
SV programmer + valve	1	1 + pot	–	3	R+R+QC	4R	RS-485	E5ER-TPRQ43F-FLK AC100-240	E5ER-TPRQ43F-FLK AC/DC24

Note
- Standard = heat and/or cool PID control, valve = valve positioning (relay up/down) (PRR)
- max 2 = 2 loops heat and/or cool or 1 loop cascade, ratio or remote SP
- max 4 = 4 loops heat and/or cool
- 1, 2 or 4 = number of analog universal input 1 + pot = 1 universal and 1 slide wire feedback from valve
- QC = voltage (pulse) or current (switch), Q = voltage (pulse), C = current, 4R = 4 two pole relay, 2T = two transistor output NPN

Accessories

Terminal covers	Order code
Terminal cover for E5AR	E53-COV14
Terminal cover for E5ER	E53-COV15

E5_R/E5_R-T optional tools

Option	Order code
PC based configuration and tuning software CX-Thermo	EST2-2C-MV4

Specifications

Item	
Thermocouple input type	K, J, T, E, L, U, N, R, S, B, W
RTD input type	Pt100
Linear input type	mA, V
Control mode	2-PID or ON/OFF control
Accuracy	±0.1% FS
Auto-tuning	yes
RS-485	optional
Event input	optional
Ambient temperature	–10 to 55°C
IP rating front panel	IP66
Sampling period	50 ms
Size in mm (H×W×D)	E5ER: 96×48×110 E5AR: 96×96×110

CelciuX° (EJ1) - Multi-Loop temperature control – Control and Connectivity

CelciuX° (EJ1) is designed to handle complex temperature profiles thanks to Omron's unique Gradient temperature Control (GTC) algorithm and to offer easy program-less communication with Omron and third-party PLCs and HMI. Above all, CelciuX° (EJ1) incorporates all "simple to use" clever temperature control technology, like 2-PID, disturbance control and various ways of tuning.

- Interfaces to a wide range of industrial networks
- Reduced engineering due to Program-less communications, Smart Active Parts and Function Block Libraries
- Available with screw terminals and screw-less clamp terminals
- One unit handling various types of input, such as Pt, Thermocouple, mA, and V input
- Gradient Temperature Control (GTC)

Ordering information

Type	Control points	Control outputs	Auxiliary outputs	Other functions	Terminal	Order code
Basic unit	2	2 voltage (pulse)	2 transistor (NPN) *1	2 CT input *2 + 2 event input	M3 screws	EJ1N-TC2A-QNHB
Basic unit	2	2 voltage (pulse)	2 transistor (NPN) *1	2 CT input *2 + 2 event input	Screw-less clamp	EJ1N-TC2B-QNHB
Basic unit	2	2 current	2 transistor (NPN) *1	2 event input	M3 screws	EJ1N-TC2A-CNB
Basic unit	2	2 current	2 transistor (NPN) *1	2 event input	Screw-less clamp	EJ1N-TC2B-CNB
Basic unit	4	4 voltage (pulse)	–	–	M3 screws	EJ1N-TC4A-QQ
Basic unit	4	4 voltage (pulse)	–	–	Screw-less clamp	EJ1N-TC4B-QQ
High function unit	–	–	4 transistor (NPN)	4 event input	M3 screws	EJ1N-HFUA-NFLK
High function unit	–	–	4 transistor (NPN)	4 event input	Screw-less clamp	EJ1N-HFUB-NFLK
DeviceNet unit	–	–	–	–	Screw connector	EJ1N-HFUB-DRT
Ethernet unit *3	–	–	–	–	3 x RJ45	EJ1N-HFU-ETN
End unit *4	–	–	2 transistor (NPN)	–	M3 screws	EJ1C-EDUA-NFLK
End unit *4	–	–	2 transistor (NPN)	–	Removable Connector	EJ1C-EDUC-NFLK

*1 For heating/cooling control applications, the auxiliary outputs on the 2-point models are used for cooling control. On the 4-point models, heating/cooling control can be performed for two input points only.
*2 When using the heater burnout alarm, purchase a Current Transformer (E54-CT1 or E54-CT3) separately.
*3 This unit mounts to the left of the CelciuX° (EJ1) configuration and enables PROFINET or Modbus/TCP network connection. Combine the HFU-ETN with an EDU_-NFLK end unit to use with other devices supporting Modbus-RTU like E5_N temperature controllers and MX2 Inverters.
*4 An End unit is always required for connection to a Basic unit or an HFU. An HFU cannot operate without a Basic unit.

Type	Control points	Control outputs	Auxiliary outputs	Other functions	Terminal	Order code
Basic unit	2 (GTC)	2 voltage (pulse) *1	2 transistor (NPN)	2 CT input *2	M3 screws	EJ1G-TC2A-QNH
Basic unit	2 (GTC)	2 voltage (pulse) *1	2 transistor (NPN)	2 CT input *2	Screw-less clamp	EJ1G-TC2B-QNH
Basic unit	4 (GTC)	4 voltage (pulse) *1	–	–	M3 screws	EJ1G-TC4A-QQ
Basic unit	4 (GTC)	4 voltage (pulse) *1	–	–	Screw-less clamp	EJ1G-TC4B-QQ
High function unit	– (GTC)	–	4 transistor (NPN)	–	M3 screws	EJ1G-HFUA-NFLK
High function unit	– (GTC)	–	4 transistor (NPN)	–	Screw-less clamp	EJ1G-HFUB-NFLK
End unit *3	–	–	2 transistor (NPN)	–	M3 screws	EJ1C-EDUA-NFLK
End unit *3	–	–	2 transistor (NPN)	–	Removable Connector	EJ1C-EDUC-NFLK

*1 Heating/cooling control is not supported for gradient temperature control.
*2 When using the heater burnout alarm, use a Current Transformer (E54-CT1 or E54-CT3) (sold separately).
*3 An End-unit (EDU) is always required to connect an HFU and or a Basic TC unit for Communications and Power supply. A GTC (Gradient Temperature Control) basic TC unit always requires a GTC HFU unit.

Accessories

Current transformer

Diameter	Order code
5.8 dia.	E54-CT1
12.0 dia.	E54-CT3

Communications and cables

Description	Order code
G3ZA connecting cable 5 meter	EJ1C-CBLA050
USB programming cable	E58-CIFQ1
PC based configuration and tuning software CX-Thermo	EST2-2C-MV4
PROFIBUS Gateway	PRT1-SCU11

Specifications

Item	Type	EJ1_-TC2	EJ1_-TC4
Power supply voltage		24 VDC	
Operating voltage range		85% to 110% of rated voltage	
Power consumption		4 W max. (at maximum load)	5 W max. (at maximum load)
Input (see note)*1		Thermocouple: K, J, T, E, L, U, N, R, S, B, W, PLII ES1B Infrared Thermosensor: 10 to 70°C, 60 to 120°C, 115 to 165°C, 140 to 260°C. Analog input: 4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 5 V, 0 to 10 V Platinum resistance thermometer: Pt100, JPt100	
Input impedance		Current input: 150Ω max., voltage input: 1 MΩ min.	
Control outputs	Voltage output	Output voltage: 12 VDC ±15%, max. load current: 21 mA (PNP models with short-circuit protection circuit)	
	Transistor output	Max. operating voltage: 30 V, max. load current: 100 mA	–
	Current output	Current output range: 4 to 20 mA or 0 to 20 mA DC Load: 500 Ω max. (including transfer output) (Resolution: Approx: 2,800 for 4 to 20 mA DC, approx. 3,500 for 0 to 20 mA DC)	–
Event inputs	Input points	2	–
	Contact input	ON: 1 kΩ max., OFF. 100 kΩ min.	–
	Non-contact input	ON: Residual voltage: 1.5 V max., OFF: Leakage current: 0.1 mA max.	–
		Outflow current: approx. 4 mA per point	–
Number of input and control points		Input points: 2, control points: 2	Input points: 4, control points: 4
Setting method		Via communications	
Control method		ON/OFF control or 2-PID (with autotuning, selftuning, Heat & Cool autotuning and non-linear cool output selection)	
Other functions		Two-point input shift, digital input filter, remote SP, SP ramp, manual manipulated variable, manipulated variable limiter, interference overshoot adjustment, loop burnout alarm, RUN/STOP, banks, I/O allocations, etc.	
Alarm output		2 points via End unit	
Communication		RS-485, PROFIBUS, Modbus, DeviceNet	RS-485, PROFIBUS, Modbus, DeviceNet
Size in mm (W×H×D)		31×96×109	
Weight		180 g	
Ambient temperature range		Operating –10°C to 55°C, Storage –25°C to 65°C (with no icing or condensation)	
Ambient humidity range		Operating 25% to 85% (with no condensation)	

*1 Inputs are fully multi-input. Therefore, platinum resistance thermometer, thermocouple, infrared thermosensor, and analog input can be selected.

Dimensions

Item	Size in mm (H×W×D)
EJ1N-HFU_-NFL_	95.4×31.0×104.9/109.0
EJ1N-HFUB-DRT	90.9×31.0×82.2
EJ1C-EDU	95.4×15.7×76.2/79.7

Temperature sensors for standard applications

E52-E temperature sensors and thermocouples provide accurate temperature sensing for standard and challenging environments and include a wide range of mounting and connection options.
For best control results, the E52-E series is optimized to operate perfectly with suitable E5_ temperature controllers.

- Thermocouples and PT100 elements
- Wide range of housing, mounting and connection options
- Best performance match with temperature controllers from the E5_ portfolio

Ordering information

Line-Type	Series	Technology	Sub-Type	Min [°C]	Max [°C]	Dia. [mm]	Length [mm]	Material	Type	Fixing	Length [m]	Order code
PRO-Line	Smooth tube	t/c*1	T	–80	400	3	100	SUS 316	2-wire	pre-wired with cable end shoes	2	E52-ETT3-100-2-A
						6						E52-ETT6-100-2-A
			J		600	1						E52-ETJ1-100-2-A
						2						E52-ETJ2-100-2-A
						3						E52-ETJ3-100-2-A
						4.5						E52-ETJ4.5-100-2-A
						6						E52-ETJ6-100-2-A
Lite-Line				0	400	4		SUS 304				E52-ELTJ4-100-2-A
						5						E52-ELTJ5-100-2-A
						6						E52-ELTJ6-100-2-A
						8						E52-ELTJ8-100-2-A
Pro-Line			K	–80	1100	1		INCONEL 600				E52-ETK1-100-2-A
						2						E52-ETK2-100-2-A
						3						E52-ETK3-100-2-A
						4.5						E52-ETK4.5-100-2-A
						6						E52-ETK6-100-2-A
Lite-Line				0	400	4		SUS 304				E52-ELTK4-100-2-A
						5						E52-ELTK5-100-2-A
						6						E52-ELTK6-100-2-A
						8						E52-ELTK8-100-2-A
Pro-Line		PT100	class B	–50	500	3	250	SUS 316	3-wire	pre-wired with open cable ends		E52-EP3-250-2-B
						6						E52-EP6-250-2-B
Lite-Line				0	400	4	50	SUS 304				E52-ELP4-50-2-A
						5	100					E52-ELP5-100-2-A
						6						E52-ELP6-100-2-A
						8						E52-ELP8-100-2-A
Pro-Line	Bayonet mounting			–50		6	35	SUS 316				E52-EP6-35-2-BG1/4G-B
	Enclosed terminals, smooth tube				500		200		2-wire	enclosed screw terminals	–	E52-EP6-200-T2-B
	Bayonet mounting	t/c*1	J	0	400		15			pre-wired with open cable ends	2	E52-ETJ6-15-2-BG1/4G-B
	Enclosed terminals, smooth tube		K		1150		200	INCONEL 600		enclosed screw terminals	–	E52-ETK6-200-T2-B
			J		720			SUS 316				E52-ETJ6-200-T2-B
	Enclosed terminals, G1/2"g; mounting		K		1150			INCONEL 600				E52-ETK6-200-T2-CG1/2G-B
			J		720			SUS 316				E52-ETJ6-200-T2-CG1/2G-B
		PT100	class B	–50	500				3-wire			E52-EP6-200-T2-CG1/2G-B
	Enclosed terminals, clamp mounting 1.5"				200		100					E52-EP6-100-T2-CC1.5-B
	Enclosed terminals, clamp mounting 2"											E52-EP6-100-T2-CC2-B
Pro^{plus}-Line	Surface temperature	t/c*1	J	0	250	10	dia	Cu (tin plated)	2-wire	pre-wired with open cable ends	2	E52-ETJS1-B
	Environmental temperature	PT100	class B	–40	80	–	–	Aluminium	3-wire	enclosed screw terminals	–	E52-EPE1-B
								PVC				E52-EPE2-B
	Non-contact	IR*2	up to 60 mm	10	260	M18	44.5	ABS	4-wire	pre-wired with open cable ends	3	ES1B
			up to 1000 mm	0	400		120	SUS 304	5-wire		2	ES1C-A40

*1 t/c = Thermocouple
*2 IR = Infrared Sensor

Note: Further types with different dia., tube & cable lengths and other confectioning are available on request.

Omron's intelligent PROFIBUS and CompoWay/F gateway

This gateway supports all CompoWay/F equipped products, including temperature controllers, digital panel indicators, etc. It can also be used for connecting MCW151-E and E5_K series.

- Cost-effectively integrates basic instruments into a PROFIBUS network
- Requires no complex protocol conversion writing
- Has function blocks for drag-and-drop configuration
- Connects up to 15 instruments to a single PROFIBUS point

Ordering information

Name	Order code
PROFIBUS remote terminal serial communications unit	PRT1-SCU11

Supports all CompoWay/F equipped units, but has "drag-and-drop" function blocks for

- E5AN/E5EN/E5CN/E5GN
- E5ZN and CelciuX° (EJ1)
- E5AR/E5ER
- E5AK/E5EK

Specifications

Item	PRT1-SCU11
Storage temperature	–20 to +75°C
Ambient temperature	0 to 55°C
Ambient humidity	10 to 90% (non-condensing)
EMC compliance	EN 50081-2, EN 61131-2
Power supply	+24 VDC (+10%/–15%) Current consumption 80 mA (typical)
Weight	125 g (typical)
Communication interface	RS-485 based PROFIBUS-DP RS-422A Host link RS-485 CompoWay/F RS-232C Peripheral Port supporting connection to thermotools
Size in mm (H×W×D)	90×40×65

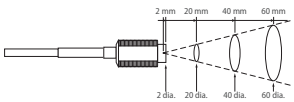
ES1B

Achieve low-cost measurements with an infrared thermosensor

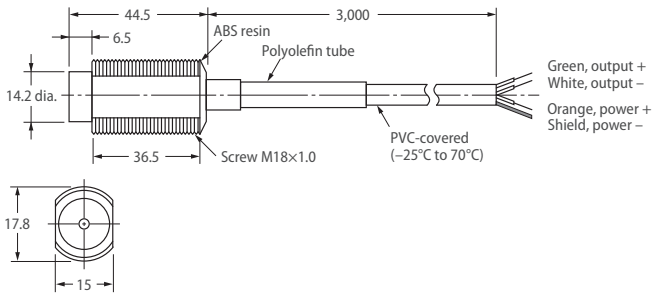
This infrared thermosensor provides an accurate, stable and cost-effective way to measure the temperature of objects. It behaves just like a standard K-type thermocouple, which enables it to operate with any temperature controller or alarm unit.

- Cost-effective infrared thermosensor
- Contactless, meaning no deterioration, unlike thermocouples
- 4 temperature ranges available: 10-70°C, 60-120°C, 115-165°C and 140-260°C
- Response speed 300 ms

Ordering information

Appearance and sensing characteristics	Specification	Order code
	10 to 70°C	ES1B 10-70C
	60 to 120°C	ES1B 60-120C
	115 to 165°C	ES1B 115-165C
	140 to 260°C	ES1B 140-260C

Dimensions (unit: mm)



Specifications

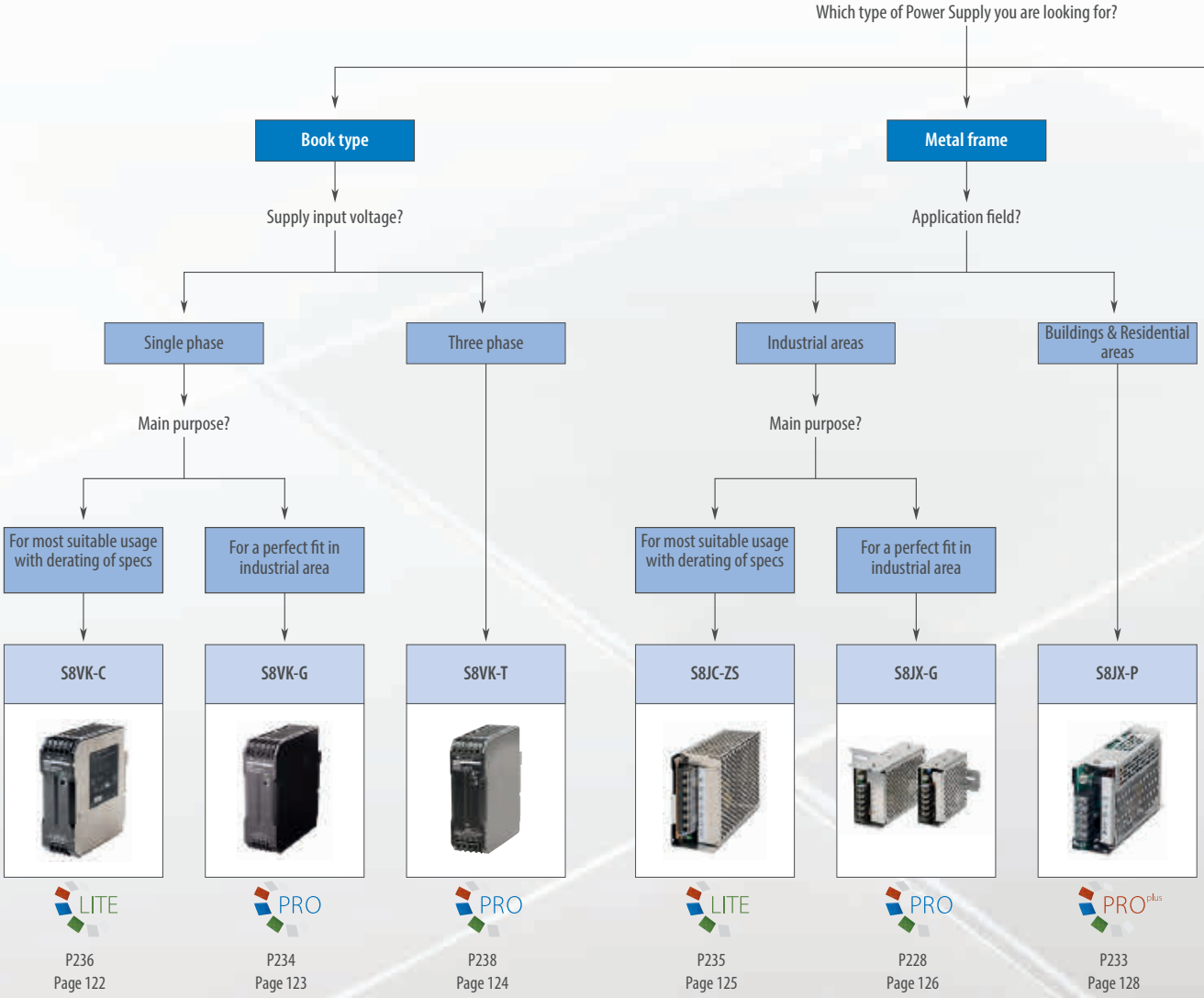
Item		ES1B
Power supply voltage		12/24 VDC
Current consumption		20 mA max.
Accuracy	±5°C	±2% PV or ±2°C, whichever is larger
	±10°C	±4% PV or ±4°C, whichever is larger
	±30°C	±6% PV or ±6°C, whichever is larger
	±40°C	±8% PV or ±8°C, whichever is larger
Reproducibility		±1% PV or ±1°C, whichever is larger
Temperature drift		0.4°C/°C max.
Receiver element		Thermopile
Response speed		Approximately 300 ms at response rate of 63%
Operating temperature		–25 to 70°C (with no icing or condensation)
Allowable ambient humidity		35 to 85%
Degree of protection		IP65
Size in mm		head: 17.8 dia.×44.5 (screw M18×1.0), cable 3,000

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 +70ºC) 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



DC Backup

Application purpose?

- Power supply device → **S8TS** — P243, Page 129
- Battery backup → **S8T-DCBU-01** — P244, Page 131
- Buffer module → **S8T-DCBU-02** — P245, Page 131

Redundancy unit → **S8VK-R** — P237, Page 132

Additional unit → **S8M** — P227, Page 133

Open frame → **S8EX** — P239, Page 130

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		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	–				
	90 W	–									
	100 W	–						■ 20 A	■ 8.5 A	■ 4.5 A	■ 2.1 A
	120 W	–		■ 5 A	–	■ 5 A		–			
	150 W	–						■ 30 A	■ 13 A	■ 6.5 A	■ 3.3 A
	180 W	–									
	240 W	–		■ 10 A	■ 5 A	■ 10 A		–			
	300 W	–						■ 60 A	■ 27 A	■ 14 A	■ 7 A
	350 W	–									
	480 W	–		■ 20 A	■ 10 A	■ 20 A		–			
	600 W	–						■ 120 A	■ 53 A	■ 27 A	■ 13 A
	960 W	–					■ 40 A	–			
	1,500 W	–									
Features	Conformes 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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Metal frame power supply								Modular			Open frame power supply					
																
S8JX-G					**S8JC-ZS**			**S8TS**			**S8EX**					
Pro line					Lite line											
Single phase																
100 V to 240 VAC					200 V to 240 VAC			100 V to 240 VAC			100 to 240 VAC (85 to 264 VAC)					
5 V	12 V	15 V	24 V	48 V	5 V	12 V	24 V	5 V	12 V	24 V	5 V	12 V	15 V	24 V	36 V	48 V
■ 3 A	■ 1.3 A	■ 1.0 A	■ 0.65 A	■ 0.35 A	■ 3 A	■ 1.3 A	■ 0.7 A	–			■ 3 A	■ 1.3 A	■ 1.0 A	■ 0.7 A	–	■ 0.32 A
–								■ 5 A	–							
–								–	■ 2.5 A	–	■ 6 A	■ 2.5 A	■ 2 A	■ 1.3 A	–	■ 0.65 A
■ 7 A	■ 3 A	■ 2.4 A	■ 1.5 A	■ 0.75 A	■ 7 A	■ 3.0 A	■ 1.5 A	–								
■ 10 A	■ 4.2 A	–	■ 2.1 A	■ 1.1 A	■ 10 A	■ 4.2 A	■ 2.1 A	–			■ 10 A	■ 4.3 A	–	■ 2.1 A	–	■ 1.1 A
–									■ 5 A	■ 2.5 A	–					
–									■ 7.5 A	–	–					
■ 20 A	■ 8.5 A	–	■ 4.5 A	■ 2.1 A	■ 20 A	■ 8.5 A	■ 4.5 A	–			■ 20 A	■ 8.5 A	–	■ 4.3 A	–	■ 2.1 A
–									■ 10 A	■ 5 A						
■ 30 A	■ 13 A	–	■ 6.5 A	■ 3.3 A	■ 30 A	■ 12.5 A	■ 6.5 A	–			■ 30 A	■ 12.5 A	–	■ 6.3 A	–	■ 3.2 A
–										■ 7.5 A						
–										■ 10 A	–			■ 10 A	■ 6.7 A	■ 5 A
■ 60 A	■ 27 A	–	■ 14 A	■ 7 A	–											
–					■ 60 A	■ 29 A	■ 14.6 A	–								
–																
■ 120 A	■ 53 A	-	■ 27 A	■ 13 A	–											
–																
–																
–											■					
–										□	–					
–					□						–					
–								■			–					
■											■					
■											■					
■											–					
■					–						□					
–								■			■					
–								■	■ 1 unit		–					
–								■			–					
■ 300 W, 600 W only by 5 units					–				■		–					
–											□					
126					125			129			130					

■ 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 60ºC
- Double set of DC output terminals (three for the negative) provide easy wiring
- Overload and overvoltage protection
- Conforms to EN61204-3, EN55011 Class A

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			

PRO

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)

Ordering information

Type	Power ratings	Input voltage	Output voltage	Output current	Size (W × H × D) [mm]	Order code
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
			12 V	1.2 A		S8VK-G01512
			24 V	0.65 A		S8VK-G01524
	30 W		5 V	5 A	32 × 90 × 90	S8VK-G03005
			12 V	2.5 A		S8VK-G03012
			24 V	1.3 A		S8VK-G03024
	60 W		12 V	4.5 A	32 × 90 × 110	S8VK-G06012
			24 V	2.5 A		S8VK-G06024
	120 W		24 V	5 A	40 × 125 × 113	S8VK-G12024
	240 W		24 V	10 A	60 × 125 × 140	S8VK-G24024
			48 V	5 A		S8VK-G24048
	480 W		24 V	20 A	95 × 125 × 140	S8VK-G48024
			48 V	10 A		S8VK-G48048

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					
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					

PRO

Compact 3-phase input power supply

The S8VK-T has an exceptionally wide operating temperature range from – 40 to 70°C as well as S8VK-G, single phase power supply. These models have also good endurance against hard vibration and guarantee the stable operation even in 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

Ordering information

Type	Power ratings	Input voltage	Output voltage	Output current	Size (W × H × D) [mm]	Order code
Power supply three-phase	120 W	3 × 380 to 480 VAC, 2 × 380 to 480 VAC 450 to 600 VDC (Excluding 960 W)	24 V	5 A	40×125×113	S8VK-T12024
	240 W			10 A	60×125×140	S8VK-T24024
	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
	960 W			40 A	135×125×170	S8VK-T96024

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			

Cost effective range with CE marking

The S8JC-ZS Lite family of metal framed power supplies is our best standard power supply for material cost reduction. The range covers 15 W, 35 W, 50 W, 100 W, 150 W and 350 W models and all are available with 5, 12 or 24 VDC output voltages.

- CE marking
- Overload and over voltage protection
- Conforms to EN 61204-3, EN 55011 Class A

Ordering information

Power ratings	Output voltage	Output current	Size in mm (H × W × D)	Order code
15 W	5 V	3.0 A	97 × 36 × 79.5	S8JC-ZS01505CD-AC2
	12 V	1.3 A		S8JC-ZS01512CD-AC2
	24 V	0.7 A		S8JC-ZS01524CD-AC2
35 W	5 V	7 A	98.3 × 38 × 129	S8JC-ZS03505CD-AC2
	12 V	3.0 A		S8JC-ZS03512CD-AC2
	24 V	1.5 A		S8JC-ZS03524CD-AC2
50 W	5 V	10 A	98.3 × 38 × 129	S8JC-ZS05005CD-AC2
	12 V	4.2 A		S8JC-ZS05012CD-AC2
	24 V	2.1 A		S8JC-ZS05024CD-AC2
100 W	5 V	20 A	98 × 50 × 159	S8JC-ZS10005CD-AC2
	12 V	8.5 A	97.6 × 38 × 159	S8JC-ZS10012CD-AC2
	24 V	4.5 A		S8JC-ZS10024CD-AC2
150 W	5 V	30 A	98 × 43 × 199	S8JC-ZS15005CD-AC2
	12 V	12.5 A	98 × 50 × 159	S8JC-ZS15012CD-AC2
	24 V	6.5 A		S8JC-ZS15024CD-AC2
350 W	5 V	60 A	115 × 50 × 193.6	S8JC-ZS35005CD-AC2
	12 V	29 A		S8JC-ZS35012CD-AC2
	24 V	14.6 A	115 × 50 × 194.8	S8JC-ZS35024CD-AC2

Specifications

Item		15 W	35 W	50 W	100 W	150 W	350 W
Efficiency (Typ.)		80% (24 V)	84% (24 V)	83% (24 V)	87% (24 V)	87% (24 V)	84% (24 V)
Input	Rated input voltage	200 to 240 VAC					
	Allowable range	185 to 264 VAC					
Output	Voltage adjustment range(with V.ADJ)	±10%					
Overload protection		Yes, 105% of rated current					
Overvoltage protection		Yes					
Operating ambient temperature		–20 to 60°C (–4 to 140°F)					
Series operation		No					
Parallel operation		No					
Fulfilled standards		EN 50178 (CE mark by self declaration)					

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 overvoltage, 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		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		S8JX-G15012CD
	24 V	6.5 A	92 × 50 × 150	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		S8JX-G30012CD
	24 V	14 A	92 × 110 × 167	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						

EMI Class B and Power Factor Correction

The main improvements provided by the S8JX-P models are harmonic current suppression/PFC (Power Factor Correction) and EMI EN55011 Class B compliant. In addition, further functionalities have been implemented (applies only to 300 and 600 W models):

- Remote sensing, to compensate for voltage drops on the load lines
- Remote control, using an external signal allows to turn the output ON and OFF without removing the input voltage
- Alarm output, informing about PS errors, such as fan failure or insufficient voltage

Ordering information

Power ratings	Output voltage	Output current	Size in mm (H × W × D)	Order code
50 W	5 V	10 A	92 × 42 × 129	S8JX-P05005CD
	12 V	4.2 A		S8JX-P05012CD
	24 V	2.1 A		S8JX-P05024CD
	48 V	1.1 A		S8JX-P05048CD
100 W	5 V	20 A	92 × 42 × 159	S8JX-P10005CD
	12 V	8.5 A		S8JX-P10012CD
	24 V	4.5 A		S8JX-P10024CD
	48 V	2.1 A		S8JX-P10048CD
150 W	5 V	30 A	92 × 42 × 159	S8JX-P15005CD
	12 V	13 A		S8JX-P15012CD
	24 V	6.5 A		S8JX-P15024CD
	48 V	3.3 A		S8JX-P15048CD
300 W	5 V	60 A	92 × 71 × 165	S8JX-P30005CD
	12 V	27 A		S8JX-P30012CD
	24 V	14 A		S8JX-P30024CD
	48 V	7 A		S8JX-P30048CD
600 W	5 V	120 A	92 × 110 × 165	S8JX-P60005CD
	12 V	53 A		S8JX-P60012CD
	24 V	27 A		S8JX-P60024CD
	48 V	13 A		S8JX-P60048CD

Specifications

Item		50 W	100 W	150 W	300 W	600 W
Efficiency (Typ. at 230 VAC)		82% (24 V)	87% (24 V)	88% (24 V)	87% (24 V)	85% (24 V)
Input	Rated input voltage	100 to 240 VAC				
	Allowable range	85 to 264 VAC, 80 to 370 VDC (DC is not applicable for the safety standards.)				
Output	Voltage adjustment range (with V.ADJ)	–10% to 15% for 5 V to 24 V, ±10% for 48 V (with V.ADJ)			–10% to 15% for 12 V and 24 V, ±10% for 5 V and 48 V	
	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				
Power Boost		–			115% of rated current for 24 V only	
Overvoltage protection		Yes				
Operating ambient temperature		–10 to 70°C (14 to 158°F)				
Series operation		Yes, up to 2 units				
Parallel operation		No			Yes, up to 5 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 EN61000-3-2				
Approved standards		UL: UL508 (Listing), UL60950-1, cUL: 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				

Industrial use, modular power supply for multiple configurations

The S8TS is an expandable power supply; standard units can easily be snapped together in parallel to provide you with ultimate flexibility. Expandable up to 4 units, it can deliver a total power of 240W at 24VDC or a multi-output configuration.

- Improves system reliability by building up N+1 redundancy
- Standard unit; 60 W at 24 VDC, 30 W at 12 VDC and 25 W at 5 VDC
- Battery back-up unit protects against power outage (see accessories)
- Buffer unit protects against power glitches and outage (see accessories)
- EMI Class B, UL Class 2, UL Class 1 division 2

Ordering information

Basic block		Order code			
Output voltage	Output current	Screw terminal type		Connector terminal type	
		With bus line connectors *1	Without bus line connectors *2	With bus line connectors *1	Without bus line connectors *2
24 V	2.5 A	S8TS-06024-E1 *3	S8TS-06024	S8TS-06024F-E1	S8TS-06024F
12 V	2.5 A	S8TS-03012-E1	S8TS-03012	S8TS-03012F-E1	S8TS-03012F
5 V	5 A	–	S8TS-02505	–	S8TS-02505F

*1 One S8T-BUS01 connector and one S8T-BUS02 connector are included as accessories.
*2 Bus line connectors can be ordered separately if necessary.
*3 Conforms to EMI class B with DC minus terminal ground.

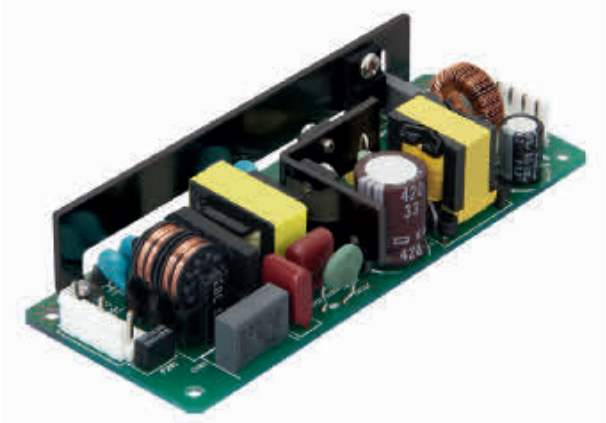
Accessories

Bus line connector		
Type	Number of connectors	Order code
AC line + DC line bus (For parallel operation)	1 connector	S8T-BUS01
	10 connectors *1	S8T-BUS11
AC line bus (For series operation or isolated operation)	1 connector	S8T-BUS02
	10 connectors *2	S8T-BUS12

*1 One package contains 10 S8T-BUS01 connectors.
*2 One package contains 10 S8T-BUS02 connectors.

Specifications

Item		5 V models	24/12 V models	
		Single operation	Single operation	Parallel operation
Efficiency		62% min.	24 V models: 75%, 12 V models: 70% min.	
Power factor		0.8 min.	24 V models: 0.9 min., 12 V models: 0.8 min.	
Input voltage		100 to 240 VAC, (85 to 264 VAC), single-phase		
Output voltage	Voltage adjustment	5 V ±10% min.	24 V models: 22 to 28 V, 12 V models: 12 V ±10% min.	
	Ripple	2% (p-p) max.	2% (p-p) max.	2% (p-p) max.
	Input variation	0.5% max.	–	–
	Temperature influence	0.05%/°C max. (with rated input, 10 to 100% load)		
Overcurrent protection		105 to 125% of rated load current, inverted L drop, automatic reset		
Overvoltage protection		yes	yes	yes
Output indicator		yes (green)	yes (green)	yes (green)
Weight		450 g max.	450 g max.	450 g max.
Series operation		yes	yes	yes
Parallel operation		no	yes	yes
Size in mm (HxWxD)		120x43x120		



Open frame power supply, the best to build-in small equipment

The S8EX is a open frame power supply to mount on small equipment directly. The wide variation of output voltage and Power boost function 200% can contribute the down sizing of equipment and the standardization of power supply

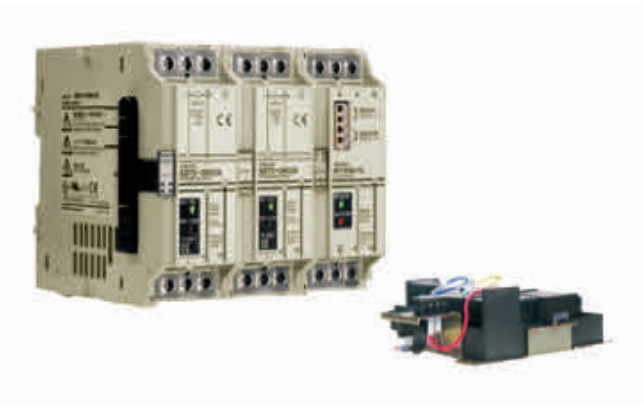
- 200% Power boost function
- Connector terminals
- Various installations are possible.
- Wide operation temperature range: –10 to 70°C

Ordering information

Power ratings	Input voltage	Output voltage	Output current	Size (W × H × D) [mm]	Order code
15 W	100 to 240 VAC	5 V	3 A	50 × 22 × 105	S8EX-N01505
		12 V	1.3 A		S8EX-N01512
		15 V	1 A		S8EX-N01515
		24 V	0.7 A		S8EX-N01524
		48 V	0.32 A		S8EX-N01548
30 W		5 V	6 A	50 × 27 × 105	S8EX-N03005
		12 V	2.5 A		S8EX-N03012
		15 V	2 A		S8EX-N03015
		24 V	1.3 A		S8EX-N03024
		48 V	0.65 A		S8EX-N03048
50 W		5 V	10 A	50 × 28.5 × 132	S8EX-BP05005
		12 V	4.3 A		S8EX-BP05012
		24 V	2.1 A		S8EX-BP05024
		48 V	1.1 A		S8EX-BP05048
100 W		5 V	20 A	62 × 35.5 × 155	S8EX-P10005
		12 V	8.5 A		S8EX-BP10012
		24 V	4.3 A		S8EX-BP10024
		48 V	2.1 A		S8EX-BP10048
150 W		5 V	30 A	75 × 37.5 × 160	S8EX-P15005
		12 V	12.5 A		S8EX-BP15012
		24 V	6.3 A		S8EX-BP15024
		48 V	3.2 A		S8EX-BP15048
240 W		24 V	10 A	84 × 42.5 × 180	S8EX-BP24024
		36 V	6.7 A		S8EX-BP24036
		48 V	5 A		S8EX-BP24048

Specifications

Specification		15 W	30 W	50 W	100 W	150 W	240 W
Efficiency (Typ at 200 VAC)		78% (24 V)	86% (24 V)	85% (24 V)	86% (24 V)	87% (24 V)	90% (24 V)
Input	Rated Input Voltage	100 to 240 VAC					
	Allowable range	85 to 264 VAC					
Output	Voltage adjustment range (with V.ADJ)	±10%					
	Input variation influence	0.5% max. (at 85 to 264 VAC input, 100% load)					
	Load variation Influence	2.0% max. (5 V), 1.5% max. (12, 24, 36, 48 V), at 0 to 100% load					
	Temperature variation influence	0.05%/°C max.					
Overload protection		Yes, 105 to 160% of rated current					
Power Boost		–		150% of rated current (5 V of 50 W, 12 V) 200% of rated current (24 V, 36 V, 48 V)			
Overvoltage protection		Yes					
Operating ambient temperature		–10 to 70°C (14 to 158°F)					
EMI		Conforms to EN 61204-3, EN55011 Class B					
EMS		Conforms to EN 61204-3 high severity levels					
Harmonic current emissions		Conforms to EN 61000-3-2					
Approved Standards		UL: UR 60950-1, cUR: CSA C22.2 No.60950-1, EN/VDE: EN 50178 (=VDE 0160), EN 60950-1 (=VDE 0805)					



S8T-DCBU-01

The S8T-DCBU-01 battery backup block supplies 24 VDC for a fixed period of time during AC input outages to considerably improve system reliability.

- Supplies 24 VDC for a long period of time during AC input outages
- For system reliability improvement
- Block power supply basic block is connected by the bus line connector
- Simple system configuration
- Alarms indicated on main unit and via alarm signal output

Ordering information

Product	Input voltage	Output voltage	Output current			Order code
DC back-up block	24 to 28 VDC	24 V	3.7 A/8 A			S8T-DCBU-01
Battery holder	–	–	–			S82Y-TS01
Product	**Input voltage**	**Output voltage**	**Output current**	**Type**		**Order code**
Basic block (use together with the DC back-up block)	100 to 240 VAC	24 V	2.5 A	Screw terminal type	With bus line connectors	S8TS-06024-E1
					Without bus line connectors	S8TS-06024
				Connector terminal type	With bus line connectors	S8TS-06024F-E1
					Without bus line connectors	S8TS-06024F
Product	**Back-up time**	**Overcurrent protection operating point selector**				**Order code**
Battery	8 min./3.7 A	5.7 A (typ.)	–			LC-R122R2PG
	4 min./8.0 A	5.7 A (typ.)	11.7 A (typ.)			LC-R123R4PG

Note: The S8TS DC back-up block is for S8TS power supplies only.

Specifications

Item	Size in mm (HxWxD)
S8T-DCBU-01	120x43x130
Battery holder	82x185.7x222.25

S8T-DCBU-02

Prevents equipment stoppage, data loss and other problems resulting from momentary power failures. One S8T-DCBU-02 buffer block provides a back-up time of 500 ms at an output current of 2.5 A. Can be wired to the 24 VDC output from any switch mode power supply.

- Connects to all Omron power supplies: S8TS, S8VS, S82J, S82K, S8VM, S8PE
- Connects to both single-phase and three-phase power supplies
- Connects to an S8TS power supply via an S8T-BUS03 bus line connector
- Parallel connection up to 4 units to increase back-up time and capacity
- Complies with Semi F47-0200 standard

Ordering information

Input voltage	Output voltage (during back-up operation)	Output current	Order code
24 VDC (24 to 28 VDC)	22.5 V	2.5 A	S8T-DCBU-02

Accessories

Type	Number of connectors	Order code
DC bus line connector (for use with S8TS only)	1 connector	S8T-BUS03
	10 connectors	S8T-BUS13

Specifications

Item	Size in mm (H×W×D)
S8T-DCBU-02	120×43×120

Redundancy Unit, contributes to build high reliable systems

The S8VK-R is a redundancy unit used with S8VK Power Supply series. This unit consists of 2 main diodes and additional function to build the redundancy of Power supply and can save your design time by the combination of S8VK series with high reliability.

- Redundancy operating LED for the status confirmation
- A signal output for failure detection of power supplies
- By adjusting the power supply voltage to light up Balance LED the lifetime of power supplies will be more than twice.
- •Wide operation temperature range: –40 to 70°C

Ordering information

Input voltage	Output current	Size (W × H × D) [mm]	Order code
5 to 30 VDC	10 A	32 × 90 × 110	S8VK-R10
10 to 60 VDC	20 A	40 × 125 × 113	S8VK-R20

Specifications

Type	S8VK-R10	S8VK-R20
Rated Input Voltage	5 to 30 V	10 to 60 V
Output Current	10 A	20 A
Voltage Drop	0.7 V max at 10 A	0.9 V max at 20 A
Operation Temperature range	–40 to 70°C	–40 to 70°C
Safety Standard	UL 60950-1, UL 508, cURus, cULus, EN 50178, EN 60950-1	
Signal output	30 VDC 50 mA max by Photo MOS Relay	
Redundancy OK Indicator	LED (Green), The function to know the both of PS operate normally.	
Voltage Balance Indicator	LED (Green), The function to help to get the balance of 2 unit PS output voltage	
Grounding terminal	–	Yes, One for Chassis grounding

Digital multi circuit protector for DC output of power supply

The S8M turns your machine directly into UL Class 2 compliant, maximum tripping current is 3,8 A per channel (adjustable). This unit controls up to 4 circuits. On top of this you will get startup/shutdown–sequence control, display and alarm functions, like voltage, output current, runtime, and over temperature and external reset. These functions can be set by using the front buttons or with the free support tool software. These settings can be protected.

- 4 circuit protection up-to 4 A per channel
- UL Class 2 (max. 3.8 A)
- Emergency stop by external signal
- Optimize use of available power through start-up sequence
- Maintenance control

Ordering information

Input voltage	Communications	UL class 2 output	Size (W × H × D) [mm]	Order code
24 VDC	–	–	75 × 115 × 94	S8M-CP04
	RS-232C	–		S8M-CP04-R
		Compliant		S8M-CP04-RS

Specifications

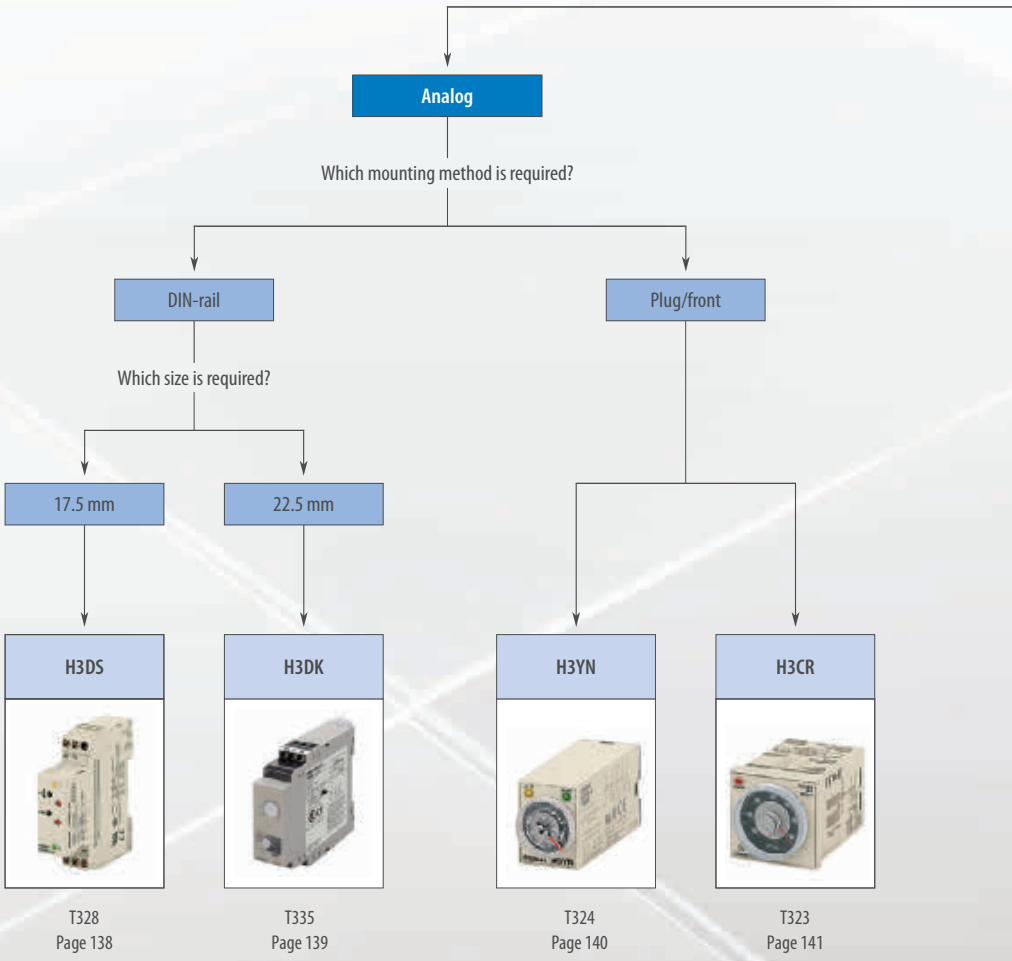
Type		S8M-CP04	S8M-CP04-R	S8M-CP04-RS
Input characteristics	Rated input voltage	24 VDC (19.2 to 26.4 VDC)		
	Allowable input current	17.0 A max.		16.0 A max
	Power consumption	10 W max		15 W max
Output characteristics	Number of branches	4		
	Max tripping current	4.0 A		3.8 A
	Adjustable tripping range	0.5 to 4.0 A in 0.1 A units		0.5 to 3.8 A in 0.1 A units
	Internal voltage drop	0.5V max at 4 A		0.7V max at 3.8 A
Approved Standards		UL: UL508(Listing), UR 60950-1 cUL, cUR: CSA C22.2 No. 107.1 and No.60950-1 EN/VDE: EN 50178 (=VDE 0160), EN 60950-1 (=VDE 0805)		UL: UL508(Listing), Class 2 per UL 1310), UR 60950-1 cUL, cUR: CSA C22.2 No. 107.1 and No.60950-1 EN/VDE: EN 50178 (=VDE 0160), EN 60950-1 (=VDE 0805)

WHEN TIMING ACCURACY MATTERS!

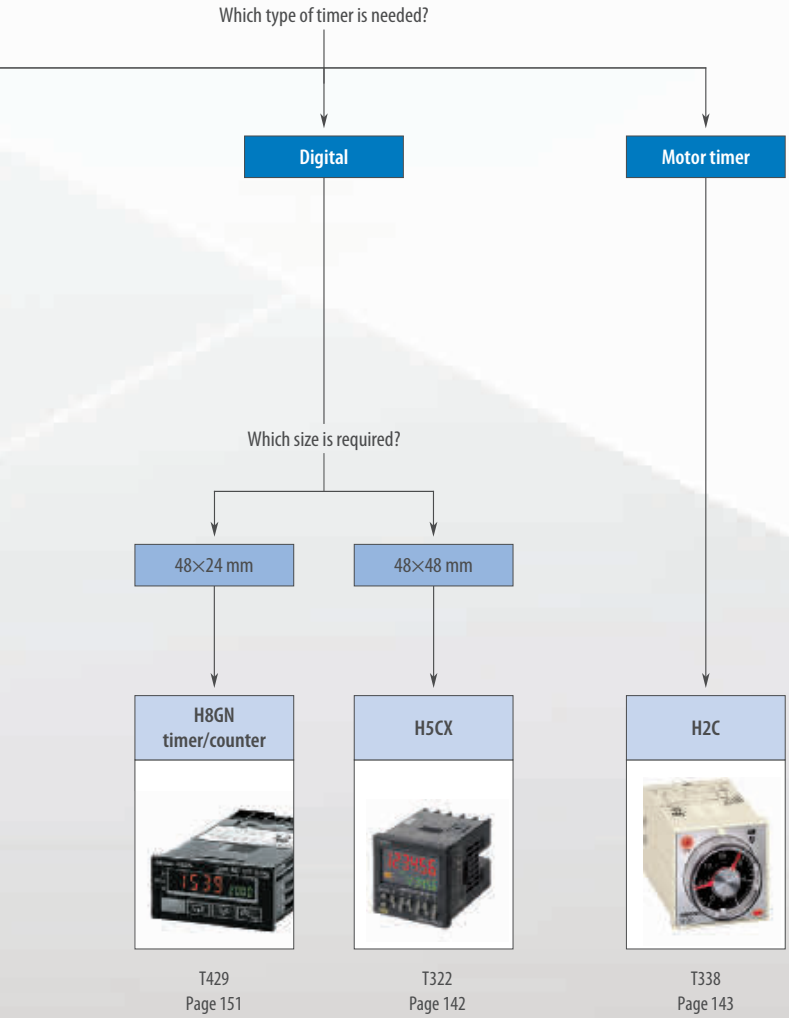
H5CX – The most complete digital timer

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




TIMER
MODE
RST
OMRON H5CX
TIMER
MODE
RST
OMRON H5CX


Which type of timer is needed?
Digital
Motor timer
Which size is required?
48×24 mm
48×48 mm
H8GN timer/counter
H5CX
H2C
T429
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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		□	□	□	–	–	–	□	□	–	–	–
Outputs	Transistor		–	–	–	–	–	–	–	–	–	–	–
	Relay		■	■	■	■	■	–	■	■	■	■	■
	SCR		–	–	–	–	–	■	–	–	–	–	–
	Relay output type	SPDT	■	■	■	■	–	–	□	■	■	■ (2x)	■
		SPST-NO	–	–	–	–	■ (2×)	–	–	–	–	–	–
		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	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	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		–	–	–	–	–	■	–	–	–	–	–
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Category			Analog solid state timer					Digital timer		Motor timer
										
Model			H3YN	H3CR-A	H3CR-F	H3CR-G	H3CR-H	H5CX	H8GN	H2C
Selection criteria	Mounting		Socket/on panel							
	Size		21.5 mm	1/16 DIN					1/32 DIN	1/16 DIN
	Type		Miniature	Multi-functional	Twin timer	Star-delta	Power OFF-delay	Multi-functional	Preset counter/ timer	Motor 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)	0.2 s to 30 h
		Number of sub ranges	2	9	14	4	4	10	9	15
	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	24, 48, 100, 110, 115, 120, 200, 220, 240 VAC
	Number of operating modes		4	6 (model dependent)	–	1	1	15	6	2
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		140	141				142	151	143

■ 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 to120 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		2× Relay SPST-NO	1 s to 120 s	Star-delta	H3DS-GL	H3DS-GLC
Two-wired timer	24 to 230 VAC/VDC (50/60 Hz)	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	±1% FS max. (1 s range: ±1% ±10 ms max.)	
Setting error	±10% ±50 ms FS max.	
Reset time	Min. power-opening time: 0.1 s max. (including halfway reset)	
Influence of voltage	±2% FS max.	
Influence of temperature	±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 A-1: Signal ON-delay 2 A-2: Power ON-delay 1 A-3: Power ON-delay 2 b: Repeat cycle 1 b-1: Repeat cycle 2 d: Signal OFF-delay E: Interval F: Cumulative Z: ON/OFF-duty adjustable flicker	Screw terminals	48×48×84	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-A-N
	12 to 24 VDC/24 VAC			48×48×65		H5CX-AD-N
Transistor output	100 to 240 VAC			48×48×84		H5CX-AS-N
	12 to 24 VDC/24 VAC			48×48×65		H5CX-ASD-N
Contact output	100 to 240 VAC		11-pin socket	48×48×69.7	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-A11-N
	12 to 24 VDC/24 VAC					H5CX-A11D-N
Transistor output	100 to 240 VAC					H5CX-A11S-N
	12 to 24 VDC/24 VAC					H5CX-A11SD-N
Contact output	100 to 240 VAC	toff: Twin timer OFF start ton: Twin timer ON start	8-pin socket	48×48×69.7	Signal, Reset (NPN inputs)	H5CX-L8-N
	12 to 24 VDC/24 VAC					H5CX-L8D-N
Transistor output	100 to 240 VAC					H5CX-L8S-N
	12 to 24 VDC/24 VAC					H5CX-L8SD-N
Contact output Models with instantaneous contact outputs	100 to 240 VAC	A-2: Power ON-delay 1 b: Repeat cycle 1 E: Interval Z: ON/OFF-duty adjustable flicker toff: Twin timer OFF start 1 ton: Twin timer ON start 1			–	H5CX-L8E-N
	12 to 24 VDC/24 VAC					H5CX-L8ED-N
Transistor output	12 to 24 VDC	A: Signal ON-delay 1 F: Cumulative	Screw terminals	48×48×65	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-BWSD-N

Accessories

Name		Order code
Flush-mounting adapter		Y92F-30
Waterproof packing		Y92S-29
Front-connecting socket	8-pin, finger safe type	P2CF-08-E
	11-pin, finger safe type	P2CF-11-E
Back-connecting socket	8-pin	P3G-08
	11-pin	P3GA-11
Hard cover		Y92A-48
Soft cover		Y92A-48F1
Front panels (4-digit models)	Light gray	Y92P-CXT4G
	White	Y92P-CXT4S

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)	red	
	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)		

DIN-sized (48×48) motor timer with variable time ranges

This motor timer series provides you with many features, such as ON-delay, time indicator, moving pointer and synchronous motor. Moreover, the LED indicator shows the time operation, time range and the rated voltage.

- DIN-sized 48 × 48mm
- Front-panel/plug-in/DIN-rail
- All supply voltages available
- 0.2 s to 30 h
- SPDT, 6A at 250VAC

Ordering information

Operation/resetting system	Internal connection	Terminal	Time-limit contact	Instantaneous contact	Time range code	Order code
Time-limit operation/ electric resetting	Separate motor and clutch connection	11-pin socket	SPDT	SPDT	1.25 s to 30 h in 5 ranges	H2C-RSA 110AC
						H2C-RSA 220AC
						H2C-RSA 24AC
					0.2 s to 6 h in 5 ranges	H2C-RSB 110AC
						H2C-RSB 220AC
						H2C-RSB 24AC
					0.5 s to 12 h in 5 ranges	H2C-RSC 110AC
						H2C-RSC 220AC
						H2C-RSC 24AC
Time-limit operation/ self-resetting	Separate motor and clutch connection	11-pin socket	SPDT	SPDT	1.25 s to 30 h in 5 ranges	H2C-SA 110AC
						H2C-SA 220AC
						H2C-SA 24AC
					0.2 s to 6 h in 5 ranges	H2C-SB 110AC
						H2C-SB 220AC
						H2C-SB 24AC
					0.5 s to 12 h in 5 ranges	H2C-SC 110AC
						H2C-SC 220AC
						H2C-SC 24AC

Note: Other voltages available on request

Accessories

Name/specifications		Order code
DIN-rail mounting/ front-connecting socket	8-pin, finger safe type	P2CF-08-E
	11-pin, finger safe type	P2CF-11-E
Back-connecting socket	8-pin, screw terminal	P3G-08
	11-pin	P3GA-11

Name/specifications		Order code
Hold-down clip (pair)	For PL08 and PL11 sockets	Y92H-1
	For PF085A socket	Y92H-2
Flush mounting adapter		Y92F-30
Time setting ring		Y92A-Y1

Specifications

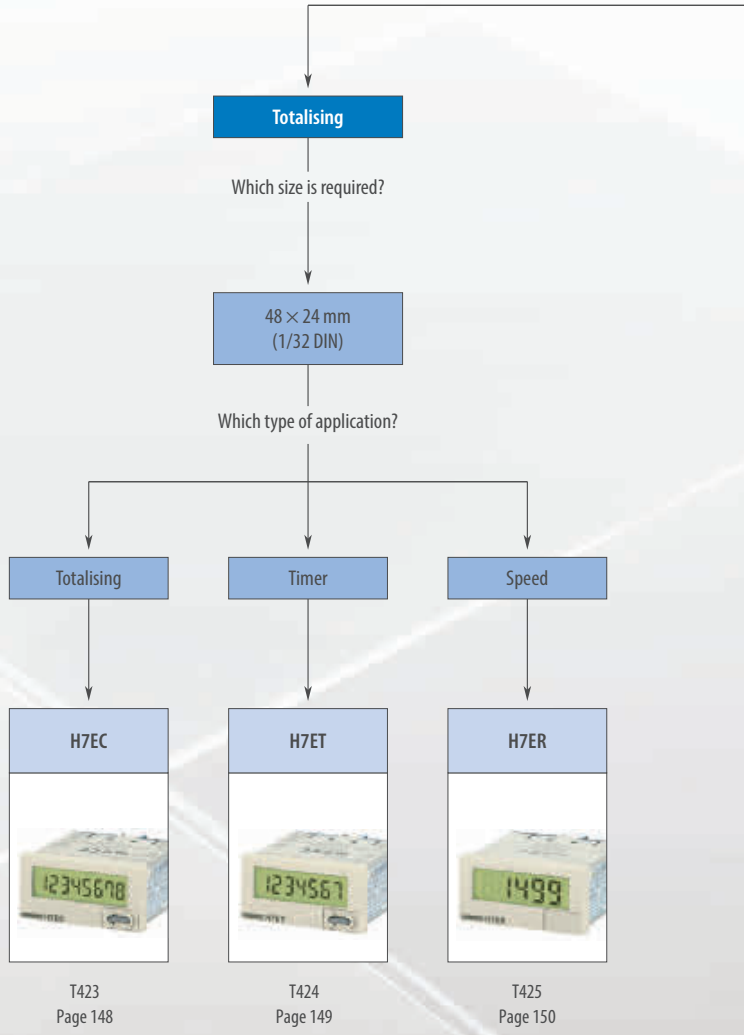
Operating voltage range	85 to 110% of rated supply voltage
Reset voltage	10% max. of rated supply voltage
Reset time	Min. power-opening time: 0.5 s, min. pulse width: 0.5 s
Control outputs	6 A at 250 VAC, resistive load ($\cos\phi = 1$)
Mounting method	Flush mounting (except for H2C-F/-FR models), surface-mounting, DIN-rail mounting
Life expectancy	Mechanical: 10,000,000 operations min.
	Electrical: 500,000 operations min.
Motor life expectancy	20,000 h
Accuracy of operating time	±0.5% FS max. (±1% max. at 0.2 to 6 s for the time range code B or at 0.5 to 12 s for the time range code C)
Setting error	±2% FS max.
Reset time	0.5 s max.
Influence of voltage	±1% FS max.
Influence of temperature	±2% FS max.
Ambient temperature	Operating: –10 to 50°C
Case color	Light grey (Munsell 5Y7/1)
Degree of protection	IP40 (panel surface)
Size in mm (H×W×D)	48×48×77.5

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) → **H8GN counter/timer**

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- 48 × 48 mm (1/16 DIN) → **H7CX**

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Cam positioner

Which size is required?

- 96 × 96 mm (1/4 DIN) → **H8PS**

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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	–	–	–
	Tachometer	■	–	■
Inputs	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	–	–	–
	IP rating	IP66	IP66	IP66
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 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	■	■	■
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Counter type		Pre-set counter/timer	Pre-set counter	Cam positioner
				
Model		**H8GN**	**H7CX**	**H8PS**
Selection criteria	Display	LCD negative transmissive		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	■	■	–
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■ 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 DC voltage input	7-segment LCD	H7ET-NV	H7ET-NV-B	H7ET-NV1	H7ET-NV1-B
	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 DC voltage input	7-segment LCD	H7ER-NV	H7ER-NV-B	H7ER-NV1	H7ER-NV1-B
	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 ($\cos\phi = 1$)
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 1-stage counter with total counter 2-stage counter 1-stage counter with batch counter Dual counter (addition/subtraction) Tachometer Twin counter	Screw terminal	12 VDC	100 to 240 VAC	Contact and transistor output	6	48×48×84	H7CX-AU-N
			12 to 24 VDC/24 VAC				H7CX-AUD1-N
				Transistor output (2×)			H7CX-AUSD1-N
			100 to 240 VAC	Contact output (2×)			H7CX-AW-N
			12 to 24 VDC/24 VAC				H7CX-AWD1-N
1-stage counter 1-stage counter with total counter	11-pin socket	12 VDC	100 to 240 VAC	Contact output		48×48×69.7	H7CX-A11-N
			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	11-pin, finger safe type	P2CF-11-E
Back-connecting socket	11-pin	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	Y92P-CXC4G
	White	Y92P-CXC4S
Front panels (6-digit models)	Light gray	Y92P-CXC6G
	White	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 ($\cos\phi = 1$) 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)

Compact, easy-to-use cam positioner

The H8PS provides high speed operation at 1,600 r/min and high-precision settings to 0.5° ensuring widespread application. H8PS features a highly visible display with back-lit negative transmissive LCD. Advance angle compensation function compensates for output delays.

- 96 to 121.2H×96W×60.6 to 67.5D mm
- Front-panel / DIN-rail
- 24 VDC
- 8-, 16- and 32-outputs
- NPN/PNP 100 mA at 30 VDC

Ordering information

Number of outputs	Mounting method	Output configuration	Bank function	Size in mm (H×W×D)	Order code
8-outputs	Flush-mounting	NPN transistor output	No	96×96×67.5	H8PS-8B
		PNP transistor output			H8PS-8BP
	Front-mounting/DIN-rail mounting	NPN transistor output		96×96×60.6	H8PS-8BF
		PNP transistor output			H8PS-8BFP
16-outputs	Flush-mounting	NPN transistor output	Yes	96×96×67.5	H8PS-16B
		PNP transistor output			H8PS-16BP
	Front-mounting/DIN-rail mounting	NPN transistor output		121.2×96×60.6	H8PS-16BF
		PNP transistor output			H8PS-16BFP
32-outputs	Flush-mounting	NPN transistor output		96×96×67.5	H8PS-32B
		PNP transistor output			H8PS-32BP
	Front-mounting/DIN-rail mounting	NPN transistor output		121.2×96×60.6	H8PS-32BF
		PNP transistor output			H8PS-32BFP

Encoders

Type	Resolution	Cable length	Order code
Economy	256	2 m	E6CP-AG5C-C 256 2M
Standard	256	1 m	E6C3-AG5C-C 256 1M
		2 m	E6C3-AG5C-C 256 2M
	360		E6C3-AG5C-C 360 2M
	720		E6C3-AG5C-C 720 2M
Rigid	256	2 m	E6F-AG5C-C 256 2M
	360		E6F-AG5C-C 360 2M
	720		E6F-AG5C-C 720 2M

Accessories

Name	Specification	Order code
Discrete wire output cable	2 m	Y92S-41-200
Connector-type output cable	2 m	E5ZE-CBL200
Support software	CD-ROM	H8PS-SOFT-V1
USB cable	A miniB, 2 m	Y92S-40
Parallel input adapter	Two units can operate in parallel	Y92C-30
Protective cover		Y92A-96B
Watertight cover		Y92A-96N
DIN-rail mounting base		Y92F-91

Encoder accessories

Name	Specification	Order code
Shaft coupling for the E6CP	Axis: 6 mm dia.	E69-C06B
Shaft coupling for the E6C3	Axis: 8 mm dia.	E69-C08B
Shaft coupling for the E6F	Axis: 10 mm dia.	E69-C10B
Extension cable	5 m (same for E6CP, E6C3, and E6F)	E69-DF5

Specifications

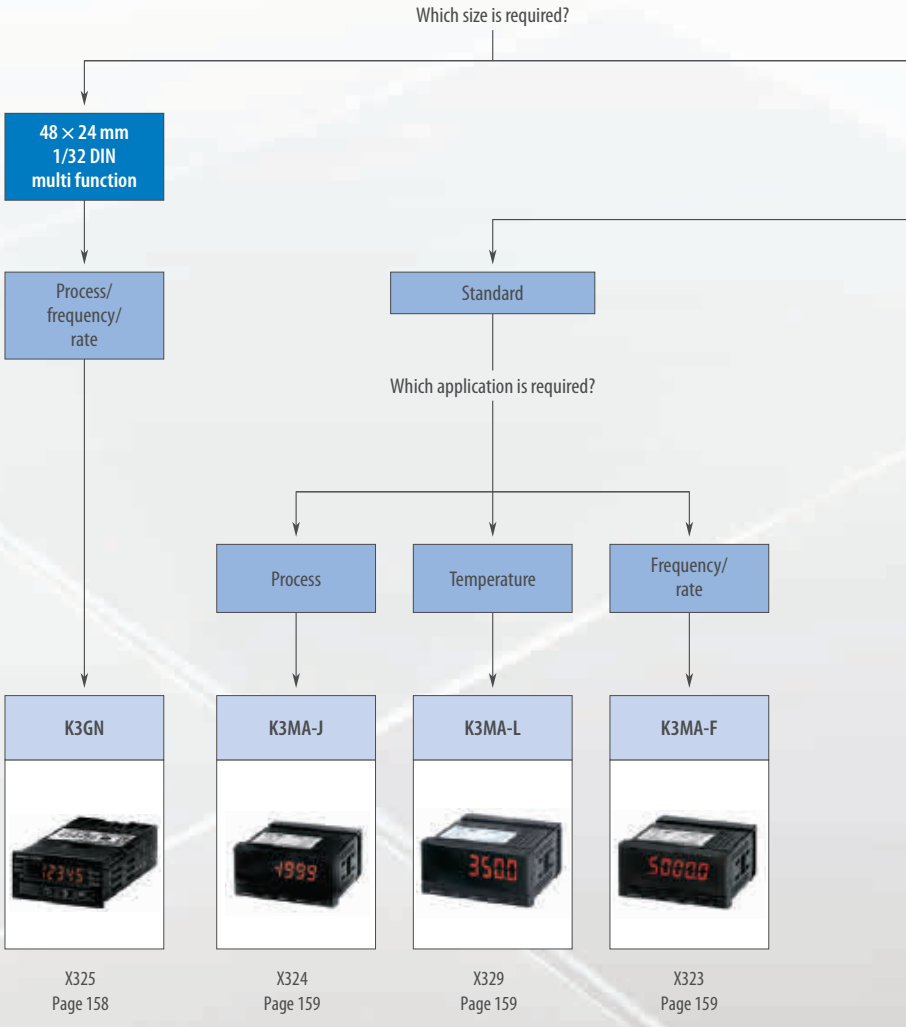
Rated supply voltage			24 VDC
Inputs	Encoder input		8-output models: None; 16-/32-output models: Bank inputs 1/2/4, origin input, start input
	External inputs	Input signals	8-output models: None; 16-/32-output models: Bank inputs 1/2/4, origin input, start input
		Input type	No voltage inputs: ON impedance: 1 kΩ max. (leakage current: Approx. 2 mA at 0 Ω) ON residual voltage: 2 V max., OFF impedance: 100 kΩ min., applied voltage: 30 VDC max. Minimum input signal width: 20 ms
Number of banks			8 banks (for 16-/32-output models only)
Display method			7-segment, negative transmissive LCD (main display: 11 mm (red), sub-display: 5.5 mm (green))
Memory backup method			EEPROM (overwrites: 100,000 times min.) that can store data for 10 years min.
Ambient operating temperature			–10 to 55°C (with no icing or condensation)
Storage temperature			–25 to 65°C (with no icing or condensation)
Ambient humidity			25 to 85%
Degree of protection			Panel surface: IP40, rear case: IP20
Case color			Light grey (Munsell 5Y7/1)

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 10 V/100 mA. 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



96 × 48 mm (1/8 DIN)

Advanced

Which application is required?

Process	Temperature	Weighing	Linear sensor	Up/down counting pulse	Time interval	Rotary pulse
K3HB-X	**K3HB-H**	**K3HB-V**	**K3HB-S**	**K3HB-C**	**K3HB-P**	**K3HB-R**
						
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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	■	■	■	■	■
	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	■	–	–	–	□
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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: ±0.3% of full scale, Pt-100: ±0.2% of full scale	±0.1% of full scale	One input: ±0.1% of full scale, two inputs: ±0.2% of full scale		±0.08% rgd ±1 digit	±0.006% rgd ±1 digit ±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
□	□	□	■	■	■
□	□	□	■	■	■
■	–	–	–	–	–
–	–	–	–	–	–
–	–	–	■	■	■
–	■	–	–	–	–
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–	–	■	–	–	–
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□	□	□	□	□	□
□	□	□	□	□	□
□	□	□	□	□	□
□	□	□	□	□	□
–	–	–	□	□	□
□	□	□	□	□	□
160			162		

■ Standard □ Available – No/not available

Compact and intelligent digital panel meter

The K3GN is able to cover a wide variety of applications with its 3 main functions: process meter, RPM processor/tachometer and digital data display for PC/PLC. Configuration is easy and the design is advanced and compact.

- Process indicator DC voltage/current
- RPM process/tachometer
- Digital data display for PC/PLC
- Very compact 1/32 DIN housing: Size in mm (HxWxD): 24x48x83mm
- 5-digit display with programmable display color, in red or green

Ordering information

Input type	Supply voltage	Output	Order code	
			No communications	RS-485
DC voltage/current, NPN	24 VDC	Dual relays (SPST-NO)	K3GN-NDC 24 DC	K3GN-NDC-FLK 24 DC
		Three NPN open collector	K3GN-NDT1 24 DC	K3GN-NDT1-FLK 24 DC
DC voltage/current, PNP		Dual relays (SPST-NO)	K3GN-PDC 24 DC	K3GN-PDC-FLK 24 DC
		Three PNP open collector	K3GN-PDT2 24 DC	K3GN-PDT2-FLK 24 DC

Specifications

Supply voltage	24 VDC
Operating voltage range	85 to 110% of the rated supply voltage
Power consumption	2.5 W max. (at max. DC load with all indicators lit)
Ambient temperature	Operating: –10 to 55°C (with no condensation or icing) Storage: –25 to 65°C (with no condensation or icing)
Display refresh period	Sampling period (sampling times multiplied by number of averaging times if average processing is selected)
Max. displayed digits	5 digits (–19999 to 99999)
Display	7-segment digital display, character height: 7.0 mm
Polarity display	"-" is displayed automatically with a negative input signal
Zero display	Leading zeros are not displayed
Scaling function	Programmable with front-panel key inputs (range of display: -19999 to 99999). The decimal point position can be set as desired.
External controls	HOLD: (measurement value held)
	ZERO: (forced-zero)
Hysteresis setting	Programmable with front-panel key inputs (0001 to 9999)
Other functions	Programmable color display Selectable output operating action Teaching set values Average processing (simple average) Lockout configuration Communications writing control (communications output models only)
Output	Relays: 2 SPST-NO Transistors: 3 NPN open collector 3 PNP open collector
	Combinations: Communications output (RS-485) + relay outputs Communications output (RS-485) + transistor outputs Communications output (RS-485) + transistor outputs (3 PNP open collector)
Communications	Communications function: RS-485
Delay in comparative outputs (transistor outputs)	750 ms max.
Degree of protection	Front-panel: NEMA4X for indoor use (equivalent to IP66) Rear case: IEC standard IP20 Terminals: IEC standard IP20
Memory protection	Non-volatile memory (EEPROM) (possible to rewrite 100,000 times)
Size in mm (H×W×D)	24×48×80

Highly visible LCD display with 2 color (red and green) LEDs

The K3MA series comes with a process meter, a frequency/rate meter and a temperature meter of either 100 to 240 VAC or 24 VAC/VDC. All are equipped with the same quality display and have the same short depth of 80 mm.

- 1/8 DIN size housing
- Highly visible, negative transmissive backlit LCD display
- 14.2 mm high characters
- 5 digits (–19,999 to 99,999), K3MA-L: 4 digits
- Front-panel IP66

Ordering information

Indicator	Supply voltage	Input type & ranges	Output	Order code
Process meter	100 to 240 VAC	DC voltage: 0 to 5 V, 1 to 5 V, -5 to 5 V, -10 to 10 V DC current: 0 to 20 mA, 4 to 20 mA	2 relay contact outputs (SPST-NO)	K3MA-J-A2 100-240VAC
	24 VAC/VDC		2 relay contact outputs (SPST-NO)	K3MA-J-A2 24VAC/VDC
Temperature meter	100 to 240 VAC	Platinum-resistance thermometer: Pt100, JPt100 or thermocouple K, J, T, E, L, U, N, R, S, B	1 relay contact output (SPDT)	K3MA-L-C 100-240VAC
	24 VAC/VDC		1 relay contact output (SPDT)	K3MA-L-C 24VAC/VDC
Frequency/rate meter	100 to 240 VAC	Rotary pulse: No voltage: 0.05 to 30.00 Hz; open collector: 0.1 to 5000.0 Hz	2 relay contact outputs (SPST-NO)	K3MA-F-A2 100-240VAC
	24 VAC/VDC		2 relay contact outputs (SPST-NO)	K3MA-F-A2 24VAC/VDC

Accessories

Type	Order code
Splash-proof soft cover	K32-49SC
Hard cover	K32-49HC

Specifications

Item	100-240 VAC models	24 VAC/VDC models
Supply voltage	100 to 240 VAC	24 VAC (50/60 Hz), 24 VDC
Operating voltage range	85 to 110% of the rated supply voltage	
Power consumption (under maximum load)	6 VA max.	4.5 VA max. (24 VAC) 4.5 W max. (24 VDC)
Ambient temperature	Operating: –10 to 55°C (with no condensation or icing) Storage: –25 to 65°C (with no condensation or icing)	
Weight	Approx. 200 g	
Display	7-segment digital display, character height: 14.2 mm	
Polarity display	"-" is displayed automatically with a negative input signal	
Zero display	Leading zeros are not displayed	
Hold function	Max. hold (maximum value), min. hold (minimum value)	
Hysteresis setting	Programmable with front-panel key inputs (0001 to 9,999)	
Delay in comparative outputs	1 s max.	
Degree of protection	Front-panel: NEMA4X for indoor use (equivalent to IP66) Rear case: IEC standard IP20 Terminals: IEC standard IP00 + finger protection (VDE 0106/100)	
Memory protection	Non-volatile memory (EEPROM) (possible to rewrite 100,000 times)	
Size in mm (H×W×D)	48×96×80	

Process, temperature, weighing and linear sensor indicators

These indicators with analog input feature a clear and easy-to-use color change display. All models are equipped with an IP66 housing. K3HB series is high speed, with a sample rate of 50 Hz, and even 2,000 Hz for K3HB-S

- Position meter indication for easy monitoring
- Optional DeviceNet, RS-232C, RS-485
- Double display, with 5 digits, in two colors
- 1/8 DIN size housing

Ordering information

Type of indicator	Input sensor type and range	Supply voltage	Order code
Process indicator K3HB-X	AC current input, from 0.000 to 10.000 A, 0.0000 to 19.999 mA	100 to 240 VAC	K3HB-XAA 100-240VAC
		24 VAC/VDC	K3HB-XAA 24VAC/VDC
	DC current input, from ±199.99 mA, to 4.000 to 20.000 mA	100 to 240 VAC	K3HB-XAD 100-240VAC
		24 VAC/VDC	K3HB-XAD 24VAC/VDC
	AC voltage input, from 0.0 to 400.0 V to 0.0000 to 1.999 V	100 to 240 VAC	K3HB-XVA 100-240VAC
		24 VAC/VDC	K3HB-XVA 24VAC/VDC
	DC voltage input, from ±199.99 V to 1.0000 to 5.0000 V	100 to 240 VAC	K3HB-XVD 100-240VAC
		24 VAC/VDC	K3HB-XVD 24VAC/VDC
Temperature indicator K3HB-H	Temperature input Pt100, thermocouple K, J, T, E, L, U, N, R, S, B, W	100 to 240 VAC	K3HB-HTA 100-240VAC
		24 VAC/VDC	K3HB-HTA 24VAC/VDC
Weighing indicator K3HB-V	Load cell input (DC low voltage input), 0.00 to 199.99 mV, 0.000 to 19.999 mV, 100.00 mV, 199.999 mV	100 to 240 VAC	K3HB-VLC 100-240 VAC
		24 VAC/VDC	K3HB-VLC 24VAC/VDC
Linear sensor indicator K3HB-S	DC process input, 0 to 5 V, 1 to 5 V, –5 to 5 V, –10 to 10 V, 0 to 20 mA, 4 to 20 mA	24 VAC/VDC	K3HB-SSD AC/DC24
		100 to 240 VAC	K3HB-SSD AC100-240

Option boards

Sensor power supply/output boards

Slot	Output		Sensor power supply	Communications	Applicable indicator types	Order code
B	Relay	PASS: SPDT	12 VDC ±10%, 80 mA	–	K3HB-X, -H, -S	K33-CPA *1
	Linear current	DC0(4) - 20 mA		–	K3HB-X, -H, -S	K33-L1 A *2
	Linear voltage	DC0(1) - 5 V, 0 to 10 V		–	K3HB-X, -H, -S	K33-L2A *2
	–	–		–	K3HB-X, -H, -S	K33-A *2
	–	–		RS-232C	K3HB-X, -H, -S	K33-FLK1 A *2
	–	–		RS-485	K3HB-X, -H, -S	K33-FLK3A *2
	Relay	PASS: SPDT	10 VDC ±5%, 100 mA	–	K3HB-V	K33-CPB *1
	Linear current	DC0(4) - 20 mA		–	K3HB-V	K33-L1B *2
	Linear voltage	DC0(1) - 5 V, 0 to 10 V		–	K3HB-V	K33-L2B *2
	–	–		–	K3HB-V	K33-B *2
	–	–		RS-232C	K3HB-V	K33-FLK1B *2
	–	–		RS-485	K3HB-V	K33-FLK3B *2

Relay/transistor output boards

Slot	Output		Communications	Order code
C	Relay	H/L: SPDT each	–	K34-C1
		HH/H/LL/L: SPST-NO each	–	K34-C2
	Transistor	NPN open collector: HH/H/PASS/L/LL	–	K34-T1
		PNP open collector: HH/H/PASS/L/LL	–	K34-T2
	–	–	DeviceNet	K34-DRT *2

Event input boards

Slot	Input type	Number of points	Communications	Order code
D	NPN open collector	5	M3 terminal blocks	K35-1
		8	10-pin MIL connector	K35-2
	PNP open collector	5	M3 terminal blocks	K35-3
		8	10-pin MIL connector	K35-4

*1 CPA/CPB can be combined with relay outputs only.
*2 Only one of the following can be used by each digital indicator: RS-232C/RS-485 communications, a linear output, or DeviceNet communications. K3HB has got three slots for option boards: Slot B, slot C and slot D.

Accessories

Type	Order code
Special cable (for event inputs with 8-pin connector)	K32-DICN

Specifications

Power supply voltage			100 to 240 VAC (50/60 Hz), 24 VAC/VDC, DeviceNet power supply: 24 VDC
Allowable power supply voltage range			85 to 110% of the rated power supply voltage, DeviceNet power supply: 11 to 25 VDC
Power consumption			100 to 240 V: 18 VA max. (max. load), 24 VAC/DC: 11 VA/7 W max. (max. load)
Display method			Negative LCD (backlit LED) display 7-segment digital display (character height: PV: 14.2 mm (green/red); SV: 4.9 mm (green))
Ambient operating temperature			–10 to 55°C (with no icing or condensation)
Display range			–19,999 to 99,999
Weight			Approx. 300 g (base unit only)
Degree of protection		Front-panel	Conforms to NEMA 4X for indoor use (equivalent to IP66)
		Rear case	IP20
		Terminals	IP00 + finger protection (VDE0106/100)
Memory protection			EEPROM (non-volatile memory), number of rewrites: 100,000
Event input ratings		Contact	ON: 1 kΩ max., OFF: 100 kΩ min.
		No-contact	ON residual voltage: 2 V max., OFF leakage current: 0.1 mA max., load current: 4 mA max. Maximum applied voltage: 30 VDC max.
Output ratings	Transistor output	Maximum load voltage	24 VDC
		Maximum load current	50 mA
		Leakage current	100 µA max.
	Contact output (resistive load)	Rated load	5 A at 250 VAC, 5 A at 30 VDC
		Rated through current	5 A
		Mechanical life expectancy	5,000,000 operations
		Electrical life expectancy	100,000 operations
	Linear output	Allowable load impedance	500 Ω max. (mA); 5 kΩ min. (V)
		Resolution	Approx. 10,000
		Output error	±0.5% FS
Size in mm (H×W×D)			48×96×100

Rotary pulse, timer interval and up/down counting pulse indicators

These indicators with analog input feature a clear and easy-to-use color change display. All models are equipped with an IP66 housing. K3HB-R and -C are high-speed, with a sample rate up to 50 kHz.

- Position meter indication for easy monitoring
- Optional DeviceNet, RS-232C, RS-485
- Double display, with 5 digits, in two colors
- 1/8 DIN size housing

Ordering information

Type of indicator	Input ranges	Supply voltage	Input sensor	Order code
Rotary pulse indicator K3HB-R	No voltage contact: 30 Hz max. Voltage pulse: 50 kHz max. Open collector: 50 kHz max.	100 to 240 VAC	NPN input/voltage pulse	K3HB-RNB 100-240VAC
		24 VAC/VDC		K3HB-RNB 24VAC/VDC
		100 to 240 VAC	PNP input	K3HB-RPB 100-240VAC
		24 VAC/VDC		K3HB-RPB 24VAC/VDC
		100 to 240 VAC	NPN	K3HB-PNB 100-240VAC
		100 to 240 VAC	PNP	K3HB-PPB 100-240VAC
Timer interval indicator K3HB-P		24 VAC/VDC	PNP	K3HB-PPB 24VAC/VDC
		100 to 240 VAC	NPN	K3HB-CNB 100-240VAC
Up/down counting pulse indicator K3HB-C		24 VAC/VDC	NPN	K3HB-CNB 24VAC/VDC
		24 VAC/VDC	PNP	K3HB-CPB 24VAC/VDC

Option boards

Sensor power supply/output boards

Slot	Output		Sensor power supply	Communications	Order code
B	Relay	PASS: SPDT	12 VDC ±10%, 80 mA	–	K33-CPA *1
	Linear current	DC0(4) - 20 mA		–	K33-L1 A *2
	Linear voltage	DC0(1) - 5 V, 0 to 10 V		–	K33-L2A *2
	–	–		–	K33-A *2
	–	–		RS-232C	K33-FLK1 A *2
	–	–		RS-485	K33-FLK3A *2

Relay/transistor output boards

Slot	Output		Communications	Order code
C	Relay	H/L: SPDT each	–	K34-C1
		HH/H/LL/L: SPST-NO each	–	K34-C2
	Transistor	NPN open collector: HH/H/PASS/L/LL	–	K34-T1
		PNP open collector: HH/H/PASS/L/LL	–	K34-T2
	–		DeviceNet	K34-DRT *2
	BCD + transistor	NPN open collector: HH/H/PASS/L/LL	–	K34-BCD

Event input boards

Slot	Input type	Number of points	Communications	Order code
D	NPN open collector	5	M3 terminal blocks	K35-1
		8	10-pin MIL connector	K35-2
	PNP open collector	5	M3 terminal blocks	K35-3
		8	10-pin MIL connector	K35-4

*1 CPA can be combined with relay outputs only.
*2 Only one of the following can be used by each digital indicator: RS-232C/RS-485 communications, a linear output, or DeviceNet communications. K3HB has got three slots for option boards: Slot B, slot C and slot D.

Accessories

Type	Order code
Special cable (for event inputs with 8-pin connector)	K32-DICN
Special BCD output cable	K32-BCD

Specifications

Power supply voltage			100 to 240 VAC (50/60 Hz), 24 VAC/VDC, DeviceNet power supply: 24 VDC
Allowable power supply voltage range			85 to 110% of the rated power supply voltage, DeviceNet power supply: 11 to 25 VDC
Power consumption			100 to 240 V: 18 VA max. (max. load), 24 VAC/DC: 11 VA/7 W max. (max. load)
Display method			Negative LCD (backlit LED) display 7-segment digital display (character height: PV: 14.2 mm (green/red); SV: 4.9 mm (green))
Ambient operating temperature			–10 to 55°C (with no icing or condensation)
Display range			–19,999 to 99,999
Weight			Approx. 300 g (base unit only)
Degree of protection		Front-panel	Conforms to NEMA 4X for indoor use (equivalent to IP66)
		Rear case	IP20
		Terminals	IP00 + finger protection (VDE0106/100)
Memory protection			EEPROM (non-volatile memory), number of rewrites: 100,000
Event input ratings		Contact	ON: 1 kΩ max., OFF: 100 kΩ min.
		No-contact	ON residual voltage: 2 V max., OFF leakage current: 0.1 mA max., load current: 4 mA max. Maximum applied voltage: 30 VDC max.
Output ratings	Transistor output	Maximum load voltage	24 VDC
		Maximum load current	50 mA
		Leakage current	100 µA max.
	Contact output (resistive load)	Rated load	5 A at 250 VAC, 5 A at 30 VDC
		Rated through current	5 A
		Mechanical life expectancy	5,000,000 operations
		Electrical life expectancy	100,000 operations
	Linear output	Allowable load impedance	500 Ω max. (mA); 5 kΩ min. (V)
		Resolution	Approx. 10,000
		Output error	±0.5% FS
Size in mm (H×W×D)			48×96×100

Safety

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.

Content

Safety

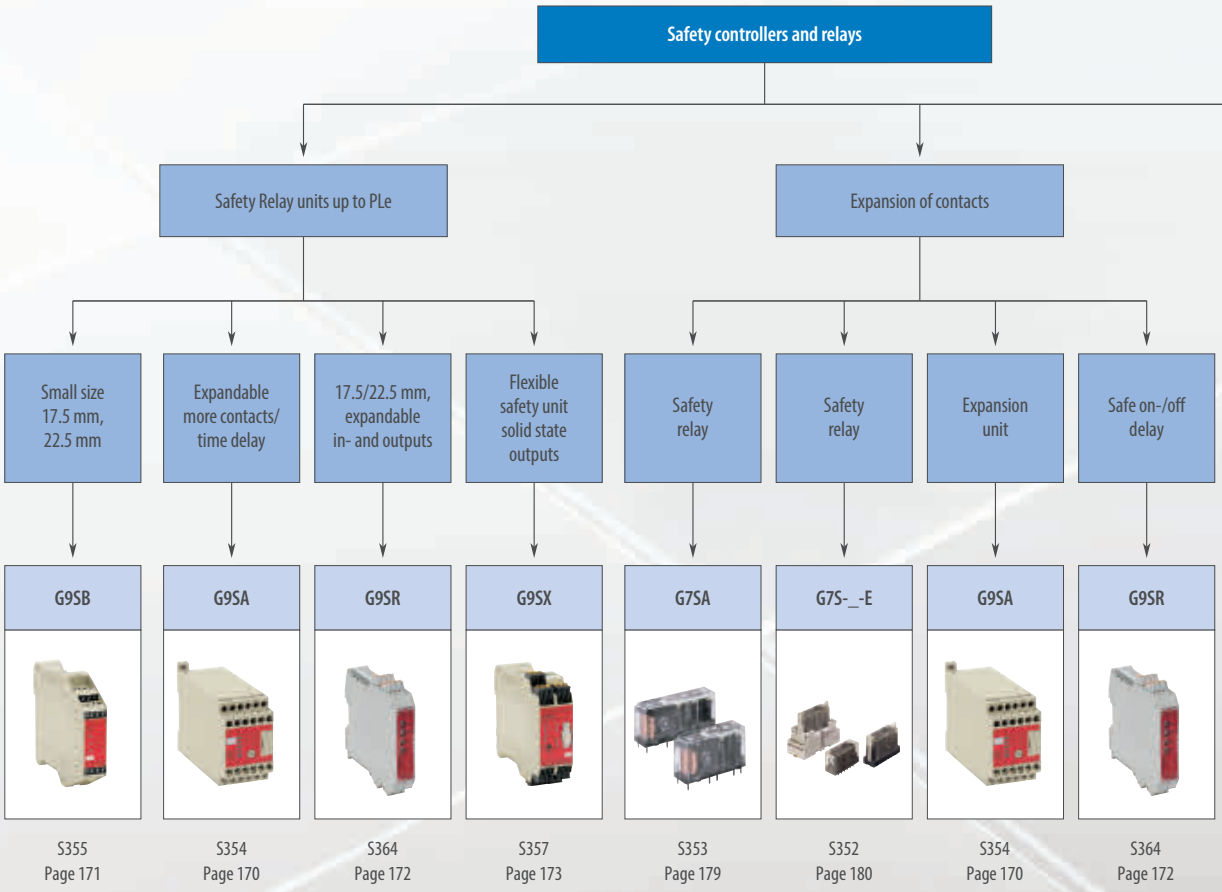
Safety control systems

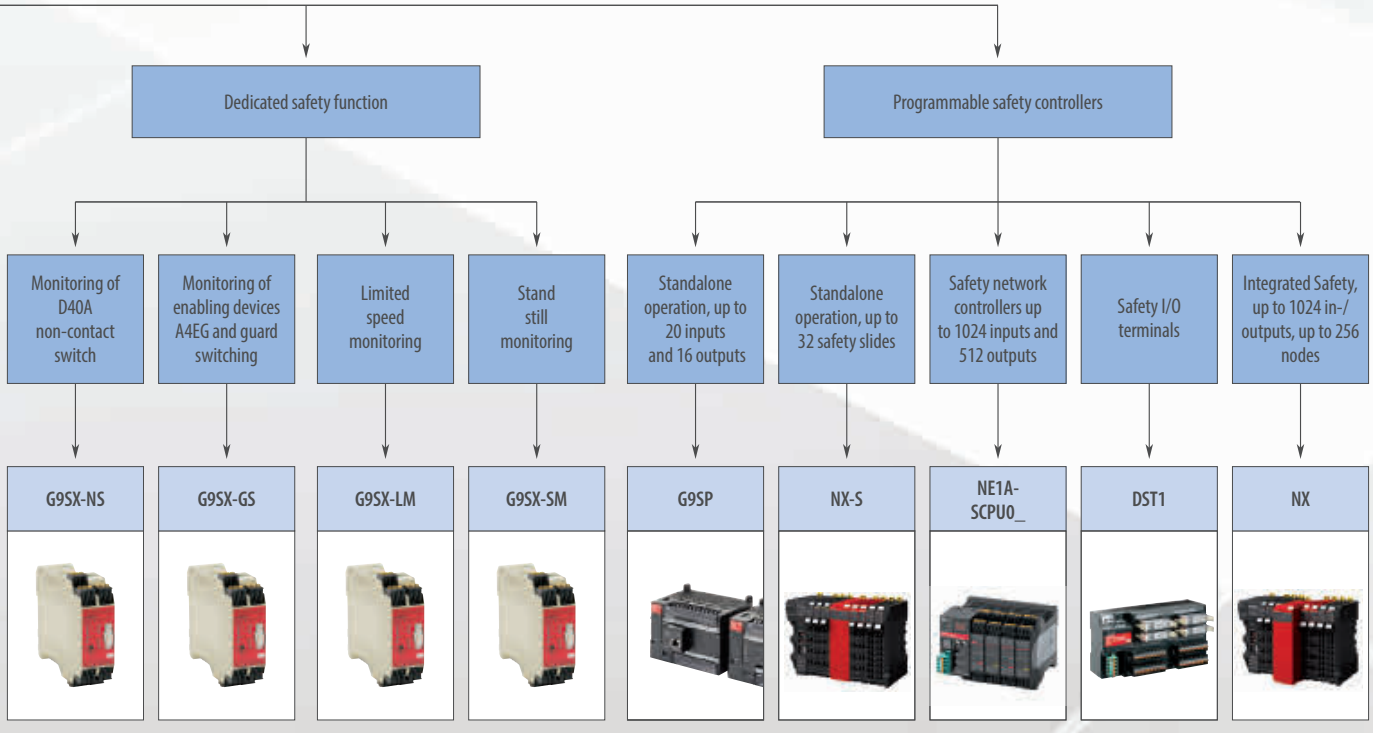
BREAK THROUGH BARRIERS IN SAFETY DESIGN

Configurable, flexible and simple

Omron safety controllers offer transparent standalone operation and scalability in safety networking applications for all sizes of machine safety control systems. The G9SP safety controller is simple to configure and setup and overcomes limitations of hard-wired solutions by adding flexibility of a software - based solution. Total cost of ownership is reduced by having user-defined function blocks and an integrated simulation tool for debugging or the application program.

- EN ISO 13849-1 (PLe) and IEC 61508 (SIL3) certification for future-proof design of the safety system
- Predefined function blocks for simple configuration and self-explanatory validation
- Equipped with Ethernet and serial interface for transparent diagnosis




Dedicated safety function
Programmable safety controllers
Monitoring of D40A non-contact switch
Monitoring of enabling devices A4EG and guard switching
Limited speed monitoring
Stand still monitoring
Standalone operation, up to 20 inputs and 16 outputs
Standalone operation, up to 32 safety slides
Safety network controllers up to 1024 inputs and 512 outputs
Safety I/O terminals
Integrated Safety, up to 1024 in-/outputs, up to 256 nodes
G9SX-NS
G9SX-GS
G9SX-LM
G9SX-SM
G9SP
NX-S
NE1A-SCPU0_
DST1
NX
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Selection table

		Safety relay units		Safety relays	Flexible safety unit
					
Model		**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
	Reaction time	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
	Operating temperature	–25 to 55°C	–25 to 55°C	–10 to 55°C	–10 to 55°C
	Flux-tight	–	–	–	–
	Number of poles	–	–	–	–
Features	Gold clad contacts	–	–	–	–
	Relay socket	–	–	–	–
	Detachable cage clamp terminals	–	–	■	■
	Screw terminals	■	■	optional	■
	Safe timing functions	■	–	on-delay and off-delay	■
	USB-interface	–	–	–	–
	Programming software	–	–	–	–
Application	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	■	–	■	■
	Two-Hand control	■	–	■	–
	Manual/ automatic reset	■	■	■	■
	Non-contact switches monitoring	–	–	■	■
	Guard switching/ enabling function	–	–	■	■
	limited speed monitoring	–	–	–	■
	standstill monitoring	–	–	–	■
	General safety application	■	■	■	■
Supply voltage	24 VDC	■	■	■	■
	100 VAC to 240 VAC	■	–	–	–
In- and outputs	Safety inputs	■	■	■	■
	Test signal output	–	–	■	■
	Solid state safety outputs	–	–	■	■
	Safety relay outputs	3PST-NO, 5PST-NO	DPST-NO, 3PST-NO	DPST-NO, 3PST-NO	■
	Auxiliary outputs	SPST-NC	SPST-NC	Solid state, SPST-NO	■
	4PST-NO + DPST-NC	–	–	–	–
	3PST-NO + 3PST-NC	–	–	–	–
	3PST-NO + SPST-NC	–	–	–	–
	DPST-NO + DPST-NC	–	–	–	–
	5PST-NO + SPST-NC	–	–	–	–
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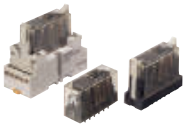
		Safety relays		Programmable safety system		
						
Model		**G7SA**	**G7S-_-E**	**G9SP**	**NE1A-SCPU0_**	**DST1**
Selection criteria	Performance level	–	–	up to PLe acc. EN ISO 13849-1 depending on application		
	Safety integrity level (IEC 61508)	–	–	SIL 3		
	Reaction time	–	–	dependent on safety application program		
	DeviceNet safety Bus interface	–	–	–	■	■
	Standard DeviceNet Bus interface	–	–	Diagnosis via Ethernet and Serial interface (option)	■	■
	EDM function	–	–	■	■	■
	Interlock function	–	–	■	■	■
	Logical 'AND' connection	–	–	–	–	–
	Relay expansion units	–	–	–	–	–
	Housing	Plastic	Plastic	Plastic	Plastic	Plastic
	Operating temperature	–40 to 85°C	–25 to 70°C	–10 to 55°C	–10 to 55°C	–10 to 55°C
	Flux-tight	■	■	–	–	–
	Number of poles	4 pole and 6 pole	6 pole	–	–	–
Features	Gold clad contacts	■	–	–	–	–
	Relay socket	■	■	–	–	–
	Detachable cage clamp terminals	–	–	–	■	■
	Screw terminals	–	–	■	–	–
	Safe timing functions	–	–	■	■	■
	USB-interface	–	–	■	■	–
	Programming software	–	–	■	■	–
Application	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	–	–	■	■	■
	Two-Hand control	–	–	■	■	■
	Manual/ automatic reset	–	–	■	■	■
	Non-contact switches monitoring	–	–	■	■	■
	Guard switching/ enabling function	–	–	■	■	■
	limited speed monitoring	–	–	–	–	■
	standstill monitoring	–	–	–	–	■
	General safety application	■	■	■	■	■
Supply voltage	24 VDC	■	■	■	■	■
	100 VAC to 240 VAC	–	–	–	–	–
In- and outputs	Safety inputs	–	–	■	■	■
	Test signal output	–	–	■	■	■
	Solid state safety outputs	–	–	■	■	■
	Safety relay outputs	–	–	–	–	■
	Auxiliary outputs	–	–	■	■	■
	4PST-NO + DPST-NC	■	■	–	–	–
	3PST-NO + 3PST-NC	■	■	–	–	–
	3PST-NO + SPST-NC	■	–	–	–	–
	DPST-NO + DPST-NC	■	–	–	–	–
	5PST-NO + SPST-NC	■	–	–	–	–
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■ 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	G9SA-301
			100 to 240 VAC	
5PST-NO	SPST-NC	1 channel or 2 channels possible	24 VAC/VDC	G9SA-501
			100 to 240 VAC	

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	G9SA-321-T075
					100 to 240 VAC	
				15 s	24 VAC/VDC	G9SA-321-T15
					100 to 240 VAC	
				30 s	24 VAC/VDC	G9SA-321-T30
					100 to 240 VAC	

Two-hand controller

Main contacts	Auxiliary contact	Number of input channels	Rated voltage	Order code
3PST-NO	SPST-NC	2 channels	24 VAC/VDC	G9SA-TH301
			100 to 240 VAC	

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 permissable 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
- 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 13949-1 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 outputs	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: 19.2 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)		

Flexible safety unit

G9SX-family modules can be connected by a logical "AND" function to implement partial/global stopping of a machine. Solid-state outputs, detailed LED diagnosis and clever feedback signals help to keep maintenance easy. The line-up is completed by expansion units with safe timing functions.

- Clear and transparent segmentation of safety functions by use of unique "AND" connection
- Solid-state outputs for long life and relay outputs in extension box available
- Detailed LED indications enable easy diagnosis
- Clever feedback signals for easy maintenance
- 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	Max. OFF-delay time *1	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed						
3 P channel MOS-FET transistor output	2 P channel MOS-FET transistor output	2 PNP transistor outputs	1 or 2 channels	0 to 15 sec in 16 steps	24 VDC	Screw terminals	G9SX-AD322-T15-RT
						Cage clamp terminals	G9SX-AD322-T15-RC
2 P channel MOS-FET transistor output	2 P channel MOS-FET transistor output	2 PNP transistor outputs	1 or 2 channels	0 to 150 sec in 16 steps	24 VDC	Screw terminals	G9SX-AD-322-T150-RT
						Cage clamp terminals	G9SX-AD-322-T150-RC
				0 to 15 sec in 16 steps	24 VDC	Screw terminals	G9SX-ADA-222-T15-RT
						Cage clamp terminals	G9SX-ADA-222-T15-RC
				0 to 150 sec in 16 steps	24 VDC	Screw terminals	G9SX-ADA-222-T150-RT
						Cage clamp terminals	G9SX-ADA-222-T150-RC

*1 The OFF-delay time can be set in 16 steps as follows: T15: 0/0.2/0.3/0.4/0.5/0.6/0.7/1/1.5/2/3/4/5/7/10/15 s, T150: 0/10/20/30/40/50/60/70/80/90/100/110/120/130/140/150 s.

Basic unit

Safety outputs		Auxiliary outputs	No. of input channels	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed					
2 P channel MOS FET transistor output	–	2 PNP transistor output	1 or 2 channels	24 VDC	Screw terminals	G9SX-BC202-RT
					Cage clamp terminals	G9SX-BC202-RC

Expansion unit

Safety outputs		Auxiliary outputs	OFF-delay time	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed					
4 PST-NO (contact)	–	2 (solid state) PNP transistor outputs	–	24 VDC	Screw terminals	G9SX-EX401-RT
					Cage clamp terminals	G9SX-EX401-RC
–	4 PST-NO (contact)		Synchronized with G9S-X-AD - unit		Screw terminals	G9SX-EX041-T-RT
					Cage clamp terminals	G9SX-EX041-T-RC

Specifications

Power input

Item	G9SX-AD_	G9SX-BC202-_	G9SX-EX-_
Rated supply voltage	20.4 to 26.4 VDC (24 VDC -15% +10%)		

Inputs

Item	G9SX-AD_	G9SX-BC202-_
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC, internal impedance: Approx. 2.8 kΩ	
Feedback/reset input		

Outputs

Item	G9SX-AD_	G9SX-BC202-_
Instantaneous safety output OFF-delayed safety output	P channel MOS FET transistor output Load current:Using 2 outputs or less: 1 A DC max. Using 3 outputs or more: 0.8 A DC max.	P channel MOS FET transistor output Load current:Using 1 output: 1 A DC max. Using 2 outputs: 0.8 A DC max.
Auxiliary output	PNP transistor output Load current: 100 mA max.	

Expansion unit

Item	G9SX-EX-_
Rated load	250 VAC, 3A/30 VDC, 3A (resistive load)
Rated carry current	3 A
Maximum switching voltage	250 VAC, 125 VDC

Characteristics

Item		G9SX-AD_	G9SX-BC202-_	G9SX-EX-_
Operating time (OFF to ON state)		50 ms max. (Safety input: ON) 100 ms max. (Logical AND connection input: ON)	50 ms max. (Safety input: ON)	30 ms max.
Response time (ON to OFF state)		15 ms max.		10 ms max.
Durability	Electrical	–		100,000 cycles min.
	Mechanical	–		5,000,000 cycles min.
Ambient temperature		–10°C +55°C (with no icing or condensation)		

Safety guard switchting unit

The safety controller to support maintenance mode of machinery in the safe way.

- Two operation modes to support:
  - Auto switching for applications where machine and worker co-operate.
  - Manual switching for applications with limitation in operation like maintenance.
- Clear and transparent segmentation of safety functions by use of unique "AND" connection
- Clear LED diagnosis of all in- and output signals for easy maintenance
- PLe according to EN ISO 13849-1 and SIL 3 according to EN 61508.

Ordering information

Enabling grip switches

Contact form			Order code
Enabling switch	Monitor switch	Pushbutton switch	
Two contacts	1NC (grip output)	None	A4EG-C000041
Two contacts	None	Emergency stop switch (2NC)	A4EG-BE2R041
Two contacts	None	Momentary operation switch (2NO)	A4EG-BM2B041

Safety guard switching units

Safety outputs *1		Auxiliary outputs *2	Logical AND connection input	Logical AND connection output	Max. OFF delay time *3	Rated voltage	Terminal block type	Order code
Instantaneous	OFF-delayed *4							
2 (Semi-conductors)	2 (Semi-conductors)	6 (Semi-conductors)	1	1	15 s	24 VDC	Screw terminals	G9SX-GS226-T15-RT
							Spring-cage terminals	G9SX-GS226-T15-RC

*1 P channel MOS FET transistor output
*2 PNP transistor output
*3 The OFF-delay time can be set in 16 steps as follows:
T15: 0, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 1, 1.5, 2, 3, 4, 5, 7, 10 or 15 s
*4 The OFF-delayed output becomes an instantaneous output by setting the OFF-delay time to 0 s.

Specifications

Ratings of guard switching unit

Power input

Item	G9SX-GS226-T15-_	G9SX-EX-_
Rated supply voltage	24 VDC	

Inputs

Item	G9SX-GS226-T15-_
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC, internal impedance: approx. 2.8 kΩ
Feedback/reset input	
Mode selector input	

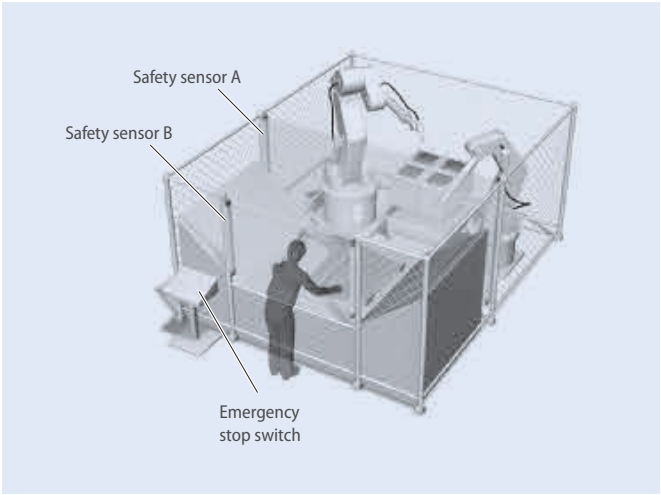
Outputs

Item	G9SX-G9SX-GS226-T15-_
Instantaneous safety output OFF-delayed safety output	P channel MOS FET transistor output Load current: 0.8 A DC max.
Auxiliary output	PNP transistor output Load current: 100 mA max.
External indicator outputs	P channel MOS FET transistor outputs Connectable indicators • Incandescent lamp: 24 VDC, 3 W to 7 W • LED lamp: 10 to 300 mA DC

Application example

Automatic switching mode

Worker is loading and unloading the machine manually. When loading is finished, robot cycle is started manually by the worker. When robots return to their home position, loading cycle is selected automatically.
Loading condition: Safety sensor B is not active, safety sensor A is active because the robots are not allowed to move to the loading area while the worker loads the machine. So the worker is safe because safety sensor A is active.
Robot work condition: Safety sensor B is active, safety sensor A is not active because the worker is not allowed to move to the loading area when the robots work. So the worker is safe because safety sensor B stops the machine if he moves to the loading area.



Manual switching mode

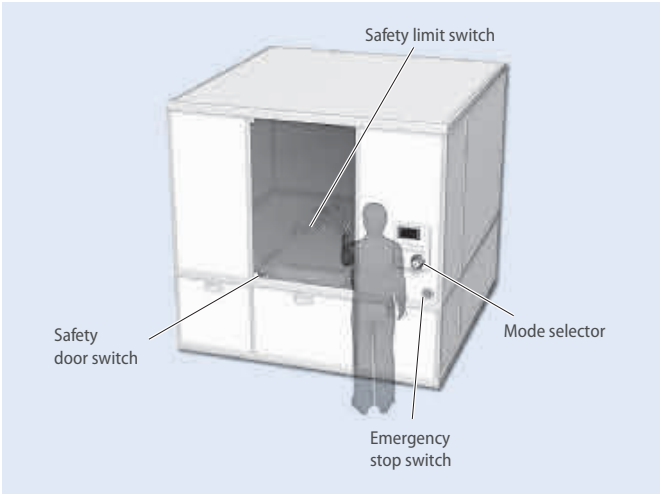
Worker has to do maintenance in this machine. While maintenance, it is necessary to move the machine in a limited way. The worker has to select automatic mode or manual mode manually by using the mode selector switch.

Operation steps:

1) Select maintenance mode by using the mode selector
2) Open the door to do the maintenance while the machine still is able to operate in a limited way (monitoring of limited movement by using the safety limit switch).
3) Close the cover after finishing maintenance
4) Select automatic mode by using the mode selector

E-Stop conditions:

a) open the door while not in maintenance mode
b) the machine actuates the limit switch (breaks the limit).
c) the Enabling grip switch A4EG is actuated to stop the machine in emergency condition.



Limited speed monitoring unit

Safe limited speed monitoring unit for complete support of maintenance mode in machinery.

- Preset of limited speed frequency by using integrated preset switches
- Easy integration in G9SX-Systems by using unique logical "AND" connection
- Clear LED diagnosis of all in- and output signals for easy maintenance
- Applicable up to PLd according to EN ISO 13849-1 using Omron proximity sensors

Ordering information

Proximity sensors

Classification			Order code
Proximity sensor	Shielded	M8	E2E-X1R5F1
		M12	E2E-X2F1
		M18	E2E-X5F1
	Unshielded	M8	E2E-X2MF1
		M12	E2E-X5MF1
		M18	E2E-X10MF1

Ratings of limited speed monitoring unit

Safety outputs *1 Instantaneous	Auxiliary outputs *2	Logical AND connection input	Rated voltage	Sensor power supply terminals	Terminal block type	Order code
4 (Semi-conductors)	4 (Semi-conductors)	1	24 VDC	2	Screw terminals	G9SX-LM224-F10-RT
					Spring-cage terminals	G9SX-LM224-F10-RC

*1 P channel MOS FET output
*2 PNP transistor output

Specifications

Ratings of limited speed monitoring unit

Power input

Item	G9SX-LM224-F10-_
Rated supply voltage	24 VDC

Inputs

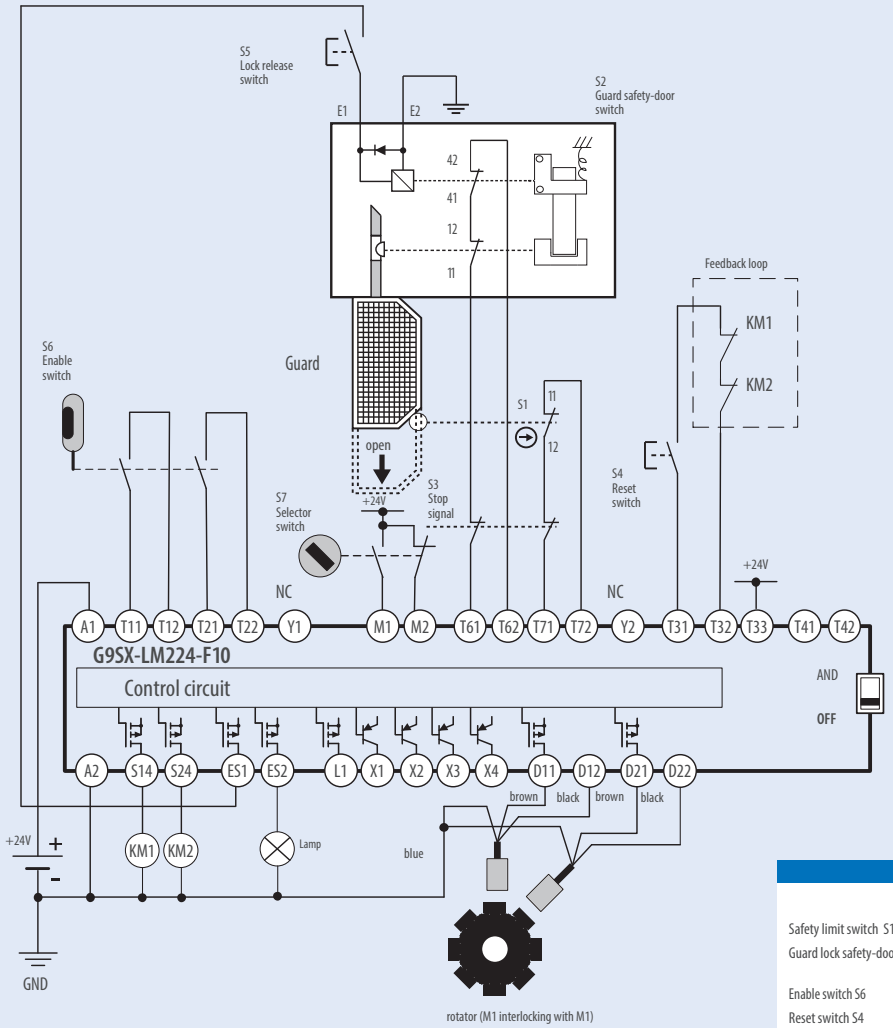
Item	G9SX-LM224-F10-_
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC Internal impedance: approx. 2.8 kΩ
Feedback/reset input	
Mode selector input	
Rotation detection input	Operating voltage 20.4 VDC to 26.4 VDC Internal impedance: approx. 2.8 kΩ Input frequency: 1 kHz max.

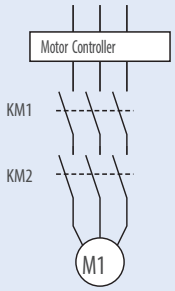
Outputs

Item	G9SX-LM224-F10-_
Safety solid state output	P channel MOS FET transistor output Load current: 0.8 A DC max.
Safety speed detection output	P channel MOS FET transistor output Load current: 0.3 A DC max.
External indicator output	PNP transistor output Load current: 100 mA max.

Application example

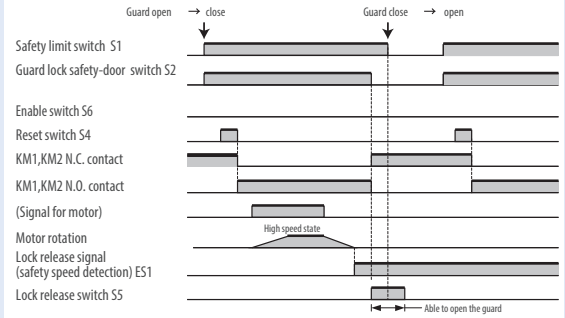
Safe limited speed

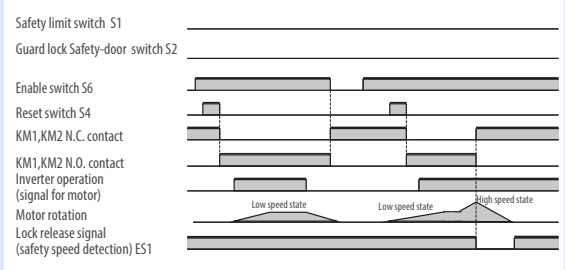




S1	: Safety limit switch
S2	:Guard lock safety-door switch
S3	:Stop signal
S4	:Reset switch
S5	:Lock release switch
S6	:Enable switch
S7	:Selector switch
KM1, KM2	:Contactor
M1	:3-phase motor

This example is corresponding to category 3 (EN954-1 or PL=d (EN ISO13849-1)





Standstill monitoring unit

Safe standstill monitoring unit based on Back-EMF operation for two- and three-phase systems.

- Ready to use – covering all standard applications without additional setup
- Easy integration in star- and delta wiring
- Clear LED diagnosis of all in- and output signals for easy maintenance
- Applicable up to PLe according to EN ISO 13849-1

Ordering information

Safety standstill monitoring unit

Safety outputs *1 Instantaneous	Auxiliary outputs *1	Power input Rated supply voltage	Terminal block type	Order code
3 (Semi-conductors)	2 (Semi-conductors)	24 VDC	Screw terminals	G9SX-SM032-RT
			Spring-cage terminals	G9SX-SM032-RC

*1 PNP transistor output

Specifications

Ratings of standstill monitoring unit

Power input

Item	G9SX-SM032-_
Rated supply voltage	24 VDC

Inputs

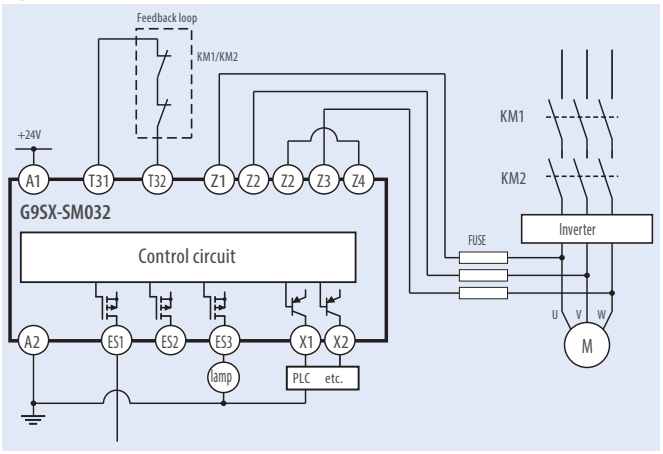
Item	G9SX-SM032-__
Input voltage	Standstill detection input (Z1-Z2/Z3-Z4) AC 415 Vrms + 10% max.
Maximum power supply frequency for AC induction motor	60 Hz max.
Internal impedance	Standstill detection input: approx, 660 kΩ EDM input: approx. 2.8 kΩ

Outputs

Item	G9SX-SM032-_
Safety standstill detection output	Sourcing output (PNP) Load current: 300 mA DC max.
Auxiliary output	Sourcing output (PNP) Load current: 100 mA DC max.

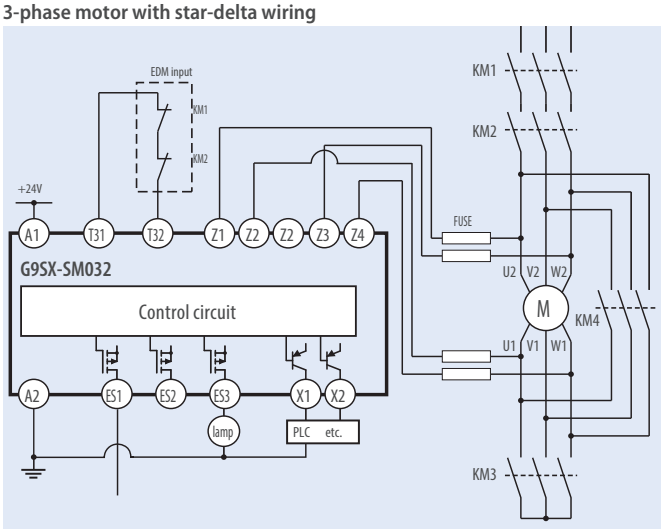
Application example

3-phase motor



Standstill detected

3-phase motor with star-delta wiring



Standstill detected

Relays with forcibly guided contacts

The slim G7SA relay family with forcibly guided contacts is available as a four- or six-pole type in various contact combinations and offers reinforced insulation. Terminals are arranged for easy PCB layout. It can be soldered directly to a PCB or used together with the P7SA sockets.

- Forcibly guided contacts
- Conforms to EN 50205
- 6 A at 240 VAC and 6A at 24 VDC for resistive loads
- Reinforced insulation between inputs and outputs and poles
- 4- and 6-pole relays available

Ordering information

Relays with forcibly guided contacts

Type	Sealing	Poles	Contacts	Rated voltage	Order code
Standard	Flux-tight	4 poles	3PST-NO, SPST-NC	24 VDC*1	G7SA-3A1B
			DPST-NO, DPST-NC		G7SA-2A2B
		6 poles	5PST-NO, SPST-NC		G7SA-5A1B
			4PST-NO, DPST-NC		G7SA-4A2B
			3PST-NO, 3PST-NC		G7SA-3A3B

*1 12 VDC, 21 VDC, 48 VDC are available on request.

Sockets

Type		LED indicator	Poles	Rated voltage	Order code
Track-mounting	Track mounting and screw mounting possible	Yes	4 poles	24 VDC	P7SA-10F-ND
			6 poles		P7SA-14F-ND
Back-mounting	PCB terminals	No	4 poles	–	P7SA-10P
			6 poles		P7SA-14P

Specifications

Coil

Rated voltage	Rated current	Coil resistance	Must-operate voltage	Must-release voltage	Max. voltage	Power consumption
24 VDC	4 poles: 15 mA 6 poles: 20.8 mA	4 poles: 1,600 Ω 6 poles: 1,152 Ω	75% max. (V)	10% min. (V)	110% (V)	4 poles: Approx. 360 mW 6 poles: Approx. 500 mW

Note: Refer to datasheet for details

Contacts

Load	Resistive load (cosϕ = 1)
Rated load	6 A at 250 VAC, 6 A at 30 VDC
Rated carry current	6 A
Max. switching voltage	250 VAC, 125 VDC

Load	Resistive load (cosϕ = 1)
Max. switching current	6 A
Max. switching capacity (reference value)	1,500 VA, 180 W

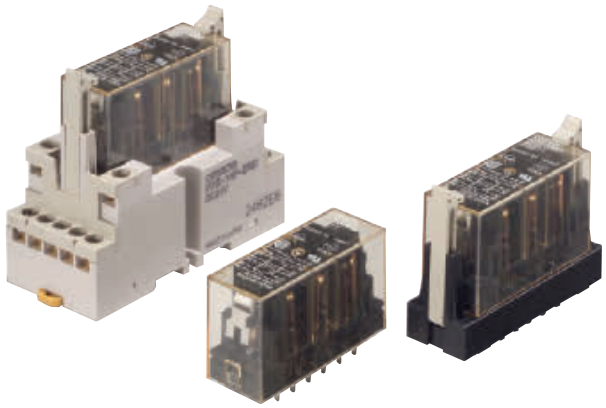
Relays with forcibly guided contacts

Contact resistance		100 mΩ max. (The contact resistance was measured with 1 A at 5 VDC using the voltage-drop method.)
Operating time *1		20 ms max.
Response time *1		10 ms max. (The response time is the time it takes for the normally open contacts to open after the coil voltage is turned OFF.)
Release time *1		20 ms max.
Insulation resistance		100 MΩ min. (at 500 VDC) (The insulation resistance was measured with a 500 VDC megger at the same places that the dielectric strength was measured.)
Dielectric strength *2 *3		Between coil contacts/different poles: 4,000 VAC, 50/60 Hz for 1 min (2,500 VAC between poles 3-4 in 4-pole Relays or poles 3-5, 4-6, and 5-6 in 6-pole Relays.) Between contacts of same polarity: 1,500 VAC, 50/60 Hz for 1 min
Durability	Mechanical	10,000,000 operations min. (at approx. 36,000 operations/hr)
	Electrical	100,000 operations min. (at the rated load and approx. 1,800 operations/hr)
Min. permissible load *4		5 VDC, 1 mA (reference value)
Ambient temperature *5		Operating: –40 to 85°C (with no icing or condensation)
Ambient humidity		Operating: 35 to 85%
Approved standards		EN61810-1 (IEC61810-1), EN50205, UL508, CSA22.2 No. 14

*1 These times were measured at the rated voltage and an ambient temperature of 23°C. Contact bounce time is not included.
*2 Pole 3 refers to terminals 31-32 or 33-34, pole 4 refers to terminals 43-44, pole 5 refers to terminals 53-54, and pole 6 refers to terminals 63-64.
*3 When using a P7SA socket, the dielectric strength between coil contacts/different poles is 2,500 VAC, 50/60 Hz for 1 min.
*4 Min. permissible load is for a switching frequency of 300 operations/min.
*5 When operating at a temperature between 70°C and 85°C, reduce the rated carry current (6 A at 70°C or less) by 0.1 A for each degree above 70°C.

Note: The values listed above are initial values.

Please check Omron in the Internet for updated information on product reliability data and the SISTEMA libraries: http://industrial.omron.eu/safety



Relays with forcibly guided contacts

The slim G7S-_-E relay family with forcibly guided contacts is available as a six-pole type in two different contact combinations. Terminals are arranged for easy PCB layout. It can be soldered directly to a PCB or used together with the P7SA sockets.

- Forcibly guided contacts
- Conforms to EN 50205
- NO contacts: 10 A at 250 VAC and 10 A at 30 VDC
  NC contacts: 6 A at 250 VAC and 6 A at 30 VDC
  (for resistive loads)
- Reinforced insulation between inputs and outputs and poles
- 4- and 6-pole relays available

Ordering information

Relays with forcibly guided contacts

Type	Sealing	Poles	Contacts	Rated voltage	Order code
Standard	Flux-tight	6 poles	4PST-NO, DPST-NC	24 VDC	G7S-4A2B-E
			3PST-NO, 3PST-NC		G7S-3A3B-E

Sockets

Type		LED indicator	Rated voltage	Order code
Track-mounting	Track mounting and screw mounting possible	Yes	24 VDC	P7S-14F-END
Back-mounting	PCB terminals	No	–	P7S-14P-E

Specifications

Ratings

Coil

Rated voltage	Rated current (mA)*1	Coil resistance (Ω)*1	Max. voltage (V)*2	Power consumption (W)
24 VDC	30	800	110%	Approx. 0.8

*1 The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of ±15%.
*2 The maximum voltage is based on an ambient operating temperature of 23°C maximum.

Contacts

Item		Resistive load
Rated load	NO contact	10 A at 250 VAC, 10 A at 30 VDC
	NC contact	6 A at 250 VAC, 6 A at 30 VDC
Rated carry current	NO contact	10 A
	NC contact	6 A

Item		Resistive load
Maximum switching voltage		250 VAC, 30 VDC
Maximum switching current	NO contact	10 A
	NC contact	6 A

G7S-_-E Characteristics of Sockets

Model	P7S-14F-END	P7S-14P-E
Continuous current	10 A	
Dielectric strength	2000 VAC for 1 min. between terminals	
Insulation resistance	1000 MW min. *1	
Ambient operating humidity	25 to 85%	5 to 85%

*1 Measurement conditions: Measurement of the same points as for the dielectric strength at 500 VDC.

Characteristics

Contact resistance*1		100 mΩ max.
Operating time*2		50 ms max.
Release time*2		50 ms max.
Maximum operating frequency	Mechanical	18,000 operations/h
	Rated load	1,800 operations/h
Insulation resistance		100 MΩ min.
Durability*3	Mechanical	10,000,000 operations min. (at approx. 18,000 operations/h)
	Electrical	100,000 operations min. (at the rated load and approx. 1,800 operations/h)
Inductive load switching capability*4 (IEC60947-5-1)	NO Contact	AC15 AC240V 5A, DC13 DC24V 2A
	NC Contact	AC15 AC240V 3A, DC13 DC24V 2A
Ambient operating temperature		–25 to 70°C (with no icing or condensation)
Ambient operating humidity		5% to 85%

*1 Measurement conditions: 5 VDC, 10 mA, voltage drop method.
*2 Measurement conditions: Rated voltage operation, ambient operating temperature: 23°C, contact bounce time is not included.
*3 The durability is for an ambient temperature of 15 to 35°C and an ambient humidity of 25% to 75%.
*4 AC15: cosϕ = 0.3, DC13: L/R = 96-ms

Note: The values listed above are initial values.

Please check Omron in the Internet for updated information on product reliability data and the SISTEMA libraries: http://industrial.omron.eu/safety

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 monitring via Ethernet or serial connection
- Memory cassette for easy duplication of configuration
- Unique programming software to support easy design, verfication, standardization and reusage 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

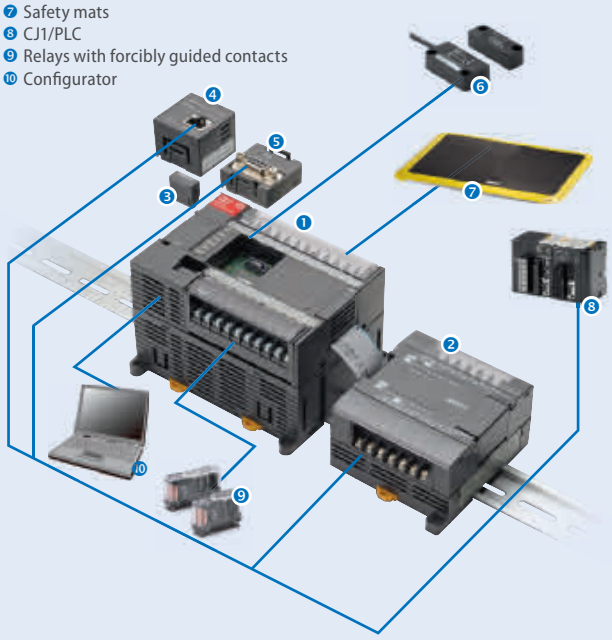
Appearance	Media	Applicable OS	Order code
G9SP configurator	Setup disk 1 license	Windows 2000 Windows XP Windows Vista Windows 7	WS02-G9SP01-V1
	Setup disk 10 licenses		WS02-G9SP10-V1
	Setup disk 50 licenses		WS02-G9SP50-V1
	Setup disk Site license		WS02-G9SPXX-V1

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

G9SP configuration

❶ Safety controller G9SP
❷ Expansion I/O Units
❸ Memory cassette
❹ Ethernet option board
❺ RS-232C option board
❻ Compact non-contact door switch
❼ Safety mats
❽ CJ1/PLC
❾ Relays with forcibly guided contacts
❿ Configurator



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

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)

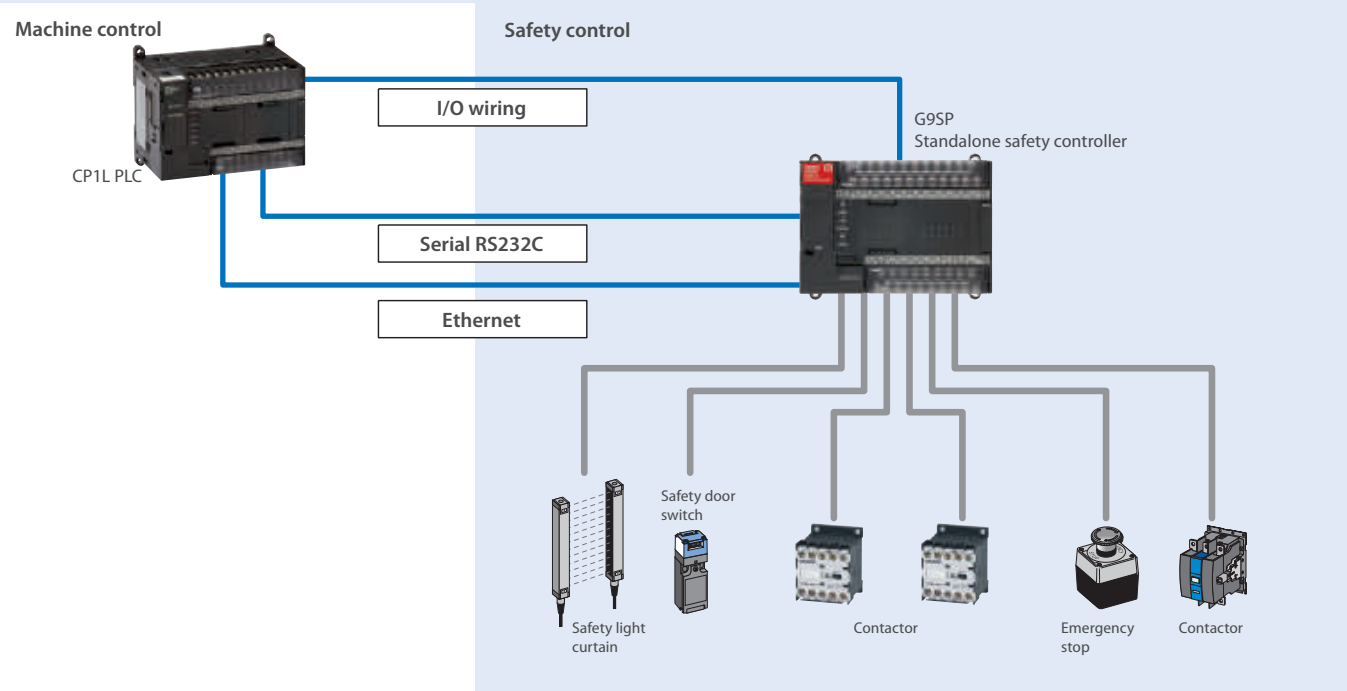
Output type	Sourcing outputs (PNP)
ON Residual voltage	1.5 V max. (between each output terminal and V2)
Rated output current	100 mA max.*

*For details on the rated output current, please refer to the user manual of G9SP.

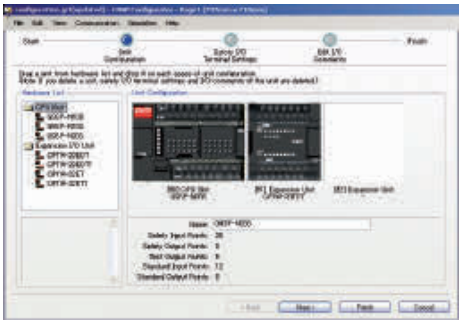
Control system integration

Safety - I/O-status becomes transparent

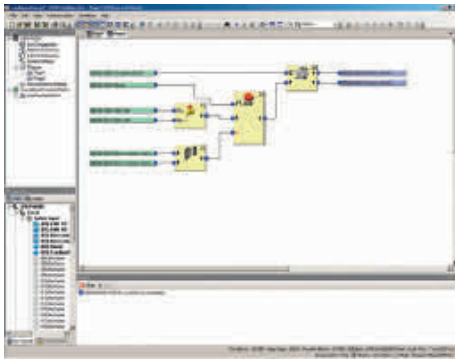
The standalone safety controller offers diagnosis information in 3 ways:
1) via parallel wiring
2) via serial RS232C interface (option)
3) via Ethernet interface (option).
Information of all safety in- and outputs on the standard control system ensure minimum downtime of the machine.



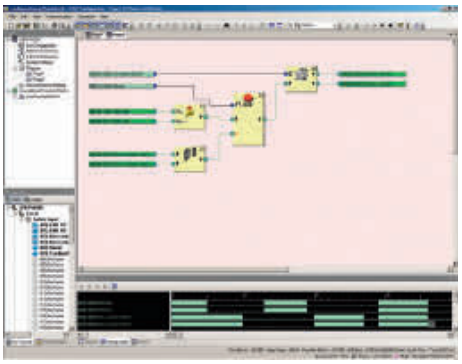
G9SP configuration tool



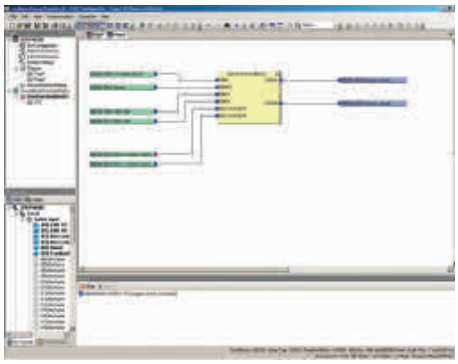
Easy setup and configuration is provided by a setup wizard supporting the hardware selection.



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.



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.



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.

NJ-SERIES MACHINE AUTOMATION CONTROLLER

Complete and robust machine automation

The NJ-Series Machine A utomation Controller is at the heart of the new Sysmac platform. One in tegrated machine controller that o ffers speed, f lexibility and s calability of software centric architecture without compromising on the traditional reliability and robustness that you have come to expect from Omron PLCs. The NJ-Series is de signed to meet extreme machine control requirements in terms of motion control speed and ac curacy, communication, security and robust system. You just create…

- Integration of logic and motion in one Intel CPU
- Scalable control: CPUs for 4, 8, 16, 32 and 64 axes
- EtherCAT and EtherNet/IP ports embedded
- Fully conforms to IEC 61131-3 standards
- Certified PLCopen function blocks for motion control
- Linear, circular and spiral (helical) interpolation
- CPU units with SQL client and robotic functionality

sysmac
always in control

Type of CPU needed?

Standard NJ	NJ Robotics	NJ Database connection
• Sequence	• Sequence	• Sequence
• Motion	• Motion	• Motion
• Vision	• Vision	• Vision
• Safety	• Safety	• Safety
	• **Robotics**	• **Database connection**

up to 8 axes	up to 64 axes
NJ3 series	**NJ5 series**
	
	· NJ5 · NJ5 Robotics · NJ5 Database connection
H245	H248, H246, H252

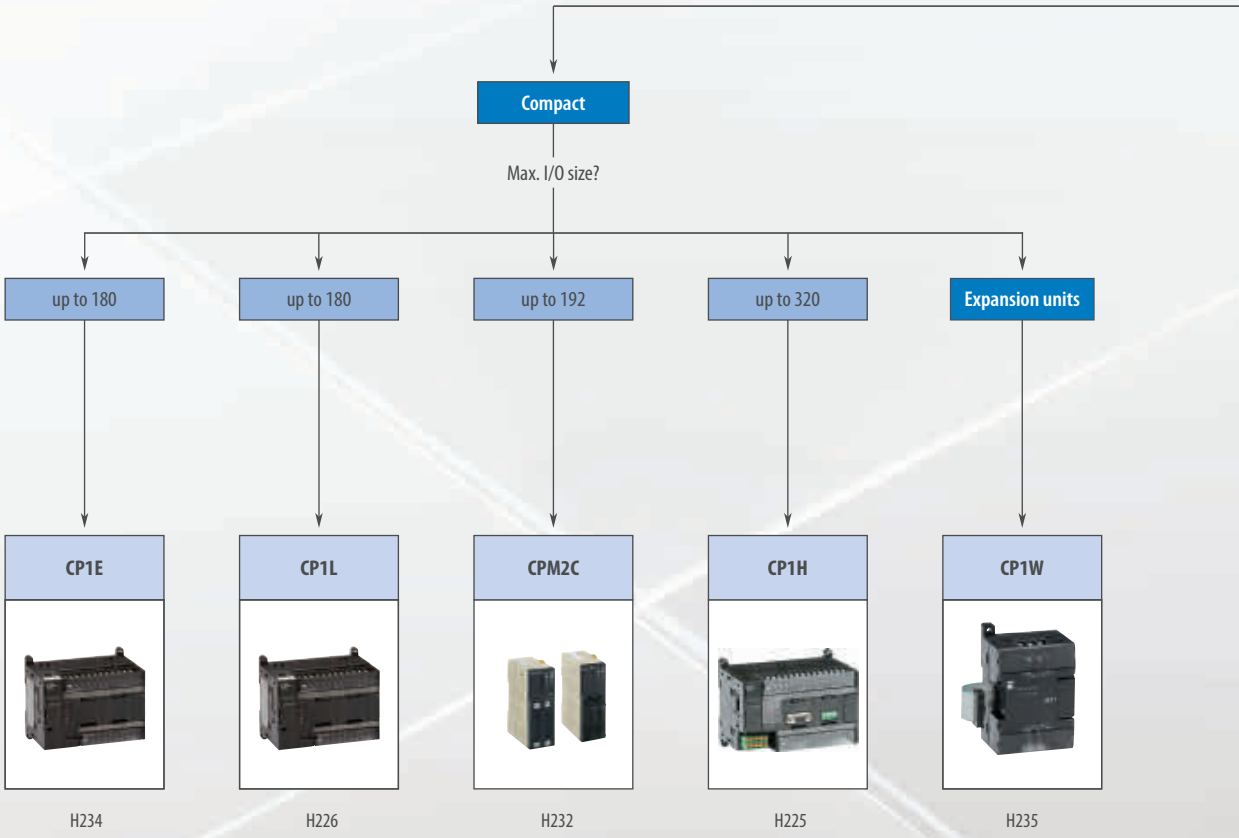
	Machine automation controller			
				
Model	**NJ5**	**NJ5 Robotics**	**NJ5 with Database connection**	**NJ3**
Description	NJ5 series Machine Controller with Sequence and Motion functionality	NJ5 series Machine Controller with Sequence, Motion and Robotics functionality	NJ5 series Machine Controller with Sequence, Motion and Database connection functionality	NJ3 series Machine Controller with Sequence and Motion functionality
Task	Multi-tasking program			
Software	Sysmac Studio			
Programming	• Ladder • Structured Text • In-Line ST			
Standard programming	• IEC 61131-3 • PLCopen Function Blocks for Motion Control			
Program capacity	20 MB			5 MB
SD Memory Card	SD and SDHC Memory card			
Built-in port	• EtherNet/IP • EtherCAT • USB 2.0			
EtherCAT slaves	192			
Number of axes	64, 32, 16			8, 4
Servo Drive	Accurax G5/EtherCAT			
Motion Control	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and group	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and group • Up to 8 Delta Robot control	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and group	
Local I/O (Compatible CJ series units)	**Digital I/O units**		**Analog I/O units**	**Special I/O units**	**Communication units**	**ID sensor units**
	CJ1W-IA201 CJ1W-IA111 CJ1W-ID201 CJ1W-ID211 CJ1W-ID211(SL) CJ1W-ID212 CJ1W-INT01 CJ1W-IDP01 CJ1W-ID231 CJ1W-ID232 CJ1W-ID233 CJ1W-ID261 CJ1W-ID262 CJ1W-OA201 CJ1W-OC201 CJ1W-OC201(SL) CJ1W-OC211 CJ1W-OC211(SL) CJ1W-OD201 CJ1W-OD203 CJ1W-OD211 CJ1W-OD211(SL)	CJ1W-OD213 CJ1W-OD231 CJ1W-OD233 CJ1W-OD234 CJ1W-OD261 CJ1W-OD263 CJ1W-OD202 CJ1W-OD204 CJ1W-OD212 CJ1W-OD212(SL) CJ1W-OD232 CJ1W-OD262 CJ1W-MD232 CJ1W-MD231 CJ1W-MD233 CJ1W-MD261 CJ1W-MD263 CJ1W-MD563	CJ1W-AD04U CJ1W-AD04U(SL) CJ1W-AD041-V1 CJ1W-AD041-V1(SL) CJ1W-AD042 CJ1W-AD081-V1 CJ1W-AD081-V1(SL) CJ1W-DA021 CJ1W-DA021(SL) CJ1W-DA041 CJ1W-DA041(SL) CJ1W-DA042V CJ1W-DA08V CJ1W-DA08V(SL) CJ1W-DA08C CJ1W-DA08C(SL) CJ1W-MAD42 CJ1W-MAD42(SL) CJ1W-PH41U CJ1W-PDC15 CJ1W-TS561 CJ1W-TS561(SL) CJ1W-TS562 CJ1W-TS562(SL) CJ1W-TC003 CJ1W-TC004 CJ1W-TC103 CJ1W-TC104	CJ1W-CT021 CJ1W-CTL41-E	CJ1W-SCU22 CJ1W-SCU32 CJ1W-SCU42 CJ1W-EIP21 CJ1W-DRM21 CJ1W-CRM21 CJ1W-PRM21 CJ1W-PRT21 CJ1W-PNT21 CJ1W-CIF11	CJ1W-V680C11 CJ1W-V680C12
Remote I/O	NX I/O units/EtherCAT			
Mounting	DIN rail			
Global standards	CE, cULus, NK, LR			
Page/Quick Link	H248	H246	H252	H245

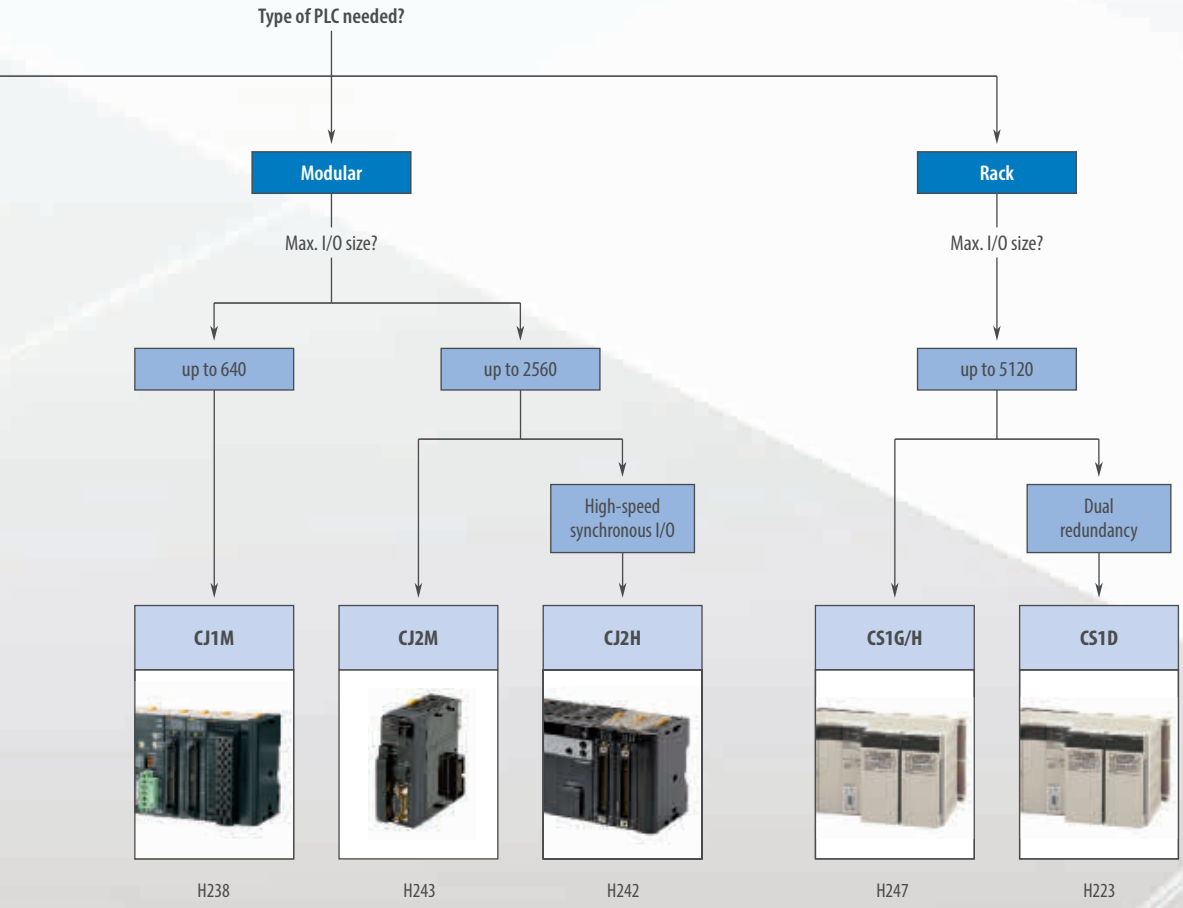
KNOW ONE ... KNOW THEM ALL!

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




Type of PLC needed?
Modular
Rack
Max. I/O size?
Max. I/O size?
up to 640
up to 2560
up to 5120
High-speed synchronous I/O
Dual redundancy
CJ1M
CJ2M
CJ2H
CS1G/H
CS1D
H238
H243
H242
H247
H223

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
Page/Quick Link		H232	H234	H226	H225

[*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 SSI encoder input High-speed counters (500 kHz) 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)				
Page/Quick Link		H238, H224	H243	H242	H247	H223

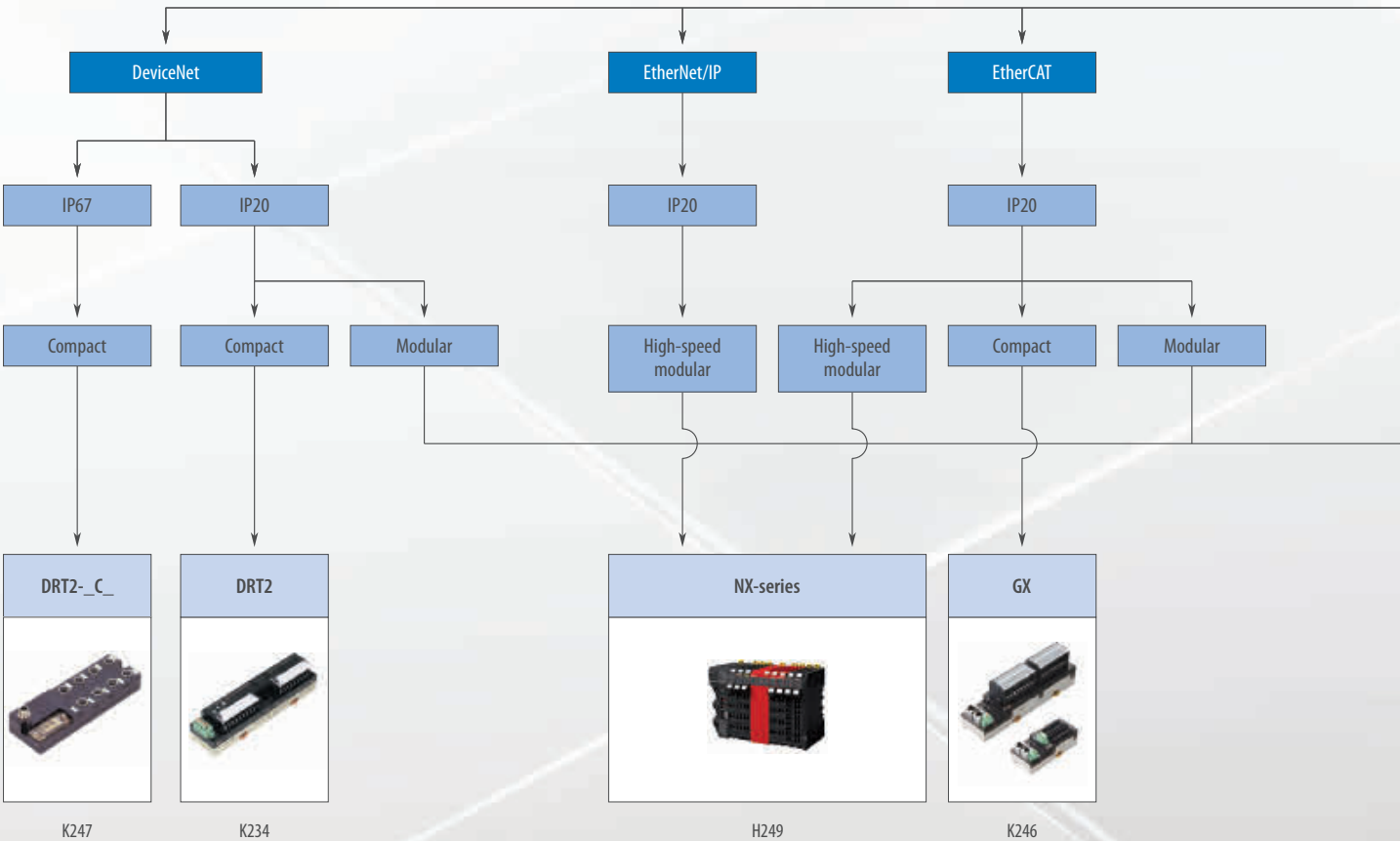
[*1] Some features listed are not available for all CPU types within each series. Please review specifications for more information on CPU features and performance.

I/O SYSTEMS TO MEET EVERY NEED

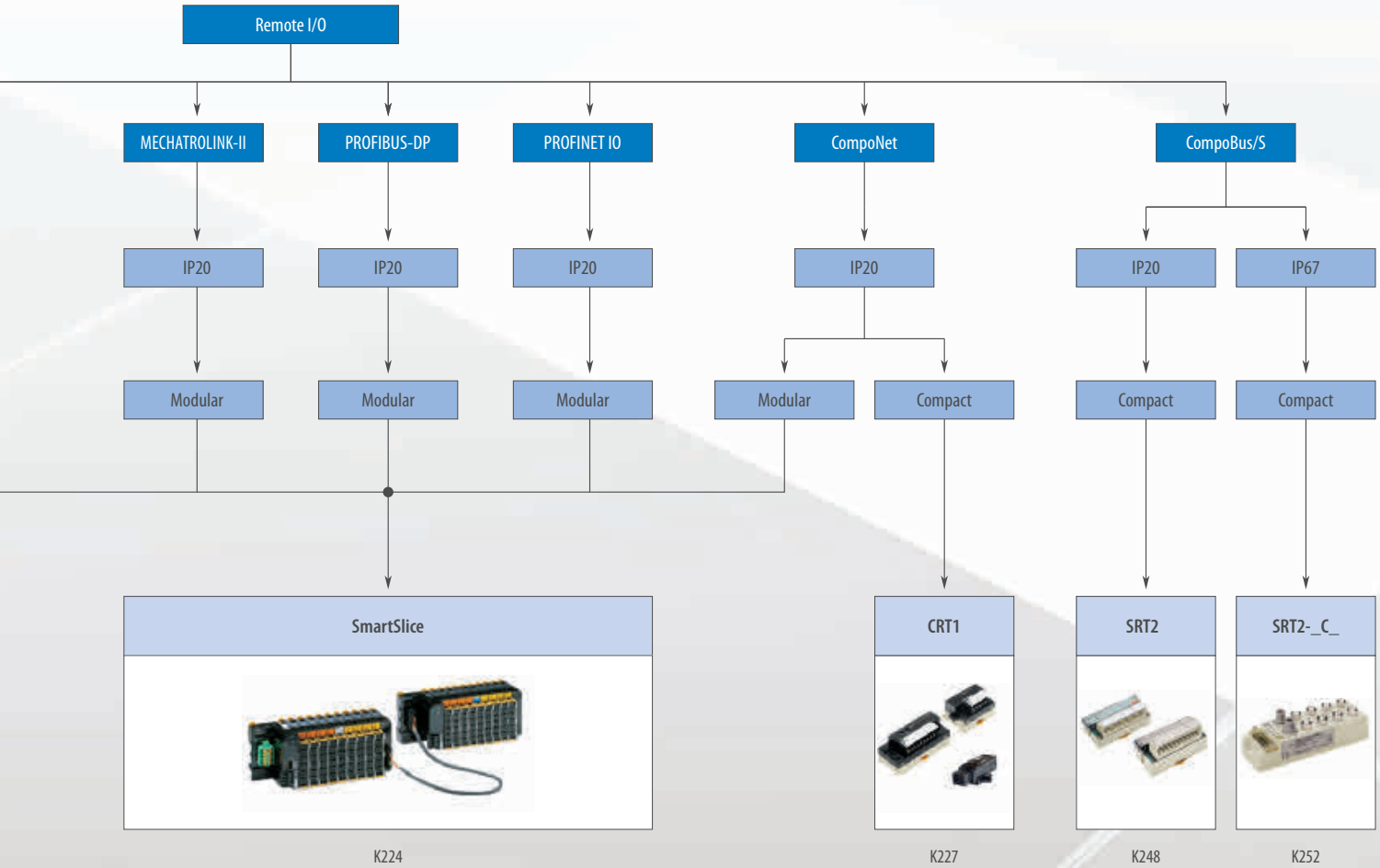
Choose by network, style and flexibility

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, and 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.



K247 K234 H249 K246


Remote I/O
MECHATROLINK-II
PROFIBUS-DP
PROFINET IO
CompoNet
CompoBus/S
IP20
IP20
IP20
IP20
IP20
IP67
Modular
Modular
Modular
Modular
Compact
Compact
Compact
SmartSlice
CRT1
SRT2
SRT2-_C_
K224
K227
K248
K252

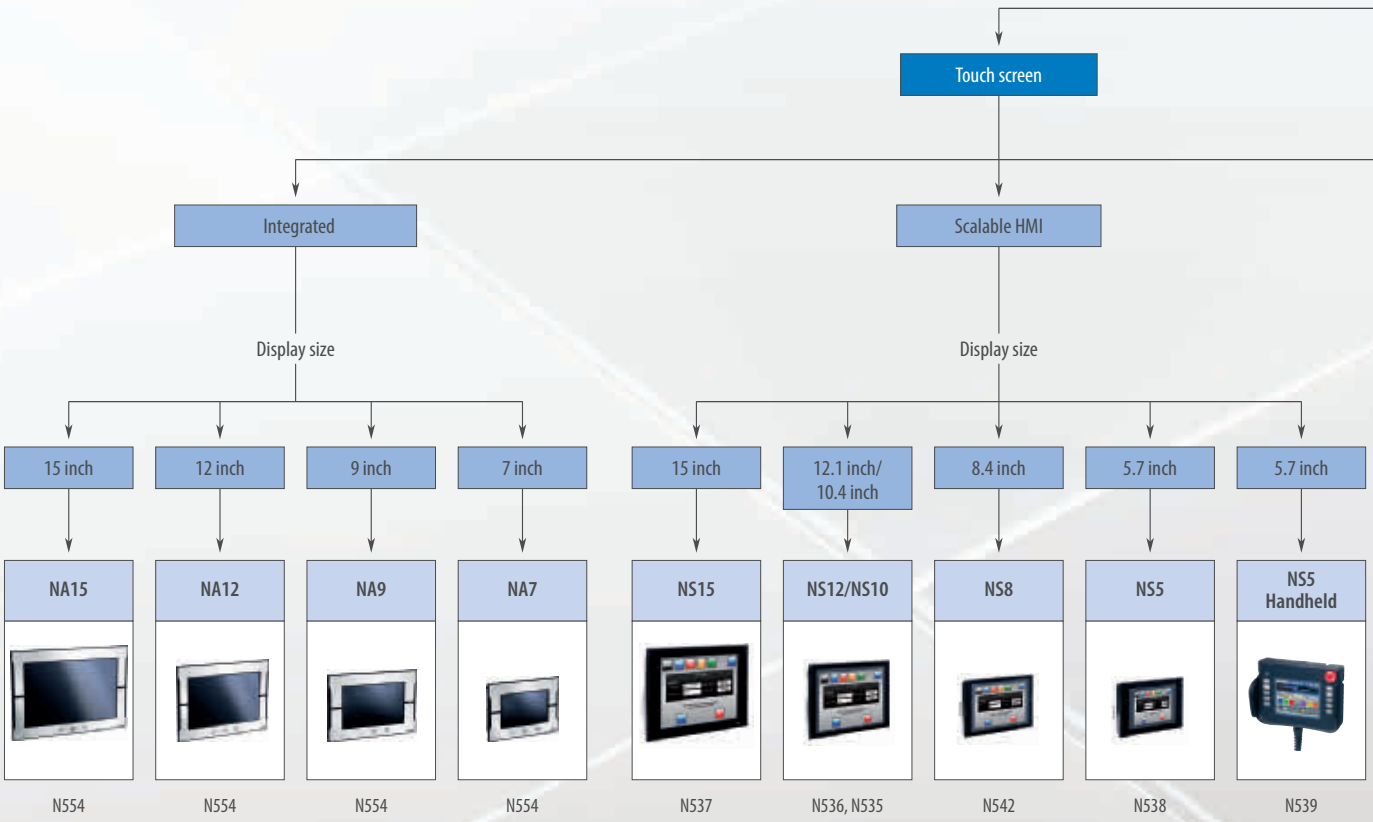
	Modular I/O		Compact I/O		
					
Model	**NX-series**	**SmartSlice**	**GX**	**DRT2**	**CRT1**
Network connection	EtherCAT in- and outgoing connections by RJ45 ethernet ports, EtherNet/IP with built-in Ethernet switch and 2 RJ45 ports	DeviceNet, CompoNet, PROFIBUS DP, PROFINET I/O, EtherCAT, MECHATROLINK-II	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/0 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+extenstion, 8 DI + 8 DO 16 relay out, 4 AI (V/I, TC, Pt100), 2 AO (V/I),	8/16 DI+extension, 8/16 DO+extenstion, 8 DI + 8 DO 4 AI, 2 AO, 2 DI, 2 DO
I/0 Connection technology	Push-in wiring on removable terminal block, MIL 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)
Page/Quick Link	H249	K224	K246	K234	K227

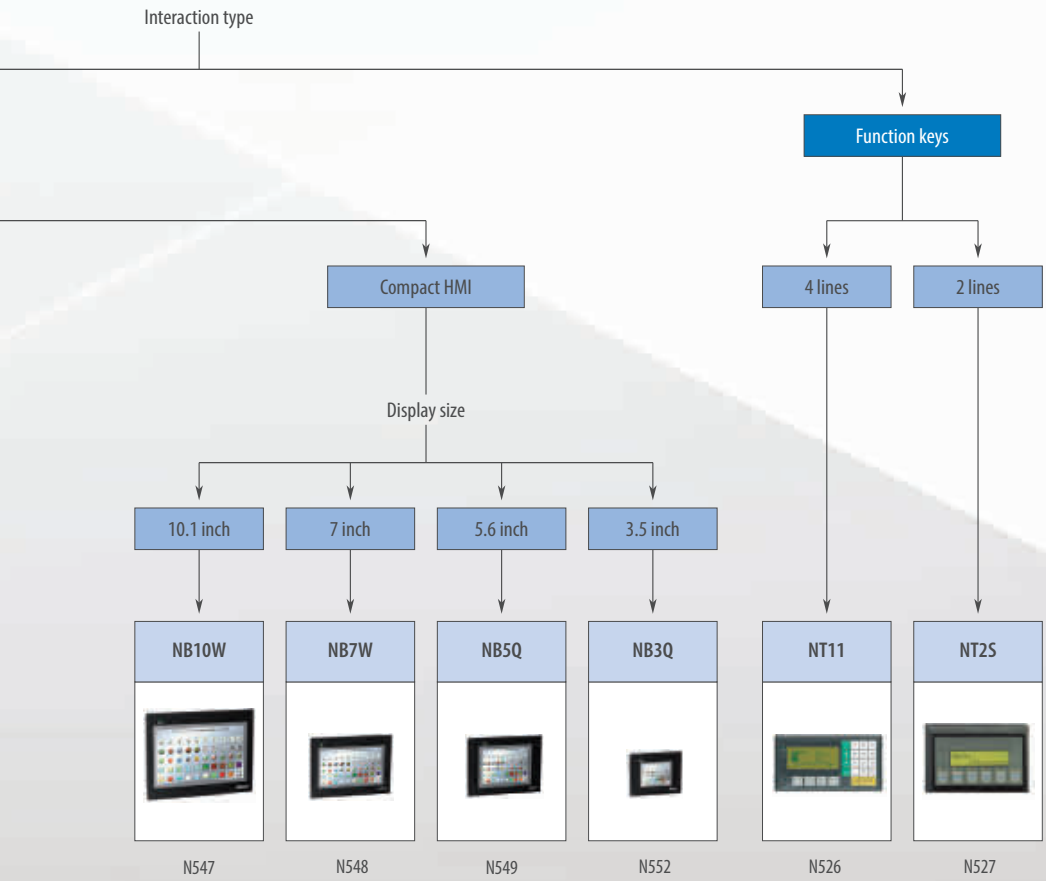
	Compact I/O	Field I/0	
			
Model	**SRT2**	**DRT2-_C_**	**SRT2-_C_**
Network connection	CompoBus/S, (2-wire + power) by M3 screw terminals	DeviceNet with M12 micro connector	CompoBus/S, by 4-wire M12 connector, unshielded
I/0 types	4/8/16 DI, 4/8/16 DO, 8/16 relay out, 4 AI (V/I) 2 AO (V/I)	8/16 DI, 8/16 DO, 8DI + 8 DO	4/8 DI, 4/8 DO
I/0 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
Page/Quick Link	K248	K247	K252

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
4 lines
2 lines
Display size
10.1 inch
7 inch
5.6 inch
3.5 inch
NB10W
NB7W
NB5Q
NB3Q
NT11
NT2S
N547
N548
N549
N552
N526
N527

Selection table

	Integrated			
				
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)
Page/Quick Link	N554			

	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)
Page/Quick Link	N537	N536	N535	N542	N538	N539

		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 & 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	1 × USB Host & 1 × USB Slave
	Ethernet	1 × Ethernet	1 × Ethernet (TW01 model)	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		N547	N548	N549	N552

	Function-key HMI			
				
Model	**NT11**	**NT2S**		
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		

Motion controllers

NJ-Series Machine Controller

- Integration of logic and motion in one Intel CPU
- Scalable control: CPUs for 4, 8, 16, 32 and 64 axes
- EtherCAT and EtherNet/IP ports embedded
- Linear, circular and spiral (helical) interpolation

SYSMAC
always in control

Which motion architecture do you need?

Machine controller

Sequence, Motion, Vision, Safety, Robotics and Database connection functionality

NJ Series

Integration of logic and motion in one Intel CPU, advanced motion, up to 64 axes

H245, H248, H246, H252

Accurax G5 EtherCAT

50 W to 15 kW

Indexer functionality into the drive

Accurax G5 A/P

50 W to 15 kW

G-Series A/P

50 W to 1.5 kW

SmartStep2

50 to 750 W

Stand-alone controller

2 axes + 1 axis pulse train output

Trajexia 2.5 axes motion controller

Advanced motion, e-cam, 2 axes synchronisation

F422

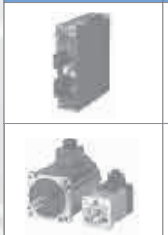
EtherCAT, MECHATROLINK-II, analog output and pulse train output

Trajexia motion controller

Advanced motion, e-cam, multi-axis synchronization

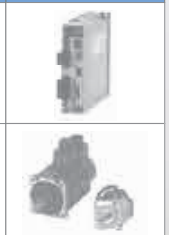
F422

Accurax G5 ML2



50 W to 5 kW

G-Series ML2



50 W to 1.5 kW

Trajexia with EtherCAT

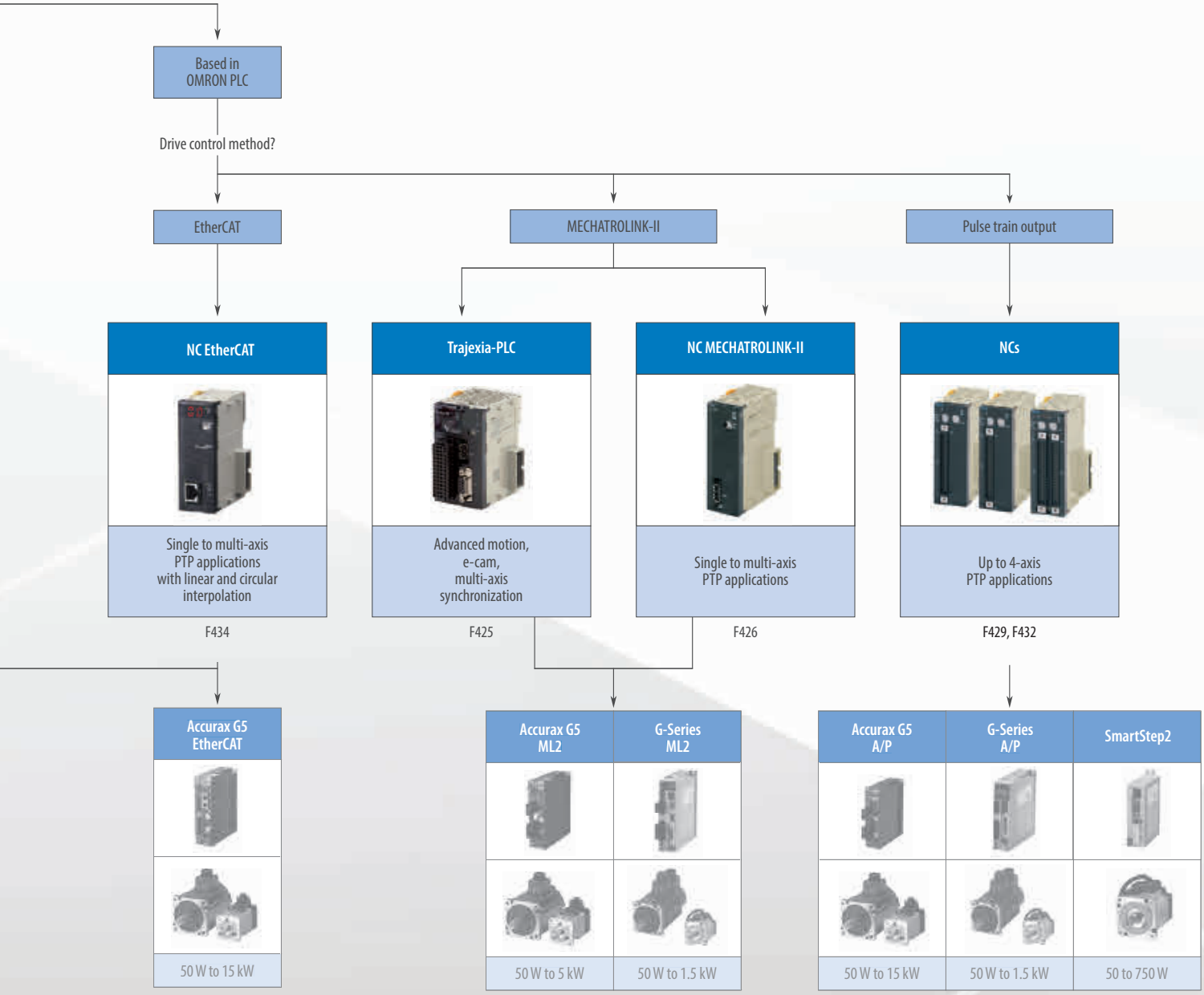
- Perfect control of 64 axes
- Scalability with EtherCAT masters for 4, 16 and 64 axes
- Supports servos, inverters, vision systems and distributed I/O modules

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				
				
Model	**NJ Series machine controller**	**Trajexia stand-alone**		**NC EtherCAT**
	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	4, 8, 16, 32, 64	4, 16, 64	2	2, 4, 8, 16
Applicable servo drive	Accurax G5	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	NJ Series machine controller	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
Page/Quick Link	H245, H248, H246, H252	F422		F434

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
Page/Quick Link	F425	F426	F429	F432

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

Which motion architecture do you need?

Machine controller

Sequence, Motion, Vision, Safety, Robotics and Database connection functionality

NJ Series

Integration of logic and motion in one Intel CPU, advanced motion, up to 64 axes

Accurax G5 EtherCAT

50 W to 15 kW

F354, F356

Indexer functionality into the drive

Accurax G5 A/P

50 W to 15 kW

F354, F356

Stand-alone controller

2 axes + 1 axis pulse train output

Trajexia 2.5 axes motion controller

Advanced motion, e-cam, 2 axes synchronisation

G-Series A/P

50 W to 1.5 kW

F352, F355

SmartStep2

50 to 750 W

F353, F355

EtherCAT, MECHATROLINK-II, analog output and pulse train output

Trajexia motion controller

Advanced motion, e-cam, multi-axis synchronization

Accurax G5 ML2

50 W to 5 kW

F354, F356

G-Series ML2

50 W to 1.5 kW

F352, F355

Based in OMRON PLC

Drive control method?

- EtherCAT
  - NC EtherCAT
    - 
    - Single to multi-axis PTP applications with linear and circular interpolation
    - Accurax G5 EtherCAT
      - 
      - 
      - 50 W to 15 kW
      - F354, F356
- MECHATROLINK-II
  - Trajexia-PLC
    - 
    - Advanced motion, e-cam, multi-axis synchronization
    - Accurax G5 ML2
      - 
      - 
      - 50 W to 5 kW
      - F354, F356
    - G-Series ML2
      - 
      - 
      - 50 W to 1.5 kW
      - F352, F355
  - NC MECHATRONLINK-II
    - 
    - Single to multi-axis PTP applications
- Pulse train output
  - NCs
    - 
    - Up to 4-axis PTP applications
    - Accurax G5 A/P
      - 
      - 
      - 50 W to 15 kW
      - F354, F356
    - G-Series A/P
      - 
      - 
      - 50 W to 1.5 kW
      - F352, F355
    - SmartStep2
      - 
      - 
      - 50 to 750 W
      - F353, F355

Selection table

	Servo drives		
			
	Accurax G5	**G-Series**	**SmartStep 2**
	EtherCAT network and safety built-in	Compact size and ML2 motion bus	Pulse train input with ultra-compact size
Ratings 230 V single-phase	100 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	N/A	N/A
Applicable servomotor	Accurax G5 and G-Series rotary motors	G-Series	G-Series
Position control	EtherCAT, MECHATROLINK-II or Pulse train input	MECHATROLINK-II or Pulse train input	Pulse train input
Speed control	EtherCAT, MECHATROLINK-II or Analog input ±10 V	MECHATROLINK-II or Analog input ±10 V	N/A
Torque control	EtherCAT, MECHATROLINK-II or Analog input ±10 V	MECHATROLINK-II or Analog input ±10 V	Torque limits only
	Embedded indexer functionality	N/A	N/A
Safety approvals	ISO13849-1:2008 (PL d), EN 954-1:1996 (Cat-3)	N/A	N/A
Full closed loop	Built-in	N/A	N/A
Page/Quick Link	F354	F352	F353

	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
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	F355			

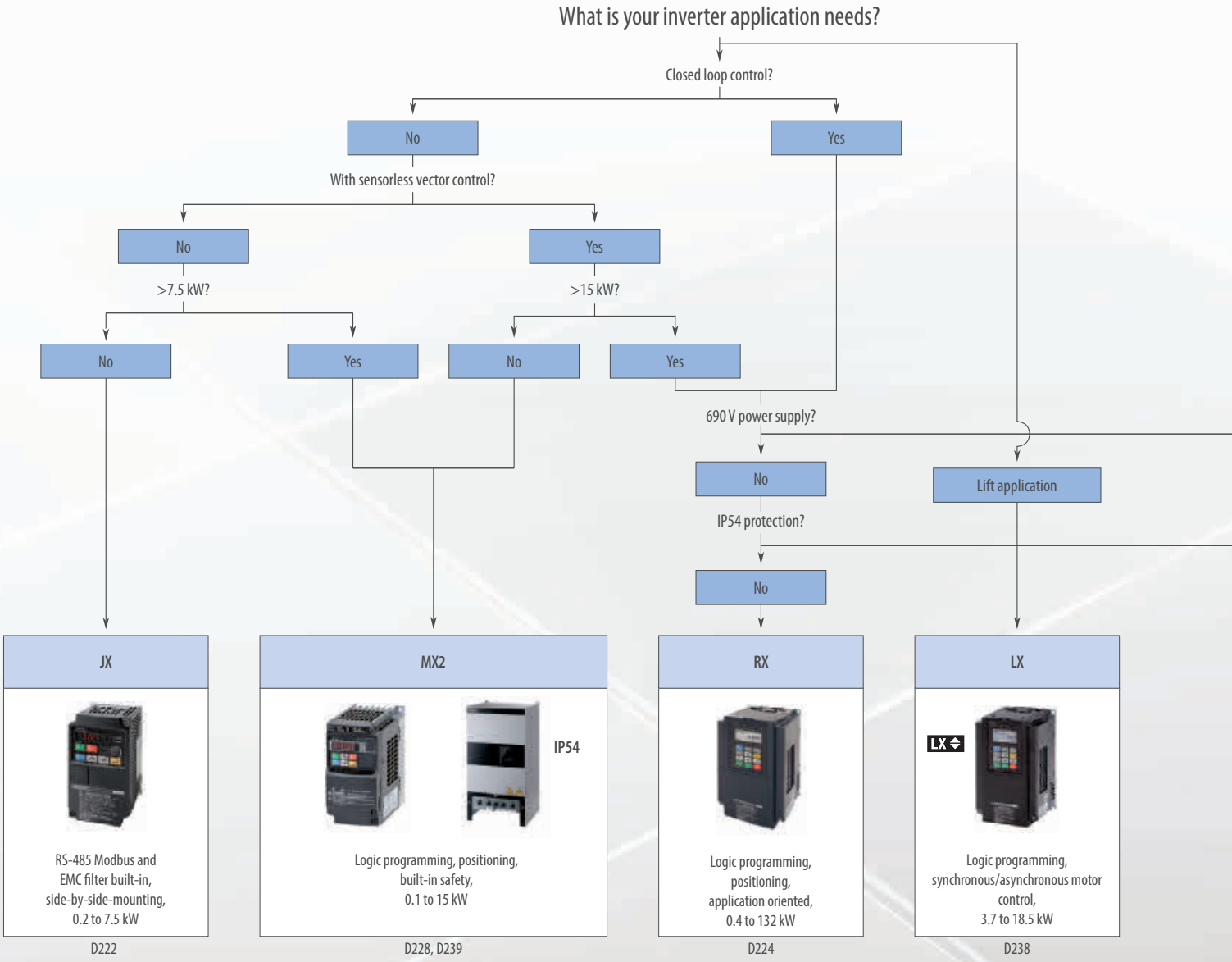
	Accurax G5 servo motors		
			
	High inertia models		
	3,000 r/min motor	2,000 r/min motor	1,500 r/min motor
Rated speed	3,000 rpm	2,000 rpm	1,500 rpm
Maximum speed	5,000 rpm	3,000 rpm	2,000 to 3,000 rpm
Rated torque	0.64 Nm to 2.4 Nm	4.77 Nm to 23.9 Nm	47.8 Nm
Sizes	200 W to 750 W	1 kW to 5 kW	7.5 kW
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
Quick Link	F356		

BORN TO DRIVE MACHINES

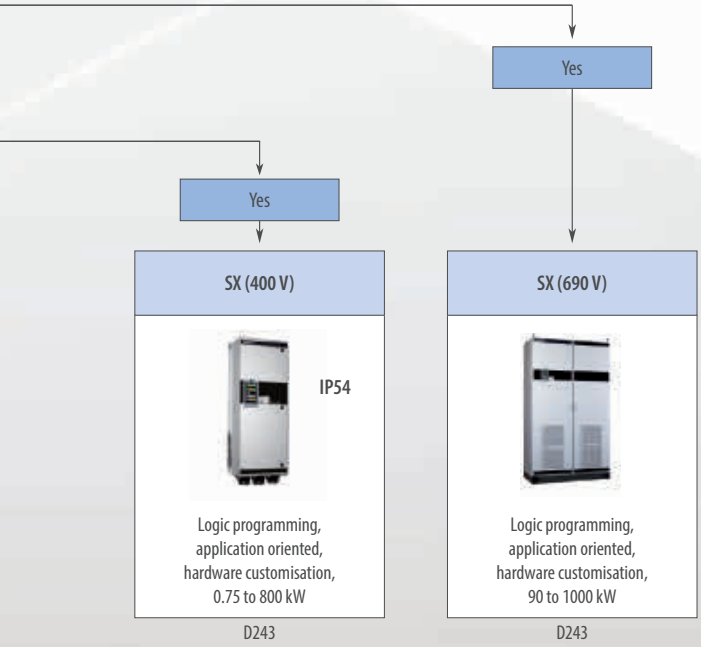
Harmonised motor and machine control

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.




200V
3PHASE
0.4kW
OMRON
MX2 INVERTER
RUN PWR
RUN
STOP
RESET
WARNING – Risk of electric shock.


Yes
Yes
SX (400 V)
IP54
Logic programming,
application oriented,
hardware customisation,
0.75 to 800 kW
D243
SX (690 V)
Logic programming,
application oriented,
hardware customisation,
90 to 1000 kW
D243

Model	RX	LX
		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	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	D228, D239	D222

Model	SX (400 V)	SX (690 V)
	 IP54	
	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, …)
Page/Quick Link	D243	D243

General-purpose Relay – Types of Loads

Question: What types of load are there (resistive loads, inductive loads, lamp and capacitor loads)?

Answer:

The load types and their characteristics are as follows.

1. Resistive Loads

Nichrome heaters and other loads to which the same current continues to flow when voltage is applied

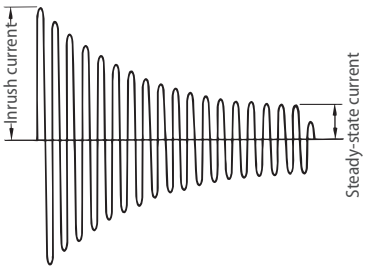
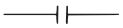
2. Inductive Loads

Motors, solenoids, and other loads with inrush current

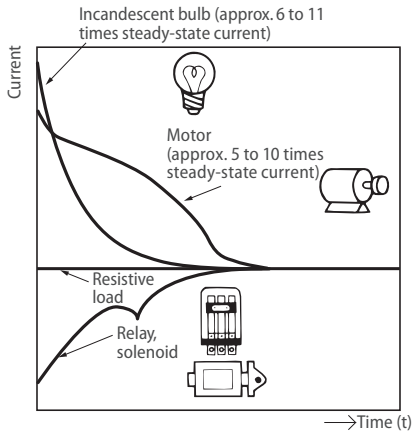
3. Lamp and Capacitor Loads

Loads with inrush current even larger than with inductive loads

AC Load Types and Inrush Current

Type of load	Ratio of inrush current to steady-state current	Waveform
Solenoid 	Approx. 10 times	
Incandescent bulb 	Approx. 10 to 15 times	
Motor 	Approx. 5 to 10 times	
Relay 	Approx. 2 to 3 times	
Capacitor 	Approx. 20 to 50 times	
Resistive load 	1 times	

DC Load Types and Inrush Current



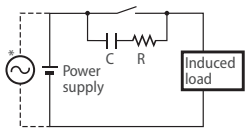
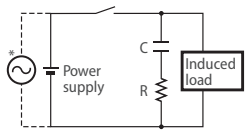
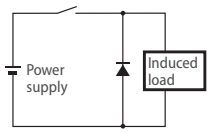
General-purpose Relay – The Most Effective Type for Protecting Contacts

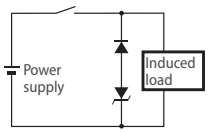
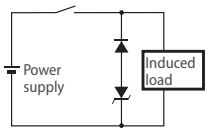
Question: Choosing from among CR elements, diodes, varistors, and other kinds of surge suppressor elements, which is the most effective for protecting contacts?

Answer:

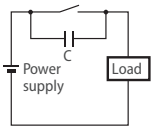
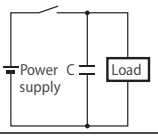
For a DC load, a diode is generally the most effective, and the next most effective is CR elements. For an AC load, a varistor or CR elements are the most effective.

Typical Surge Suppressor Examples:

Item / Type	Circuit example	Applicability AC	Applicability DC	Features and remarks	Element selection guidelines
CR type		* (OK)	OK	*Load impedance must be much smaller than the CR circuit impedance when using the Relay for an AC voltage. When the contacts are open, current flows to the inductive load via CR.	Use the following as guides for C and R values: C: 0.5 to 1 μF per 1 A of contact current (A) R: 0.5 to 1 W per 1 V of contact voltage (V) These values depend on various factors, including the load characteristics and variations in characteristics. Capacitor C suppresses the discharge when the contacts are opened, while the resistor R limits the current applied when the contacts are closed the next time. Confirm optimum values experimentally. Generally, use a capacitor with a dielectric strength of 200 to 300 V. For applications in an AC circuit, use an AC capacitor (with no polarity). If there is any question about the ability to cut off arcing of the contacts in applications with high DC voltages, it may be more effective to connect the capacitor and resistor across the contacts, rather than across the load. Perform testing with the actual equipment to determine this.
		OK	OK	The release time of the contacts will be increased if the load is a Relay or solenoid.	
Diode type		NG	OK	The electromagnetic energy stored in the inductive load reaches the inductive load as current via the diode connected in parallel, and is dissipated as Joule heat by the resistance of the inductive load. This type of circuit increases the release time more than the CR type.	Use a diode having a reverse breakdown voltage of more than 10 times the circuit voltage, and a forward current rating greater than the load current. A diode having a reverse breakdown voltage two or three times that of the supply voltage can be used in an electronic circuit where the circuit voltage is not particularly high.

Item / Type	Circuit example	Applicability AC	Applicability DC	Features and remarks	Element selection guidelines
Diode + Zener diode type		NG	OK	This circuit effectively shortens the release time in applications where the release time of a diode circuit is too slow.	The breakdown voltage of the Zener diode should be about the same as the supply voltage.
Varistor type		OK	OK	This circuit prevents a high voltage from being applied across the contacts by using the constant-voltage characteristic of a varistor. This circuit also somewhat increases the release time. Connecting the varistor across the load is effective when the supply voltage is 24 to 48 V, and across the contacts when the supply voltage is 100 to 240 V.	The cutoff voltage Vc must satisfy the following conditions. For AC, it must be multiplied by $\sqrt{2}$. Vc > (Supply voltage × 1.5) If Vc is set too high, its effectiveness will be reduced because it will fail to cut off high voltages

Do not use the following kind of surge suppressor application.

	This circuit arrangement is very effective for diminishing arcing at the contacts when breaking the circuit. However, since electrical energy is stored in C (capacitor) when the contacts are open, the current from C flows into the contacts when they close. This may lead to contact welding.		This circuit arrangement is very useful for diminishing arcing at the contacts when breaking the circuit. However, since the charging current to C flows into the contacts when they are closed, contact welding may occur.

This circuit effectively suppresses arcs when the contacts are OFF. Capacity is stored in C when the contacts are open. Consequently, when the contacts are ON again, short-circuited current from the capacitance may cause contact weld.

It is commonly believed that it is more difficult to switch DC inductive loads than resistive loads, but the performance can be improved to about the same level as resistive loads by using a surge suppressor.

Solid-state Relay – High Temperature

Question: Is it abnormal that the SSR is so hot that I can't continue touching it?

Answer:

The temperature reaches 80°C to 100°C when the maximum power is supplied within the rated range. It is not abnormal. Heat dissipation, however, must be sufficiently considered. In general, the switchable load current decreases as the ambient temperature increases.

The residual voltage held by the SSR switching element (e.g., triac, thyristor, power transistor) generates heat. (The residual voltage is the loss voltage in the semiconductor when the semiconductor turns ON.)

Power Supply – Estimate Amount of Heat Produced

Question: What is the best way to estimate the amount of heat produced by the Power Supply?

Answer:

The Power Supply's internal loss becomes heat energy (internal loss = heat produced).

Equations:

Internal loss (W)

= Effective input power – Output power

= Output power/Efficiency – Output power

Note: Reducing the load rate is an effective way to reduce the amount of heat produced.

Example Calculating the Heat Produced by a 100-W S82K Switch Mode Power Supply

Power rate: 80%

Output power: 24 V × 4.2 A = 100.8 W
Effective input power: Output power/Efficiency = 100.8 W/80% = 126 W

Internal loss (heat produced): 126 W – 100.8 W = 25.2 W
To convert the internal loss to calories:

By Joule's law, 1 W = 0.24 cal/s,

so 25.2 W = 25.2 × 0.24 cal/s = 6.05 cal/s

Power Supply – Overload Protection Function

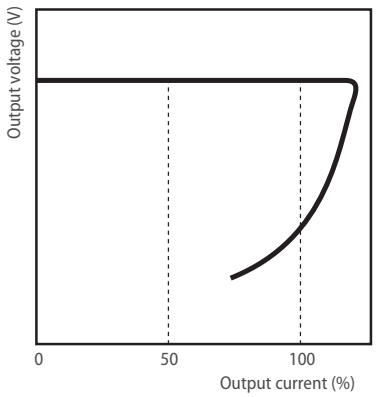
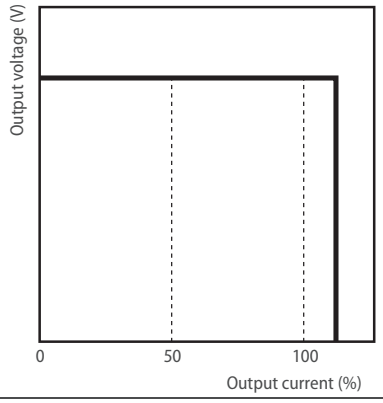
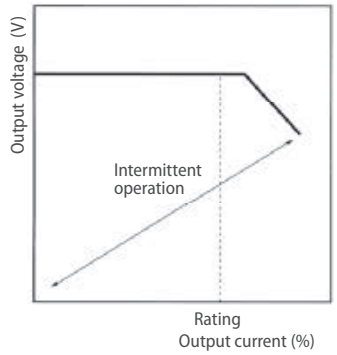
Question: What is overload protection function?

Answer:

The overload protection function prevents damage to the Power Supply and load from an overload (including an overload due to a shorted output).

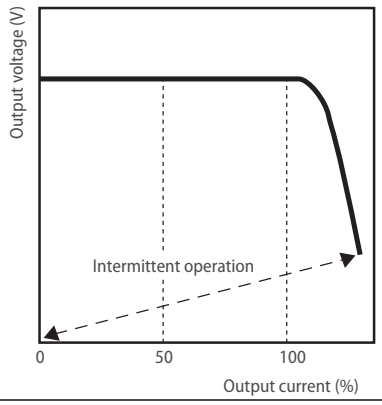
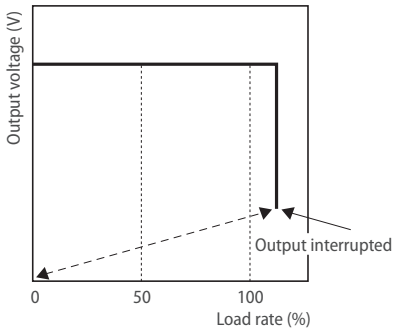
When a current greater than the overcurrent detection value (actual value depends on the Power Supply being used) is detected, the protection function will operate and the output current will be limited. In addition, the output voltage will also drop in accordance with the load's status, i.e., the load's impedance. The level to which the voltage drops depends on the overload status and the impedance of the load wiring.

The output voltage drop characteristics can be divided into the three following categories.

Drop characteristics	Voltage vs. current curve	Trend
Inward-sloping drop		The output current tends to drop as the output voltage drops.
Straight drop (Inverted L drop)		The output current remains fairly constant as the output voltage drops.
Outward-sloping drop		The output current tends to rise as the output voltage drops.

These curves are called drop curves and basically the output is continuous during the drop. When the overcurrent condition is eliminated, the output will return to normal automatically (automatic reset).

The following characteristics may occur together with the three drop characteristics shown in the table above.

Output	Voltage vs. current curve	Trend
Intermittent operation		The output becomes intermittent if the voltage drops below a certain level. The Power Supply itself reduces its load by making the output intermittent.
Interrupted operation		The output is stopped if the overload condition lasts longer than a preset time. The Power Supply itself has no load because the output is stopped.

These drop characteristics can also be referenced as the maximum output current that can be supplied to a load when the power is turned ON (during the output voltage startup process).

When selecting a Power Supply for a load that starts from a low voltage (such as a load with a built-in DC-DC converter) or a capacitive load that absorbs a significant inrush current, consider the Power Supply's overload protection characteristics and the load's startup characteristics.

Typically, the Inverted L drop characteristic is the most suitable.

Main drop characteristics (for reference)

Inward-sloping drop	S82K (3 W, 7.5 W, 15 W)
Inverted L drop (Straight drop)	S82J (100 W (5 V, 12 V, 15 V), 150W), S82K (90 W, 100 W, 240 W), S8TS
Inward-sloping drop with intermittent operation	S82J (10 W, 25 W)
Inverted L drop with intermittent operation	S8PS (300W), S8VS
Outward-sloping drop with intermittent operation	S82J (50 W, 100 W (24 V)), S82K (30 W, 50 W), S8PS (50 W, 100 W, 150 W)
Inverted L drop with interrupted operation	S82J (600 W), S8PS (600 W)

Note:
1. If the S82J is connected to a load with a built-in DC-DC converter (a electronic device such as a PLC or digital multimeter) or a capacitive load, the overload protection function may be triggered at startup and the Power Supply may not produce an output.
2. Do not continue using the Power Supply with an overcurrent or with the output terminals short-circuited. Doing so may shorten the service life of internal components or may cause them to fail entirely.
3. Even if the load is short-circuited, the drop in voltage will vary depending on factors such as the impedance in the load line.
4. Even if different models have the same drop characteristics, the actual characteristics (output current, output voltage, etc.) will vary from model to model.
5. Additional precautions apply to some models.

Power Supply – Proper Wiring Method (Input and Output)

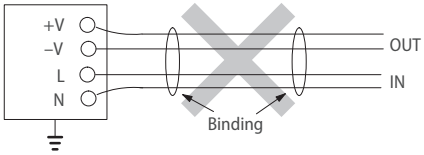
Question: What is the proper wiring method to use when wiring the input and output?

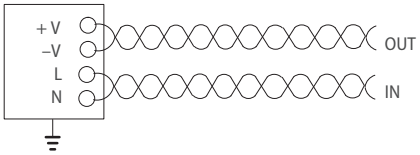
Answer:

We recommend wiring the Power Supply with the following method in order to minimize noise.

Separate the Power Supply's input wiring from its output wiring and twist the wire pairs.

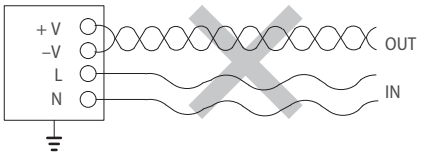
If the input wires are bundled with the output wires or wired too close together, noise will be induced in the output lines.

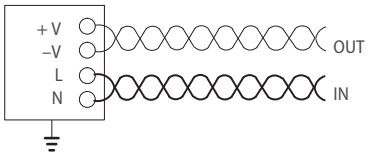




Use heavy-gauge, short input wires.

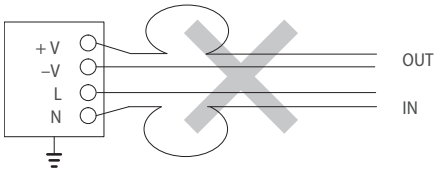
The input wires are a source of radiation noise, so use heavy gauge, short input wires.

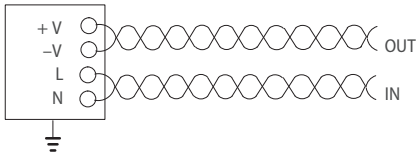




Do not make loops in the input wiring or output wiring.

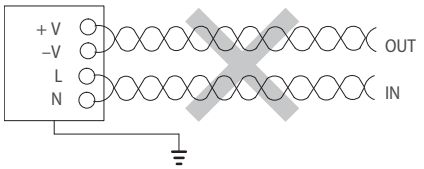
If there are loops in the wiring, the Power Supply may become a radiation noise source for other electronic devices and the loops may act as antennae that induce high-frequency noise.

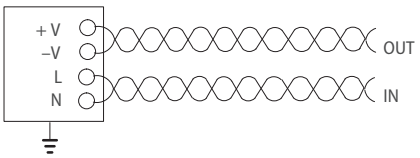




Use a heavy-gauge, short ground wire.

If a long wire is used for grounding, the attenuation capabilities of the Power Supply's internal noise filter will be reduced, so use a heavy-gauge, short ground wire.

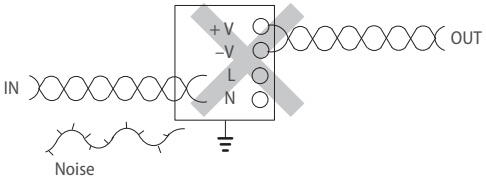


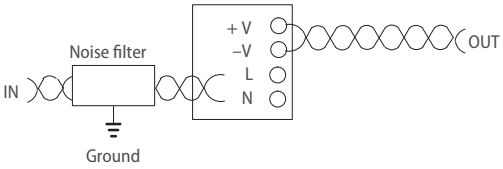


Connect a noise filter

Connect a noise filter to the Power Supply's input line if there is a device that produces surges (such as a large magnetic relay) connected to the same AC input line and electronic devices connected to the Power Supply's output are not functioning properly.

Also, we recommend grounding the noise filter; NF with a heavy-gauge, short wire.





Temperature Controller – Precautions for Extending Lead Wires of Temperature Sensor

Question: Please tell me of any precautions for extending the lead wires of a Temperature Sensor.

Answer

Platinum-resistance Thermometers

All three lead wires used for extension must have the same resistance and the same length. The extension will cause the resistance of the lead wires to affect the display temperature, so use lead wires with thick conductors. (OMRON does not carry lead wires for extension. Use commercially available lead wires.)

Thermocouples

Be sure to use compensating conductors for the extension. Also, select compensating conductors that suit the characteristics of the Thermocouple. Do not extend the lead wires with compensating conductors that do not suit the characteristics of the Thermocouple, or with ordinary lead wires, as this would prevent proper temperature measurement. Be sure also to connect the wires using the correct polarity (+/-).

Thermistors

Use lead wires with thick conductors for extension. There is no polarity.

General Precautions

Be careful of the cable routing because extending the lead wires makes the Sensor more susceptible to the effects of electrical noise.

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