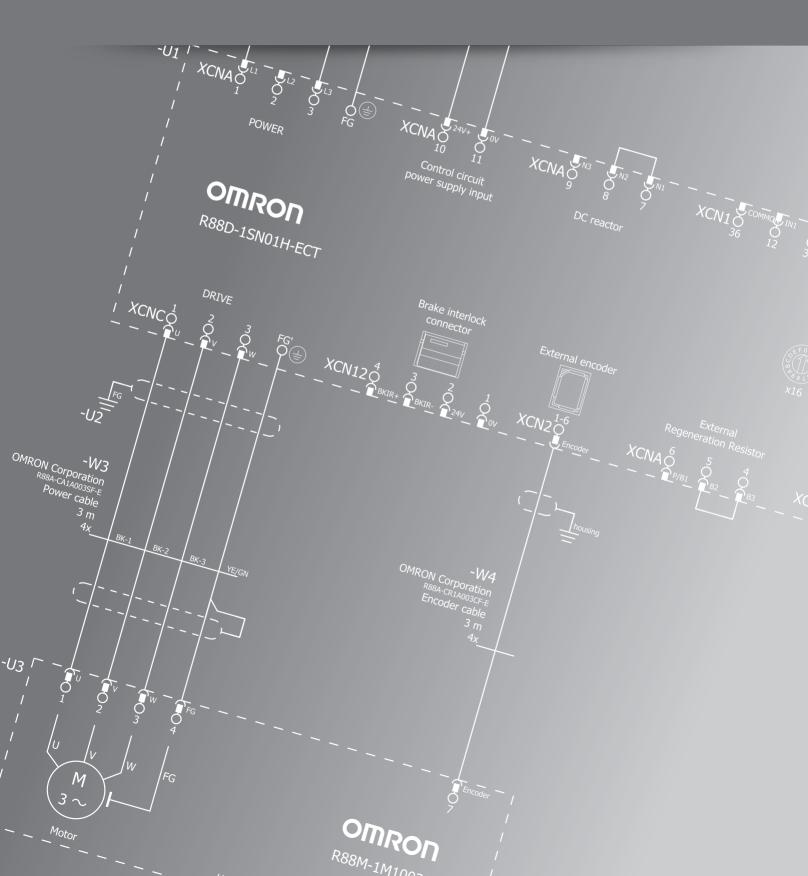


Panel Builder Guide 2017

Switching & control solutions for panels



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 the most commonly used 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
- EPLAN parts data Library

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industrial.omron.eu

Panel Builder Guide 2017

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1



Kazuma Tateisi, founder of Omron

Omron at a glance

200,000 products ranging Input, Logic, Output & Safety

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

6%

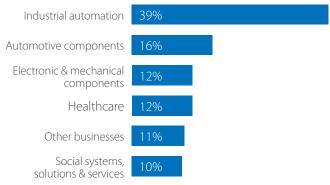
Annual investment in Research & Development

Innovation track record of 80 years

1,200 employees dedicated to R&D 12,500 + issued and pending patents



Working for the benefit of society



Close to your needs

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

New value for control panels

Control panels: The heart of manufacturing sites

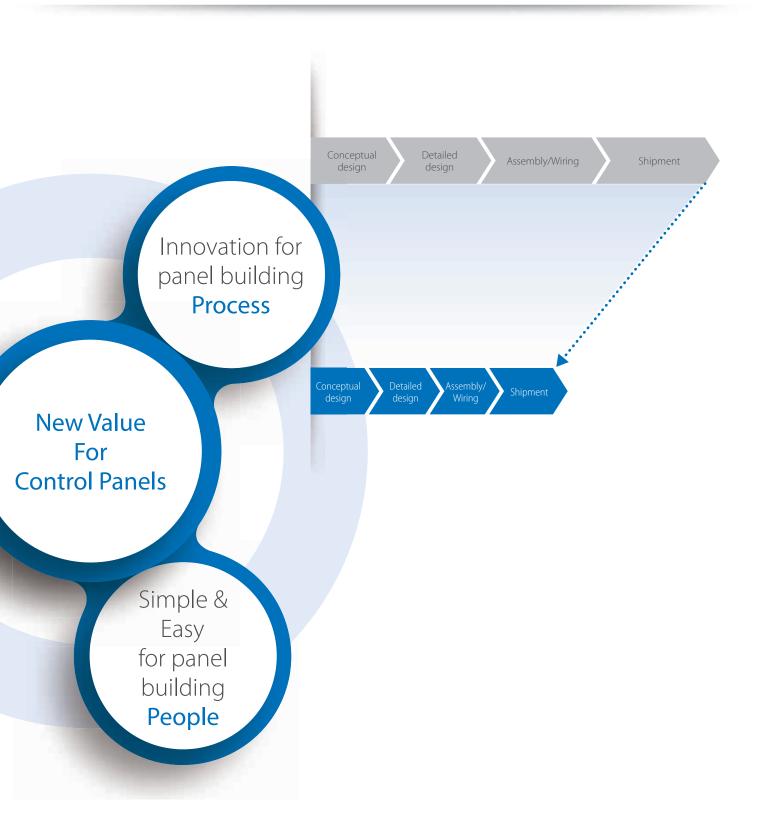
Any evolution within control panel design and manufacturing will result in a follow-on evolution within production facilities, therefore benefitting not only panel builders, but the end users or machine builders. If panel design, panel manufacturing processes and human interaction with panels can be innovated by way of new products, wiring techniques and technologies, then control panel manufacturing becomes simpler and makes a huge leap forward in terms of efficiency. Starting with our shared Value Design for Panel *1 concept for control panel product specification, we offer you control panel evolution and process innovation.





*1 Value Design for Panel

Our shared Value Design for Panel (herein after referred to as Value Design) concept for the specifications of products used within control panels will create new value for our control panel customers. Combining multiple products that share the Value Design concept will further increase the value provided.

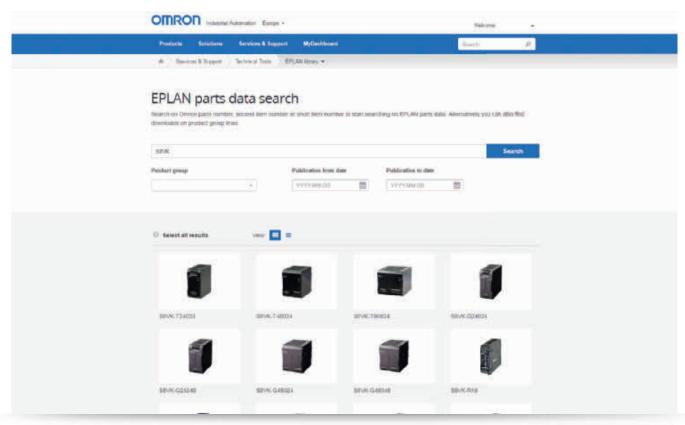


Engineering tools for the control panel

Today computers and powerful CAD/CAE software are now an indispensable tool for developing switch cabinets, as they make the job of the designer much easier. But even the best program can be limited by the database that powers it. Unfortunately nowadays the typical approach is to supply a multitude of manuals describing the dimensions and properties of a product, but with the introduction of EPLAN and Zuken eCAD data for our panel components and devices things are starting to change.

Developers can download a digital data record from our portal that contains all the essential data about a product in electronic form and can be used to seamlessly integrate the drawings (parts data), documents etc. contained within the data record into the CAD/CAE program. This saves time, avoids errors and reduces the time-to-market. Besides EPLAN and Zuken parts data, 2D & 3D CAD files can be downloaded via our CAD library (http://industrial.omron.eu/en/products/cad-library).

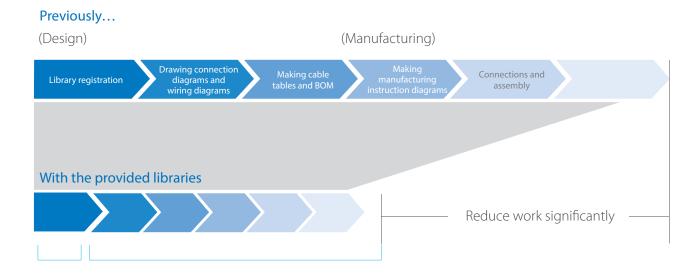
For more information on our partnered programs, go to the links at the bottom of the page:







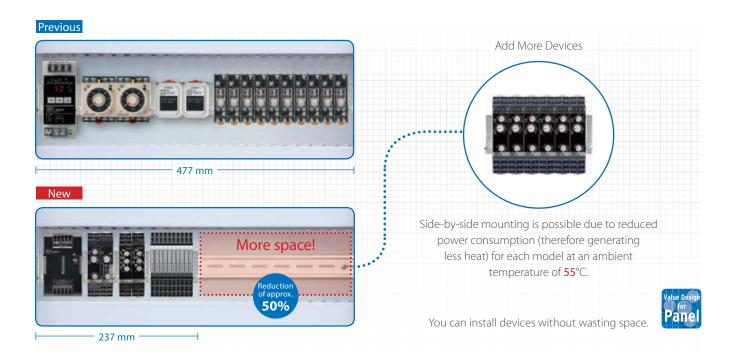
Utilising component libraries will reduce work from design to manufacturing as well as for library registration, and also improve quality



Further Evolution for Panels

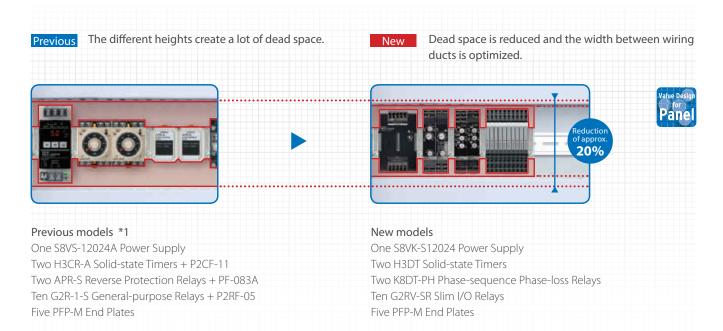
Space saving

By adding devices in the newly available space, you can mount more devices in the same size control panel to increase control panel functionality.



Reduce dead space

We'll help you to downsize control panels by reducing the width between wiring ducts and dead space.



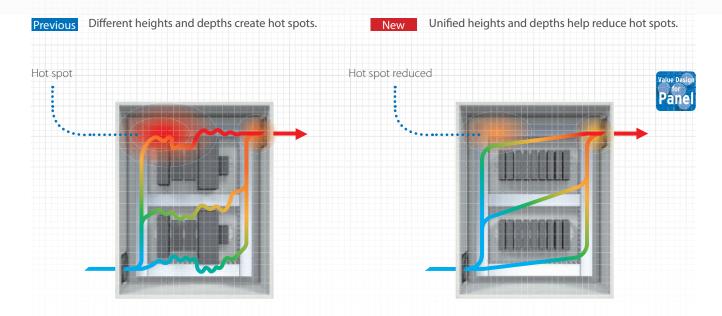
Vibration resistance

You can use products with Push-In Plus technology (refer to page 8) to create robust control panels that withstand vibration during both shipping and operation.



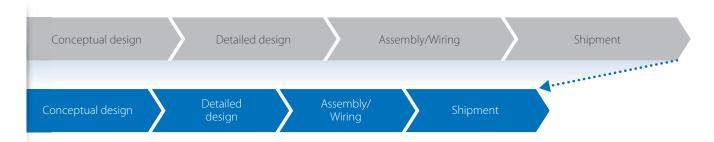
Improve airflow

The use of components with a uniform height ensures unobstructed airflow. As a result, heat is easily dissipated. Reducing the temperature inside the panel increases product reliability, decreases failure rates, and prolongs product life expectancies.



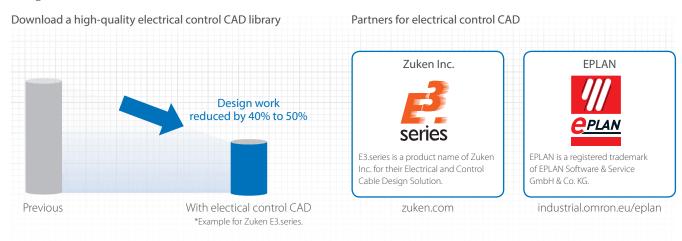
Innovation for panel building Process

Meeting customer needs by reducing process time



Efficient Designing

Our electrical control CAD library of our products (industrial.omron.eu/cadlibrary) can assist in reducing design effort.



Swift customisation

Devices with unified specifications allow you to easily customise panels for each customer.

The height and depth of our products have been unified, to enable existing designs to be easily customised.

No Need to change width between Wiring Ducts

The wide range of products with unified specifications gives you a wider selection.



Power Supplies, Timers, Measuring and Monitoring Relays, Sockets (for Relays, Timers, Liquid Leakage Sensors), SSR, DIN-rail Terminal Blocks, Temperature Controllers, Power Monitors, UPSs, EtherCAT Slave Terminals

Faster wiring

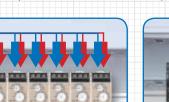
Unified wiring methods and specifications help shorten delivery times.

Easy-to-understand terminal positions enable more accurate work.

Unified I/O terminal positons allow you to organize the wiring of control panels.

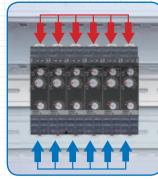
Previous

Inputs and Outputs are Mixed on the Top and Bottom



New

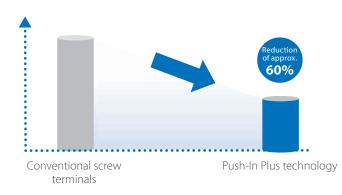
Inputs are on the top and outputs are on the bottom.



Red: Inputs, Blue: Outputs

Greatly reduce wiring effort with Push-In Plus technology.

Retightening is not required with Push-In Plus technology.



Spring Structure

The pressure of the clamp spring holds the ferrule or wire securely, eliminating issues related to screws loosening due to vibration.



Information for Push-In Plus technology and screw terminals is based on our actual measurement data.

Global shipping

Our Value Design products are certified for UL and CSA & bear a CE-mark





Express delivery services available within Europe.

Simple & Easy for panel business **People**

Easy wiring

Push-In Plus technology help to simplify wiring.

What is Push-In Plus technology?

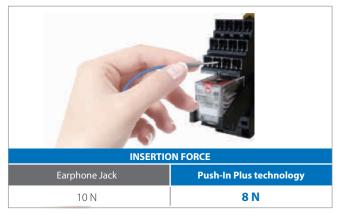
Push-In Plus technology has been developed to provide easy wire insertion and firm wire holding, therefore reducing the time and work involved in wiring.

Easy to insert

Using our terminals with Push-In Plus technology is easier than inserting an earphone jack.

Held firmly in place

Even though less insertion force is required, the wires are held firmly in place. With our advanced mechanism design and manufacturing technology, we have produced a spring that allows low insertion force while ensuring high pull-out force.





Work with both hands

The terminal mechanism has been designed to hold the screwdriver, enabling you to have both hands free to insert the wiring into the front-facing cable entry point.

Wiring possible with stranded wires

It is possible to insert wires with ferrules, solid or stranded wires.





^{*} Patents relating to Push-In Plus technology: Patent-pending

Front-in and front-release wiring

The terminal cable entry of our independently developed terminals with Push-In Plus technology all face forward for easy wire insertion.

Previous



New



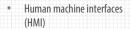


Software

Software

^{*} Please contact your Omron representative.







Cables and accessories



Inductive sensors



Mechanical sensors/Limit switches



Rotary encoders



Cable connectors



30 Safety logic control systems



38 Safety outputs



102 Counters



Programmable relays



112 Digital panel indicators



122 Energy monitoring devices



Photovoltaic



226 Pushbutton switches



244 Terminal blocks

Automation systems

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Content

Automation systems

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Machine controller	
NX1 series	22

Machine automation controller

COMPLETE AND ROBUST MACHINE AUTOMATION

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

- $\bullet\,$ Fastest cycle time: 125 μs
- Up to 256 synchronized axes
- Fully conforms with IEC 61131-3 standards
- PLCopen Function Blocks for Motion Control
- · Advanced motion with Robotics functionality
- Built-in EtherCAT and EtherNet/IP ports
- IPC Machine Controller type: Sysmac machine control inside and Open operating system
- Sysmac Studio: IDE for Configuration, Programming, Simulation and Monitoring

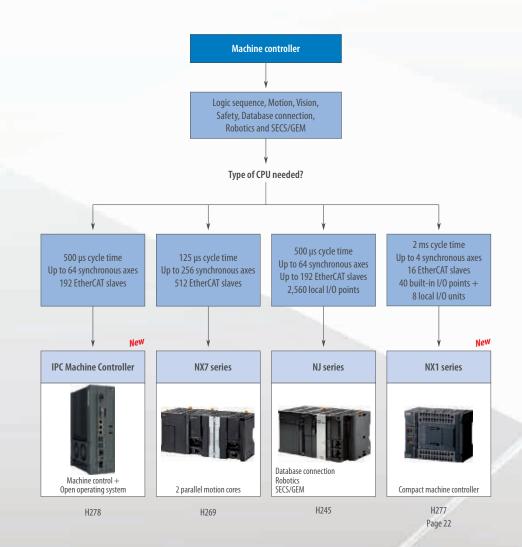














Machine automation controlle	er					_
	150					
Model	IPC Machine Controller	NX7	NJ5	NJ3	NJ1	NX1
Fastest cycle time	500 μs	125 μs	500 μs	500 μs	1 ms	2 ms
Number of synchronized axes	64, 32, 16	256, 128	64, 32, 16	8, 4	2, 0	4, 2, 0
Task	Multi-tasking program					
Motion core	Synchronized motion core	2 parallel motion cores	Synchronized motion cor	e		
Functions	Logic sequence Motion	Logic sequence Motion	Logic sequence Motion Robotics Database connection SECS/GEM	Logic sequence Motion	Logic sequence Motion Database connection	Logic sequence Motion
Software tool	Sysmac Studio		•	•		•
Programming languages	Ladder Structured Text In-Line ST					
Standard programming	IEC 61131-3 PLCopen Function Block	ks for Motion Control				
Program capacity	40 MB	80 MB	20 MB	5 MB	3 MB	1.5 MB
Storage	HDD, SSD, SD memory card	SD and SDHC memory ca	rd			
Built-in port	Ethernet EtherNet/IP EtherCAT USB 3.0/2.0 DVI	EtherNet/IP EtherCAT USB 2.0				EtherNet/IP EtherCAT
EtherCAT slaves	192	512	192		64	16
Servo drive	1S, Accurax G5/EtherCAT	and Integrated servo moto	r		•	
Motion control	Axes groups interpolatiElectronic cams and gesDirect position control f					
Robotics	-		Up to 8 Delta robot control	-		
Supported SQL servers	_		Microsoft SQL Server Oracle IBM DB2 MySQL Firebird	_	Microsoft SQL Server Oracle IBM DB2 MySQL Firebird	_
Local I/O points	-		2560			40 built-in I/O + 8 local I/O units
Mounting	Industrial Box PC type: Book and Wall mounting Industrial Panel PC type: Panel mounting	DIN rail				
Global standards	EMC Directive	CE, cULus	CE, cULus, NK, LR			CE, cULus
	2014/30/EU (EN 61131-2)					



Machine controller



Compact in size, powerful in functionality

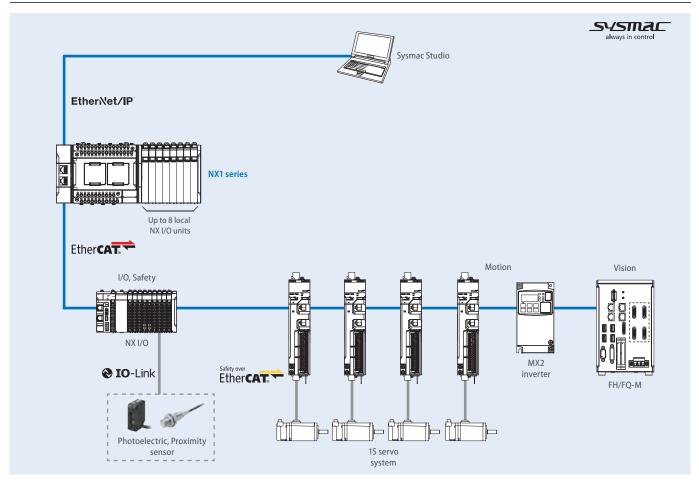
The NX1 completes the NX/NJ machine controllers family offering same functionality in a compact design. The NX1 provides synchronized control of all machine devices such as motion, I/O, safety and vision under one Integrated Development Environment.

- Fastest cycle time: 2 ms
- Functions: Logic sequence and Motion control
- Up to 8 axes (4 synchronized axes)
- Built-in I/0: 40 or 24 I/0 points
- Up to 8 local NX I/O units
- Built-in EtherCAT and EtherNet/IP ports
- Up to 16 EtherCAT slaves
- Up to 2 option boards can be connected to add serial communications or analog I/O functionality

Ordering information

Value Desigr

Pane



NX1 series CPU units

Appearance	Type	Program	Memory capacity for variables	Number o	f axes		Built-in I/O points			Order code
		capacity		Real axes	Motion control servo axes	Single-axis position control servo axes	I/O points	Input points	Output points	
	NX1	1.5 MB	32 KB (retained dur- ing power	8 axes	4 axes	4 axes	40 points	24 points	16 points NPN transistor	NX1P2-1140DT
7			interruptions) or 2 MB (not retained		2 axes				16 points PNP transistor*1	NX1P2-1140DT1
			during power interruptions)	6 axes					16 points NPN transistor	NX1P2-1040DT
									16 points PNP transistor*1	NX1P2-1040DT1
1				4 axes	0 axes		24 points	14 points	10 points NPN transistor	NX1P2-9024DT
7									10 points PNP transistor*1	NX1P2-9024DT1

^{*1} With the load short-circuit protection.

Note: The end cover unit NX-END02 is included with the CPU unit.



Option boards

Appearance	Туре	Specifications	Supported protocol	Order code
	Serial communications	1 × RS-232C port Transmission distance: 15 m Connection type: Screwless push-in terminal block (9 terminals)	Host link, Modbus-RTU master and no-protocol	NX1W-CIF01
11		1 × RS-422A/485 port Transmission distance: 50 m Connection type: Screwless push-in terminal block (5 terminals)		NX1W-CIF11
		1 × RS-422A/485 port (isolated) Transmission distance: 500 m Connection type: Screwless push-in terminal block (5 terminals)		NX1W-CIF12
益	Analog I/O	2 × Analog input Voltage input: 0 to 10 V (Resolution: 1/4,000) Current input: 0 to 20 mA (1/2,000) Connection type: Screwless push-in terminal block (5 terminals)		NX1W-ADB21
7		2 × Analog output Voltage output: 0 to 10 V (Resolution: 1/4,000) Connection type: Screwless push-in terminal block (3 terminals)		NX1W-DAB21V
The same of		2 × Analog input / 2 × Analog output Voltage input: 0 to 10 V (Resolution: 1/4,000) Current input: 0 to 20 mA (1/2,000) Voltage output: 0 to 10 V (Resolution: 1/4,000) Connection type: Screwless push-in terminal block (8 terminals)		NX1W-MAB221

NX I/O units (local and remote I/O)

Up to 8 local NX I/O units can be connected to an NX1 CPU unit. The NX-Safety units must be used in combination with the EtherCAT communication coupler unit.

Communication and control units

Module Type	Protocol	Connection	Specification	Width	Order code
Communication coupler	l	(in + out)	Up to 63 I/O units. Max. 1,024 bytes in + 1,024 bytes out Supports distributed clock I/O power supply up to 10 A	46 mm	NX-ECC203
Safety controller*1	FSoE Protocol	128 Safety connections	For up to 1,024 safety I/O points	30 mm	NX-SL3500
		32 Safety connections	For up to 256 safety I/O points	30 mm	NX-SL3300

 $^{^{*1}}$ The NX-Safety units must be used in combination with the EtherCAT communication coupler unit.

Digital I/O units

Module type	Channels, Signal type	Performance*1, I/O Refresh Mode	Connection type ^{*2}	Width	Order code	NPN-type*3
AC Digital Input	4 inputs, 200 to 240 VAC, 50/60 Hz	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-IA3117	_
Safety Digital Input*4	4 inputs + 2 test outputs	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-SIH400	-
	8 inputs + 2 test outputs	Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-SID800	_
DC Digital Input	4 inputs, 3-wire connection	High-speed Synchronous Time Stamp	Screwless push-in (NX-TBA122)	12 mm	NX-ID3444	NX-ID3344
		High-speed Synchronous/Free Run	Screwless push-in (NX-TBA122)	12 mm	NX-ID3443	NX-ID3343
		Stamp High-speed Synchronous/Free Run Screwless push-in (NX-TBA122) 12 mm NX-ID3443 Synchronous/Free Run Screwless push-in (NX-TBA122) 12 mm NX-ID3447 wire connection Synchronous/Free Run Screwless push-in (NX-TBA162) 12 mm NX-ID4442 I-wire connection Synchronous/Free Run Screwless push-in (NX-TBA162) 12 mm NX-ID5442 I-wire connection Synchronous/Free Run Screwless push-in (NX-TBA162) 12 mm NX-ID5442 I-wire connection Synchronous/Free Run Screwless push-in (NX-TBA162) 12 mm NX-ID5142-5 I-wire connection Synchronous/Free Run I-x 40-pin MIL connector 30 mm NX-ID6142-5 I-x 40-pin Fujitsu connector 30 mm NX-ID6142-6 I-6 outputs 0.5 A, Pection + common I-x 40-pin MIL connector 30 mm NX-ID6142-6 I-5 A, 3-wire connection High-speed Synchronous Time Stamp Screwless push-in (NX-TBA082) 12 mm NX-OD2258 I-x 40-pin Fujitsu connector 30 mm I-x ID6142-6 I-x 40-pin Fujitsu connector 30 mm I-x ID6142-6 I-x 40-pin Fujitsu connector 30 mm INX-ID6142-6 I-x 40-pin Fujitsu connector 30 mm INX-ID6	NX-ID3317			
	8 inputs, 2-wire connection	Synchronous/Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-ID4442	NX-ID4342
	16 inputs, 1-wire connection	Synchronous/Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-ID5442	NX-ID5342
			1 × 20-pin MIL connector	30 mm	NX-ID5142-5	same
			M3 screw	30 mm	NX-ID5142-1	same
	32 inputs, 1-wire connection	Synchronous/Free Run	1 × 40-pin MIL connector	30 mm	NX-ID6142-5	same
			1 × 40-pin Fujitsu connector	30 mm	NX-ID6142-6	same
DC Digital I/O	16 inputs + 16 outputs 0.5 A,	Synchronous/Free Run	2 × 20-pin MIL connector	30 mm	NX-MD6256-5	NX-MD6121-5
	1-wire connection + common		2 × 24-pin Fujitsu connector	30 mm	_	NX-MD6121-6
DC Digital Output	2 outputs 0.5 A, 3-wire connection		Screwless push-in (NX-TBA082)	12 mm	NX-OD2258	NX-OD2154
	4 outputs 0.5 A, 3-wire connection	High-speed Synchronous/Free Run	Screwless push-in (NX-TBA122)	12 mm	NX-OD3257	NX-OD3153
		Synchronous/Free Run	Screwless push-in (NX-TBA122)	12 mm	NX-OD3256	NX-OD3121
	4 outputs 2 A/point, 8 A total, 3-wire connection	Synchronous/Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-OD3268	_
	8 outputs 0.5 A, 2-wire connection	Synchronous/Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-OD4256	NX-OD4121
	16 outputs 0.5 A, 1-wire connection	Synchronous/Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-OD5256	NX-OD5121
			1 × 20-pin MIL connector	30 mm	NX-OD5256-5	NX-OD5121-5
			M3 screw	30 mm	NX-OD5256-1	NX-OD5121-1
	32 outputs 0.5 A, 1-wire connection	Synchronous/Free Run	1 × 40-pin MIL connector	30 mm	NX-OD6256-5	NX-OD6121-5
			1 × 40-pin Fujitsu connector	30 mm	-	NX-OD6121-6
Safety Digital Output*4	2 outputs, 2.0 A	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-SOH200	_
	4 outputs, 0.5 A	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-SOD400	-
Relay Digital Output	2 outputs, N.O., 2.0 A	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-OC2633	-
	8 outputs, N.O., 2.0 A	Free Run	Screwless push-in (NX-TBA082 × 2)	24 mm	NX-OC4633	-
	2 outputs, N.O.+ N.C., 2.0 A	Free Run	Screwless push-in (NX-TBA082)	12 mm	NX-OC2733	-



Position control units

Module type	Channels, Signal type	Performance, I/O Refresh Mode	Connection type*2	Width	Order code	NPN-type*3
Encoder Input	1 SSI encoder, 2 MHz	Synchronous/Free Run	Screwless push-in (NX-TBA122)	12 mm	NX-ECS112	_
	2 SSI encoders, 2 MHz	Synchronous/Free Run	Screwless push-in (NX-TBA122)	12 mm	NX-ECS212	-
	1 incremental encoder line driver 4 MHz + 3 Digital Inputs (1 µs)	Synchronous/Free Run	Screwless push-in (NX-TBA122 + NX-TBB122)	24 mm	NX-EC0142	NX-EC0132
	1 incremental encoder open collector 500 kHz + 3 Digital Inputs (1 μs)	Synchronous/Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-EC0122	NX-EC0112
	2 incremental encoders open collector 500 kHz	Synchronous/Free Run	Screwless push-in (NX-TBA122)	12 mm	NX-EC0222	NX-EC0212
Pulse Output	1 Pulse Up/Down or Pulse/Direction open collector 500 kHz + 2 Digital Inputs + 1 Digital Output (1 μs)	Synchronous	Screwless push-in (NX-TBA162)	12 mm	NX-PG0122	NX-PG0112
	2 pulse line driver 4 MHz + 5 digital inputs per channel + 3 digital out- puts per channel		1 × 34-pin MIL connector	30 mm	NX-PG0242-5	NX-PG0232-5
	4 pulse line driver 4 MHz + 5 digital inputs per channel + 3 digital outputs per channel		2 × 34-pin MIL connector	30 mm	NX-PG0342-5	NX-PG0332-5

Serial Communication Interface Units

Module type	Channels, Signal type	Performance, I/O Refresh Mode	Connection type ^{*2}	Width	Order code	NPN-type*3
Serial Communication	1 × RS-422A/485	Free Run	Screwless push-in (NX-TBC162)	12 mm	NX-CIF105	_
	1 × RS-232C	Free Run	Screwless push-in (NX-TBC162)	12 mm	NX-CIF101	_
	2 × RS-232C	Free Run	9-pin D-sub	30 mm	NX-CIF210	_

^{*1} Digital I/O performance

Digital I/O performance		Standard	Standard		
		ON delay	OFF delay	ON delay	OFF delay
Input	PNP	0.02 ms	0.4 ms	100 ns	100 ns
	NPN				
	AC	10 ms	40 ms	N.A.	N.A.
Output	PNP	0.5 ms	1.0 ms	300 ns	300 ns
	NPN	0.1 ms	0.8 ms		
	Relay	15 ms	15 ms	N.A.	N.A.

^{*2} Units with screwless push-in connections are supplied with the appropriate terminal connector. Units with MIL/Fujitsu connectors are supplied without matching plugs; for connecting cables see page 98 (http://omron.me/iag2017)
*3 Order codes are for PNP-type signals (positive switching, 0 V common). Most models are also available as NPN-type (negative switching, 24 V common). Inputs of MIL-connector versions can

Analog I/O Units

Module type	Signal type	Performance, I/O Refresh Mode	Channels	Connection type *1	Width	Order code
Temperature Sensor	Thermocouple type	0.1°C resolution, 200 ms/unit	2	Screwless push-in terminal block(s)	12 mm	NX-TS2101
Input	B,E,J,K,L,N,R,S,T,U,WRe5-26,PLII	Free Run	4	with cold junction sensor, calibrated	24 mm	NX-TS3101
		0.01°C resolution, 10 ms/unit Free Run	2	individually at the factory	12 mm	NX-TS2102
			4		24 mm	NX-TS3102
		0.001°C resolution, 60 ms/unit	2		12 mm	NX-TS2104
		Free Run	4		24 mm	NX-TS3104
	RTD type	0.1°C resolution, 200 ms/unit	2	Screwless push-in (NX-TBA162)	12 mm	NX-TS2201
	Pt100 (3-wire), Pt1000, Ni508.4	Free Run	4	Screwless push-in (NX-TBA162 + NX-TBB162)	24 mm	NX-TS3201
		0.01°C resolution, 10 ms/unit	2	Screwless push-in (NX-TBA162)	12 mm	NX-TS2202
		Free Run	4	Screwless push-in (NX-TBA162 + NX-TBB162)	24 mm	NX-TS3202
		0.001°C resolution, 60 ms/unit	2	Screwless push-in (NX-TBA162)	12 mm	NX-TS2204
		Free Run	4	Screwless push-in (NX-TBA162 + NX-TBB162)	24 mm	NX-TS3204



be used as NPN or PNP.

^{*4} The NX-Safety units must be used in combination with the EtherCAT communication coupler unit.

Module type	Signal type	Performance, I/O Refresh Mode	Channels	Connection type *1	Width	Order code
Analog Input	4 to 20 mA	1/8000 resolution, 250 μs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2203
	single ended	Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3203
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4203
	4 to 20 mA	1/8000 resolution, 250 μs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2204
	differential	Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3204
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4204
		1/30000 resolution,10 μs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2208
		Synchronous/Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3208
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4208
	-10 to 10 V	1/8000 resolution, 250 μs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2603
	single ended	Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3603
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4603
	-10 to 10 V	1/8000 resolution, 250 μs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2604
	differential	Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3604
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4604
		1/30000 resolution,10 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2608
		Synchronous/Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3608
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4608
Analog Output	4 to 20 mA	1/8000 resolution, 250 μs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2203
		Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3203
		1/30000 resolution,10 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2205
		Synchronous/Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3205
	-10 to 10 V	1/8000 resolution, 250 μs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2603
		Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3603
		1/30000 resolution,10 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2605
		Synchronous/Free Run	4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3605

Load cell input

Module type	Specifications	Excitation voltage/input range	I/O refresh method	Connection type *1	Width	Order code
Load cell input	1 load cell input, 125 μs conversion	l	,	Screwless push-in (NX-TBC162)	12 mm	NX-RS1201
	cycle		Free Run			

Heater burnout detection

Module type	Channels, signal type	The state of the s	I/O refresh method	Connection type *1	Width	Order code
Heater burnout detection		NPN, 12 to 24 VDC 0.1 A/point, 0.4 A/unit	Free Run	Screwless push-in (NX-TBA162)	12 mm	NX-HB3101
		PNP 24 VDC 0.1 A/point, 0.4 A/unit		Screwless push-in (NX-TBA162)	12 mm	NX-HB3201

Other units

Module type	Description	Connection type ^{*1}	Width	Order code
Power Unit	NX bus power supply unit, 24 V DC input, non-isolated	Screwless push-in (NX-TBC082)	12 mm	NX-PD1000
	I/O power feed unit, for separation of power groups, up to 10 A	Screwless push-in (NX-TBA082)	12 mm	NX-PF0730
	I/O power connection unit, 16 × IOV	Screwless push-in (NX-TBA162)	12 mm	NX-PC0020
	I/O power connection unit, $16 \times IOG$	Screwless push-in (NX-TBA162)	12 mm	NX-PC0010
	I/O power connection, 8 × IOV + 8 x IOG	Screwless push-in (NX-TBA162)	12 mm	NX-PC0030
System Units and	Grounding terminal, 16 points	Screwless push-in (NX-TBC162)	12 mm	NX-TBX01
Accessories	End cover (included with Communication Coupler)	-	12 mm	NX-END01
	Replacement front connector with 8 wiring terminals (marked A+B)	Screwless push-in	12 mm	NX-TBA082
	Replacement front connector with 12 wiring terminals (marked A+B)	Screwless push-in	12 mm	NX-TBA122
	Replacement front connector with 16 wiring terminals (marked A+B)	Screwless push-in	12 mm	NX-TBA162
	Replacement front connector with 12 wiring terminals (marked C+D)	Screwless push-in	12 mm	NX-TBB122
	Replacement front connector with 16 wiring terminals (marked C+D)	Screwless push-in	12 mm	NX-TBB162
	Replacement front connector with 8 wiring terminals (marked A+B+FG)	Screwless push-in	12 mm	NX-TBC082
	Replacement front connector with 16 wiring terminals (marked A+B+FG)	Screwless push-in	12 mm	NX-TBC162
	DIN rail insulation spacers, set of 3 pcs	·	-	NX-AUX01
	30 Unit pins + 30 Terminal keying pins, to prevent mismatch of unit and terminal	block (one set is enough for 10 units)	-	NX-AUX02

^{*1} Units with screwless push-in connections are supplied with the appropriate terminal connector.



Machine controller

Recommended EtherCAT and EtherNet/IP communication cables

tem			Manufacturer	Color	Cable length (m)	Order code
therCAT cable	Cat 5e, AWG22, 2-pair cable	Standard type	OMRON	Black	0.5	XS5W-T421-BM2-SS
	M12/Smartclick connectors	Cable with connectors on both ends			1	XS5W-T421-CM2-SS
	Improved shield for EtherCAT communications	(M12 straight/M12 straight)			2	XS5W-T421-DM2-SS
	Communications				3	XS5W-T421-EM2-SS
		-0			5	XS5W-T421-GM2-SS
					10	XS5W-T421-JM2-SS
		Rugged type	1	Black	0.5	XS5W-T421-BMCSS
		Cable with connectors on both ends	5	Diack	1	XS5W-T421-CMC-SS
		(M12 straight/RJ45)			2	XS5W-T421-DMC-SS
		- 44			3	
		-0			5	XS5W-T421-EMC-SS
						XS5W-T421-GMC-SS
			-		10	XS5W-T421-JMC-SS
ernet/EtherCAT ch cable	Cat 6a, AWG27, 4-pair cable Cable sheath material: LSZH*1,*2	Standard type Cable with connectors on both ends		Yellow	0.2	XS6W-6LSZH8SS20CM-Y
Circable	Cable Sileath Haterial, ESZH	(RJ45/RJ45)			0.3	XS6W-6LSZH8SS30CM-Y
		(12.12,12.12)			0.5	XS6W-6LSZH8SS50CM-Y
					1	XS6W-6LSZH8SS100CM-Y
		-			1.5	XS6W-6LSZH8SS150CM-Y
					2	XS6W-6LSZH8SS200CM-Y
					3	XS6W-6LSZH8SS300CM-Y
					5	XS6W-6LSZH8SS500CM-Y
					7.5	XS6W-6LSZH8SS750CM-Y
					10	XS6W-6LSZH8SS1000CM-
					15	XS6W-6LSZH8SS1500CM-
					20	
				-		XS6W-6LSZH8SS2000CM-
				Green	0.2	XS6W-6LSZH8SS20CM-G
					0.3	XS6W-6LSZH8SS30CM-G
					0.5	XS6W-6LSZH8SS50CM-G
					1	XS6W-6LSZH8SS100CM-G
					1.5	XS6W-6LSZH8SS150CM-G
					2	XS6W-6LSZH8SS200CM-G
					3	XS6W-6LSZH8SS300CM-G
					5	XS6W-6LSZH8SS500CM-G
					7.5	XS6W-6LSZH8SS750CM-G
					10	XS6W-6LSZH8SS1000CM-
					15	XS6W-6LSZH8SS1500CM-
					20	XS6W-6LSZH8SS2000CM-
	Cat Fa AMC 2C A sais sable	Chair daud to us a	-	Cuana	0.5	
	Cat 5e, AWG26, 4-pair cable Cable sheath material: PUR*1	Standard type Cable with connectors on both ends		Green		XS6W-5PUR8SS50CM-G
	Cable Sileatii Illatellai. FON	(RJ45/RJ45)			1	XS6W-5PUR8SS100CM-G
		(12.12,12.12)			1.5	XS6W-5PUR8SS150CM-G
					2	XS6W-5PUR8SS200CM-G
		-			3	XS6W-5PUR8SS300CM-G
					5	XS6W-5PUR8SS500CM-G
					7.5	XS6W-5PUR8SS750CM-G
					10	XS6W-5PUR8SS1000CM-G
					15	XS6W-5PUR8SS1500CM-G
					20	XS6W-5PUR8SS2000CM-G
	Cat 5e, AWG22, 2-pair cable	Rugged type	OMRON	Grey	0.3	XS5W-T421-AMD-K
	cat se, Awd22, 2-pail cable	Cable with connectors on both ends	OMINON	diey	0.5	
		(RJ45/RJ45)			0.5	XS5W-T421-BMD-K
					-	XS5W-T421-CMD-K
		~5			2	XS5W-T421-DMD-K
		~ 0			3	XS5W-T421-EMD-K
					5	XS5W-T421-GMD-K
					10	XS5W-T421-JMD-K
					15	XS5W-T421-KMD-K
		Rugged type	1	Grey	0.3	XS5W-T421-AMC-K
		Cable with connectors on both ends		1	0.5	XS5W-T421-BMC-K
		(M12 straight/RJ45)			1	XS5W-T421-CMC-K
		All I			2	
		-0			2	XS5W-T421-DMC-K
					3	XS5W-T421-EMC-K
					5	XS5W-T421-GMC-K
					10	XS5W-T421-JMC-K
	Í.	1	1	1	15	XS5W-T421-KMC-K

Item			Manufacturer	Color	Cable length (m)	Order code
Ethernet/EtherCAT	Cat 5e, AWG22, 2-pair cable	Rugged type	OMRON	Grey	0.3	XS5W-T422-AMC-K
patch cable		Cable with connectors on both ends			0.5	XS5W-T422-BMC-K
		(M12 L right angle/RJ45)			1	XS5W-T422-CMC-K
					2	XS5W-T422-DMC-K
		P O			3	XS5W-T422-EMC-K
					5	XS5W-T422-GMC-K
					10	XS5W-T422-JMC-K
					15	XS5W-T422-KMC-K
Ethernet installation	Cat 5, SF/UTP, 4 × 2 × AWG 24/1 (solid	core), Polyurethane (PUR)	Weidmüller	Green	100	WM IE-5IC4x2xAWG24/1-PUR
cable	Cat 5, SF/UTP, 4 × 2 × AWG 26/7 (strand	ded core), Polyurethane (PUR)]	Green	100	WM IE-5IC4x2xAWG26/7-PUR
Connectors	RJ45 metallic connector For AWG22 to AWG26	A		-	-	WM IE-T0-RJ45-FH-BK
	RJ45 plastic connector For AWG22 to AWG24		OMRON	-	-	XS6G-T421-1
RJ45 socket	DIN-rail mount socket to terminate inst	allation cable in the cabinet	Weidmüller	-	_	WM IE-T0-RJ45-FJ-B

^{*1} The lineup features low smoke zero halogen cables for in-cabinet use and PUR cables for out-of-cabinet use.
*2 This cable is available in yellow, green and blue colors.

Note: Please be careful while cable processing, for EtherCAT, connectors on both ends should be shield connected and for EtherNet/IP, connectors on only one end should be shield connected.

Accessories

Appearance	Specifications			Order code					
	EtherCAT junction slaves	3 ports Power supply voltage: 20.4 to 28.8 VDC (2 Current consumption: 0.08 A	4 VDC –15 to 20%)	GX-JC03					
100 mea		6 ports Power supply voltage: 20.4 to 28.8 VDC (2 Current consumption: 0.17 A	4 VDC –15 to 20%)	GX-JC06					
	Industrial switching hubs (for EtherNet/IP and Ethernet)	Quality of Service (QoS): EtherNet/IP control data priority.	3 ports Power supply connector included	W4S1-03B					
		Failure detection: Broadcast storm and LSI error detection	5 ports Power supply connector included	W4S1-05B					
		10/100 BASE-TX, Auto-Negotiation Current consumption: 0.22 A	5 ports Power supply connector and connector for informing error included	W4S1-05C					
omeon A HMC-Spziri	SD memory card	2 GB		HMC-SD291					
2GB		4 GB	4 GB						
	DIN track	Length: 0.5 m; height: 7.3 mm		PFP-50N					
		Length: 1 m; height: 7.3 mm		PFP-100N					
		Length: 1 m; height: 16 mm		PFP-100N2					
	End plate to secure the units on	the DIN rail		PFP-M (2 pcs)					
	Battery for NX/NJ CPU unit	Battery for NX/NJ CPU unit							
	End cover	End cover for NX1 CPU unit (Provided with the CPU unit)		NX-END02					
3		End cover for EtherCAT communication co (Provided with the EtherCAT communicat		NX-END01					

Computer software

Specifications	Order code
Sysmac Studio Lite Edition ^{*1} version 1.17 or higher	SYSMAC-LE*2

^{*1} Same functionality and supported devices than Sysmac Studio Standard Edition except for controller. The Lite Edition only supports the NJ1 and NX1 machine controllers.

*2 Refer to the Sysmac Studio datasheet (Cat. No. SysCat_I181E) for detailed information or contact your OMRON representative.

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

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Safety logic control systems

BREAK THROUGH BARRIERS IN SAFETY DESIGN

Configurable, scalable and simple

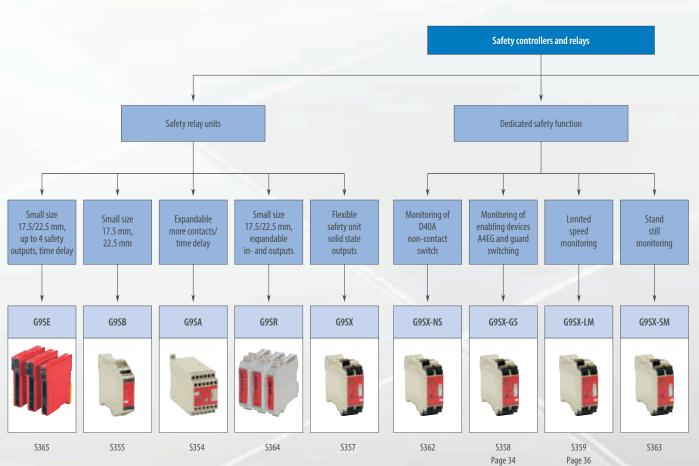
Omron safety controllers, offer a wide solution portfolio from safety relay units to a distributed and integrated safety logic control systems. It allows to solve any safety needs from a simple machines through to manufacturing cells.

Safety relay units covers the most exigent safety wired needs. The compact safety controller is simple to configure and setup and overcomes limitations of hard-wired solutions by adding flexibility of a software - based solution. The expandable and programmable modular safety controller series provides a complex logic solution for stand alone designs. The distributed safety, allows to manage all safety complexity and integrated architecture types reducing your engineering time.

Omron provides from dedicated safety network such as DeviceNet Safety to Integrated and distributed safety like Fail Safe over EtherCAT.

- EN ISO 13849-1 (PLe) and IEC 61508 (SIL3) certification for future-proof design of the safety system
- · Predefined and validated function blocks for simple configuration
- Scalable safety solution for compact, distributed and fully integrated safety systems







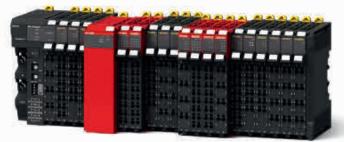
Modular Programmable safety controller

Distributed and integrated Programmable safety controller





Compact Programmable safety controller



Programmable safety controllers

Compact operation,
up to 20 inputs and 16 outputs

Modular operation,
up to 32 safety stides

Up to 1024 inputs and 512 outputs

NX-S

NETA-SCPUD_

NX

S356

H253

S322

H275

Selection table

ур	Appli	cation							Powe	r suppl	у	Interface	Input	Outpu	t						Widt
			t	Ξ		ъ		ce lev 13849	VDC	VAC				Safety		Safety off-de		Auxilia (non-s		Test	
	e-stop	Safeguard	Safeguard Safeguard non-contact Light curtain Standstill Limit speed	Two-hand	Performance level acc.EN ISO 13849-	cc.EN ISO	24	100 to 240		Relay	Solid state	Relay	Solid state	Relay (NC)	Solid state	Solid state	mm				
9SA																					
G9SA-301								PL e						3		0		1			45
G9SA-501								PL e						5		0		1			45
G9SA-321T								PL e						3		2		1			45
G9SA-EX301								PL e						3		0		1			17.5
G9SA-EX031T								PL e						0		3		1			17.5
G9SA-TH301								PL e						3		0		1			45
i9SB											_										
G9SB-2002-A			Te T	T	T	T	T	PL e			T		Τ	2		0		0			17.5
G9SB-200-B								PL e						2		0		0			17.5
G9SB-2002-C				1				PL e						2		0		0			17.5
G9SB-200-D								PL e						2		0		0			17.5
G9SB-3010			1	1	+		+	PL e		\vdash	1		+	3		0		1			17.5
G9SB-3012-A							1	PL e						3		0		1			22.5
G9SB-301-B					+	+	+	PL e					1	3		0		1			22.5
G9SB-3012-C				F	+	+	+	PL e			+		+	3		0		1			22.5
G9SB-301-D						+		PL e					1	3		0		1			22.5
S9SR				_				1.20			1			1-		10		1.			122.5
G9SR-BC201		T	Terr		Т	Т	Т	PL e		Т	Τ	I	Т		2	О			1		17.6
G9SR-AD201		1	=		+	+	+	PLe		+	1		1	2	_	0			1		22.5
G9SR-EX031-T90	_	+	+	┼	+	+	+	PLe		+	1		1	3 ^{*1}		3*1			1		22.5
i9SE								ILC	_					12		12			<u>''</u>		22.5
G9SE-201		T			Т	Т	Т	PL e		Т	Τ	I	Т	2	Π	0	Π	Τ	1	Τ	17.5
G9SE-401	=	╁			+	+	+	PLe			+		+	4		0			1		22.5
G9SE-221-T05	-	1			+	+	+	PLe			+			2		2			1		22.5
G9SE-221-T03	-	-			+	+	+	PLe			+			2		2			1		22.5
i9SX	_			_				rLe	_					4		-			<u> </u>		22.3
G9SX-BC202	Terror	T	Terror		Т	Т	Т.	PL e	Terror	Т	Т	1	Т	Ι	2		О		2		22.5
G9SX-BC202	-	-	Ε-	Ε-	+	+	+	PLe	-	+	1		+		2		0		2		22.5
G9SX-AD322-T15	-	-			+	+	+	PLe	-	+	+		+		3		2		2		35
G9SX-AD322-T15-RC	=	=	-		+	+	+	PLe		+	+		+		3		2		2		35
G9SX-AD322-113-RC	=	+			+	+	+	PLe	-	-	+		+		2		2		2		35
G9SX-ADA222-T15-RC		+	-	H		+		PLe		-					2		2		2		35
	=	+	-		-	+	+			+	1		+		2		2				_
G9SX-GS-226-T15	-	-		-	-	+	+	PL e		+	+	1	+	-	3	-		-	6	-	35
G9SX-SM032	1	+	+	1		-	+	PL e		+	+		+	-		-		-	2	-	35
G9SX-LM224-F10	-	+	-	-	+		+	PL d		-	+		+		4	-	0		4		45
G9SX-NS202	-	-		1	+	1	+	PL d		1	+		1		2	-	0	-	2	-	22.5
G9SX-NSA222-T03		-		+	+-	1	+	PL d		-	+		1		2		2	-	2	-	35
G9SX-EX401	-	+	+	-	+	\perp	+	PL e		-	+		+	4		0			2		22.5
G9SX-EX401-RC	-	+	1	1	1_	1	1	PL e	-	_	1		-		4		0		1		22.5
G9SX-EX041		1	1	_	1	1	1	PL e		1	1		\perp	0		4			2		22.5
G9SX-EX041-T-RC								PL e							0		4		1		22.5



Гур	Appli	cation						- <u>-</u> -	Powe	r supply	у	Interface	Input	Outpu	t						Width
			_ 5	ain		9.		nce lev 13849	VDC	VAC				Safety		Safety off-del		Auxilia (non-s		Test	
	e-stop	Safeguard	Safeguard non-contact	Light curtain	Standstill	Limit speed	Two-hand	Performance level acc.EN ISO 13849-1	24	24	100 to 240			Relay	Solid state	Relay	Solid state	Relay (NC)	Solid state	Solid state	mm
G9SP-N				•																	
G9SP-N10S	-	-	-			(■)*2	•	PL e				RS-232C, Ethernet ^{*3}	10		4		4		4	4	66
G9SP-N10D	•	-	-	-		(■)*2	-	PL e				RS-232C, Ethernet ^{*3}	10		16		16			6	130
G9SP-N20S	•	-	-			(■)*2	•	PL e	-			RS-232C, Ethernet ^{*3}	20		8		8			6	130
NE1A-SCPU						•															
NE1A-SCPU01-V1								PL e				USB, DeviceNet	16		8		8			4	99.4
NE1A-SCPU01-EIP	•		-					PL e	-			USB, Ethernet/IP DN Safety	16		8		8			4	113
NE1A-SCPU02-V1	•	-	•	•				PL e				USB, DeviceNet	40		8		8			8	135.6
NE1A-SCPU02-EIP	•			-			-	PL e	-			USB, Ethernet/IP DN Safety	40		8		8			8	158.2
DST1 expansion units	of NE1A					•															
DST1-ID12SL-1								PL e				DeviceNet	12							4	170
DST1-MD16SL-1								PL e				DeviceNet	8		8		8			4	170
DST1-MRD08SL-1								PL e				DeviceNet	4	4		4				4	170
NX-S Sysmac safety																					
NX-SL3300								PL e					256								30
NX-SL3500								PL e					1024								30
NX-SID800								PL e					8							2	12
NX-SIH400								PL e					8							2	12
NX-SOD400								PL e							4		4				12
NX-SOH200								PL e							2		2				12

^{*1} max. 3 ON and OFF-delay time can be adjusted in 16 steps from 0 to 90 s
*2 By use of special function block
*3 Option

Detailed information

Туре	Quick link
G9SA	S354
G9SB	S355
G9SR	S364
G9SE	S365
G9SX	S357
G9SP-N	S356
NE1A-SCPU	S322
DST1 expansion units of NE1A DST1-ID DST1-MD DST1-MRD	S324 S325 S326
NX-S Sysmac safety	H253





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

^{*1} P channel MOS FET transistor output *2 PNP transistor output

Specifications

Ratings of guard switching unit

Power input

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

Item	G9SX-GS226-T15
Safety input	Operating voltage: 20.4 VDC to 26.4 VDC, internal impedance: approx. 2.8 ${ m k}\Omega$
Feedback/reset input	
Mode selector input	

Outputs

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



^{*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.

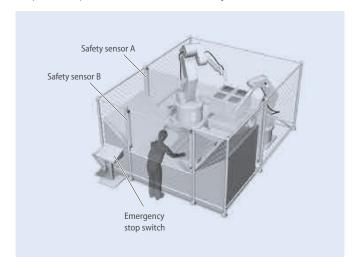
Application example

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

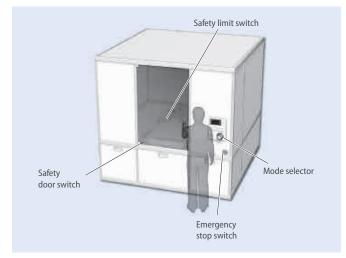
Worker has to do maintenance in this machine. While maintenance, it is necessary to move the machine in a limited way. The worker has to select automatic mode or manual mode manually by using the mode selector switch.

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.





Flexible safety 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
				1	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
Feedback/reset input	Internal impedance: approx. 2.8 k Ω
Mode selector input	
Rotation detection input	Operating voltage 20.4 VDC to 26.4 VDC Internal impedance: approx. 2.8 k Ω Input frequency: 1 kHz max.

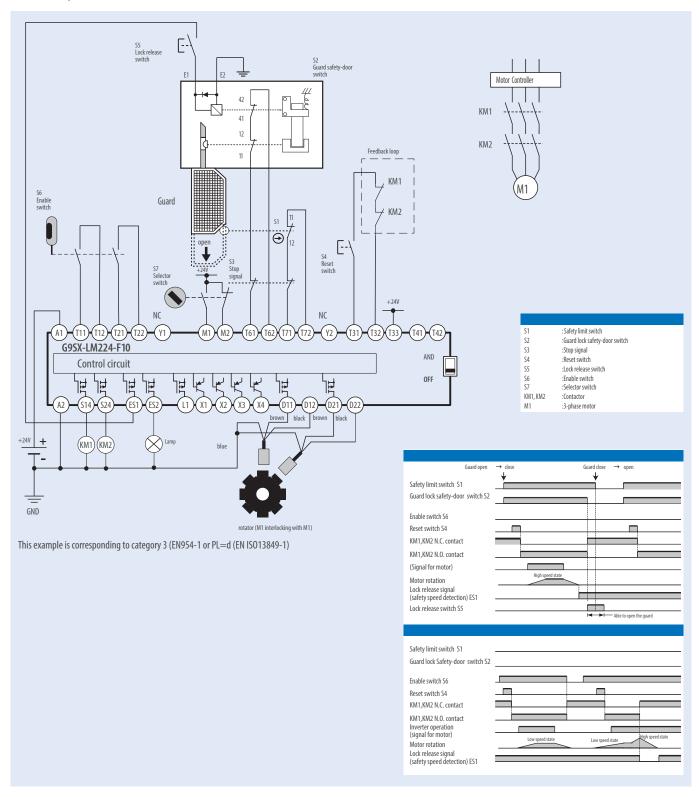
Outputs

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



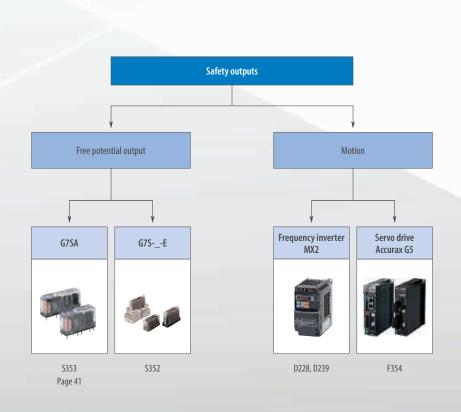
Safety outputs

STOPPING ALL DANGEROUS MOVEMENTS

Our solution helps you to stop all dangerous movements that you have in your machine. From a switch off the power, until stop some safety motion movement.

- Free potential outputs -Safety relays
- Frequency Inverters
- Servo Drives





Safety relays





Model		G7SA	G7SE
Selection criteria	Housing	Plastic	Plastic
	Operating temperature	−40 to 85°C	−25 to 70°C
	Flux-tight		
	Number of poles	4 pole and 6 pole	6 pole
Features	Gold clad contacts		_
	Relay socket		
Application	General safety application		
Supply voltage	24 VDC		
In- and outputs	4PST-NO + DPST-NC		
	3PST-NO + 3PST-NC		
	3PST-NO + SPST-NC		_
	DPST-NO + DPST-NC		-
	5PST-NO + SPST-NC		_
Page/Quick Link		41/S353	S352

Frequency inverters





IP5

	I
Model	MX2
400 V three-phase	0.4 kW to 15 kW
200 V three-phase	0.1 kW to 15 kW
200 V single-phase	0.1 kW to 2.2 kW
Application	Harmonized motor and machine control
Control method	Open loop speed and torque control for vector and speed for V/F control
Torque features	200% at 0.5 Hz
Connectivity	Modbus, DeviceNet, PROFIBUS, MECHATROLINK-II, EtherCAT, CompoNet, EtherNet IP
Logic programming	Standard firmware
Safety approvals	ISO13849-1 Category 3, Performance Level PLd
Customisation options	IP54 enclosure
Page/Quick Link	D228, D239

Servo drives



	Accurax G5
	EtherCAT network and safety built-in
Ratings 230 V single-phase	100 W to 1.5 kW
Ratings 400 V three-phase	600 W to 15 kW
Applicable servomotor	Accurax G5 and G-Series rotary motors
Position control	EtherCAT, MECHATROLINK-II or Pulse train input
Speed control	EtherCAT, MECHATROLINK-II or Analog input ±10 V
Torque control	EtherCAT, MECHATROLINK-II or Analog input ±10 V
	Embedded indexer functionality
Safety approvals	ISO13849-1:2008 (PL d), EN 954-1:1996 (Cat-3)
Full closed loop	Built-in
Page/Quick Link	F354
•	



Relays with forcibly guided contacts

The slim G7SA relay family with forcibly guided contacts is available as a fouror 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, outputs and poles
- 4- and 6-pole relays available
- Sockets available with Push-In technology

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

Mounting	Terminal type	LED indicator	Poles	Coil rated voltage	Order code
Front- mounting	Push-In Plus	Yes	4 poles	24 VDC	P7SA-10F-ND-PU
	terminals		6 poles	_	P7SA-14F-ND-PU
	Screw terminals	Yes	4 poles		P7SA-10F-ND
			6 poles		P7SA-14F-ND
		No	4 poles		P7SA-10F
			6 poles		P7SA-14F
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
	· ·	4 poles: 1,600 Ω 6 poles: 1,152 Ω	75% max. (V)	10% min. (V)	. ,	4 poles: Approx. 360 mW 6 poles: Approx. 500 mW

Note: Refer to datasheet for details

Contacts

Load	Resistive load (cos		
Rated load	6 A at 250 VAC, 6 A at 30 VDC		
Rated carry current	6 A		
Max. switching voltage	250 VAC, 125 VDC		
Delays with fersibly suided contacts			

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

Relays with forcibly guided contacts

	$100~\text{m}\Omega$ max. (The contact resistance was measured with 1 A at 5 VDC using the voltage-drop method.)	
	20 ms max.	
iting time *1 20 ms max. Inse 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.)		
	20 ms max.	
	$100~M\Omega$ min. (at 500 VDC) (The insulation resistance was measured with a 500 VDC megger at the same places that the dielectric strength was measured.)	
*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	
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)		
l ^{*4}	5 VDC, 1 mA (reference value)	
e ^{*5}	Operating: –40 to 85°C (with no icing or condensation)	
Ambient humidity Operating: 35 to 85%		
	EN61810-1 (IEC61810-1), EN50205, UL508, CSA22.2 No. 14	
	*3 Mechanical Electrical *4	

- These times were measured at the rated voltage and an ambient temperature of 23°C. Contact bounce time is not included.
- 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.
- When using a P7SA socket, the dielectric strength between coil contacts/different poles is 2,500 VAC, 50/60 Hz for 1 min.
- Min. permissible load is for a switching frequency of 300 operations/min.
 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



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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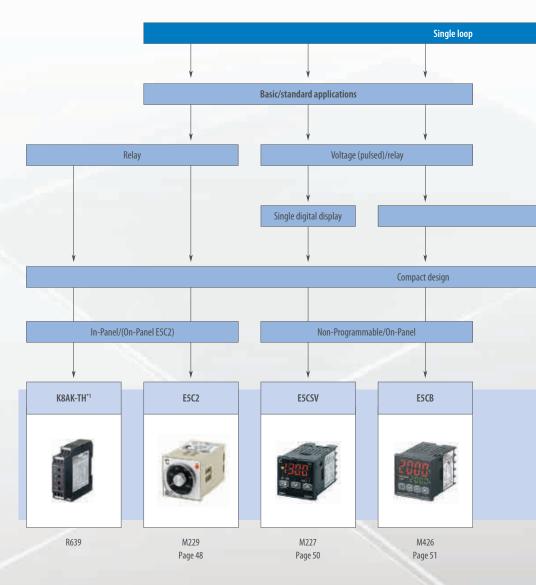
Temperature controllers

E5_C — THE NEW STANDARD

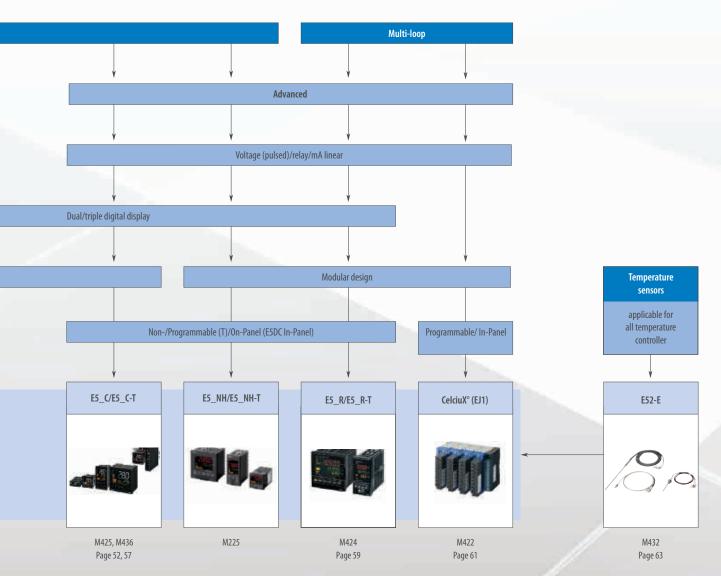
... in temperature control

Omron has been an active innovator in temperature control since introducing its first temperature controller in 1967. Now temperature control has taken a giant leap forward with Omron's next generation of controllers – the E_C, which set new global standards in the crucial areas of precision, user friendliness and control performance. The E_C series will save you time and effort in set-up and operation, while enabling faster and more accurate monitoring/control of your process. The high visibility display of the new series is also extremely easy to read and virtually eliminates any possibility for human error.









^{*1} Temperature limiter *2 Only available in Africa, Middle East and Russia

Selection table

Cate	gory		Analog temperature controller	Digital temperature controller		
			0:	1300	0000	
Mod	el		E5C2	E5CSV	E5CB	E5_C
Selection criteria	B	Terminal type	Screw			Screwless, push-in plus, Screw
. <u>.</u>		Panel	On-panel/In-Panel	On-panel		On-panel/In-Panel
ij		Loops	1	1	1	1
		Size	1/16 DIN	1/16 DIN	1/16 DIN	1/4, 1/8, 1/16, 1/32, 22,5 mm
900	2	ON/OFF PID 2-PID*1	■ /P ■ –	■ - ■	■ - ■	■ - ■
Ē		Operation*2	H/C	H/C	H/C	H&C
Control mode		Valve Control ^{*3}	-	-	-	
		Accuracy	-	±0.5%	±0.5%	±0.3%
		Auto-/Self-/Gradient-tuning	- -		■ ■ -	■ = -
		Transfer output	-	-	-	
Features	2	Remote input	-	-	-	
1 tea	במו	Number of alarms	-	1	1	0-4 □*5
		Heater alarm	IP40	IP66	IP66	IP66
		IP rating front panel Display	IP40	Single 3.5 digit	Dual 4 digit	Dual/triple 4 digit
		Display	_	Single 3.5 digit	Duai 4 digit	Dual/triple 4 digit
	e d	110/240 VAC				
Supply	volta	24 VAC/VDC	-			
		RS-232 RS-485	- -	- -	- -	-10
		Event IP	-	-	-	
		QLP port	-	-	■ *4	■ *6
Commo	2	DeviceNet	-	-	-	-
٥	5	Modbus	-	_		
		PROFIBUS	-	-	-	□*7
		Modbus TCP	-	-	-	□*8 □*8
		ProfiNet	-	-	-	□*8
_	_	Relay SSR	- -	■ - -	■ -	■ -
Control	rtbn	Voltage (pulse)	-		•	•
S	0	Linear voltage	_	_	_	-
		Linear current mA	_	_	_	-
-be-	Ä					_
Input type -	line	mV	-	-	-	-
ם		V	-	_	-	•
		К				
		J				
		Т	-			
	41	E	-	-	-	
	nple	L	-	_	-	-
/pe	000	U	-	-	-	-
Input type	<u></u>	N	-	-		-
lnp	Ė	R S	-	_		•
		В	_	_	-	-
		W	_	_	_	-
		PLII	-	-	-	<u> </u>
	RTD	Pt100 JPt100 THE	■ - ■	■ ■ -	■ - -	■ ■ -
Dan		ck Link	49/M220	50/M227	51/M426	52/M425
*1 a.r		ck Link	48/M229	50/M227	51/M426	52/M425

^{*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

Digital programmable temperature controller	Digital (programmable) ten	nperature controller	Digital temperature/Gradient controller
1300	an Augustian Consumer	THE STATE OF THE S	
E5_C-T	E5_NH/E5_NH-T	E5_R/E5_R-T	CelciuX° (EJ1/-G)
Screw			Screwless, Screw
On-panel/In-Panel	On-panel		In-panel
1	1	2/4	2/4
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
			-
±0.3%	±0.1%	±0.1%	±0.5%
■ ■ –	±0.1%	±0.1% ■ - -	■ – ■ (only G)
			☐ (only EJ1)
3-4	2-3	2-3	2
<u>5</u> *5	□*5	□*5	
IP66	IP66	IP66	IP20
Dual/triple 4 digit	Dual/triple 5 digit	Triple 5 digit	-
	-	-	-
			24 VDC
		- 🗆	
- D			
<u>□</u> *6	■ *9	■ *9	
_			
_	_		-
-	-		
- ■	- ■ □* ⁷	■	□ □*7
	■ □*7	□ ^{*7}	
□*7	•	I	□ ^{*7}
□*7 □*8	□*7 □*8	□* ⁷ □* ⁸	□*7 □*8 □*8
□*7 □*8 □*8	□*7 □*8 □*8	□'7 □*8 □*8	□*7 □*8
□'7 □'8 □'8 ■ -	□*7 □*8 □*8	□*7 □*8 □*8 ■ -	□*7 □*8 □*8 - -
□'7 □'8 □'8 ■ -	□*7 □*8 □*8	□*7 □*8 □*8 ■ I –	□*7 □*8 □*8 - -
□'7 □'8 □'8 ■ -	□*7 □*8 □*8 ■ □ ■	□*7 □*8 □*8 ■ I – ■ -	□*7 □*8 □*8 - - ■ -
□'7 □'8 □'8 ■ - ■	□*7 □*8 □*8 ■ □ ■	□*7 □*8 □*8 ■ 1 – ■ -	□*7 □*8 □*8 - - ■ - ■ (only E1)
□'7 □'8 □'8 ■ - ■ -	□*7 □*8 □*8 ■ □ ■	□*7 □*8 □*8 ■ 1 – ■ -	□*7 □*8 □*8 - - ■ - ■ (only E1)
□'7 □'8 □'8 ■ - ■ -		□*7 □*8 □*8 ■ 1 - ■ - ■ -	□*7 □*8 □*8 - - ■ (only EJ1)
□'7 □'8 □'8 ■ - ■ -		□*7 □*8 □*8 ■ I − ■ - ■ -	□*7 □*8 □*8 - - ■ (only EJ1)
□'7 □'8 □'8 ■ -	□*7 □*8 □*8 ■ □ ■ ■ □ ■ □ ■ □ ■ □ ■ □ ■ □	□*7 □*8 □*8 ■ - ■ - ■ - ■ -	□*7 □*8 □*8 - - ■ (only EJ1) ■ -
- 17	□*7 □*8 □*8 ■ □ ■ ■ □ ■ □ ■ □ ■ □ ■ □ ■ □	□*7 □*8 □*8 □ *8 ■ I − ■ - ■ - ■ ■ -	□*7 □*8 □*8 - - ■ (only EJ1) ■ -
□'7 □'8 □'8 ■ -	□ *7 □ *8 □ *8 ■ 1 ■ ■ • • • • • • • • • • • • • • • • • •	□*7 □*8 □*8 ■ I − ■ - ■ - ■ - ■ - ■ - ■ - ■ - ■ - ■ - ■	□*7 □*8 □*8 - - ■ (only EJ1) ■ -
- 1	□*7 □*8 □*8 ■ □ ■ ■ □ ■ □ ■ □ ■ □ ■ □ ■ □ ■ □ ■ □ ■		□*7 □*8 □*8 - - ■ (only EJ1) ■ - ■
-7 -78 -78 -78 -78 -78 -78 -78 -78 -78 -	□ 17 □ 18 □ 18 □ 1 ■ □	- T	□*7 □*8 □*8 - - ■ (only EJ1) ■ - ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
-7 -78 -78 -78 -78 -78 -78 -78 -78 -78 -	□ 17 □ 18 □ 18 □ 18 □ 1 ■ □ 1 ■ □ 18 □ 1 ■ □ 18 □ 18 □ 18 □ 18 □ 18 □ 18 □ 18 □ 18		□*7 □*8 □*8 - - ■ (only EJ1) ■ - ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
-7 -78 -78 -78 -78 -78 -79 -79 -79 -79 -79 -79 -79 -79 -79 -79		- T	□*7 □*8 □*8 - - ■ (only EJ1) ■ - ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
-7 -78 -78 -78 -78 -78 -78 -78 -78 -78 -			□*7 □*8 □*8 - - ■ (only EJ1) ■ - ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
-7 -8		- T	□*7 □*8 □*8 - - ■ (only EJ1) ■ - ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
-7 -78 -78 -78 -78 -78 -79 -79 -79 -79 -79 -79 -79 -79 -79 -79		- T	□*7 □*8 □*8 - - ■ (only EJ1) ■ - ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
-7 -8			□*7 □*8 □*8 - - ■ (only EJ1) ■ - ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

[|] Heater alarm = heater burnout & SSR failure detection
| Quick link port using comm. cable E58-CIFQ2
| PROFIBUS-DP communication option via PRT1-SCU11
| BIN-HFU-ETN Serial gateway | 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	Thermocouple	K (CA) Chromel vs. Alumel	0 to 200 °C	E5C2-R20K AC100-240 0-200	E5C2-R40K AC100-240 0-200
scale (°C)			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	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
℃	0 to 400 (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 $k\Omega$ at 0°C), 100 to 200 (2) (550 Ω @ 200°C) 150 to 300 (2) (4 $k\Omega$ @ 200°C)

^{*1} Values in () are the minimum unit.

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



^{*2} Values in () are the thermistor resistive value.

Temperature controllers

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		



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	100 to 240 VAC	1	Relay	E5CSV-R1T-500
48H×48W×78D			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

Туре	Order code
Hard protective cover	Y92A-48B

Specifications

Item		ESCSV		
Supply voltage		100 to 240 VAC, 50/60 Hz or 24 VAC/VDC (depending on model)		
Operating voltage range	e	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		$\pm 0.5\%$ of indication value or ± 1 °C, whichever is greater ± 1 digit max.		
Hysteresis (for ON/OFF of	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	у	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. Despite being very simply layered, the E5CB still offers a high performance inherited from the E5CN series. Even if no power is available, the E5CB can be powered and parameterized with only a few clicks using the free ThermoMini remote software.

- Set up your configuration in only 30 s
- · Large display (16.2 mm) legible up to 5 m
- Built to last and precisely regulate with Omron unique 2-PID algorithm
- Easy and quick remote parameterization via free ThermoMini software
- Speed up your application with a sampling period time of 250 ms

Ordering information

Size	Power supply voltage	Input type	Alarm output	Control output	Order code
E5CB	100 to 240 VAC	Thermocouple			E5CB-R1TC
48 × 48 mm		Platinum resistance thermometer			E5CB-R1P
		Thermocouple		Voltage output	E5CB-Q1TC
		Platinum resistance thermometer		(for driving SSR)	E5CB-Q1P
		Thermocouple		Relay output	E5CB-R1TCD
		Platinum resistance thermometer			E5CB-R1PD
		Thermocouple		Voltage output	E5CB-Q1TCD
		Platinum resistance thermometer		(for driving SSR)	E5CB-Q1PD

Accessories

Option	Order code
USB-Serial conversion cable	E58-CIFQ2

Software

Description	Features
	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 \times W \times 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.





High performance & simplicity

The next generation E5_C temperature controller is setting a new global standard in terms of precision and user-friendly design. Best control performance, easy set-up and outstanding visibility of the white IP66 LCD display have been integrated into a space-saving housing only 60 mm deep.

- Fast and precise regulation: 50 ms sampling loop period time
- Easy to set up, and operate intuitively via CX-Thermo without power supply
- Best contrast display using white LCD technology which is visible from a far distance and from any angle
- Useful alarm and diagnosis functions for secure operation
- Practical timer and logic operation functions eliminating the need of a PLC
- Additional models with different features are available. Please check related product catalogue.

Ordering information

E5CC (48 × 48 mm) Screw terminals

Control Output	Option no	Option description	Alarm outputs	Order code	
				100 to 240 VAC	24 VAC/DC
Out1: Relay	000	No option	3	E5CC-RX3A5M-000	E5CC-RX3D5M-000
Out2: non	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	3	E5CC-RX3A5M-001	E5CC-RX3D5M-001
	003	HB/HS alarm for 3-phase heaters, RS485	3	E5CC-RX3A5M-003	E5CC-RX3D5M-003
	006	2 EV inputs, transfer output	3	E5CC-RX3A5M-006	E5CC-RX3D5M-006
	007	2 EV inputs, remote SP	3	E5CC-RX3A5M-007	E5CC-RX3D5M-007
Out1: Voltage (pulse)	000	No option	3	E5CC-QX3A5M-000	E5CC-QX3D5M-000
Out2: non	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	3	E5CC-QX3A5M-001	E5CC-QX3D5M-001
	003	HB/HS alarm for 3-phase heaters, RS485	3	E5CC-QX3A5M-003	E5CC-QX3D5M-003
	006	2 EV inputs, transfer output	3	E5CC-QX3A5M-006	E5CC-QX3D5M-006
	007	2 EV inputs, remote SP	3	E5CC-QX3A5M-007	E5CC-QX3D5M-007
Out1: Linear current	000	No option	3	E5CC-CX3A5M-000	E5CC-CX3D5M-000
Out2: non	004	RS485, 2 EV inputs	3	E5CC-CX3A5M-004	E5CC-CX3D5M-004
	006	2 EV inputs, transfer output	3	E5CC-CX3A5M-006	E5CC-CX3D5M-006
	007	2 EV inputs, remote SP	3	E5CC-CX3A5M-007	E5CC-CX3D5M-007

Note: Other models with 2 control outputs, 4 EV inputs or with different kind of option combination are available on request. Please contact the local sales office for special request.

E5CC (48 × 48 mm) Push-in plus terminals

Control Output	Option no	Option description	Alarm outputs	Order code	Order code	
				100 to 240 VAC	24 VAC/DC	
Out1: Relay Out2:	000	No option	2	E5CC-RX2ABM-000	E5CC-RX2DBM-000	
non	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	2	E5CC-RX2ABM-001	E5CC-RX2DBM-001	
	002	HB/HS alarm for 1-phase heaters, RS485	2	E5CC-RX2ABM-002	E5CC-RX2DBM-002	
	004	RS485, 2 EV inputs	2	E5CC-RX2ABM-004	E5CC-RX2DBM-004	
	006	2 EV inputs, Tranfer output	2	E5CC-RX2ABM-006	E5CC-RX2DBM-006	
Out1: Voltage (pulse)	000	No option	2	E5CC-QX2ABM-000	E5CC-QX2DBM-000	
Out2: non	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	2	E5CC-QX2ABM-001	E5CC-QX2DBM-001	
	002	HB/HS alarm for 1-phase heaters, RS485	2	E5CC-QX2ABM-002	E5CC-QX2DBM-002	
	004	RS485, 2 EV inputs	2	E5CC-QX2ABM-004	E5CC-QX2DBM-004	
	006	2 EV inputs, Tranfer output	2	E5CC-QX2ABM-006	E5CC-QX2DBM-006	



Temperature controllers

E5EC ($48 \times 96 \text{ mm}$)/E5AC ($96 \times 96 \text{ mm}$) Screw terminals

Control Output	Option no	Option description	Alarm outputs	Order code	Order code	
				100 to 240 VAC	24 VAC/DC	
Out1: Relay	000	No option	4	E5_C-RX4A5M-000	E5_C-RX4D5M-000	
Out2: non	009	HB/HS alarm for 3-phase heaters, RS485, 2 EV inputs	4	E5_C-RX4A5M-009	E5_C-RX4D5M-009	
	010	HB/HS alarm for 1-phase heaters, 4 EV inputs	4	E5_C-RX4A5M-010	E5_C-RX4D5M-010	
	011	HB/HS alarm for 1-phase heaters, 6 EV inputs, remote SP, transfer output	4	E5_C-RX4A5M-011	E5_C-RX4D5M-011	
Out1: Voltage (pulse)	000	No option	4	E5_C-QX4A5M-000	E5_C-QX4D5M-000	
Out2: non	009	HB/HS alarm for 3-phase heaters, RS485, 2 EV inputs	4	E5_C-QX4A5M-009	E5_C-QX4D5M-009	
	010	HB/HS alarm for 1-phase heaters, 4 EV inputs	4	E5_C-QX4A5M-010	E5_C-QX4D5M-010	
	011	HB/HS alarm for 1-phase heaters, 6 EV inputs, remote SP, transfer output	4	E5_C-QX4A5M-011	E5_C-QX4D5M-011	
Out1: Linear current	000	No option	4	E5_C-CX4A5M-000	E5_C-CX4D5M-000	
Out2: non	004	2 EV inputs, RS485	4	E5_C-CX4A5M-004	E5_C-CX4D5M-004	
	014	RS485, 4 EV inputs, remote SP, transfer output	4	E5_C-CX4A5M-014	E5_C-CX4D5M-014	
Out1: Relay	000	No option	4	E5_C-PR4A5M-000	E5_C-PR4D5M-000	
Out2: Relay	004	2 EV inputs, RS485	4	E5_C-PR4A5M-004	E5_C-PR4D5M-004	
Positional proportional control model	014	RS485, 4 EV inputs, remote SP, transfer output	4	E5_C-PR4A5M-014	E5_C-PR4D5M-014	

Note: Other models with 2 control outputs or with different kind of option combination are available on request. Please contact the local sales office for special request. Replace "_" with "A" for E5EC

E5EC (48x96mm) Push-in plus terminals

Control Output	Option no	Option description	Alarm outputs	Order code	Order code	
				100 to 240 VAC	24 VAC/DC	
Out1: Relay	000	No option	4	E5EC-RX4ABM-000	E5EC-RX4DBM-000	
Out2: non	008	HB/HS alarm for 1-phase heaters, RS485, 2 EV inputs	4	E5EC-RX4ABM-008	E5EC-RX4DBM-008	
	010	HB/HS alarm for 1-phase heaters, 4 EV inputs	4	E5EC-RX4ABM-010	E5EC-RX4DBM-010	
	011	HB/HS alarm for 1-phase heaters, 6 EV inputs, remote SP, transfer output	4	E5EC-RX4ABM-011	E5EC-RX4DBM-011	
Out1: Voltage (pulse)	000	No option	4	E5EC-QX4ABM-000	E5EC-QX4DBM-000	
Out2: non	008	HB/HS alarm for 1-phase heaters, RS485, 2 EV inputs	4	E5EC-QX4ABM-008	E5EC-QX4DBM-008	
	010	HB/HS alarm for 1-phase heaters, 4 EV inputs	4	E5EC-QX4ABM-010	E5EC-QX4DBM-010	
	011	HB/HS alarm for 1-phase heaters, 6 EV inputs, remote SP, transfer output	4	E5EC-QX4ABM-011	E5EC-QX4DBM-011	

Note: Other models with 2 Alarm outputs are available on request. Please contact the local sales office for special request.

E5GC ($48 \times 24 \text{ mm}$)

Control Output	Terminal type	Option no	Option description	Alarm outputs	Order code	Order code	
					100 to 240 VAC	24 VAC/DC	
Out1: Relay	Screwless clamp	000	No option	1	E5GC-RX1ACM-000	E5GC-RX1DCM-000	
		015	RS485	1	E5GC-RX1ACM-015	E5GC-RX1DCM-015	
		024	2 EV inputs	1	E5GC-RX1ACM-024	E5GC-RX1DCM-024	
Out1: Voltage (pulse)	Screwless clamp	000	No option	1	E5GC-QX1ACM-000	E5GC-QX1DCM-000	
		015	RS485	1	E5GC-QX1ACM-015	E5GC-QX1DCM-015	
		024	2 EV inputs	1	E5GC-QX1ACM-024	E5GC-QX1DCM-024	
Out1: Linear current	Screwless clamp	000	No option	1	E5GC-CX1ACM-000	E5GC-CX1DCM-000	
		015	RS485	1	E5GC-CX1ACM-015	E5GC-CX1DCM-015	
		024	2 EV inputs	1	E5GC-CX1ACM-024	E5GC-CX1DCM-024	

Note: Other models with screw terminals, 0 or 2 Alarm outputs, 1 Event input or HBA alarm are available on request. Please contact the local sales office for special request.

E5DC (In-panel mounting)

Control Output	Option no	Option description	Alarm outputs	Order code	
				100 to 240 VAC	24 VAC/DC
Out1: Relay	000	No option	2	E5DC-RX2ASM-000	E5DC-RX2DSM-000
	002	HB/HS alarm for 1-phase heaters, RS485	2	E5DC-RX2ASM-002	E5DC-RX2DSM-002
	017	HB/HS alarm for 1-phase heaters, 1 EV input	2	E5DC-RX2ASM-017	E5DC-RX2DSM-017
Out1: Voltage (pulse)	000	No option	2	E5DC-QX2ASM-000	E5DC-QX2DSM-000
	002	HB/HS alarm for 1-phase heaters, RS485	2	E5DC-QX2ASM-002	E5DC-QX2DSM-002
	017	HB/HS alarm for 1-phase heaters, 1 EV input	2	E5DC-QX2ASM-017	E5DC-QX2DSM-017
Out1: Linear current	000	No option	2	E5DC-CX2ASM-000	E5DC-CX2DSM-000
	015	RS485	2	E5DC-CX2ASM-015	E5DC-CX2DSM-015
	016	1 EV input	2	E5DC-CX2ASM-016	E5DC-CX2DSM-016

Note: Other models with no Alarm output or with different kind of option combination are available on request. Please contact the local sales office for special request.

E5_C optional tools

Option	Order code
USB based configuration cable	E58-CIFQ2, E58-CIFQ2-E (for E5AC, E5DC, E5EC and E5GC)
PC based configuration and tuning software	EST2-2C-MV4

Specifications

E5CC/E5EC/E5AC

Item		E5CC	E5EC E5AC					
Power supply volta	ge	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 consumptio	n	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: (Use a 1:1 connection when connecting the state of						
Control method		ON/OFF control or 2-PID control (with aut	to-tuning)					
Indication accuracy	1	Thermocouple input: $(\pm 0.3\%$ of indicated value or $\pm 1^{\circ}$ C, whichever is greater) ± 1 digit max. Platinum resistance thermometer input: $(\pm 0.2\%$ of indicated value or $\pm 0.8^{\circ}$ C, whichever is greater) ± 1 digit max. Analog input: $\pm 0.2\%$ FS ± 1 digit max. CT input: $\pm 5\%$ FS ± 1 digit max.	Thermocouple input: $(\pm 0.3\% \text{ of indicated value or } \pm 1^{\circ}\text{C}$, whichever is greater) $\pm 1 \text{ digit max}$. Platinum resistance thermometer input: $(\pm 0.2\% \text{ of indicated value or } \pm 0.8^{\circ}\text{C}$, whichever is greater) $\pm 1 \text{ digit max}$. Analog input: $\pm 0.2\% \text{ FS} \pm 1 \text{ digit max}$. CT input: $\pm 5\% \text{ FS} \pm 1 \text{ digit max}$. Potentiometer input: $\pm 5\% \text{ FS} \pm 1 \text{ digit max}$.					
Auto-Tuning		Yes, 40%/100% MV output limit selection. When using Heat/Cool: Automatic cool gain adjustment						
Self-Tuning 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	2 max., resolution: approx. 10,000					
Auxiliary outputs	Number of outputs	2,3	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 loa electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA	nd),				
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 kg	Ω min.					
		Non-contact input: ON: Residual voltage:	1.5 V max., OFF: Leakage current: 0.1 mA	max.				
		Current flow: approx. 7 mA per contact						
Setting method		Digital setting using front panel keys or v	ia Remote Software CX-Thermo V4.5					
Indication method		11-segment digital display and individual	l 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 icin						
Ambient operating		25% to 85%	-					
Storage temperatu	•	-25 to 65°C (with no condensation or icin	ag)	_				
Degree of protection		Front panel: IP66, Rear case: IP20, Termin						
Sampling period		50 ms	·					
Size in mm (H×W×	D)	48×48×64	48×96×64	96×96×64				
	-,	1.5	1.2	1				



E5GC

Item		E5GC			
		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	i	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 (incluing 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 pro gramming, moving average of input value, display brightness setting, simple transfer output, and work bit message. *2			
Size in mm (H×W>	<d)< td=""><td>24×48×93</td></d)<>	24×48×93			
*1 0 1 6	into are coloctable for event inputs				

E5DC

Item		E5DC				
		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				
		4.9 VA max. at 100 to 240 VAC, and 2.8 VA max. at 24 VDC or 1.5 W max. at 24 VDC				
Sensor input		Temperature inputs Thermocouple: K, J, T, E, L, U, N, R, S, B, W, or PL II Platinum resistance thermometer: Pt100 or JPt100 Infrared temperature sensor (ES1B): 10 to 70°C, 60 to 120°C, 115 to 165°C, or 140 to 260°C Analog inputs Current input (mA): 4 to 20 or 0 to 20 Voltage input (V): 1 to 5, 0 to 5, or 0 to 10				
Input impedance		Current input: 150 Ω max., Voltage input: 1 M Ω min. (Use a 1:1 connection when connecting the ES2-HB/THB.)				
Control method		ON/OFF control or 2-PID control (with auto-tuning)				
Indication accuracy	у	Thermocouple input: $(\pm 0.3\% \text{ of PV or } \pm 1^{\circ}\text{C}$, whichever is greater) ± 1 digit max. Platinum resistance thermometer input: $(\pm 0.2\% \text{ of PV or } \pm 0.8^{\circ}\text{C}$, whichever is greater) ± 1 digit max. Analog input: $\pm 0.2\% \text{ FS } \pm 1$ digit max. CT input: $\pm 5\% \text{ FS } \pm 1$ digit max.				
Auto-Tuning		Yes, 40%/100% MV output limit selection. When using Heat/Cool: Automatic cool gain adjustment				
Self-Tuning		Yes				
Control outputs	Relay output	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA				
	Voltage output (for driving SSR)	Output voltage: 12 VDC ±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 k Ω max., OFF: 100 k Ω min.				
		Non-contact input: ON: Residual voltage: 1.5 V max., OFF: Leakage current: 0.1 mA max.				
		Current flow: approx. 7 mA per contact				
Setting method		Digital setting using front panel keys				
Indication method		11-segment digital displays and individual indicators Character height: PV 8.5 mm, SV: 8.0 mm				
Multi SP		Up to eight set points (SP0 to SP7) can be saved and selected using event inputs, key operations, or serial communications.*1				
Other functions		Manual output, heating/cooling control, loop burnout alarm, SP ramp, other alarm functions, heater burnout (HB) alarm (including SSR failure (HB) alarm), 40% AT, 100% AT, MV limiter, input digital filter, self tuning, robust tuning, PV input shift, run/stop, protection functions, extraction of square root, MV change rate limit, simple calculations, temperature status display, simple programming, moving average of input value, and display brightness setting				
Ambient operating temperature		-10 to 55°C (with no condensation or icing), for 3-year warranty: -10 to 50°C (with no condensation or icing)				
Ambient operating humidity		25% to 85%				
Storage temperatu	ire	–25 to 65°C (with no condensation or icing)				
Degree of protection	on	Main unit: IP20, Terminal unit: IP00				
Sampling period		50 ms				
Size in mm (H×W×	D)	96×22.5×85				
*1 Only two set poir	nts are selectable for event inputs.	•				

Only two set points are selectable for event inputs.



^{*1} Only four set points are selectable for event inputs.
*2 Simple transfer output and work bit message are only for ESGC.

USB communication cable E58-CIFQ2

Item	E5AC	E5CC	E5DC	E5EC	E5GC
E58-CIFQ2					
E58-CIFO2-E		_			



E5AC/E5DC/E5EC/E5GC adaptation.



Compact and intelligent Ramp/Soak controller

The E5_C-T Ramp/Soak temperature controllers expand the E5_C family to handle process applications. Capable of addressing up to 6 event inputs and up to 4 auxiliary outputs all in a compact 60 mm (depth) housing, makes this controller series one of Omron's most powerful and versatile temperature controllers.

- Set up to 8 programs with 32 segments totaling 256 program segments simply via CX-Thermo software.
- The three-level display is visible simultaneously so each process status can be easily identified.
- "Segment Jump" allows users to move directly to the specified segment reducing programming time and increase production throughput.
- Additional models with different features are available. Please check related product catalog.

Ordering information

E5CC-T (48 × 48 mm)

Control Output	Option no	Option description	Alarm outputs	Order code		
				100 to 240 VAC	24 VAC/DC	
Out1: Relay	000	No option	3	E5CC-TRX3A5M-000	E5CC-TRX3D5M-000	
Out2: non	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	3	E5CC-TRX3A5M-001	E5CC-TRX3D5M-001	
	003	HB/HS alarm for 3-phase heaters, RS485	3	E5CC-TRX3A5M-003	E5CC-TRX3D5M-003	
	006	2 EV inputs, transfer output	3	E5CC-TRX3A5M-006	E5CC-TRX3D5M-006	
Out1: Voltage (pulse)	000	No option	3	E5CC-TQX3A5M-000	E5CC-TQX3D5M-000	
Out2: non	001	HB/HS alarm for 1-phase heaters, 2 EV inputs	3	E5CC-TQX3A5M-001	E5CC-TQX3D5M-001	
	003	HB/HS alarm for 3-phase heaters, RS485	3	E5CC-TQX3A5M-003	E5CC-TQX3D5M-003	
	006	2 EV inputs, transfer output	3	E5CC-TQX3A5M-006	E5CC-TQX3D5M-006	
Out1: Linear current	000	No option	3	E5CC-TCX3A5M-000	E5CC-TCX3D5M-000	
Out2: non	004	RS485,2 EV inputs	3	E5CC-TCX3A5M-004	E5CC-TCX3D5M-004	
	006	2 EV inputs, transfer output	3	E5CC-TCX3A5M-006	E5CC-TCX3D5M-006	

Note: Other models with 2 control outputs, 4 EV inputs or with different kind of option combination are available on request. Please contact the local sales office for special request.

E5EC-T (48 × 96 mm)/E5AC-T (96 × 96 mm)

Control Output	Option no	Option description	Alarm outputs	Order code	Order code		
				100 to 240 VAC	24 VAC/DC		
Out1: Relay	000	No option	4	E5_C-TRX4A5M-000	E5_C-TRX4D5M-000		
Out2: non	008	HB/HS alarm for 1-phase heaters, RS485, 2 EV inputs	4	E5_C-TRX4A5M-008	E5_C-TRX4D5M-008		
	019	HB/HS alarm for 1-phase heaters, 6 EV inputs, transfer output	4	E5_C-TRX4A5M-019	E5_C-TRX4D5M-019		
Out1: Voltage (pulse)	000	No option	4	E5_C-TQX4A5M-000	E5_C-TQX4D5M-000		
Out2: non	008	HB/HS alarm for 1-phase heaters, RS485, 2 EV inputs	4	E5_C-TQX4A5M-008	E5_C-TQX4D5M-008		
	019	HB/HS alarm for 1-phase heaters, 6 EV inputs, transfer output	4	E5_C-TQX4A5M-019	E5_C-TQX4D5M-019		
Out1: Linear current	000	No option	4	E5_C-TCX4A5M-000	E5_C-TCX4D5M-000		
Out2: non	004	RS485, 2 EV inputs	4	E5_C-TCX4A5M-004	E5_C-TCX4D5M-004		
	021	6 EV inputs, transfer output	4	E5_C-TCX4A5M-021	E5_C-TCX4D5M-021		
	022	RS485, 4 EV inputs, transfer output	4	E5_C-TCX4A5M-022	E5_C-TCX4D5M-022		
Out1: Relay Out2: Relay Positional proportional control model	000	No option	4	E5_C-TPR4A5M-000	E5_C-TPR4D5M-000		
	004	RS485, 2 EV inputs	4	E5_C-TPR4A5M-004	E5_C-TPR4D5M-004		
	022	RS485, 4 EV inputs, transfer output	4	E5_C-TPR4A5M-022	E5_C-TPR4D5M-022		

Note: Other models with 2 control outputs or with different kind of option combination are available on request. Please contact the local sales office for special request. Replace "_" with "A" for E5AC or "E" for E5EC



Specifications

E5CC-T/E5AC-T/E5EC-T

		E5CC-T	E5EC-T	E5AC-T					
Sizes in mm (W \times H \times D))	48×48×60	48×96×60	96×96×60					
Supply voltage		100 to 240 VAC 50/60Hz or 24 \	AC/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 Infrare 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 01 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			0.8°C, whichever is greater) ±1 digit n	ater) ±1 digit max. /Platinum resistance thermometer: nax.Analog input: ±0.2% FS ±1 digit max.CT input: ±5% F					
Functions		failure (HS) alarm), 40% AT, 100	% AT, MV limiter, input digital filter, ro	alarm functions, heater burnout (HB) alarm (including SSR bust tuning, PV input shift, protection functions, extractior status display, moving average of input value, and display					
Programs / segments		8/32							
PID sets		8							
Communication		RS-485 (multi-drop), Compowa	yF or Modbus RTU						
Event inputs		2-6							
QLP (Quick link port)		Yes, via USB and E58-CIFQ2 con	version cable						
Ambient temperature		−10 to 55 °C							
IP rating of front panel		IP66							
Sampling period time		50 ms							
Program control		_							
Number of programs (p	atterns)	8							
Number of segments (st	teps)	32							
Segment setting metho	od	Time setting (Segment set with set point and time.)							
		Slope setting (Segment set with	Slope setting (Segment set with segment type, set point, slope, and time.)						
Segment times		0 h 0 min to 99 h 59 min							
		0 min 0 s to 99 min 59 s							
Alarm setting		Set separately for each program.							
Reset operation		Select either stopping control or fixed SP operation.							
Startup operation		Select continuing, resetting, ma	nual operation, or run mode.						
PID sets	Number of sets	8							
	Setting method	Set separately for each progran	n (automatic PID group selection also	supported).					
Alarm SP function		Select from ramp SP and target	SP.						
Program status control	Segment operation	Advance, segment jump, hold,	and wait						
	Program operation	Program repetitions and progra	nm links						
Wait operation	Wait method	Waiting at segment ends							
	Wait width setting	Same wait width setting for all	programs						
Time signals	Number of outputs	2							
	Number of ON/OFF Operations	1 each per output							
	Setting method	Set separately for each progran	1.						
Program status output		Program end output (pulse wid	th can be set), run output, stage outp	out					
Program startup	PV start	Select from segment 1 set poin	t, slope-priority PV start						
operation	Standby	0 h 0 min to 99 h 59 min							
			0 day 0 h to 99 day 23h						
Operation end operatio	n	Select from resetting, continuing control at final set point, and fixed SP control.							
Program SP shift		Same program SP shift for all pr	ograms						
E5CC-T/E5AC-T/E5I	EC-T series optional tools								
USB PC based configura	ntion cable	E58-CIFQ2 for E5CC-T							
		E58-CIFQ2 (& E58-CIFQ2-E) for E	E5AC-T and E5EC-T						
E5CC-T/E5AC-T/E5I	EC-T series software								
CX-Thermo >4.62			and cloning software, data-logging, F ndows XP (Service Pack 3 or higher)/	ine-Tuning, logic operations, easy setting of process steps Vista/7/8					





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	Event	Number of	Outputs	AUX	Communication	Order code (96 × 96 mm)		
		analog	Inputs	outputs		outputs		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/DC2	
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	Event	Number of	Outputs	AUX	Communication	Order code (48 × 96 mm)	
		analog	Inputs	outputs		outputs		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
- Gradient Temperature Control (GTC)

Ordering information

Туре	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

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.
 When using the heater burnout alarm, purchase a Current Transformer (E54-CT1 or E54-CT3) separately.

^{*4} An End unit is always required for connection to a Basic unit or an HFU. An HFU cannot operate without a Basic unit.

Туре	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

Heating/cooling control is not supported for gradient temperature control.

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						

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.

^{*2} When using the heater burnout alarm, use a Current Transformer (E54-CT1 or E54-CT3) (sold separately).

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.

Specifications

Item Type		EJ1TC2	EJ1TC4				
Power supply volta	age	24 VDC					
Operating voltage	range	85% to 110% of rated voltage					
Power consumption	on	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: 150 Ω max., voltage input: 1 M Ω 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: 500Ω 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 k Ω max., OFF. 100 k Ω min.	-				
	Non-contact input	ON: Residual voltage: 1.5 V max., OFF: Leakage current: 0.1 mA max.	-				
		Outflow current: approx. 4 mA per point	_				
Number of input a	nd 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 temperat	ure range	Operating –10°C to 55°C, Storage –25°C to 65°C (with no i	cing 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-HFUNFL_	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	Туре	Fixing	Length [m]	Order code
PRO-Line	Smooth tube	t/c*1	Т	-80	400	3	100	SUS 316	2-wire		2	E52-ETT3-100-2-A
						6				cable end shoes		E52-ETT6-100-2-A
			J]	600	1						E52-ETJ1-100-2-A
						2						E52-ETJ2-100-2-A
						3	1		1			E52-ETJ3-100-2-A
						4.5	1					E52-ETJ4.5-100-2-A
						6	1					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	1		K	-80	1100	1	1	INCONEL 600	1			E52-ETK1-100-2-A
						2						E52-ETK2-100-2-A
						3						E52-ETK3-100-2-A
						4.5	1					E52-ETK4.5-100-2-A
						6	1					E52-ETK6-100-2-A
Lite-Line	1			0	400	4	1	SUS 304	1			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		E52-EP3-250-2-B
						6				open cable ends		E52-EP6-250-2-B
Lite-Line				0 4	400	4	50	SUS 304				E52-ELP4-50-2-A
					I F	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,	1	K	1	1150		200	INCONEL 600	1	enclosed screw	-	E52-ETK6-200-T2-B
	smooth tube Enclosed terminals,		J	1	720			SUS 316	1	terminals		E52-ETJ6-200-T2-B
		1	K	1	1150			INCONEL 600	1			E52-ETK6-200-T2-CG1/2G-B
	G1/2"g; mounting		J	1	720			SUS 316	1			E52-ETJ6-200-T2-CG1/2G-B
		PT100	class B	-50	500				3-wire	1		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 tempera- ture	t/c ^{*1}	J	0	250	10	dia	Cu (tin plated)	2-wire	pre-wired with open cable ends	2	E52-ETJS1-B
	Environmental	PT100	class B	-40	80	-	-	Aluminium	3-wire	enclosed screw	-	E52-EPE1-B
	temperature							PVC		terminals		E52-EPE2-B
	Non-contact	IR*2	*2 up to 60 mm 1	10	260	M18	44.5	ABS	4-wire	pre-wired with	3	ES1B
			up to 1000 mm	0	400		120	SUS 304	5-wire	open cable ends	2	ES1C-A40

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



^{*1} t/c = Thermocouple *2 IR = Infrared Sensor



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 CelciuXo (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

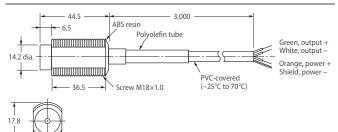
Ordering information

Appearance and sensing characteristics	Specification	Order code	
2 mm 20 mm 40 mm 60 mm	10 to 70°C	ES1B 10-70C	
	60 to 120°C	ES1B 60-120C	
	115 to 165°C	ES1B 115-165C	
2 dia. 20 dia. 40 dia. 60 dia.	140 to 260°C	ES1B 140-260C	

Specifications

Power supply voltage Current consumption		ES1B		
		12/24 VDC		
		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 dr	ift	0.4°C/°C max.		
Receiver elemen	nt	Thermopile		
Response speed	ı	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		

Dimensions (unit: mm)





Achieve Superior Environmental Resistance and a Wide Measurement Range of 0 to 400°C.

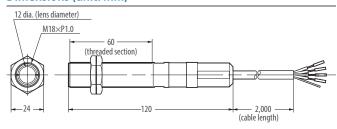
This infrared thermosensor provides a fast, accurate and very stable way to measure the temperature of objects. Its output provides a universal 4-20 mA signal, which enables it to operate with many temperature controllers or PLCs.

- Flexible placement with slim cylindrical shape and long focus with a distance of 500 mm and area diameter of 80 mm.
- The SUS body and silicon lens resist ambient operating temperatures of up to 70°C and resist dust and water to the equivalent of IP67.
- Fast measurement with high-speed response of 100 ms/90%.
- Strong resistance to noise with output of 4 to 20 mA.

Ordering information

Specification (measuring temperature range)	Order code
0 to 400°C	ES1C-A40

Dimensions (unit: mm)



Ratings and Characteristics

Item	Model	ES1C						
Power supply voltage		12 to 24 VDC						
Operating voltage range		90% to 110% of rated voltage						
Current consun	nption	70 mA max.						
Measuring tem	perature range	0 to 400°C						
Measurement a	accuracy	0 to 200°C: ±2°C, 201 to 400°C: ±1% (emissivity: 0.95)						
Response time		100 ms/90%						
Reproducibility	,	±1°C of reading value						
Emissivity		0.95 fixed						
Current output		4 to 20 mA DC, Load: 250 Ω max.						
Ambient temperature range		Operating: 0 to 70°C, Storage: –20 to 70°C (with no icing or condensation)						
Ambient humidity range		Operating and storage: 35% to 85%						
Vibration resistance (destruction)		1.5-mm amplitude at 10 to 55 Hz for 2 hours each in the X, Y, and Z directions						
Weight		180 g						
Degree of protection		Equivalent to IP67						

EJ1N-HFU-ETN



Connect Modbus slaves to ETHERNET

The EJ1N-HFU-ETN provides the solution to connect a CelciuX° (EJ1) in-panel multi-loop PID controller to PROFINET and Modbus/TCP. Although built on the CelciuX° (EJ1) platform, this unit can be used as a gateway for discrete Modbus units when only using the EJ1N-EDU endplate.

- Connects Modbus serial slaves to PROFINET and Modbus/TCP
- Built for integration into the CelciuX° (EJ1)
- Usable as a gateway for discrete units like E5_N-series temperature controllers and MX2 inverters.
- Flexible implementation with standard .gsd files
- Ethernet/IP gateway just for EJ1N-TC2 cards: up to 24 EJ1N-TC2 connectable (48 loops in total)



Ordering information

Name	Order code
ETHERNET to Serial Gateway	EJ1N-HFU-ETN

Specifications

Item	EJ1N-HFU-ETN
PROFINET	IO Device
Conformance	Class A
Supported RT	Class 1
Minimum Update Rate	8 ms
Number of Modbus RTU nodes	31
Ambient operating temperature	–10°C to 55°C
Ambient operating humidity	25% to 85%
Storage temperature	–20°C to 65°C
Weight	170 g



Power supplies

RELIABLE AND EASY OPERATION — WORLDWIDE

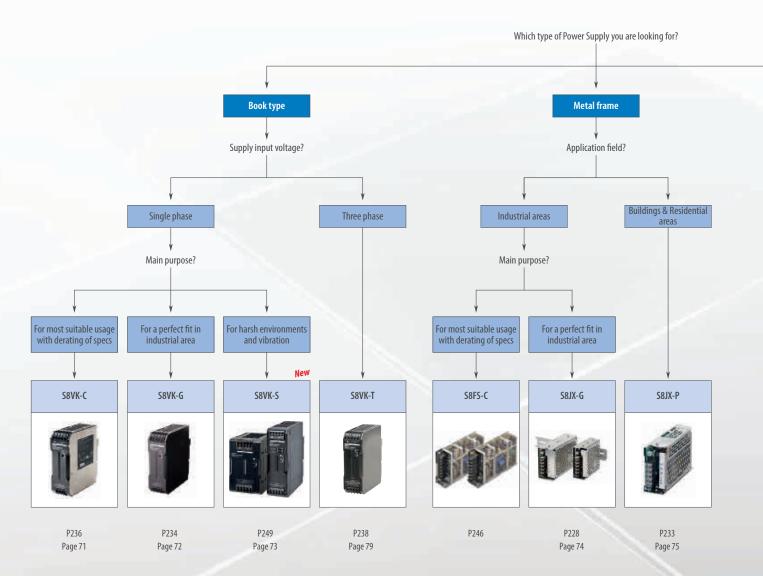
S8VK-G — The right power supply for your application

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.

S8VK-S — A perfect fit for small control panels with easy wiring

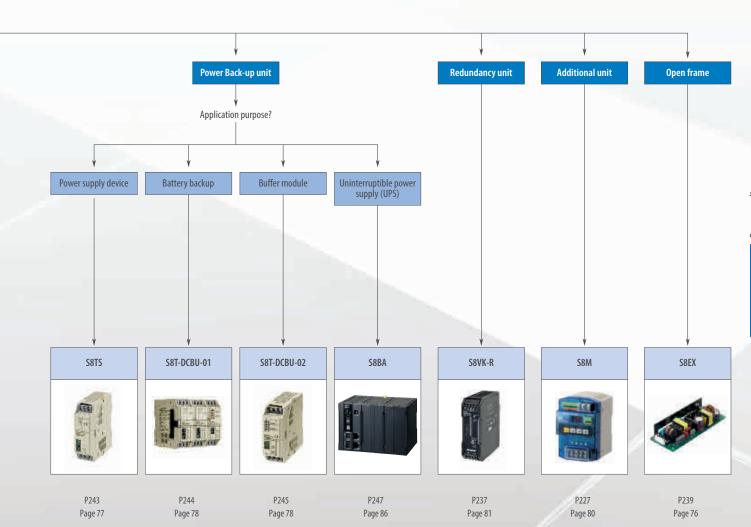
The S8VK-S can be used in harsh environments due to it's coated PCB and Screwless terminal with Push-in Plus Technology.

- Wide operating temperature range (-40 to +70°C)
- 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% for 60 W and 120 W; 150% for 240 W and 480 W models)
- Improved DIN-rail mounting clip to provide better vibration resistance and allow for easy installation
- Coated PCB allows resistance in tough environments as well as resistance to severe vibration (up to 5G)
- · RoHS compliant









Cate	gory	Book type power su	Metal fra	Metal frame power supply												
									1							
Mod		S8VK-S	S8VK-G				S8VK-C	S8VK-T	S8JX-P	S8JX-P						
Selection Criteria	Phases	Single phase						Three phases	Single ph							
lect	Rated voltage	100 V to 240 VAC (90					100 V to 240 VAC	3 × 320 V to 576 VAC								
S		24 V	5 V	12 V	24 V	48 V	24 V	24 V	5 V	12 V	24 V	48 V				
	15 W	-	■ 3 A	■ 1.2 A	■ 0.65 A	-	-	-	-							
	25 W	-	-			<u> </u>	-	_	_							
	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	■ 2.5 A	-	■ 4.5 A	■ 2.5 A	-	■ 2.5 A	-	-							
	75 W	-	-				-	-	-							
	90 W	-	-				-	-	-							
	100 W	-	-				-	-	■ 20 A	■ 8.5 A	■ 4.5 A	■ 2.1 A				
er	120 W	■ 5 A	-		■ 5 A	-	■ 5 A	■ 5 A	-							
Power	150 W	-	-				-	-	■ 30 A	■ 13 A	■ 6.5 A	■ 3.3 A				
	180 W	-	-				-	-	-							
	200 W	-	-				_	_	-							
	240 W	■ 10 A	-		■ 10 A	■ 5 A	■ 10 A	■ 10 A	-							
	300 W	-	-				-	-	■ 60 A	■ 27 A	■ 14 A	■ 7 A				
	350 W	-	-				_	_	-		·					
	480 W	■ 20 A	-		■ 20 A	■ 10 A	■ 20 A	■ 20 A	-							
	600 W	-	-				-	-	■ 120 A	■ 53 A	■ 27 A	■ 13 A				
	960 W	-	-				-	■ 40 A	-							
	1,500 W	-	-				-	-	-							
	Conforms to EN61000-3-2		-				-	•								
	DC back-up	-					-	-								
	Capacitor back-up															
	Undervoltage alarm	240 W and 480 W models	-				-	-	-							
	Overvoltage protection															
	Overload protection	-					-	-	-							
Features	DIN-rail mounting		-						•							
	Screw mounting (with bracket)	-	•				•	•	•							
	EMI Class B	-					-	•								
	UL Class 2	■ 60 W	■ 15 W, 30 W, 60 W only				-	_	_							
	N+1 Redundancy								-							
	Parallel operation	■ by 2 units	1_				-	■ by 2 units		, 600 W onl						
	Power Boost	■ 120% (60 W, 120 W) ■ 150% (240 W, 480 W)	1 20%				_	1 20%	■ 300 W	, 600 W at 2	24 V 115%					
	/Quick Link	73/P249	72/P234				71/P236	79/P238	75/P233							



Metal frame power supply							Modular			Open frame power supply					
Sajx-G Single phase	S8FS-C						S8TS			S8EX					
100 V to 240 VAC	100 V to 2	240 VAC					100 V to	240 VAC		100 to 24	40 VAC (8:	5 to 264 \	/AC)		
5 V 12 V 15 V 24 V 48 V		12 V	15 V	24 V	36 V	48 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	■ 1 A	■ 0.7 A	_		-			■ 3 A	■ 1.3 A	1.0 A	■ 0.7 A	_	0.32 A
-	■ 5 A	■ 2.1 A	■ 1.7 A	■ 1.1 A	-		■ 5 A	-		-					
-	-						-	■ 2.5 A	<u> </u>	■ 6 A	■ 2.5 A	■ 2 A	■ 1.3 A	<u> </u>	
■ 7 A ■ 3 A ■ 2.4 A ■ 1.5 A ■	■ 7 A	■ 3 A	■ 2.4 A	■ 1.5 A	1										0.65 A
0.75 A	— / A	■ 3 A	■ 2.4 A	■ 1.5 A	_		_			_					
■ 10 A ■ 4.2 A - ■ 2.1 A ■ 1.1 A	■ 10 A	■ 4.2 A	■ 3.4 A	■ 2.2 A	-	■ 1.1 A	-			■ 10 A	■ 4.3 A	_	■ 2.1 A	-	■ 1.1 A
-	-						-	■ 5 A	■ 2.5 A	-					
_	■ 14 A	■ 6.2 A	■ 5 Δ	■ 3.2 A	I_	■ 1.6 A	_			_					
	147	0.2 A	- 3 A	3.2 A		1.0 A									
-	-						-	■ 7.5 A	-	-					
■ 20 A ■ 8.5 A - ■ 4.5 A ■ 2.1 A	■ 20 A	■ 8.5 A	■ 7 A	■ 4.5 A	■ 2.8 A	■ 2.3 A	-			■ 20 A	■ 8.5 A	-	■ 4.3 A	-	■ 2.1 A
-	_						_	■ 10 A	■ 5 A	_					
								10%	- 3 / .						
■ 30 A ■ 13 A − ■ 6.5 A ■ 3.3 A	■ 26 A	12.5 A	■ 10 A	■ 6.5 A	■ 4.3 A	■ 3.3 A	-			■ 30 A	12.5 A	_	■ 6.3 A	-	■ 3.2 A
-	-				ļ		-		■ 7.5 A	-		ļ			1
	■ 40 A	■ 17 A	I_	■ 8 8 A	■ 5.9 A		_			_					
				_ 0.07.		4.43 A									
-	-						-		■ 10 A	-			■ 10 A	■ 6.7 A	. ■ 5 A
■ 60 A ■ 27 A - ■ 14 A ■ 7 A	-						-			-					
-	■ 60 A	■ 29 A	_		■ 9.7 A		-			_					
				14.6 A		7.32 A									
-	_						_			_					
■ 120 A ■ 53 A - ■ 27 A ■ 13 A	-						-			-					
-	-						-			-					
-										_					
-	■ Up to	150 W mo	odels				-			•					
-	-						-			-					
-	-									-					
										_					
•															
-										-					
•	-						-								
	■ Up to	150 W m	odels				-			•					
-	-							■ 1 unit		-					
■ 300 W, 600 W only by 5 units	-						-			-					
-	-						-								
74/P228	P246						77/P243			76/P239					







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.

Single-phase

- Operating temperature range of -25 to 60°C
- Double set of DC output terminals (three for the negative) provide easy wiring
- Overload and overvoltage protection
- Conforms to EN61204-3, EN55011 Class A
- RoHS compliant

Ordering information

Туре	Power ratings	Input voltage	Output voltage	Output current	Size (W × H × D) [mm]	Order code
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
			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	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 26	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 protecti	on	Yes							
Overvoltage prote	ection	Yes							
Operating ambier	nt temperature	−25 to 60°C (−13 to 140°F)							
Series operation		Yes, up to 2 units							
Parallel operation	1	No							
EMI		Conforms to EN 61204-3, EN 55011 Class A							
EMS		Conforms to EN 61204-3 high severity levels							
Approved standa	rds	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 protect	ion	IP20 by EN/IEC 60529							

For more information, please enter "P236" in the search field on our website industrial.omron.eu.





The standard book type power supply

The standard S8VK-G Pro line is our "install and forget" option, offering longer lifetime, higher protection and more features. The S8VK-G offers a wide product range (from 15 up to 480 W), in a very compact package. There are models available for 5, 12, 24 and 48 VDC output voltage. DC input (90 to 350 VDC) is also available through the whole range.

- Wide operating temperature range (-40 to 70°C) that guarantees stable operation
- Double set of DC output terminals (three for the negative) provide easy wiring
- High efficiency 90% to reduce the energy consumption
- Power boost functionality (120%) for the right start of the application
- Improved DIN-rail mounting clip provides a better resistance to vibrations and allows easy installation (using one hand to mount in a flash)
- For harsh environments coated models are now available. PCB coating protects against dust, corrosive gas and humidity.
- · RoHS compliant

Ordering information

Туре	Power ratings	Input voltage	Output voltage	Output current	Size $(W \times H \times D)$ [mm]	Order code	
						Standard models	Coated models
Power supply Single-phase	15 W	100 to 240 VAC	5 V	3 A	22.5 × 90 × 90	S8VK-G01505	S8VK-G01505-400
		Allannahlannan	12 V	1.2 A		S8VK-G01512	S8VK-G01512-400
		Allowable range: 85 to 264 VAC.	24 V	0.65 A		S8VK-G01524	S8VK-G01524-400
	30 W	90 to 350 VDC,	5 V	5 A	32 × 90 × 90	S8VK-G03005	S8VK-G03005-400
		2 phases less than	12 V	2.5 A		S8VK-G03012	S8VK-G03012-400
		240 VAC	24 V	1.3 A		S8VK-G03024	S8VK-G03024-400
	60 W		12 V	4.5 A	32 × 90 × 110	S8VK-G06012	S8VK-G06012-400
			24 V	2.5 A		S8VK-G06024	S8VK-G06024-400
	120 W		24 V	5 A	40 × 125 × 113	S8VK-G12024	S8VK-G12024-400
	240 W		24 V	10 A	60 × 125 × 140	S8VK-G24024	S8VK-G24024-400
			48 V	5 A		S8VK-G24048	S8VK-G24048-400
	480 W		24 V	20 A	95 × 125 × 140	S8VK-G48024	S8VK-G48024-400
			48 V	10 A		S8VK-G48048	S8VK-G48048-400

Specifications

specifications.											
Item		15 W	30 W	60 W	120 W	240 W	480 W				
Efficiency (Typ. at 2	30 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	35 to 264 VAC, 90 to 350 VDC. 2 phases less than 240 VAC								
Output	Voltage adjustment range (with V.ADJ)	-10% to 15%	0% to 15%								
	Input variation influence	0.5% max. (at 85	5% max. (at 85 to 264 VAC input, 100% load)								
	Load variation Influence	3.0% max. (5 V), 2	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	1	Yes, 130% of rated current typ.									
Power Boost		120% of rated current									
Overvoltage protec	tion	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 e	missions	Conforms to EN 61000-3-2									
Approved standard		UL: UL 508 (Listing), UL 60950-1, cUL: CSA C22.2 No. 107.1 and No. 60950-1, UL 1310 Class 2 output for 15 W, 30 W, 60 W EN/VDE: EN 50178 (=VDE0160), EN 60950-1 (=VDE0805), Lloyd's Register ANSI/ISA 12.12.01									
Fulfilled standards		SELV (EN 60950-1/EN 50178/UL 60950-1), PELV(EN 60204-1,EN 50178), Safety of power transformers (EN 61558-2-16), EN 50274 for terminal parts									
Degree of protectio	n	IP20 by EN/IEC 60)529								

For more information, please enter "P234" in the search field on our website industrial.omron.eu.





Switch mode power supply

A perfect fit for small control panels.

- Operation possible at ambient temperatures from -40 to 70°C
- DC input supported (90 to 350 VDC)
- Power boost function at 120% (60 W and 120 W)
- Power boost function at 150% (240 W and 480 W)
- Undervoltage alarm (240 W and 480 W)
- Side-by-side mounting possible (up to 55°C)
- Vibration resistance to 5G, and 300-VAC abnormal input voltage supported for
- PCB coating protects against dust, corrosive gas and humidity.
- Certification for 3000m altitude
- RoHS compliant

Ordering information

Power ratings	Input voltage	Output voltage	Output current	Maximum boost current	Size (W × H × D) [mm]	Order code
60 W	100 to 240 VAC	24 V	2.5 A	3 A	32×90×90	S8VK-S06024
120 00	(allowable range:	24 V	5 A	6 A	55×90×90	S8VK-S12024
240 W	85 to 264 VAC or 90 to 350 VDC)	24 V	10 A	15 A	38×124×122	S8VK-S24024
480 W		24 V	20 A	30 A	60×124×122	S8VK-S48024

Specifications

ltem	Power rating	60 W	120 W	240 W	480 W			
	Output voltage	24 V						
Efficiency	115 VAC input ^{*1}	87% typ.	90% typ.	91% typ.				
	230 VAC input*1	89% typ.	92% typ.	93% typ.				
Input	Voltage range ^{*2}	Single-phase, 85 to 264	VAC, 90 to 350 VDC, 265 to 3	300 VAC (1 second)				
	Frequency*2	50/60 Hz (47 to 450 Hz)	50/60 Hz (47 to 63 H	lz)				
Output	Voltage adjustment range*3	21.6 to 28 V (with V.ADJ	21.6 to 28 V (with V.ADJ)					
	Input variation influence*4	0.5% max.						
	Load variation influence*5	1.5% max.						
	Temperature variation influence	0.05%/°C max.						
Overload protect	ion	Yes, automatic reset						
Overvoltage prot	ection	Yes, 130% or higher of r	ated output voltage, power	shut off (shut off the input volt	age and turn on the input again)			
Operating ambie	perating ambient temperature ^{*6}		–40 to 70°C (Derating is required according to the temperature.) (with no condensation or icing)					
Series operation	eries operation		er Supplies, external diodes a	are required.)				
Parallel operation	1	Yes (For up to two Powe	er Supplies)					
Under-voltage de	tection output	-		Yes (Photoswitch o	utput: 30 VDC max., 50 mA max.)			
Standards	Harmonic current emissions	Conforms to EN 61000-3-2						
	EMI	Conforms to EN 61204-3	Conforms to EN 61204-3 Class B, EN 55011 Class B					
	EMS	Conforms to EN 61204-3	B high severity levels					
	Approved standards	 UL Listing: UL 508,ANSI/ISA 12.12.01 (For 60 W only Class2 Output: Per UL 1310) cUL: CSA C22.2 No107.1, CSA C22.2 No213 (For 60 W only Class2 Output: Per CSA C22.2 No.223) UL UR: UL 60950-1 (Recognition) OVCII (≤ 3000 m) Pol2 cUR: CSA C22.2 No. 60950-1 OVCII (≤ 3000 m) Pol2 EN: EN 50178 OVCIII (≤ 2000 m) OVCII (2000 m≤ and ≤ 3000 m) Pol2, EN 60950-1 OVCII (≤ 3000 m) Pol2 ATEX: EN 60079-0,-15 Group II Zone2 Category 3G planned IEC-EX: IEC 60079-0,-15 Group IIA, IIB, IIC Zone2 EPL: Gc planned 						
	Conformed standards	PELV (EN/IEC 60204-1)						
		EN/IEC 61558-2-16:2009	9+A1:2013					
	Marine standards	Lloyd's register DNV GL						
	SEMI	Conforms to F47-0706 (200 to 240 VAC input)					
Degree of protect	tion	IP20 by EN/IEC 60529						

If the input is connected to a UPS, do not connect a UPS with a square-wave output.

Doing so will cause the internal temperature of the product to increase, possibly causing smoking or burning. *3 If the output voltage adjuster (V. ADJ) is turned, the voltage will increase by more than 28 V min of the voltage adjustment range. When adjusting the output voltage, confirm the actual output

voltage from the product and be sure that the load is not damaged.

*4 This is the maximum variation in the output voltage when the input voltage is gradually changed within the allowable input voltage range at the rated output voltage and rated output

100 to 240 VAC input, in the range of 0 A to the rated output current.



The value is when both rated output voltage and rated output current are satisfied.

To not use an inverter output for the product. Inverters with an output frequency of 50/60 Hz are available, but the rise in the internal temperature of the product may result in ignition or

^{*6} At–40 to –25°C, time will be required before the rated output voltage is output after the input voltage is input.



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 ($H \times W \times D$)	Order code
15 W	5 V	3 A	91 × 40 × 90	S8JX-G01505CD
	12 V	1.3 A		S8JX-G01512CD
	24 V	0.65 A		S8JX-G01524CD
35 W	5 V	7 A		S8JX-G03505CD
	12 V	3 A		S8JX-G03512CD
	24 V	1.5 A		S8JX-G03524CD
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
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
150 W	12 V	13 A	92 × 60 × 178	S8JX-G15012CD
	24 V	6.5 A	92 × 50 × 150	S8JX-G15024CD
300 W	12 V	27 A	92 × 110 × 164.5	S8JX-G30012CD
	24 V	14 A	92 × 110 × 167	S8JX-G30024CD
500 W	24 V	27 A	92 × 150 × 160	S8JX-G60024C
	48 V	13 A		S8JX-G60048C

Note: There are other models available on request: 15 W and 35 W (15 VDC, 48 VDC); 50 W and 100 W (48 VDC); 150 W and 300 W (5 VDC, 48 VDC); 600 W (5 VDC, 12 VDC). Please contact your Omron representative for special request.

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 120 VAC/200 Switchable	to 240 VAC,		
	Allowable range	wable range 85 to 264 VAC, 80 to 370 VDC (DC is not applicable for the safety standards.) 85 to 132 VAC/170 to						o 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 2	264 VAC input, 100%	load)						
	Load variation Influence	0.8% max. at 0% to	100% load							
	Temperature variation 0.05%/°C max. influence									
Overload	protection	Yes, 105% to 160% of rated current								
Overvolta	ge protection	Yes								
Operating	ambient temperature	−10 to 60°C (14 to 140°F)								
Series ope	eration	Yes, up to 2 units			Yes, up to 2 units					
Parallel op	peration	No					Yes, up to 5 units			
EMI		Conforms to EN 61204-3, EN 55011 Class A								
EMS		Conforms to EN 612	04-3 high severity lev	rels						
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) cUR: CSA C22.2 No. 107.1 EN/VDE: EN 50178 (=VDE EN 60950-1 (=VDE0805)					07.1 and No. 60950-1, =VDE0160),			
Fulfilled st	tandards	EN 50274 for termin	al 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 power supply errors, such as fan failure or insufficient voltage

Ordering information

Power ratings	Output voltage	Output current	Size in mm ($H \times W \times D$)	Order code
50 W	24 V	2.1 A	92 × 42 × 129	S8JX-P05024CD
100 W	24 V	4.5 A	92 × 42 × 159	S8JX-P10024CD
150 W	12 V	13 A	92 × 42 × 159	S8JX-P15012CD
	24 V	6.5 A		S8JX-P15024CD
300 W	12 V	27 A	92 × 71 × 165	S8JX-P30012CD
	24 V	14 A		S8JX-P30024CD
600 W	12 V	53 A	92 × 110 × 165	S8JX-P60012CD
	24 V	27 A		S8JX-P60024CD

Note: There are other models available on request: 50 W and 100 W (5 VDC, 12 VDC, 48 VDC); 150 W, 300 W and 600 W (5 VDC, 48 VDC). Please contact your Omron representative for special request.

Item		50 W	100 W	150 W	300 W	600 W			
Efficiency	y (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 ±10% for 48 V (with V.	,		−10% to 15% for 12 ±10% for 5 V and 48	,			
	Input variation influence	0.4% max. (at 85 to 26	.4% max. (at 85 to 264 VAC input, 100% load)						
	Load variation Influence	0.8% max. at 0% to 10	.8% max. at 0% to 100% load						
	Temperature variation influence	0.05%/°C max.							
Overload	l protection	Yes, 105% to 160% of rated current							
Power Bo	oost	-		115% of rated curre	ent for 24 V only				
Overvolt	age protection	Yes							
Operatin	g ambient temperature	-10 to 70°C (14 to 158°F)							
Series op	eration	Yes, up to 2 units							
Parallel o	peration	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							
Harmoni	c 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							





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

The S8EX is an open frame power supply which can be mounted directly on to small equipment. The wide variation of output voltage and power boost function of 200% contribute to the overall down-sizing of equipment and power supply standardization.

- 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 \times H \times D) [mm]	Order code
50 W	100 to 240 VAC	12 V	4.3 A	50 × 28.5 × 132	S8EX-BP05012
		24 V	2.1 A		S8EX-BP05024
100 W	1	12 V	8.5 A	62 × 35.5 × 155	S8EX-BP10012
		24 V	4.3 A		S8EX-BP10024
150 W		12 V	12.5 A	75 × 37.5 × 160	S8EX-BP15012
		24 V	6.3 A		S8EX-BP15024
240 W		24 V	10 A	84 × 42.5 × 180	S8EX-BP24024

Note: There are other models available on request: 15 W and 30 W (5 VDC, 12 VDC, 15 VDC, 24 VDC, 48 VDC); 50 W, 100 W and 150 W (5 VDC, 48 VDC); 240 W (36 VDC, 48 VDC). Please contact your Omron representative for special request.

Specification		50 W	100 W	150 W	240 W			
Efficiency (Typ at 20	00 VAC)	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	n	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 protec	tion	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 e	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)						





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 240 W at 24 VDC 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
- Buffer unit protects against power glitches and outage
- EMI Class B, UL Class 2, UL Class 1 division 2

Ordering information

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

Tone S8T-BUS01 connector and one S8T-BUS02 connector are included as accessories.

Note • There are other models available on request. Please contact your Omron representative for special request.

• There are Bus line connector accessories available on request. Please contact your Omron representative for special request.

Item		5 V models	24/12 V models			
		Single operation	Single operation	Parallel operation		
Efficiency 62% min.		62% min.	24 V models: 75%, 12 V models: 70% min.	•		
Power fact	tor	0.8 min.	24 V models: 0.9 min., 12 V models: 0.8 min.			
Input volta	age	ge 100 to 240 VAC, (85 to 264 VAC), single-phase				
Output Voltage adjustment 5 V ±10% min. 24 V models: 22 to 2		24 V models: 22 to 28 V, 12 V models: 12 V ±109	% min.			
voltage	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% lo	0.05%/°C max. (with rated input, 10 to 100% load)			
Overcurre	nt protection	105 to 125% of rated load current, inverted L drop, automatic reset				
Overvoltag	ge protection	yes	yes	yes		
Output inc	dicator	yes (green)	yes (green)	yes (green)		
Weight		450 g max.	450 g max.	450 g max.		
Series operation		yes	yes	yes		
Parallel operation no		no	yes	yes		
Size in mm	ı (H×W×D)	120×43×120				

Bus line connectors can be ordered separately if necessary.
 Conforms to EMI class B with DC minus terminal ground.

S8T-DCBU-01/-02 DC Backup



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	Туре		Order code
Basic block	olock 100 to 240 VAC 24 V 2.5 A Screw		With bus line connectors	S8TS-06024-E1		
(use together with the DC				terminal type	Without bus line connectors	S8TS-06024
оаск-ир бюск)	pack-up block) Connector	With bus line connectors	S8TS-06024F-E1			
				terminal type	Without bus line connectors	S8TS-06024F
Product	Back-up time	Overcurrent protection operating point sel				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

Itom	Size in mm (H×W×D)
Item	Size in min (nAWAD)
S8T-DCBU-01	120×43×130
Battery holder	82×185.7×222.25



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 these Omron power supplies: S8VM, S8TS, S8VS, S8VK-C, S8VK-G, S8VK-T, S8JX-G, S8JX-P
- · 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

Note: There are DC Bus line connector accessories available on request. Please contact your Omron representative for special request.

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





Compact 3-phase input power supply

The S8VK-T has an exceptionally wide operating temperature range -40 to 70° C. These models also have high endurance against vibration and guarantee stable operation in even the harshest of environments.

- Input range: 3×320 to 576 VAC, 2×340 to 576 VAC
- Safety standard, UL 508, ANSI 12.12.01, EN 50178, EN 60950-1, UL 60950-1, CSA No. 60950-1, EN 60204-1 PELV, EN 61558-2-16 Safety transformer. Lloyd's Register
- Protection IP20 by EN/IEC 60529
- EMI Class B
- 120% boost function
- For harsh environments coated models are now available. PCB coating protects against dust, corrosive gas and humidity.
- RoHS compliant

Ordering information

Туре	Power ratings	Input voltage	Output voltage	Output current	Size $(W \times H \times D)$ [mm]	Order code		
						Standard models	Coated models	
Power supply three-phase	120 W	3 × 380 to 480 VAC, 2 × 380 to 480 VAC 450 to 600 VDC (Excluding 960 W) Allowable range: 3 × 320 to 576 VAC, 2 × 340 to 576 VAC, 450 to 810 VDC (Excluding 960 W)		5 A	40×125×113	S8VK-T12024	S8VK-T12024-400	
	240 W			10 A	60×125×140	S8VK-T24024	S8VK-T24024-400	
	480 W		3 × 320 to 576 VAC,		20 A	95×125×140	S8VK-T48024	S8VK-T48024-400
	960 W			40 A	135×125×170	S8VK-T96024	S8VK-T96024-400	

Specifications

ltem		120 W	240 W	480 W	960 W	
Efficiency	y (Typ. at 400 VAC)	89%	89%	91%	92%	
Input	Rated Input Voltage				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 \	/AC 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),	<u> </u>		
Power Bo	oost	120% of rated current				
Overvoltage protection		Yes				
Operating ambient temperature		-40 to 70°C (-40 to 158°F)				
Series Op	peration	Yes, Up to 2 units				
Parallel C	peration	Yes, Up to 2 units				
EMI		Conforms to EN 61204-3, EN 55011 Class B				
EMS		Conforms to EN 61204-3 high severity levels				
Harmoni	c 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	Safety of Power Tran	N 50178/UL 60950-1), PELV (EN 602 nsformers (EN 61558-2-16), EN 5027		
Degree o	f protection	IP20 by EN / IEC 60529				

For more information, please enter "P238" in the search field on our website industrial.omron.eu.





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	Compliant		S8M-CP04-RS

Note: Model S8M-CP04-R available on request. Please contact your Omron representative for special request.

Туре		S8M-CP04	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)			





Redundancy unit, contributes to building highly reliable systems

The S8VK-R is a redundancy unit for use with the S8VK power supply series. This unit consists of 2 main diodes and the additional function to build in the redundancy of the power supply, thus saving valuable design time in combination with the highly reliable S8VK series.

- · 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
- For harsh environments coated models are now available. PCB coating protects against dust, corrosive gas and humidity.
- · RoHS compliant

Ordering information

Input voltage	Output current	Size (W × H × D) [mm]	Order code	
			Standard models	Coated models
5 to 30 VDC	10 A	32×90×110	S8VK-R10	S8VK-R10-400
10 to 60 VDC	20 A	40 × 125 × 113	S8VK-R20	S8VK-R20-400

Specifications

Туре	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,	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	of PS operate normally.		
Voltage Balance Indicator	LED (Green), The function to help to get the k	LED (Green), The function to help to get the balance of 2 unit PS output voltage		
Grounding terminal	-	Yes, One for Chassis grounding		

For more information, please enter "P237" in the search field on our website industrial.omron.eu.



Uninterruptible power supplies (UPS)

RELIABLE AND EASY OPERATION — WORLDWIDE

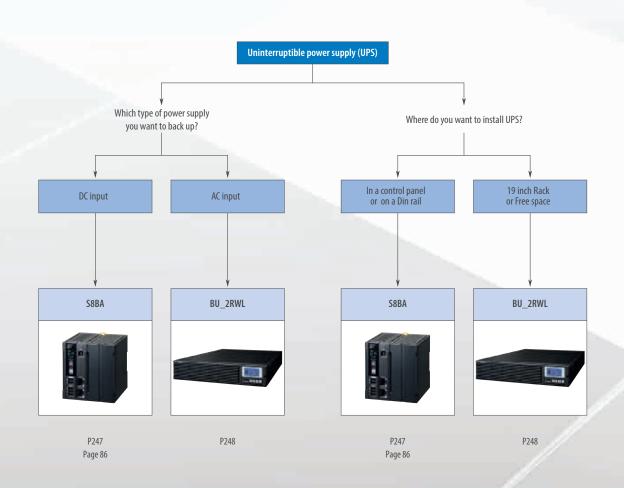
S8BA

The easy DIN-rail mountable, DC-DC type UPS is ideal countermeasure for momentary voltage drops and power failures of industrial computers (IPCs) and controllers, switching power supply. They secure full functional reliability of systems by backing up the supply of 24 VDC power source for a guaranteed period of time.

BU_2RWL

- Multiple mounting online AC-AC type UPS, useful in variety of applications.
- They are available as a stand-alone device or for mounting in a 19" rack.
- Optimum UPS for industrial equipment and embedded applications.
- UPS devices are single-phase uninterruptible power supplies.







		CODA				DII 2DW		
		S8BA	l	l		BU_2RWL	l	I
				1				-dear
Мо	del	S8BA-24D24D120LF	S8BA-24D24D240LF	S8BA-24D24D360LF	S8BA-24D24D480LF	BU2002RWLG	BU3002RWLG	BU5002RWLG
	Туре	Din-rail mounting				19 inch rack mounting		
	Input-Output type	DC-DC				AC-AC	-	
	Phases	Single phase						
riteria	Input rated voltage/ Maximum current	24 VDC/5.9 A	24 VDC/11.7 A	24 VDC/17.5 A	24 VDC/23.3 A	200 to 240 VAC/9 A	200 to 240 VAC/14 A	200 to 240 VAC/23 A
Selection Criteria	Input terminal	Push-in terminal block	(·	Terminal block		NEMA L6-30P/ Terminal block
Sele	Output rated voltage/Maximum current	24 VDC/5 A	24 VDC/10 A	24 VDC/15 A	24 VDC/20 A	Terminal block		NEMA L6-30P/ Terminal block
	Output terminal	Push-in terminal block	(<u>'</u>		Terminal block		NEMA L6-30R × 2, Terminal block
	120W		_	_	_	-	-	-
	240W	-	-	-	_	-	-	-
-	360W	-	-		-	-	-	-
Power	480W	-	-	-		-	-	-
۵	1400W	-	-	_	_		-	-
	2100W	-	-	-	-	-		-
	3500W	-	_	_	_	-	-	
	Туре	Lithium-ion				Sealed lead		
			rs (40°C), 10 years (25°C))		2.5 year (40°C), 5 years	s (25°C)	
_	Hot swapping					T		
Battery	Backup time (Maximum power)	6 min				5 min		
_	Auto battery check function	•						
	Battery life counter function							
	Under voltage alarm							
	Overvoltage protection							
	Overload protection							
	UL508					-		
	C22.2 No.107.1-01					-		
Se	UL1778	-						
tures	CE VCCL days A	•				1_		
Feat	VCCI class A	- (D145)				(D - 1-0-1-)		
	Serial communication/ RS232C (Interface terminal)	■ (RJ45)				■ (D-sub 9pin)		
	Serial communication/USB (Interface terminal)	■ (B connector)				_		
	I/O signal	■ (RJ45)				(D-sub 9pin)		
-	je/Quick Link	86/P247				P248		

■ Standard

No/not available



Compact DC-DC UPS with a DIN-rail for mounting, best suited for the prevention of voltage drop and power failure in industrial PCs (IPC)/controllers

- System reliability greatly improved because 24 VDC power supply is backed up for a certain period of time in the event of voltage drop or power failure.
- Compact, weight reduction, and long battery life thanks to the adoption of a lithium-ion battery.
- Push-in terminal block adopted for the power input and output connections.
- Shutdown in conjunction with the IPC or controller realized by the USB, RS-232C, I/O port installed in the UPS.

Ordering information

Value Desigr

Uninterruptible power supply (UPS)

Input voltage	Output voltage	Output current/capacity	Battery type	Terminal block shape	Order code
24 VDC	24 VDC	5 A/120 W	Lithium-ion battery	Push-in terminal block	S8BA-24D24D120LF
		10 A/240 W			S8BA-24D24D240LF
		15 A/360 W			S8BA-24D24D360LF
		20 A/480 W ^{*1}			S8BA-24D24D480LF

^{*1 16.7} A/400 W for use as a UL compliant device.

Communication cable

Specifications	Туре	Length	Order code
For RS-232C port	RJ45/Dsub9Pin	2 m	S8BW-C01
For Contact port	RJ45/Discrete wire x 8P	2 m	S8BW-C02

Replacement battery pack

Rated voltage	Rated capacity	Weight	Order code
14.4 VDC	1600 mAh	0.3 kg	S8BA-B120L

ltem		Capacity	120 W	240 W	360 W	480 W ^{*1}		
DC input	Rated input volta	age	24 VDC	·				
	Input voltage range	(When standard voltage sensitivity is set)	24 VDC±10%					
		(When low voltage sensitivity is set)	24 VDC±12.5%					
		(When high voltage sensitivity is set)	24 VDC±5%					
	Input maximum current	(for rated input voltage)	5.9 A	11.7 A	17.5 A	23.3 A*2		
	Input terminal		Push-in terminal block					
	Inrush current		12 A max., 0.1 ms max.	14 A max., 0.1 ms max.	16 A max., 0.1 ms max.			
DC output	Rated current	(for rated output voltage)	5 A	10 A	15 A	20 A*3		
	Switching time		Uninterrupted	•				
	Output voltage	Normal operation	Output of input voltage a	s-is				
		Backup operation	24 V±5%					
	Output terminal		Push-in terminal block					
attery	Туре		Lithium-ion battery					
	Rated voltage		14.4 VDC					
	Rated capacity		1600 mAh × 1 parallel	1600 mAh × 2 parallel	1600 mAh × 3 parallel	1600 mAh × 4 parallel		
	Expected battery	r life ^{*4}	2.5 years (50°C), 5 years (40°C), 10 years (25°C)					
	Replacement by	user	Yes (Hot swapping)					
	Charging time		4 hours ^{*5}					
ackup time (25	°C, initial character	istics)	6 min. (120 W)	6 min. (240 W)	6 min. (360 W)	6 min. (480 W)		
nvironment	Operating ambie	nt temperature/humidity	0 to 55°/10 to 90% (with r	no condensation)				
	Storage ambient	temperature/humidity	–20° to 55°/10 to 90% (wi	th no condensation)				
nclosure	Dimensions (W ×	D×H mm)	94 × 100 × 100	148 × 100 × 100	$270\times100\times100$			
	Weight of unit		Approx. 0.8 kg	Approx. 1.3 kg	Approx. 2.0 kg	Approx. 2.3 kg		
	Cooling method		Natural cooling					
afety standard	ety standard compliance			-01				
Narine standard	-		Lloyd's register/ABS/EN60	945 ^{*6} /DNV GL (Certification i	s pending for DNV GL)			
nternal power o	onsumption (norm	al ^{*7} /maximum ^{*8})	7 W/22 W	11 W/41 W	14 W/60 W	18 W/80 W		



Item Capa		Capacity	120 W	240 W	360 W	480 W ^{*1}		
Serial	RS232C (Interface	terminal)	Yes (RJ45)					
communication	USB (interface ter	minal)	Yes (B connector)					
I/O signal			Yes (RJ45)					

- $^{*1}~400~W$ for use as a UL compliant device.
- *2 20 A for use as a UL compliant device.
- *3 16.7 A for use as a UL compliant device.
- *4 An estimated value for standard mounting. Not a guaranteed value.
- *S When using in an environment at a high temperature, charging may be paused by charging temperature protection, then the charging time will be longer than specified time.

 **C ** will be displayed when sharping temperature protection is exercised.
- "CS" will be displayed when charging temperature protection is operated.

 *6 For the S8BA-24D24D120LF, install all of the RSMN-2030, RSHN-2030, and RSEN-2030 EMC filters manufactured by TDK. For the S8BA-24D24D240LF, S8BA-24D24D360LF, or S8BA-24D24D480LF, install both the RSMN-2030 and RSHN-2030 or their equivalents. Install these filters in series to the cable connected to the DC input terminal block. When you do, do not connect anything to the GR terminal.
- The effectiveness of the noise filters may be affected by the installation environment. Be sure to check effectiveness before starting operation.
- *7 Conditions: With rated loads connected, at a rated input voltage, and with the battery fully charged.
- *8 Conditions: With rated loads connected, at a rated input voltage, and at the maximum battery charging current.

Backup time table (Time unit: minutes)

For devices that use the A indication, convert the capacity into W: $W = A \times 24$

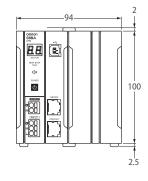
	Capacity (W)	ity (w)								
	30	60	90	120	180	240	300	360	420	480
120 W	29	14	9	6	_	_	_	_	_	_
240 W	58	29	19	15	9	6	_	_	_	-
360 W	87	43	28	22	14	10	8	6	_	-
480 W	119	59	39	29	19	15	11	9	8	6

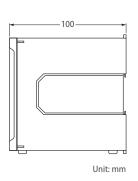
Note: The above backup times are for reference only. They may change depending on the battery life and external environment (such as temperature).

Dimensions

S8BA-24D24D120LF (120 W)

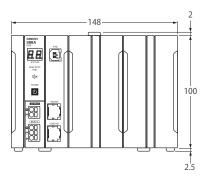


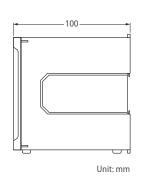




S8BA-24D24D240LF (240 W)

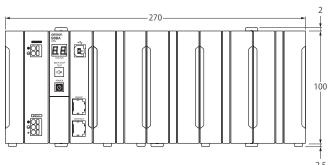


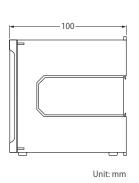




S8BA-24D24D360LF (360 W) S8BA-24D24D480LF (480 W)







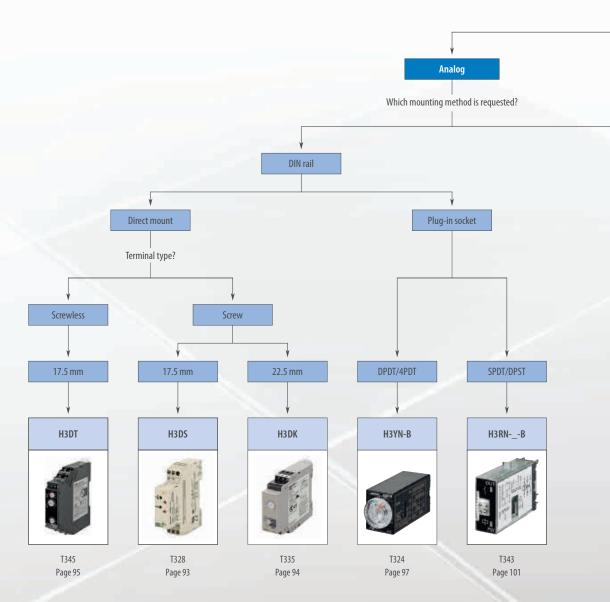
Timers

WHEN TIMING ACCURACY MATTERS!

DIN 17.5-mm-wide slim timers with Push-in plus Technology for in-panel applications

- Helps save space and reduces work in control panels
- Slim timers (17.5-mm width) with two sets of contacts: One of the slimmest timers worldwide*1
- Reduces power consumption (active power) by up to 60% help to reduce heat generation in control panels*2
- Certified for maritime standards (LR/DNV GL)*3
- RoHS compliant

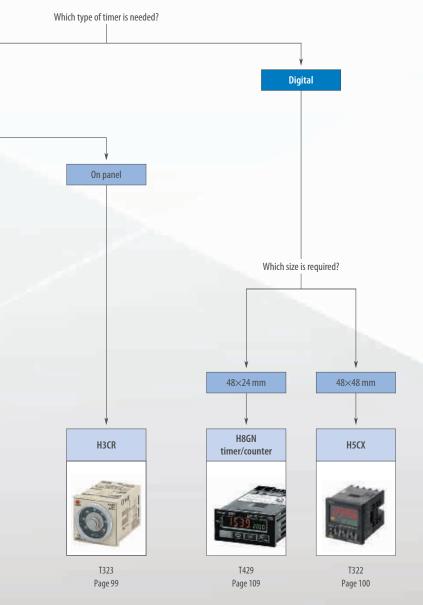
 $^{^{\}ast _{3}}$ Certification is pending for DNV GL.



 $[\]ensuremath{^{*1}}$ According to OMRON investigation in October 2015.

^{*2} Based on OMRON comparison (excluding the H3DT-H).





Categ	jory		Analog solid state tim	er				
Mode			H3DT-N	H3DT-L	H3DT-A	H3DT-G	H3DT-F	H3DT-H
eria	Mounting Size	9	DIN-rail 17.5 mm					
Selection criteria	Type		Multi-Functional, 8 mo	des	ON-Delay	Star-Delta	Twin Timer	Power off Delay
	Time limi	t			•			•
	Instantar		•		-	-	-	-
ion	Programi	mable	•	•	-	-	-	-
urati	14 pins 11 pins		-	-	-	-	-	-
nfig	8 pins		_	_	_	_	_	_
8	5 pins		_	_	_	_	_	_
Contact configuration	Screw ter	minals	-	-	_	-	-	-
	Screw-les terminals	ss clamp	-		•	-	-	
	Screw-les sockets		-	-	-	-	-	-
Inputs	Voltage i				-	-	-	-
	Transisto	r	-	-	-	-	-	-
	Relay SCR		_	•	_		-	-
ıts	Relay	SPDT	-	-	- -		-	-
Outputs	output	SPST-NO	_	_	_	- (2//)	_	-
0	type	DPDT				_	-	-
		DPST-NO	-	-	-	-	-	-
		4PDT	-	-	-	-	-	-
	Time range	Total time range	0.1 s to 1200 h	0.1 s to 1200 h	0.1 s to 1200 h	1 s to 120 s	0.1 s to 1200 h	0.1 s to 120 s (model dependent)
Features		Number of sub ranges	8	8	8	2	8	2
Fea	Supply vo	oltage	24 to 240 VAC/DC	24 to 240 VAC/DC	24 to 240 VAC/DC	24 to 240 VAC/DC	24 to 240 VAC/DC	24 to 48 VAC/DC, 100 to 120 VAC, 200 to 240 VAC
	Number of modes	of operating	8	8	1	1	2	1
	ON-delay				-	-	-	-
	Flicker Ol		-	-	-	-	-	-
	Flicker Ol Signal ON-/OFF-		-	■ (2×)	-	-	-	-
	Signal OF	F-delay		-	-	-	-	
Functions	Interval (power sta	art)	•	•	_	-	_	-
Fun	One-shot (ON-dela	y)	•	■ (Power or Signal ON)	-	-	-	-
	ON-delay		-	-	-	-	-	-
	ON/OFF t	ime setting						
	Cumulati		– ■ (On Delay	-	_	-	-	-
S	Transisto		or Interval)	_	_	_	_	_
Remarks								
Page/	Quick Lin	k	95/T345					



Categ	jory		Analog solid	state timer									
			1	The state of the s		The state of							5
Mode			H3DS-M	H3DS-S	H3DS-A	H3DS-F	H3DS-G	H3DS-X	H3DK-M	H3DK-S	H3DK-F	H3DK-G	НЗДК-Н
ria .	Mounting]	DIN-rail						laa 5				
Selection criteria	Size Type		17.5 mm Multi-function	nal		Twin timer	Star-delta	Two-wired	22.5 mm Multi-function	nal	Twin timer	Star-delta	Power OFF-delay
	Time limi	t				•		•	•		-		•
	Instantan	eous	-	-	-	-	-	-			-	-	-
ition	Programs contacts	mable	-	-	_	-	_	-			-	-	-
gura	14 pins		-	-	-	-	-	-	-	-	-	-	-
onfi	11 pins		-	_	_	-	_	-	-	-	-	-	-
acto	8 pins Screw ter	minals	_	_	_	_	_	_	_	_	_	_	_
Contact configuration	Screw-les terminals	s clamp							-	-	-	_	-
	Screw-les sockets	s clamp	-	_	_	_	_	_	_	_	-	_	-
Inputs	Voltage ii	nput				-	-	-			-	-	-
	Transisto	r	-	-	-	-	-	-	_	-	-	-	-
	Relay							-					
uts	SCR	I	-	-	-	-	-		-	-	-	-	-
Outputs	Relay output	SPDT					- (-)	-			=	■ (2x)	
	type	SPST-NO DPDT	-	-	-	-	■ (2×)	-	_	-	-	-	-
		4PDT		_	_	_	_	_	_	_	_	_	_
	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
Features		Number of sub ranges	7	7	7	6	2	7	12	12	8	2	2 (model dependent)
Fea	Supply vo	oltage				24 to 230 VAC or 24 to 48 VDC			24 to 240 VAC/DC or 12 VDC				100 to 120 VAC, 200 to 240 VAC, 24 to 48 VAC/DC
	Number of modes	of operating	8	4	1	2	1	1	8	4	1	1	1
	ON-delay				-	-	-				-	-	-
	Flicker OF			-	-	-	-	-	-	-	-	-	-
	Flicker Of Signal	v start	-	_	_	_	_	_		_	-	_	_
	ON-/OFF- Signal OF		-	_	_	_	_	_		_		_	
													_
unct	Interval (s	art)	•	-	_	-	_	-	-	-	-	-	-
	One-shot (ON-delay	y)	•	•	_	_	_	_	•	•	-	-	_
	ON-delay			_		_	_	_	_	_		-	
		ime setting	-	_	-	-	_	-	-	-	-	-	-
10	Star-delta		-	-	-	-		-	-	-	-	-	-
Remarks	Transisto	r	_	_	_	_	_	•	_	_	-	_	_
	/Quick Linl	k	93/T328						94/T335				



■ Standard

☐ Available

No/not available

Selection table Timers

Mountaing Sharainwest Sh	Categ	ory		Analog solid state	timer					Digital timer	
March State						O	0	C			
Ministration 1/2 1	Mode	el .		НЗҮМ-В	H3RNB		H3CR-F	H3CR-G	H3CR-H	H5CX	H8GN
Time limit	<u>ia</u>	Mounting)	DIN-rail with a Soc	ket	Socket/on panel					
Time limit	riter										
Manual content	Selection	Type		Miniature			Twin timer	Star-delta			
March Part		Time limi	t					-		•	
March Mar		Instantan	eous	-	-		_				-
			mable	-	_	-	_	_	_		-
Serial Content	ratio	14 pins		=	-	-	_	-	-	-	-
Serial Content	figu	11 pins		-			ļ		<u> </u>		-
Serial Content	coni										-
Serial Content	tact			-		-	_	_	-	_	_
Serial Content	Cont			-	-	-	-	-	-		
Marcha		terminals	· ·	_		-	_	_	_	_	-
Table Page		sockets	·	•	•	-	-	-	_	-	-
Relay							_				
SCR			r	-	-		_	-	-		-
Relay large		_		-	_		_	_	•		-
PDDT	53		CDDT	-	-	-	-	-	-	-	-
PDDT	tbn			-	_		_	- (2)			-
Page	8			-	_	_	_	■ (2X)	- 	_	_
Marting Total time Trange Total time Trange T				_	-	_	_	_	-	_	_
Time range Total time range					-	_	_	_	_	_	_
Supply voltage 24 VDC, 12 VDC, 24 VAC, 100 to 120 VAC, 100 to 120 VAC, 100 to 120 VAC, 120 VDC, 24 VAC, 100 to 120 VAC, 125 VDC 24 VAC, 100 to 120 VAC, 1			Total time	(model	(model	s to 600 h (model	s to 300 h (model	0.5 s to 120 s			0.000 s to 9999 h (configurable)
Supply voltage	ures			4	4	9	14	4	4	10	9
Modes	Feat	Supply vo	oltage	24 VAC, 100 to 120 VAC, 200 to		100 to 125 VDC, 24 to 48 VAC,	12 VDC, 24 VAC/DC, 48 to		200 to 240 VAC, 24 VAC/DC, 48 VDC, 100 to	24 VAC,	24 VDC
Flicker OFF start			of operating	4	4		-	1	1	15	6
Flicker ON start							-	_	-		
Signal ON-/OFF-delay -								-	_		
Non-/OFF-delay Signal OFF-delay Signal OFF-de			N start					-	-		-
Interval (signal or power start)		ON-/OFF-	-	-	-		-	-	-		-
ON-delay (fixed)				_	_		-	_			
ON-delay (fixed)	nctions	power sta	art)	•			_	_	_		
Independent		delay)		-	-		-	-	-		-
Star-delta -		Independ	lent	-	-	-	-	_	-		-
Cumulative -		ON/OFF t	ime setting								
Transistor				-	-		-		-	-	-
				-	-	-	-	-	-		
	Remarks	Transisto	r	-	_		_	_	-	•	_
	_	Quick Lin	k	97/T324	101/T343	99/T323				100/T322	109/T429



■ Standard

☐ Available

No/not available



DIN-rail mounted, standard 17.5 mm wide solid state timer range

This broad range of timers includes many functionalities and has a wide AC/DC power supply range. Models with screwless clamp connection available.

- 17.5 mm width, modular 45 mm
- DIN-rail mounting
- 24-48 VDC and 24-230 VAC
- 0.1 s to 120 h, 7 ranges

Ordering information

Туре	Supply voltage	Control output	Time setting	Operating modes	Order code	
			range		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

Terminal block	Screw terminal type: Clamps two 2.5 mm ² max. bar terminals without sleeves
Terminal block	Screw-less clamp type: Clamps two 2.5 mm ⁻ 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 \times W \times D): 79 \times 22.5 \times 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

Туре	Supply voltage	Control output	Time setting range	Operating modes	Order code
Multi-functional	12 VDC	SPDT	0.1 s to 1200 h	ON-delay, flicker OFF start, flicker ON start,	H3DK-M1A DC12
standard timers		DPDT		signal ON/OFF-delay, signal OFF-delay, interval, one-shot	H3DK-M2A DC12*1
		SPDT		ON-delay, flicker ON start, interval, one-shot	H3DK-S1A DC12
	24 to 240 VAC/VDC	SPDT		ON-delay, flicker OFF start, flicker ON start,	H3DK-M1 AC/DC24-240
		DPDT		signal ON/OFF-delay, signal OFF-delay, interval, one-shot	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
	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.

Note: There are other model available on request. Please contact your Omron representative for special request.

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 ($\cos \varphi = 1$), 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	$\pm 10\%$ of FS ± 0.05 s max.
Minimum input signal width	50 ms (start input) (Only for H3DK-M/S)
Influence of voltage	$\pm 0.5\%$ of FS max. ($\pm 0.5\% \pm 10$ ms max. at 1.2 s range). For H3DK-G: $\pm 0.5\%$ of FS max.
Influence of temperature	$\pm 2\%$ of FS max. ($\pm 2\% \pm 10$ ms max. at 1.2s range). For H3DK-G: $\pm 2\%$ 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





DIN 17.5-mm-wide slim timers with Push-in plus **Technology for in-panel applications**

- Helps save space and reduces work in control panels
- Slim timers (17.5-mm width) with two sets of contacts: One of the slimmest timers worldwide $^{\ast 1}$
- Reduces power consumption (active power) by up to 60% to help reduce heat generation in control panels *2
- Certified for maritime standards (LR/DNV GL)*3
- RoHS compliant
- *1 According to OMRON investigation in October 2015.
 *2 Based on OMRON comparison (excluding the H3DT-H).
 *3 Certification is pending for DNV GL.

Ordering information

Туре	Supply voltage	Operating modes	Terminal block	Input type	Control output	Time range	Order code
Multi-range,	24 to 240 VAC/DC	A2 : ON Delay (Power ON Delay)	10 terminals	Voltage input	Relay, DPDT	0.1 s to 1,200 h	H3DT-N2
multi-mode standard timer		B3 : Flicker OFF Start (Power ON Start) B4 : Flicker ON Start (Power ON Start) D : Signal OFF Delay E2 : Interval (Power ON Start) E3 : Signal OFF Interval F2 : Cumulative (ON Delay) F3 : Cumulative (Interval)	8 terminals		Relay, SPDT		H3DT-N1
Multi-range,		A : ON Delay (Signal ON Delay)	10 terminals		Relay, DPDT		H3DT-L2
multi-mode expansion timer		B: Flicker OFF Start (Signal Start) B2: Flicker ON Start (Signal Start) C: Signal ON/OFF Delay E: Interval (Signal Start) G: Signal ON/OFF Delay J: One-shot Output (Signal Start) J2: One-shot Output (Power ON Start)	8 terminals		Relay, SPDT		H3DT-L1
Power ON-delay	24 to 240 VAC/DC	Power ON-delay	8 terminals	-	Relay, DPDT	0.1 s to 1,200 h	H3DT-A2
timer			6 terminals		Relay, SPDT	1	H3DT-A1
Twin timer	24 to 240 VAC/DC	Flicker OFF start/flicker ON start	6 terminals	-	Relay, SPDT	0.1 s to 1,200 h	H3DT-F
Star-delta timer	24 to 240 VAC/DC	Star-delta	8 terminals	-	Relay, Time-limit Star circuit, SPDT Delta circuit, SPDT	1 to 120 s*1	H3DT-G
Power OFF-delay	100 to 120 VAC	Power OFF-delay	6 terminals	_	Relay, SPDT	0.1 to 12 s	H3DT-HCS
timer	200 to 240 VAC						H3DT-HDS
	24 to 48 VAC/DC						H3DT-HBS
	100 to 120 VAC					1 to 120 s	H3DT-HCL
	200 to 240 VAC						H3DT-HDL
	24 to 48 VAC/DC						H3DT-HBL

 $^{^{*1}\,}$ Star set time (t1) range. Star-Delta transfer time (t2): Select from 0.05, 0.1, 0.25, or 0.5 s

	H3DT										
	-N2/-L2	-N1/-L1	-A2	-A1	-F	-G	-HCS	-HCL	-HDS	-HDL	-HBS/-HBL
Power supply voltage	24 to 240 VAC/DC, 50/60 Hz *1,*2									24 to 48 VAC/ DC, 50/60 Hz*	
Allowable voltage fluctuation range	85% to 110% of rated voltage										
Power reset	Minimum pov	ver-OFF time: 0.	.1 s				-				
Reset voltage	10% of rated v	voltage					-				
Voltage input	24 to 240 VAC High level: 20.4 to 264 VA Low level: 0 to	AC/DC,	-								
Power consumption	At 240 VAC: 2.3 VA max., at 240 VDC: 1.0 W max., at 24 VDC: 0.3 W max.*3	At 240 VAC: 2.0 VA max., at 240 VDC: 0.9 W max., at 24 VDC: 0.3 W max.*3	At 240 VAC: 2.2 VA max., at 240 VDC: 0.7 W max., at 24 VDC: 0.3 W max.*3	At 240 VAC: 1.8 VA max., at 240 VDC: 0.6 W max., at 24 VDC: 0.3 W max.*3	At 240 VAC: 1. at 240 VDC: 0.0 at 24 VDC: 0.3	6 W max.,	At 120 VAC: 8.7 VA max.	At 120 VAC: 8.8 VA max.	At 240 VAC: 21.6 VA max.	At 240 VAC: 21.7 VA max.	At 48 VAC: 1.0 VA max., at 24 VDC: 0.4 W max.
Control output	Contact output: 5 A at 250 VAC with resistive load (cos \$\phi = 1\$), 5 A at 30 VDC with resistive load, 0.15 A max. at 125 VDC with resistive load, 0.14 max. at 125 VDC with L/R of 7 ms. The minimum applicable load is 10 mA at 5 VDC (P reference value). Contact materials: Ag-alloy (Recommended fuse: BLN5 (Littelfuse) or 0216005MXEP)										
Ambient temperature		0 to 60°C (with to 70°C (with no									
Accuracy of operating time	±1% of FS ma	x. (±1% ±10 ms	max. at 1.2 s ra	nge)		±1% of FS max.	±1% of FS ma	ıx. (±1% ±10 m	is max. at 1.2 s ra	nge)	
Setting error	±10% of FS ±0	0.05 s max.									
nfluence of oltage	±0.5% of FS m	nax. (±0.5% ±10) ms max. at 1.2	s range)		±0.5% of FS max.	±0.5% of FS n	nax. (±0.5% ±1	0 ms max. at 1.2	s range)	
Influence of temperature	±2% of FS max. (±2% ±10 ms max. at 1.2 s range) ±2% of FS max. (±2% ±10 ms max. at 1.2 s range) max.										
Life expectancy			tions min. (unde min. (5 A at 250								
Degree of protection	IP30 (Termina	P30 (Terminal block: IP20)									
Size in mm (H × W × D)	100×17.5×90										

^{*1} When using a 24 VDC power supply voltage, there will be an inrush current of approximately 0.5 A. Allow for this inrush current when turning ON and OFF the power supply to the Timer with device with a solid-state output, such as a sensor.

*2 DC ripple: 20% max.

*3 The power consumption is the value after the timer times out.







Compact, Multi-function Timers with Plug-in socket

- The Plug-in socket with Push-in plus technology, PYF-__-PU is available for easy wiring.
- Easy replacement and helps to reduce your maintenance time.
- Slim 21.5 mm wide design saves space.
- · Large transparent time setting knob facilitates time setting.

Ordering information

Operating modes	Control output	Supply voltage	Order code	
			Short-time range (0.1 s to 10 min)	Long-time range (0.1 m to 10 h)
On-delay, Interval,	DPDT	24 VAC	H3YN-2-B AC24	H3YN-21-B AC24
Flicker OFF-start, Flicker ON		48 VDC	H3YN-2-B DC48	H3YN-21-B DC48
tart		24 VDC	H3YN-2-B DC24	H3YN-21-B DC24
		12 VDC	H3YN-2-B DC12	H3YN-21-B DC12
		100 to 120 VAC	H3YN-2-B AC100-120	H3YN-21-B AC100-120
		200 to 230 VAC	H3YN-2-B AC200-230	H3YN-21-B AC200-230
		100 to 110 VDC	H3YN-2-B DC100-110	H3YN-21-B DC100-110
		125 VDC	H3YN-2-B DC125	H3YN-21-B DC125
	4PDT	24 VAC	H3YN-4-B AC24	H3YN-41-B AC24
		48 VDC	H3YN-4-B DC48	H3YN-41-B DC48
		24 VDC	H3YN-4-B DC24	H3YN-41-B DC24
		12 VDC	H3YN-4-B DC12	H3YN-41-B DC12
		100 to 120 VAC	H3YN-4-B AC100-120	H3YN-41-B AC100-120
		200 to 230 VAC	H3YN-4-B AC200-230	H3YN-41-B AC200-230
		100 to 110 VDC	H3YN-4-B DC100-110	H3YN-41-B DC100-110
		125 VDC	H3YN-4-B DC125	H3YN-41-B DC125
	4PDT, Twin Contact	24 VDC	H3YN-4-Z-B DC24	H3YN-41-Z-B DC24

Note: There are other models with Screw socket compatibility available on request (grey version). Please contact your Omron representative for special request.

Accessories

Plug-in Socket

Туре	Timer	Order code
Screwless socket with Push-in plus technology	H3YN-2-B/H3YN-21-B	PYF-08-PU-L
	H3YN-4-B/H3YN-41-B/H3YN-41-Z-B	PYF-14-PU-L

Hold-down clip

Type	Order code
PYF-08-PU-L/PYF-14-PU-L	Y92H-3 (2 pcs in a pack)

Item	H3YN-2-B/H3YN-21-B	H3YN-4-B/H3YN-41-B/H3YN-41-Z-B			
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*1	24, 100 to 120, 200 to 230 VAC (50/60 Hz), 12, 24, 48, 100-110, 12	5 VDC			
Pin type	Plug-in				
Operating mode	ON-delay, interval, flicker OFF-start, or flicker-ON start selectable	by DIP switch			
Operating voltage range	85% to 110% of rated supply voltage (12 VDC: 90% to 110% of ra	ted supply voltage) ^{*2}			
Reset voltage	10% max. of rated supply voltage				
Control outputs	DPDT: 5 A at 250 VAC, resistive load (cosφ = 1) The minimum applicable load is 1 mA at 5 VDC (P reference value). Contact materials: Ag 4PDT: 3 A at 250 VAC, resistive load (cosφ = 1) H3YN-4-B/-41-B series: The minimum applicable load is 1 mA at 1 VDC (P reference value) H3YN-4-Z/-41-Z-B series: The minimum applicable load is 1 mA at 1 VDC (P reference value) Contact materials: Au-clad + Aq-alloy				
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°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)				
Degree of protection	IP40 (Terminal screw sections are excluded.)				
Size in mm ($H \times W \times D$)	28 × 21.5 × 52.6				



^{*1} Refer to Safety Precautions for All Times when combining the timer with an AC 2-wire proximity sensor.
*2 When using the H3YN in any place where the ambient temperature is more than 50°C, supply 90% to 110% of the rated voltages (12 VDC: 95% to 110% of the rated voltage).



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,	H3CR-A 100-240AC/100-125DC
		24 to 48 VAC/12 to 48 VDC		flicker ON start, signal ON/	H3CR-A 24-48AC/12-48DC
Transistor		24 to 48 VAC/12 to 48 VDC	0.05 s to 300 h	OFF-delay, signal OFF-delay, interval	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,	H3CR-A8 100-240AC/100-125DC
		24 to 48 VAC/12 to 48 VDC		interval, one-shot	H3CR-A8 24-48AC/12-48DC
Transistor	1	24 to 48 VAC/12 to 48 VDC	0.05 s to 300 h		H3CR-A8S 24-48AC/12-48DC
Relay SPDT	1	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/100-125DC
		24 VAC/VDC			H3CR-F 24-48AC/12-48DC
	8	100 to 240 VAC			H3CR-F8 100-240AC/100-125DC
		24 VAC/VDC			H3CR-F8 24-48AC/12-48DC
	11	100 to 240 VAC	0.05 s to 30 h	Flicker ON start	H3CR-FN 100-240AC/100-125DC
		24 VAC/VDC			H3CR-FN 24-48AC/12-48DC
	8	100 to 240 VAC			H3CR-F8N 100-240AC/100-125DC
		24 VAC/VDC			H3CR-F8N 24-48AC/12-48DC
Time-limit contact and		100 to 120 VAC		Star-delta	H3CR-G8EL 100-120AC
instantaneous contact		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	

Accuracy of operati	ng time	±0.2% FS max. (±0.2% ±10 ms max. in a range of 1.2 s)
Influence of voltage	e	±0.2% FS max. (±0.2% ±10 ms max. in a range of 1.2 s)
Influence of tempe	rature	±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×I	D)	48×48×66.6 (H3CR-A, -F), 48×48×78 (H3CR-G, -H)
Setting error		±5% FS ±50 ms
Degree of protection	on	IP40 (panel surface)
Weight		Approx. 90 q





The most complete digital standard timer on the market

H5CX offers you the most complete series of products on the market today. Based on extensive customer research, these new timers have been designed with value added features that users both need and appreciate.

- Size in mm (H×W×D): 48×48×59 to 78 mm
- Three color display value, red, green or orange
- Models with Instantaneous Contact Outputs
- 0.001 s to 9999 h, 10 ranges
- · Input NPN, PNP and contact

Ordering information

Output type	Supply voltage	Functions	External connection	Size in mm (H×W×D)	Inputs	Order code
Contact output	100 to 240 VAC	A: Signal ON-delay	Screw terminals	48×48×84	Signal, Reset, Gate (NPN/PNP inputs)	H5CX-A-N
	12 to 24 VDC/24 VAC	A-1: Signal ON-delay 2		48×48×65		H5CX-AD-N
Transistor output	100 to 240 VAC	A-2: Power ON-delay 1 A-3: Power ON-delay 2		48×48×84		H5CX-AS-N
	12 to 24 VDC/24 VAC	b: Repeat cycle 1		48×48×65		H5CX-ASD-N
Contact output	100 to 240 VAC	b-1: Repeat cycle 2	11-pin socket	48×48×69.7	Signal, Reset, Gate	H5CX-A11-N
	12 to 24 VDC/24 VAC	d: Signal OFF-delay E: Interval			(NPN/PNP inputs)*1	H5CX-A11D-N
Transistor output	12 to 24 VDC/24 VAC	F: Cumulative				H5CX-A11SD-N
Contact output	100 to 240 VAC	Z: ON/OFF-duty adjustable flicker	8-pin socket	48×48×69.7	Signal, Reset (NPN inputs)*1	H5CX-L8-N
	12 to 24 VDC/24 VAC	toff: Twin timer OFF start				H5CX-L8D-N
Transistor output	12 to 24 VDC/24 VAC	ton: Twin timer ON start				H5CX-L8SD-N
Contact output Models with instanta- neous contact outputs	100 to 240 VAC	A-2: Power ON-delay 1 b: Repeat cycle 1 E: Interval			_	H5CX-L8E-N
	12 to 24 VDC/24 VAC	Z: ON/OFF-duty adjustable flicker toff: Twin timer OFF start 1 ton: Twin timer ON start 1				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

^{*1} There are other models available on request. Please contact your Omron representative for special request.

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

Item	H5CX-A_ H5CX-A11_ H5CX-L8_				
Display	7-segment, negative transmissive LCD				
	Present value: 12 mm high characters	Present value: 12 mm high characters			
	red, orange or green (programmable)				
	Set value: 6 mm high characters, green				
Digits	4 digits				
Total time range	0.001 s to 9,999 h (configurable)				
Timer mode	Elapsed time (Up), remaining time (Down) (selectable)				
Input signals	Signal, reset, gate Signal, reset				
Key protection	Yes				
Memory backup	EEPROM (overwrites: 100,000 times min.) that can store data for 10 years min.				
Ambient temperature	Operating: –10 to 55°C (no icing or condensation), side-by-side mounting: –10 to 50°C				
Case color	Black (N1.5)				





Compact, Multi-function Timers with Plug-in socket

- The Plug-in socket with Push-in plus technology, P2RF-___-PU is available for easy wiring.
- Easy replacement and reduces your maintenance time
- Space saving by Slim design 15.5 mm width.

Ordering information

Operating modes	Control output	Supply voltage	Order code	
			Short-time range (0.1 s to 10 min)	Long-time range (0.1 m to 10 h)
On-delay, Interval, Flicker OFF-start, Flicker ON Start	SPDT	24 VAC	H3RN-1-B AC24	H3RN-11-B AC24
		24 VDC	H3RN-1-B DC24	H3RN-11-B DC24
		12 VDC	H3RN-1-B DC12	H3RN-11-B DC12
	DPST-NO	24 VAC	H3RN-2-B AC24	H3RN-21-B AC24
		24 VDC	H3RN-2-B DC24	H3RN-21-B DC24
		12 VDC	H3RN-2-B DC12	H3RN-21-B DC12

Accessories

Value Design

Plug-in socket

Туре	Timer	Order code
Screwless socket with Push-in plus	H3RN-1-B/-11-B	P2RF-05-PU
technology	H3RN-2-B/-21-B	P2RF-08-PU

Item	H3RN-1-B/H3RN-2-B	H3RN-11-B/H3RN-21-B		
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*1	24 VAC (50/60 Hz); 12, 24 VDC	·		
Pin type	Plug-in			
Operating mode	ON-delay, interval, flicker OFF-start, or flicker-ON start selectable	by DIP switch		
Operating voltage range	85% to 110% of rated supply voltage (12 VDC: 90% to 110% of ra	ted supply voltage) ^{*2}		
Reset voltage	10% max. of rated supply voltage			
Control outputs	3 A at 250 VAC, resistive load (cos ϕ = 1) (G6B-2_14P-FD-US used The minimum applicable load is 10 mA at 5 VDC (P reference values)			
Accuracy of operating time	±1% FS max. (1 s range: ±1%±10 ms max.)	±1% FS max. (1 s range: ±1%±10 ms max.)		
Setting error	±15% ±50 ms FS max.			
Reset time	Min. power-opening time: 12, 24 VDC: 0.1 s max. (including halfway reset) 24 VAC: 0.5 s max. (including halfway reset)			
Influence of voltage	±2% FS max.			
Influence of temperature	±2% FS max.			
Ambient temperature	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)			
Degree of protection	IP40 (Terminal screw sections are excluded.)			
Size in mm (H \times W \times D)	31.2×12.8×47.2			



^{*1} Refer to Safety Precautions for All Times when combining the timer with an AC 2-wire proximity sensor.
^{*2} When using the H3RN in any place where the ambient temperature is more than 50°C, supply 90% to 110% of the rated voltages (12 VDC: 95% to 110% of the rated voltage).

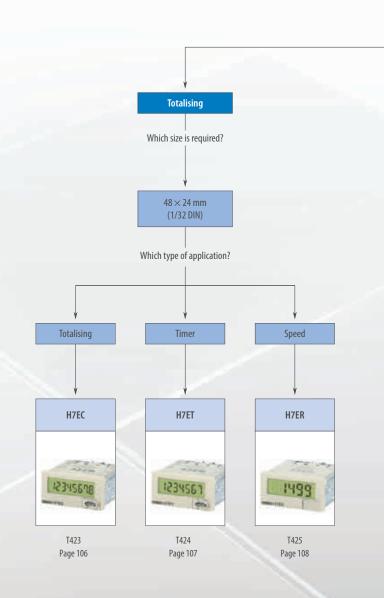
Counters

MULTI-FUNCTIONAL PRESET COUNTER

H7CX — Designed with value added features

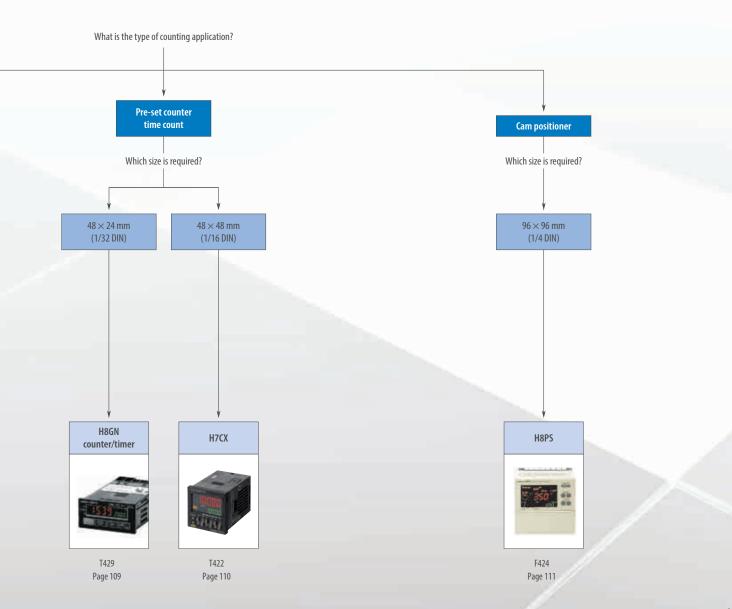
The H7CX series offers the ultimate in versatility and intuitive programming.

- 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









Selection table

Catego	ry	Self-powered total	Self-powered timer	Self-powered tachometer
		BUSSAE21	1234567	1433
Model		Н7ЕС	Н7ЕТ	H7ER
= _	Display	LCD		
Selection	Size	1/32 DIN		
	Control outputs		-	_
	5 stage	-	-	_
outs	Total			-
Outputs	Time	-		_
Ü	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
	Dual operation	-	-	_
	Number of digits	8	7	4 or 5
10	NPN/PNP switch			
Features	Back-lit			
eat	External reset			_
_	Manual reset			_
	Number of banks	-	-	_
	Built-in sensor power supply	-	-	_
	IP rating	IP66	IP66	IP66
S	Screw terminals			
Terminals	PCB terminals	_	_	_
Terr	11-pin socket	-	-	-
ply	100 to 240 VAC	-	-	-
Supply voltage	12 to 24 VDC		-	
	24 VDC			
	Comms	- -	-	-
	Up	-		-
	Down Up/down		-	
SI	Reversible	_	_	
tior	Speed	0 to 30 Hz or 0 to 1 kHz	_	1 or 10 kHz
Functions	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			•
S	Black		•	
	Page/Quick Link	106/T423	107/T424	108/T425



Counte	er type	Pre-set counter/timer	Pre-set counter	Cam positioner
		1539	Sing of the second seco	
Model		H8GN	нтсх	H8PS
<u> </u>	Display	LCD negative transmissive		LCD negative transmissive
Selection criteria	Size	1/32 DIN	1/16 DIN	1/4 DIN
	Control outputs	1 relay (SPDT)	1 relay (SPDT), transistor	NPN or PNP, cam outputs 8/16/32, run out, tachometer
	5 stage			-
uts	Total	•		-
Outputs	Time		-	-
0	Preset			_
	Batch			_
	Dual			-
	Tachometer	-		_
Inputs	Control inputs	No-voltage	No-voltage, PNP/NPN	Encoder
	Dual operation			
	Number of digits	PV: 4, SV: 4	PV: 4, SV: 4 or PV: 6, SV: 6	7
50	NPN/PNP switch	_		_
Features	Back-lit	-		
Feat	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
als	Screw terminals	•	•	_
Terminals	PCB terminals	-	-	
	11-pin socket	-		-
ply	100 to 240 VAC	-	-	-
Supply voltage	12 to 24 VDC 24 VDC	-	•	- -
	Comms		_	-
	Up		- -	_
	Down	- -	- -	_
	Up/down	- -	•	_
ns	Reversible		•	-
Functions	Speed	0 to 30 Hz or 0 to 5 kHz	0 to 30 Hz or 0 to 5 kHz	-
Fun	Counting range	-999 to 9999	-99999 to 999999	-
Color	Beige	-	-	
ŭ	Black	•		-
	Page/Quick Link	109/T429	110/T422	111/F424











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 ($H\times W\times D$): 24 \times 48 \times 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	30 Hz <-> 1 kHz (switchable)	7-segment LCD	H7EC-NV	H7EC-NV-B
voltage input		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

Item	H7EC-NV/H7EC-NVH	H7EC-NFV	H7EC-N		
Operating mode	Up type				
Mounting method	Flush mounting	Flush mounting			
External connections	Screw terminals, optional wire-wrap terminals				
Number of digits	8	8			
Display	7-segment LCD with or without backligh	t, zero suppression (character height: 8.6 mr	n)		
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 brad	cket			
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 $k\Omega$)	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 k Ω max. Short-circuit residual voltage: 0.5 V max.		
Reset input		No voltage input Maximum short-circuit impedance: 10 k Ω max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 k Ω min			
Minimum signal width	20 Hz: 25 ms, 30 Hz: 16.7 ms, 1 KHz: 0.5 m	ns	·		
Reset system	External reset and manual reset: Minimu	m signal width of 20 ms			
Ambient temperature	Operating: –10 to 55°C (with no condens	ation or icing), storage: –25 to 65°C (with no	condensation or icing)		
Degree of protection	Front-panel: IP66, NEMA4, terminal block	c: 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 \times W \times D) 24 \times 48 \times 55.5, 1/32 DIN size housing
- 7 digits, 8.6 mm character height
- Black or light-grey housing
- Dual time range 999999.9 h <-> 3999 d 23.9 h or 999 h 59 m 59 s <-> 9999 h 59.9m

Ordering information

Timer input	Display	Order code				
		Time range 999999.9h <-> 3999d23.9h (switchable)		Time range 999h59m59s <-> 9999h59.9m		
		Light grey body	Black body	Light grey body	Black body	
No-voltage input	7-segment LCD	H7ET-N	H7ET-N-B	H7ET-N1	H7ET-N1-B	
PNP/NPN universal	7-segment LCD	H7ET-NV	H7ET-NV-B	H7ET-NV1	H7ET-NV1-B	
DC voltage input	7-segment LCD with backlight	H7ET-NV-H	H7ET-NV-BH	H7ET-NV1-H	H7ET-NV1-BH	
AC/DC multi-voltage input	7-segment LCD	H7ET-NFV	H7ET-NFV-B	H7ET-NFV1	H7ET-NFV1-B	

Item	H7ET-NV/H7ET-NVH	H7ET-NFV	H7ET-N			
Operating mode	Accumulating		·			
Mounting method	Flush mounting					
External connections	Screw terminals					
Display	7-segment LCD with or without backling	ght, zero suppression (character height: 8.6 mm)				
Number of digits	7					
Case color	Light grey or black (-B models)					
Attachment	Waterproof packing, flush mounting b	racket, 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.			
Reset input		No voltage input Maximum short-circuit impedance: $10~k\Omega$ max. Short-circuit residual voltage: $0.5~V$ max. Minimum open impedance: $750~k\Omega$ min.	Minimum open impedance: 750 k Ω min			
Minimum pulse width	1 s					
Reset system	External reset and manual reset: Minim	num signal width of 20 ms				
Ambient temperature	Operating: –10 to 55°C (with no conde	nsation or icing), storage: –25 to 65°C (with no co	ndensation or icing)			
Time accuracy	±100 ppm (25°C)					
Degree of protection	Front-panel: IP66, NEMA4 with waterp	roof 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					



H7ER Totalisers



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 \times W \times D) 24 \times 48 \times 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				
		1,000 min ⁻¹ (60 pulse/rev.)		ion)		
				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	

ltem	H7ER-NV1/H7ER-NV1H	H7ER-NV/H7ER-NVH	H7ER-N		
Operating mode	Up type				
Mounting method	Flush mounting				
External connections	Screw terminals, wire-wrap termir	nals			
Display	7-segment LCD with or without ba	acklight, zero suppression (character height: 8.6	mm)		
Number of digits	5	4			
Max. revolutions displayed	1,000.0 s ⁻¹ (when encoder resoluti of 10 pulse/rev is used) 1,000.0 min ⁻¹ (when encoder resol tion of 600 pulse/rev is used) <-> 10,000 min ⁻¹ (when encoder re lution of 60 pulse/rev is used) (switchable with switch)	1,000 min ⁻¹ (when encoder resolution of 60			
Attachment	Waterproof packing, flush mounting bracket, revolution unit labels				
Supply voltage	Backlight model: 24 VDC (0.3 W m No-backlight model: Not required		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 k Ω max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 k Ω 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 co	ondensation or icing), storage: –25 to 65°C (with	no condensation or icing)		
Degree of protection	Front-panel: IP66, NEMA4 with wa	terproof packing, terminal block: IP20			
Battery life (reference)	7 years min. with continuous inpu	t 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 \times W \times D) 24 \times 48 \times 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	

Rated supply volta	nge	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 tig	htening 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 k Ω max. (approx. 2 mA runoff current at 0 Ω) Short-circuit (ON) residual voltage: 2 VDC max. Open (OFF) impedance: 100 k Ω 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 tin	ne	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: $\pm 0.03\% \pm 30$ ms max. Power-ON start: $\pm 0.03\% \pm 50$ ms max.		
Ambient	Operating storage	−10 to 55°C (with no icing or condensation)		
temperature		−25 to 65°C (with no icing or condensation)		
Case color		Rear section: Grey smoke; front section: N1.5 (black)		
Degree of protecti	on	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

Туре	External connection	Sensor power supply	Supply voltage	Output type	Digits	Size in mm (H×W×D)	Order code
1-stage counter	Screw terminal	12 VDC	100 to 240 VAC	Contact and transistor	6	48×48×84	H7CX-AU-N
1-stage counter with total counter			12 to 24 VDC/24 VAC	output			H7CX-AUD1-N
2-stage counter 1-stage counter with batch counter				Transistor output (2×)			H7CX-AUSD1-N
Dual counter (addition/subtraction)			100 to 240 VAC	Contact output (2×)			H7CX-AW-N
Tachometer Twin counter			12 to 24 VDC/24 VAC				H7CX-AWD1-N
1-stage counter	11-pin socket	12 VDC	100 to 240 VAC	Contact output		48×48×69.7	H7CX-A11-N
1-stage counter with total counter			12 to 24 VDC/24 VAC				H7CX-A11D1-N
			100 to 240 VAC	Transistor output			H7CX-A11S-N
			12 to 24 VDC/24 VAC				H7CX-A11SD1-N
	Screw terminal		100 to 240 VAC	Contact output		48×48×84	H7CX-A-N
			100 to 240 VAC	Transistor output			H7CX-AS-N

Accessories

Name		Order code		
Flush-mounting adapter				
Waterproof packing				
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				
oft cover		Y92A-48F1		
ront panels	Light gray	Y92P-CXC4G		
4-digit models)	White	Y92P-CXC4S		
ront panels	Light gray	Y92P-CXC6G		
6-digit models)	White	Y92P-CXC6S		

Display	7-segment, negative transmissive LCD			
Digits	6-digits: –99,999 to 999,999, SV range: –99999 to 999999 or 0 to 999999			
Max. counting speed	30 Hz or 5 kHz (selectable, ON/OFF ratio 1:1)			
Input modes	Increment, decrement, increment/decrement (UP/DOWN A (command input), UP/DOWN B (individual inputs), or UP/DOWN C (quadrature inputs))			
Control output	Contact output: 3 A at 250 VAC/30 VDC, resistive load (cosφ = 1) Minimum applied load: 10 mA at 5 VDC Transistor output: NPN open collector, 100 mA at 30 VDC Residual voltage: 1.5 VDC max. (approx. 1V) Leakage current: 0.1 mA max.			
Key protection	Yes			
Decimal point adjustment	Yes (rightmost 3 digits)			
Sensor waiting time	290 ms max.			
Memory backup	EEPROM (overwrites: 100,000 times min.) stores data 10 years min.			
Ambient temperature	Operating: –10 to 55°C (–10 to 50°C when mounted side by side)			
Case color	Black (N1.5) (Optional Front Panels are available to change the Front Panel color to light gray or white.)			
Life expectancy	Mechanical: 10,000,000 operations min.			
	Electrical: 100,000 operations min. (3 A at 250 VAC, resistive load)			
Degree of protection	Panel surface: IP66, NEMA 4 (indoors), and UL Type 4X (indoors)			





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

Туре	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

Rated supply	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		Input type	No voltage inputs: ON impedance: $1 \text{ k}\Omega$ max. (leakage current: Approx. 2 mA at 0Ω) ON residual voltage: 2 V max., OFF impedance: $100 \text{ k}\Omega$ min., applied voltage: 30 VDC max. Minimum input signal width: 20 ms		
Number of ba	Number of banks		8 banks (for 16-/32-output models only)		
Display meth	od		7-segment, negative transmissive LCD (main display: 11 mm (red), sub-display: 5.5 mm (green))		
Memory back	up method		EEPROM (overwrites: 100,000 times min.) that can store data for 10 years min.		
Ambient oper	rating temperature		−10 to 55°C (with no icing or condensation)		
Storage temp	erature		–25 to 65°C (with no icing or condensation)		
Ambient hum	Ambient humidity		25 to 85%		
Degree of protection			Panel surface: IP40, rear case: IP20		
Case color			Light grey (Munsell 5Y7/1)		



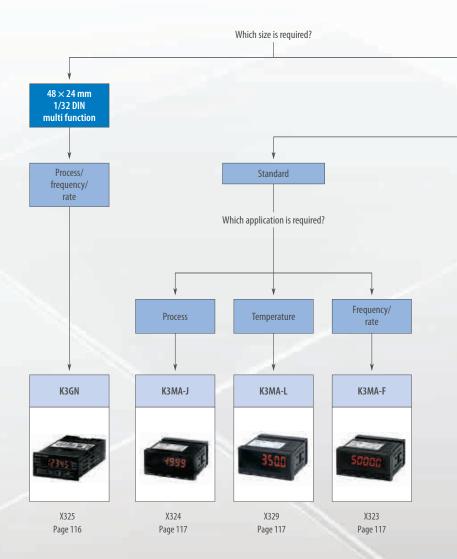
Digital panel indicators

LOOKING FOR PERFECT MEASURING & READ-OUT?

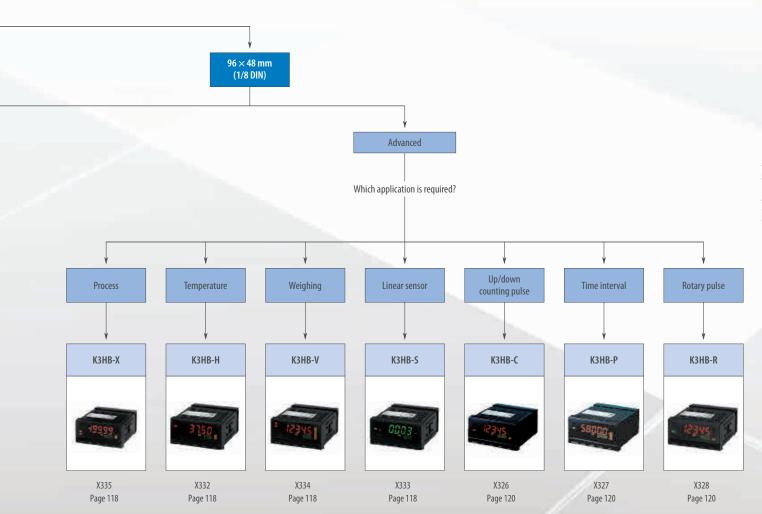
K3HB-V — For perfect weighing

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







egory	Multifunctional digital panel indicator	Process indicator	Temperature indicator	Frequency/rate indicator	Process indicator
	123VS	1999	3500 [3]	50000	: 19999
del	K3GN	K3MA-J	K3MA-L	КЗМА-F	КЗНВ-Х
1	1/32 DIN	1/8 DIN			
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	-	-	-	•	
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
NPN		-			
PNP		-			
Temperature	-	-	-	-	-
Contact	-	-	-	-	-
Voltage pulse Load cell	=	-	-	•	-
	-	-	-	-	-
DC voltage	-	-		-	
DC current	•	•	_	-	
AC voltage	-	_	-	-	
AC current	-	-	-	-	
Relay	-	•		•	
NPN		_	-	-	
PNP	-	_	-	-	
	_	_	-	-	
	-	-	-	-	-
	_	117/V224	117/V220	117/V222	□ 118/X335
PNP Linear BCD Comms Page/Quick Link		- - - 116/X325			



Temperature indicator	Weighing indicator	Linear sensor indicator	Up/down counting pulse	Time interval indicator	Rotary pulse indicator
			indicator		
and the second		E TON			A STATE OF THE STA
3750 1	123451	- 0003 (L)	- 12345	- 58ggg.	. 12345 T
КЗНВ-Н	K3HB-V	K3HB-S	КЗНВ-С	КЗНВ-Р	K3HB-R
1/8 DIN	I -	I -	1-	-	-
5	5	5	5	5	5
	•	•	-	•	•
	•	•			
-	-	-	-	-	-
-	•		-		
_	_	_	_	_	-
Thermocouple: ±0.3%	±0.1% of full scale	One input: ±0.1%		±0.08% rgd ±1 digit	±0.006% rgd ±1 digit
of full scale, Pt-100: ±0.2% of full scale		of full scale, two inputs: ±0.2%			±0.02% rgd ±1 digit
		of full scale			
Pt100, thermocouple K, J, T, E,	0.00 to 199.99 mV,	0 to 20 mA, 4 to 20 mA,	No voltage contact:	No voltage contact:	No voltage contact:
L, U, N, R, S, B, W	0.000 to 19.999 mV,	0 to 5 V, -5 to 5 V,	30 Hz, voltage pulse:	30 Hz, voltage pulse:	30 Hz, voltage pulse:
	100.00 mV, 199.99 mV	-10 to 10 V	50 kHz, open collector: 50 kHz	50 kHz, open collector: 50 kHz	50 kHz, open collector: 50 kHz
20 ms	20 ms	0.5 ms	_	_	_
Scaling, teaching, averaging,	Scaling, teaching, averaging,	Scaling, 2-input calculation,	Scaling, measurement	Scaling, measurement	Scaling, measurement
output hysteresis, output	output hysteresis, output	teaching, averaging, output	operation selection, output	operation selection, output	operation selection,
OFF-delay, output test, bank selection, reset, comparative	OFF-delay, output test, bank selection, reset, comparative	hysteresis, output OFF-delay, output test, bank selection,	hysteresis, output OFF-delay, output test, display value	hysteresis, output OFF-delay, output test, teaching, display	averaging, previous average value comparison, output
output	output	reset, comparative output	selection, display color	value selection, display color	hysteresis, output
			selection, key protection, bank selection, display refresh	selection, key protection, bank selection, display refresh	OFF-delay, output test, teaching, display value
			period, maximum/minimum	period, maximum/minimum	selection, display color
			hold, reset	hold, reset	selection, key protection, bank selection, display refresh
					period, maximum /minimum
					hold, reset
□ IBee					ID66
IP66	IP66	IP66	IP66	IP66	IP66
100 to 240 VAC or	100 to 240 VAC or	100 to 240 VAC or			
24 VAC/VDC	24 VAC/VDC	24 VAC/VDC	24 VAC/VDC	24 VAC/VDC	24 VAC/VDC
				•	•
	_	_	_	_	_
-	_	_	_	_	_
-	_	-	•		
-		-	-	_	-
-	-		-	-	-
_	_	•	-	_	_
-	-	-	-	-	-
-	-	-			
110.0/222					120 0/220
118/X332	118/X334	118/X333	120/X326	120/X327	120/X328



■ 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 (H \times W \times D): 24 \times 48 \times 83 mm
- 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	
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	

Note: There are other models available on request. Please contact your Omron representative for special request.

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		2 relay contact outputs (SPST-NO)	K3MA-J-A2 100-240VAC
	24 VAC/VDC	DC current: 0 to 20 mA, 4 to 20 mA	2 relay contact outputs (SPST-NO)	K3MA-J-A2 24VAC/VDC
Temperature meter	100 to 240 VAC	Platinum-resistance thermometer: Pt100, JPt100	1 relay contact output (SPDT)	K3MA-L-C 100-240VAC
	24 VAC/VDC	or thermocouple K, J, T, E, L, U, N, R, S, B	1 relay contact output (SPDT)	K3MA-L-C 24VAC/VDC
Frequency/rate meter	100 to 240 VAC		2 relay contact outputs (SPST-NO)	K3MA-F-A2 100-240VAC
	24 VAC/VDC	open collector: 0.1 to 5000.0 Hz	2 relay contact outputs (SPST-NO)	K3MA-F-A2 24VAC/VDC

Accessories

Туре	Orde	er code
Splash-proof soft cover	K32-4	49SC
Hard cover	K32-4	49HC

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 in	uts (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
rocess indicator	AC current input, from 0.000 to 10.000 A, 0.0000 to 19.999 mA	100 to 240 VAC	K3HB-XAA 100-240VAC
КЗНВ-Х		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 ^{*1}	100 to 240 VAC	K3HB-XVA 100-240VAC
	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
emperature indicator	Temperature input Pt100, thermocouple K, J, T, E, L, U, N, R, S, B, W	100 to 240 VAC	K3HB-HTA 100-240VAC
ЗНВ-Н		24 VAC/VDC	K3HB-HTA 24VAC/VDC
leighing indicator	Load cell input (DC low voltage input), 0.00 to 199.99 mV, 0.000 to 19.999 mV,	100 to 240 VAC	K3HB-VLC 100-240 VAC
K3HB-V	100.00 mV, 199.999 mV	24 VAC/VDC	K3HB-VLC 24VAC/VDC
inear sensor indicator	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
(3HB-S		100 to 240 VAC	K3HB-SSD AC100-240

^{*1} There are other models available on request. Please contact your Omron representative for special request.

Option boards

Sensor power supply/output boards

Slot	Output		Sensor power supply	Communications	Applicable indicator types	Order code
В	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
С	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*1

^{*1} 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.

Event input boards

Slot	Input type	Number of points	Communications	Order code *1
D	NPN open collector	5	M3 terminal blocks	K35-1
	PNP open collector	5	M3 terminal blocks	K35-3

^{*1} There are other models available on request. Please contact your Omron representative for special request.

Note: K32-DICN special cable accessory (for event inputs with 8-pin connector) available on request. Please contact your Omron representative.



^{*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.

Digital panel indicators

-					
Power supply vol	tage		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 consumpt	ion		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 operatir	ng 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	on		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	Rated load	5 A at 250 VAC, 5 A at 30 VDC		
	(resistive load)	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.	100 to 240 VAC	NPN input/voltage pulse	K3HB-RNB 100-240VAC
	Voltage pulse: 50 kHz max.	24 VAC/VDC		K3HB-RNB 24VAC/VDC
	Open collector: 50 kHz max.	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*1		100 to 240 VAC	NPN	K3HB-CNB 100-240VAC
Up/down counting pulse indicator K3HB-C*1		24 VAC/VDC	PNP	K3HB-CPB 24VAC/VDC
		100 to 240 VAC		K3HB-CPB 100-240VAC

^{*1} There are other models available on request. Please contact your Omron representative for special request.

Option boards

Sensor power supply/output boards

Slot	Output	Output		Communications	Order code
В	Relay	Relay PASS: SPDT		_	K33-CPA *1
	Linear current	Linear current DC0(4) - 20 mA Linear voltage DC0(1) - 5 V, 0 to 10 V		-	K33-L1 A *2
	Linear voltage				K33-L2A *2
	_	_			K33-A *2
	_	_		RS-232C	K33-FLK1 A *2
	_	_	\neg	RS-485	K33-FLK3A *2

^{*1} CPA can be combined with relay outputs only.

Relay/transistor output boards

Slot	Output		Communications	Order code
С	Relay	ay 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 *1
	BCD + transistor	NPN open collector: HH/H/PASS/L/LL	_	K34-BCD

^{*1} 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.

Event input boards

Slot	Input type	Number of points	Communications	Order code *1
D	NPN open collector	5	M3 terminal blocks	K35-1
	PNP open collector	5	M3 terminal blocks	K35-3

^{*1} There are other models available on request. Please contact your Omron representative for special request.

Accessories

Туре	Order code
Special BCD output cable	K32-BCD

Note: K32-DICN special cable accessory (for event inputs with 8-pin connector) available on request. Please contact your Omron representative.



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.

Digital panel indicators

Power supply vol	tage		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 operatir	ng 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 Rear case Terminals		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 k Ω max., OFF: 100 k Ω 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	Rated load	5 A at 250 VAC, 5 A at 30 VDC		
	(resistive load)	Rated through current	5 A		
		Mechanical life expectancy	5,000,000 operations		
		Electrical life expectancy	100,000 operations		
	Linear output	Allowable load impedance	500Ω max. (mA); $5 k\Omega$ min. (V)		
		Resolution	Approx. 10,000		
		Output error	±0.5% FS		
Size in mm (H×W	(vD)		48×96×100		

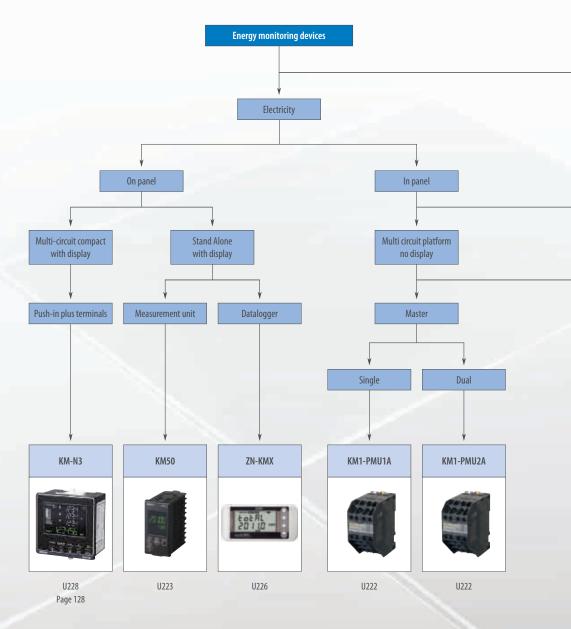
Energy monitoring devices

RISE ABOVE YOUR ENERGY CHALLENGES

Energy monitoring devices

Understanding energy usage is the first step in becoming energy efficient. Learn how to expose energy waste deep within your system with new hardware and software solutions that target devices consuming excess power.

- · Measure more lines with fewer devices
- Accurate measurements with minimal installation space
- · Monitor electrical and other forms of energy
- · Push in plus terminals





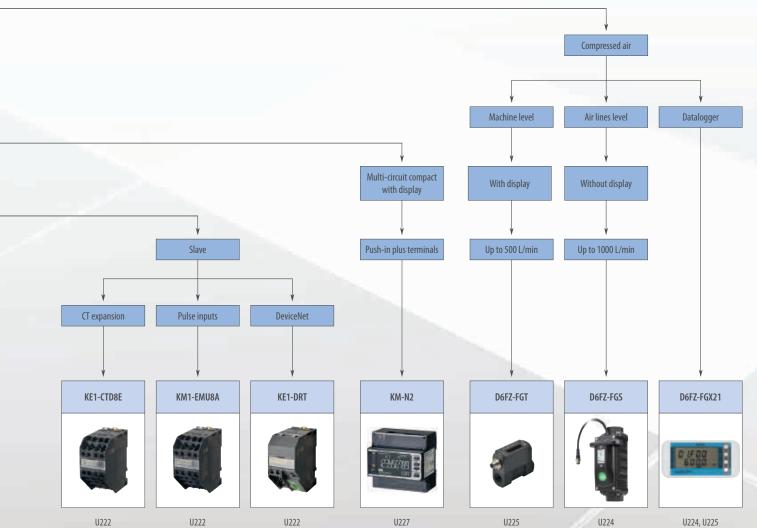












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		KM50 series	ZN-KMX series	KM-N series	
			ESCAL	1 234 234 1 234 1 234 234 234 234 234 234 234 234 234 234	P3950/89 E
Model		KM50-E1-FLK	ZN-KMX-21A	KM-N3-FLK	KM-N2-FLK
Туре		On panel type	Data logger for KM50 series	On panel, multi-circuit compact	In panel, multi-circuit compact
				measurement	measurement
Applicati		Electricity measurements			
Installati	on	On panel, option DIN track	Magnet mounting, screw mounting hook, free standing	, On panel	In panel, DIN track
Display		Eleven segment LEDs	7-seg. 5-digit 2-step LCD display	White and Green LCD display	White LCD display
	(H × D) [mm]	DIN 48 × 96, Depth: 88	117.2 × 56.8 × 24.6 (W × H × D)	96 × 96 × 64 (W × H × D)	90 × 90 × 65 (W × H × D)
	Single-phase, two-wire	Yes	Depending on connected KMs	Yes	Yes
Applicable phase	Three-phase, three-wire	Yes		Yes	Yes
ppli ph	Three-phase, four-wire	Yes	-	Yes	Yes
	rect measurement	Yes 100 to 240 VAC	DC input: 24 VDC + 100/	Yes 100 to 240 VAC	Yes
Power su	ippiy	100 to 240 VAC	DC input: 24 VDC±10%	100 to 240 VAC	85% to 115% of rated power supply voltage
	Energy	Yes	Yes	Yes	Yes
	Active power	Yes	Yes	Yes	Yes
sms	Reactive power	Yes		Yes	Yes
Measured items	Current	Yes	_	Yes	Yes
urec	Voltage	Yes	_	Yes	Yes
eas	Power factor	Yes	Yes	Yes	Yes
Σ	Frequency	Yes	-	Yes	Yes
	Pulse count	Yes	Yes	_	_
Commur	nication interface	RS-485	RS-485 KM side/Ethernet PC side	RS-485	RS-485
Alarm ou	ıtput	Yes	Yes	_	_
		Yes	SD card		_
Data logging		1.02	3D Caru	-	
Page/Qu		U223	U226	128/U228	126/U227
				128/U228	126/U227
		U223		128/U228	126/U227
Page/Qu		WM1-PMU_A	U226 KE1-CTD8E	128/U228	126/U227 KE1-DRT-FLK
Page/Qu Model Type	ick Link	KM1-PMU_A In panel, reduced wiring, space-sa	U226 KE1-CTD8E		
Model Type Applicati	ick Link	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements	U226 KE1-CTD8E		
Model Type Applicati	ick Link	KM1-PMU_A In panel, reduced wiring, space-sa	U226 KE1-CTD8E		
Model Type Applicati Installati	ick Link ion on	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track -	KE1-CTD8E ving, multi-circuit measurement	KM1-EMU8A	
Model Type Applicati Installati Display Size (W ×	ick Link ion on (H × D) [mm]	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximum)	KE1-CTD8E ving, multi-circuit measurement	KM1-EMU8A	
Model Type Applicati Installati Display Size (W ×	ick Link ion on K H × D) [mm] Single-phase, two-wire	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximulyes	KE1-CTD8E ving, multi-circuit measurement um width of 45 × 5 when five Units are Yes	KM1-EMU8A	
Model Type Applicati Installati Display Size (W ×	ion on (H × D) [mm] Single-phase, two-wire Three-phase, three-wire	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximum)	KE1-CTD8E ving, multi-circuit measurement	KM1-EMU8A	
Model Type Applicati Installati Display Size (W ×	ick Link ion on K H × D) [mm] Single-phase, two-wire	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximulyes	KE1-CTD8E ving, multi-circuit measurement um width of 45 × 5 when five Units are Yes	KM1-EMU8A	
Model Type Applicati Installati Display Size (W ×	ion on (H × D) [mm] Single-phase, two-wire Three-phase, three-wire	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximuly yes Yes	KE1-CTD8E ving, multi-circuit measurement um width of 45 × 5 when five Units are Yes Yes	KM1-EMU8A	
Model Type Applicati Installati Display Size (W ×	ion on (H×D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement	KM1-PMU_A In panel, reduced wiring, space-se Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximum yes Yes PMU1A only	KE1-CTD8E ving, multi-circuit measurement um width of 45 × 5 when five Units are Yes Yes	KM1-EMU8A	
Model Type Applicati Installati Display Size (W ×	ion on (H×D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement	KM1-PMU_A In panel, reduced wiring, space-se Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximum yes Yes PMU1A only Yes	KE1-CTD8E ving, multi-circuit measurement Im width of 45 × 5 when five Units are Yes Yes Yes Yes	KM1-EMU8A linked together)	
Model Type Applicati Installati Display Size (W ×	ion on (H × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement upply	KM1-PMU_A In panel, reduced wiring, space-se Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximum yes Yes PMU1A only Yes 100 to 240 VAC	KE1-CTD8E ving, multi-circuit measurement Im width of 45 × 5 when five Units are Yes Yes Yes Provided by Master	KM1-EMU8A linked together)	
Model Type Applicati Installati Display Size (W ×	ick Link ion on (H × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement apply Energy	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximum yes Yes PMU1A only Yes 100 to 240 VAC Yes	WE1-CTD8E ving, multi-circuit measurement Im width of 45 × 5 when five Units are Yes Yes Yes Provided by Master Yes	KM1-EMU8A linked together)	
Model Type Applicati Installati Display Size (W ×	ion on (H × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement ipply Energy Active power	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximul Yes Yes PMU1A only Yes 100 to 240 VAC Yes Yes	WE1-CTD8E ving, multi-circuit measurement Im width of 45 × 5 when five Units are Yes Yes Yes Provided by Master Yes Yes Yes	KM1-EMU8A linked together)	
Model Type Applicati Installati Display Size (W ×	ion on (H × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement apply Energy Active power Reactive power	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximuly yes Yes PMU1A only Yes 100 to 240 VAC Yes Yes Yes	WE1-CTD8E wing, multi-circuit measurement www.width of 45 × 5 when five Units are Yes Yes Yes Yes Provided by Master Yes Yes Yes Yes Yes Yes	KM1-EMU8A linked together)	
Model Type Applicati Installati Display Size (W ×	ion on (H × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement apply Energy Active power Reactive power Current	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximuly yes Yes PMU1A only Yes 100 to 240 VAC Yes Yes Yes Yes Yes Yes Yes Yes	WE1-CTD8E wing, multi-circuit measurement www.width of 45 × 5 when five Units are Yes Yes Yes Yes Provided by Master Yes Yes Yes Yes Yes Yes	KM1-EMU8A linked together)	
Model Type Applicati Installati Display Size (W ×	ion on KH × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement ipply Energy Active power Reactive power Current Voltage	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximuly yes Yes PMU1A only Yes 100 to 240 VAC Yes	WEI-CTD8E wing, multi-circuit measurement www.ing, multi-circuit measurement www.ing, multi-circuit measurement www.ing, multi-circuit measurement yes Yes Yes Yes Yes Yes Yes Yes	KM1-EMU8A linked together)	
Model Type Applicati Installati Display Size (W ×	ion on K H × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement ipply Energy Active power Reactive power Current Voltage Power factor	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximi Yes Yes PMU1A only Yes 100 to 240 VAC Yes	WEI-CTD8E wing, multi-circuit measurement www.ing, multi-circuit measurement www.ing, multi-circuit measurement www.ing, multi-circuit measurement yes Yes Yes Yes Yes Yes Yes Yes	KM1-EMU8A linked together)	
Model Type Applicati Installati Display Size (W ×	ion on I H × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement ipply Energy Active power Reactive power Current Voltage Power factor Frequency	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximi Yes Yes PMU1A only Yes 100 to 240 VAC Yes	WEI-CTD8E wing, multi-circuit measurement www.ing, multi-circuit measurement www.ing, multi-circuit measurement www.ing, multi-circuit measurement yes Yes Yes Yes Yes Yes Yes Yes	KM1-EMU8A linked together)	
Model Type Applicati Installati Display Size (W ×	ion on I H × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement ipply Energy Active power Reactive power Current Voltage Power factor Frequency Pulse count incation interface	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximulyes Yes Yes PMU1A only Yes 100 to 240 VAC Yes	WEI-CTD8E wing, multi-circuit measurement www.ing, multi-circuit measurement www.ing, multi-circuit measurement www.ing, multi-circuit measurement yes Yes Yes Yes Yes Yes Yes Yes	Ilinked together)	KE1-DRT-FLK
Model Type Applicati Installati Display Size (W ×	ion on I H × D) [mm] Single-phase, two-wire Three-phase, three-wire Three-phase, four-wire rect measurement ipply Energy Active power Reactive power Current Voltage Power factor Frequency Pulse count idication interface	KM1-PMU_A In panel, reduced wiring, space-sa Electricity measurements In panel, DIN track - 45 × 96 × 90 (W × H × D) (maximuly yes Yes PMU1A only Yes 100 to 240 VAC Yes	WE1-CTD8E ving, multi-circuit measurement um width of 45 × 5 when five Units are Yes Yes Yes Yes - Provided by Master Yes Yes Yes Yes Yes Yes Yes Yes	Ilinked together)	KE1-DRT-FLK









Model		D6FZ-FGT200	D6FZ-FGT500	D6FZ-FGS1000	D6FZ-FGX21
Туре		Air flow sensor up to 200 l/min	Air flow sensor up to 500 l/min	Air flow sensor up to 1,000 l/min	Data logger for D6FZ series
Application	on	Air flow and nitrogen (N2) measure	ment	•	•
Installatio	on	Mounting bracket		-	Mounting magnet
Display		11-segment digital display		-	7-seg. 5-digit 2-step LCD display
Size (W ×	H × D) [mm]	$30 \times 63.7 \times 77 \text{ (W} \times H \times D)$		64 × 195 × 93 (W × H × D)	117.2 × 56.8 × 24.6 (W × H × D)
Applicabl	e pipe	Rc1/4 (8 A)	Rc1/2 (15 A)	Rc1 (25 A)	-
Power su	pply	12 to 24 VDC±10%			24 VDC±10%
	Flow	Yes	Yes	Yes	Yes
urec ms	Leakage	Yes	Yes	Yes	Yes
Measured items	Pressure	_	-	Yes	Yes
2	Temperature	-	-	Yes	Yes
Commun	ication interface	Analog (4 to 20 mA), pulse, RS-485			Ethernet PC side
Alarm output		Threshold value			Yes
Data logg	ing	-	-	-	SD card
Page/Qui	ck Link	U225		U224	U224, U225

No/not available





Multi-circuit compact power monitor for in-panel installation

- Over 20 years of experience in Power Monitoring Technology
- Compact with multi-circuit capabilities (up to 4 circuits connected to one unit)
- Solve design, installation, wiring, and commissioning issues with only one model
- IEC 62053-22 accuracy class 0.5S
- Push-in plus technology for easy wiring
- Automatic LED and acoustic alarm in case of incorrect wiring
- Large, easy-to-read, white LCD
- DIN-rail mounting
- Bi-directional power measurement

Ordering information

Applicable circuits and rated input voltage	Power supply voltage	Dimensions (W×H×D)	Communications	Order code
Single-phase, 2-wire: 100 to 277 VAC Single-phase, 3-wire: 100 to 240 VAC (L-N) or 200 to 480 VAC (L-L) Three-phase, 3-wire: 100 to 277 VAC (L-N) or 173 to 480 VAC (L-L) Three-phase, 4-wire: 100 to 277 VAC (L-N) or 173 to 480 VAC (L-L)	Rated input voltage 85 to 115%	90 × 65 × 90 mm	RS-485, Modbus (RTU) or CompoWay/F	KM-N2-FLK

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			a	

Single-phase two-wire, single-phase three-wire, three-phase three-wire, and three-phase four-wire						
Single-phase two-wire: 4 circuits, single-phase three-wire or three-phase three-wire: 2 circuits, three-phase four-wire: 1 circuit						
Single-phase, 2-wire: 100 to 277 VAC Single-phase, 3-wire: 100 to 240 VAC (L-N) or 200 to 480 VAC (L-L) Three-phase, 3-wire: 100 to 277 VAC (L-N) or 173 to 480 VAC (L-L) Three-phase, 4-wire: 100 to 277 VAC (L-N) or 173 to 480 VAC (L-L)						
85% to 115% of rated power supply voltage						
7 VA max.						
General-purpose CT: 1 A or 5 A Rated load: 0.5 VA min.						
50/60 Hz						
6 A max.						
−25 to 55°C (with no condensation or icing)						
–25 to 85°C (with no condensation or icing)						
25% to 85%						
2,000 m max.						
Overvoltage category II, pollution degree 2, measurement category II						
Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)						
EN 61010-2-030, EN 61326-1, and UL 61010-1						



^{*1} A CT with a different capacity can be specified for each circuit.
*2 The KM-series CTs (the KM20-CTF or KM-NCT series) cannot be used. Use general-purpose CTs with a secondary-side output of 1 A or 5 A.

Performance							
Measurement	Active power	IEC 62053-22 class 0.5S (Accuracy ±0.5% F.S. ±1 digit) ^{*1}					
specifications	Reactive power	IEC 62053-23 class 2 (Accuracy ±2% F.S. ±1 digit)*1					
	Sampling cycle	80 ms for 50 Hz and 66.7 ms for 60 Hz					
Measured items		Energy consumption (active, regenerative, and reactive), power (active and reactive), current, voltage, power factor, and frequency					
Insulation resistan	ce	 Between all electrical circuits and the case: 20 MΩ min. (at 500 VDC) Between all power supply and voltage inputs and all communications and pulse output terminals:: 20 MΩ max. (at 500 VDC) 					
Dielectric strength		Between all electrical circuits and the case: 2,200 VAC for 1 min Between all voltage and current inputs and all communications and pulse output terminals: 2,200 VAC for 1 min					
Vibration resistand	:e	Single amplitude: 0.1 mm, Acceleration: 15 m/s ² , Frequency: 10 to 150 Hz, 10 sweeps for 8 min each along three axes					
Shock resistance		150 m/s ² , 3 times each in 6 directions (up/down, left/right, forward/backward)					
Weight		Approx. 350 g (Power Monitor only)					
Degree of protecti	on	IP20					
Installation metho	d	DIN Rail mounting					
Pulse output	Number of outputs	Number of outputs: 4 (photoMOS relay outputs) Used for the total power consumption pulse output.					
	Output capacity	50 mA at 40 VDC ON residual voltage: 1.5 V max. (for output current of 50 mA) OFF leakage current: 0.1 mA max.					
	Output unit	1, 10, 100, 1k, 5k, 10k, 50k, or 100k (wh) Pulse ON time: 500 ms (Cannot be changed.)					
Communications	Communications method	RS-485 (2-wire half-duplex with start-stop synchronization)					
interface	Communications protocol	Modbus (RTU): Binary. CompoWay/F: ASCII					
	Baud rate	1.2, 2.4, 4.8, 9.6, 19.2, or 38.4 kbps					
	Data length	Data length: 7 or 8 bits Stop bits: 1 or 2 bits Vertical parity: Even, odd, or none					
	Maximum transmission distance	1,200 m*1					
	Maximum number of connected Power Monitors	Modbus: 99, CompoWay/F: 31					

^{*1} The error of the CT or VT is not included.



Multi-circuit compact Power Monitor for on panel installation

- Over 20 years of history in Power Monitoring Technology
- Compact with multi-circuit capabilities (up to 4 circuits connected to one unit)
- · Solve design, installation, wiring, and commissioning issues with only one model
- IEC 62053-22 accuracy class 0.5S
- Push-in plus technology for easy wiring
- · Clear indication in case of incorrect wiring
- Large, easy-to-read, white and green LCD
- On panel mounting
- Bi-directional power measurement

Ordering Information

Power Monitor

Value Desigr

Applicable circuits and rated voltage	Power supply voltage	Dimensions (W×H×D)	Communications	Order Code
Single-phase, 2-wire: 100 to 277 VAC Single-phase, 3-wire: 100 to 240 VAC (L-N) or 200 to 480 VAC (L-L) Three-phase, 3-wire: 173 to 480 VAC (L-L) Three-phase, 4-wire: 100 to 277 VAC (L-N) or 173 to 480 VAC (L-L)			RS-485 communications, pulse output	KM-N3-FLK

Note: To use a commercially available current transformer, use a CT with a secondary current rating of 1 A or 5 A, and a rated load of at least 1.0 VA.

Specifications

Ratings

natiligs						
Applicable phase wiring methods		Single-phase two-wire, single-phase three-wire, three-phase three-wire, and three-phase four-wire				
Number of meas	ured circuits	Single-phase two-wire: 4 circuits max., Single-phase three-wire or three-phase three-wire: 2 circuits max., Three-phase four-wire: 1 circuit				
Power supply vo	tage (operating frequency)	100 to 240 VAC (50/60 Hz)				
Power supply all	owable voltage range	85% to 110% of rated power supply voltage				
Power consumpt	ion	7 VA max.				
Input	Rated input voltages	Single-phase, 2-wire: 100 to 277 VAC Single-phase, 3-wire: 100 to 240 VAC (L-N) or 200 to 480 VAC (L-L) Three-phase, 3-wire: 173 to 480 VAC (L-L) Three-phase, 4-wire: 100 to 277 VAC (L-N) or 173 to 480 VAC (L-L)				
	Allowable supply voltage range	85% to 115% of rated power supply voltage				
	Connectable CTs	General-purpose CT with a rated secondary current of 1 A or 5 A*1				
	Maximum CT secondary current	6 A				
	Rated input frequency	50/60 Hz				
Ambient operation	ng temperature	–25 to 55°C (with no condensation or icing)				
Ambient operation	ng humidity	25% to 85%				
Storage tempera	ture	–25 to 85°C (with no condensation or icing)				
Storage humidity	/	25% to 85%				
Operating altitud	le	2,000 m max.				
Installation envir	onment	Overvoltage category II, measurement category II, pollution degree 2				
Electromagnetic	environment	Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)				
Compliant stand	ards	EN 61010-2-030, EN 61326-1, and UL 61010-1				
		•				

^{*1} The KM-series CTs (the KM20-CTF Series) cannot be used. Use general-purpose CTs with a secondary-side output of 1 A or 5 A.



Performance							
Measured items		Energy consumption (active, regenerative, and reactive), power (active and reactive), current, voltage, power factor, and frequency					
Measurement	Active power	0.5% (IEC 62053-22 class 0.5S*1					
specifications	Reactive power	2% (IEC 62053-23 class 2)*1					
	Sampling cycle	80 ms for 50 Hz and 66.7 ms for 60 Hz					
Insulation resistan	ce	(1) Between all electrical circuits and the case: $20 \text{ M}\Omega$ min. (at 500 VDC) (2) Between all power supply and voltage inputs and all communications and pulse output terminals: $20 \text{ M}\Omega$ max. (at 500 VDC)					
Dielectric strength		(1) Between all electrical circuits and the case: 1,400 VAC for 1 min (2) Between all voltage and current inputs and all communications and pulse output terminals: 2,200 VAC for 1 min					
Vibration resistanc	e	Single amplitude: 0.1 mm, Acceleration: 15 m/s², Frequency: 10 to 150 Hz, 10 sweeps for 8 min each along three axes					
Shock resistance		150 m/s², 3 times each in 6 directions (up/down, left/right, forward/backward)					
Indications and op	eration method	LCD indications and operation buttons					
Weight		Approx. 350 g (Power Monitor only)					
Degree of protection	on	Front: IP65, Rear case: IP20, Terminal: IP00					
Pulse output	Number of outputs	Number of outputs: 4 (photoMOS relay outputs) Used for the total power consumption pulse output.					
	Output capacity	50 mA at 40 VDC ON residual voltage: 1.5 V max. (for output current of 50 mA) OFF leakage current: 0.1 mA max.					
	Output unit	Output unit: 1, 10, 100, 1k, 5k, 10k, 50k, or 100k (wh) Pulse ON time: 500 ms (Cannot be changed.)					
Communications	Communications method	RS-485 (2-wire half-duplex with start-stop synchronization)					
interface	Communications protocol	Modbus (RTU): Binary. CompoWay/F: ASCII					
	Baud rate	1.2, 2.4, 4.8, 9.6, 19.2, or 38.4 kbps					
	Data length	Data length: 7 or 8 bits Stop bits: 1 or 2 bits Vertical parity: Even, odd, or none					
	Maximum transmission distance	1,200 m					
	Maximum number of connected Power Monitors	Modbus: 99, CompoWay/F: 31 If you measure more than one circuit with one Power Monitor, the number of circuits is treated as the number of connected Power Monitors.					
Dimensions (W×H)	×D)	$96 \times 96 \times 64$ mm (excluding protrusions)					
Installation metho	d	On-panel installation					
Accessories		Instruction Manual and Compliance Sheet, Mounting adapter and waterproof packing					

 $^{^{*1}}$ The error of the CT or VT is not included. IEC 62053 is an international standard for power metering.

Switching components

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Switching components

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Electromechanical relays

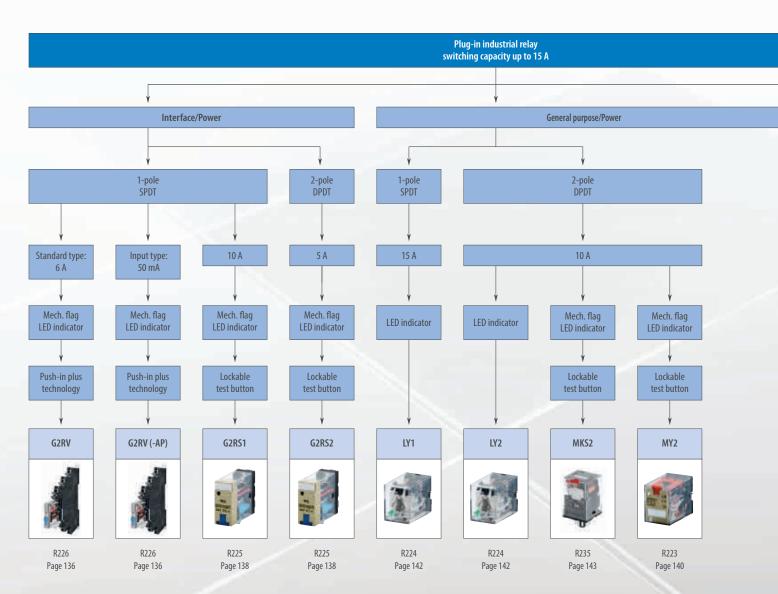
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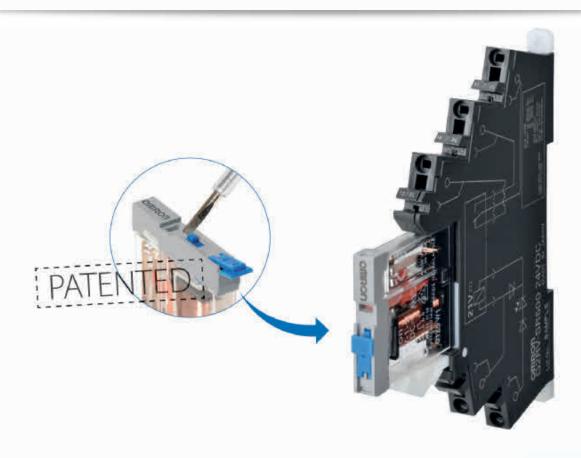
$G2RV-SR \square \square$ 1-6 mm relay with lockable test switch

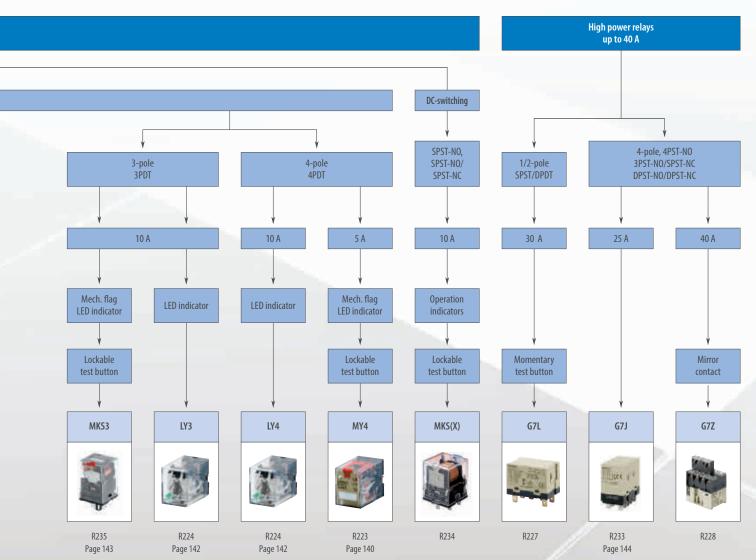
At the heart of the industrial G2RV relay is a strong mechanical pin with a large contact surface that ensures reliable connection and high conductivity between the socket and relay. The patented switch design with rotating protection cover is (almost) impossible to achieve in an adapted PCB relay.

Benefits

- · Push-in plus technology to save wiring work
- 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







Catego	ory	Interface/Powe	r		General purpose/F	General purpose/Power			
				ORE TO SEE					
Family		G2RV		G2RS		MY			
	1-pole				_	_	-	-	
	2-pole	_	_	_			-	-	
	3-pole	_	-	-	_	_	-	-	
	4-pole	-	-	-	-	-			
iteria	Contact configuration	SPDT	SPDT	SPDT	DPDT	DPDT	4PDT	4PDT bifurcated	
Selection criteria	Contact material	AgSnIn	AgSnIn + gold plating	AgSnIn	AgSnIn	Ag	AgNi + Au	AgNi + Au	
Selec	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)	6.2 mm ^{*1}	6.2 mm ^{*1}	13.0 mm	13.0 mm	21.5 mm	21.5 mm	21.5 mm	
	LED indication								
	Mechanical flag								
	Momentary testbutton	_	_	-	_		-		
Features	Momentary/ Lockable testbutton (/switch)		_						
eatı	Label								
	Diode (DC coil)	-	-						
	Varistor (AC coil)	-	-	-	-	-	-	-	
	CR network (AC coil)	-		-	-				
٥	Screw (plate clamp)	-	-						
ing	Screw (box clamp)								
Wiring to socket	Screw-less clamp								
	Quick Link	136/R226		138/R225		140/R223			

^{*1} Socket included

Catego	ory	High power relays									
	TO THE REAL PROPERTY OF THE PARTY OF THE PAR										
Family	<i>!</i>	G7J				G7L		G7Z			
	1-pole	-	-	_	-	=	_	_	-	_	
	2-pole	-	-	-	-	-		-	-	-	
	3-pole	-	-	-	-	-	-	-	-	-	
ø	4-pole			=	=	-	-		=		
Selection criteria	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	
tior	Max. switching current	25 A	25 A	25 A	25 A	30 A	25 A	40 A	40 A	40 A	
Selec	Min. permissible load	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	_	-	-	_			_	_	_	
als	Screw										
Relay terminals	Quick-connect							_	-	_	
R	PCB terminals							_	-	-	
	Screw	-	-	-	-	-	-				
ing	DIN rail	-	-	-	-	-	-				
Mounting	Clip (screw)							-	-	_	
δ	Flange (screw)							_	-	-	
	DIN rail (adapter)	-	-	-	_			-	_	_	
Page/0	Quick Link	144/R233				R227		R228			



Categ	ory	General purp	ose/Power							
				The second						
Family	/	LY					MKS		MKS(X)	
	1-pole		_	_	-	-	-	_		-
	2-pole	-			-	-		-	-	
	3-pole	-	-	-		-	-		_	-
	4-pole	_	-	-	-		-	_	_	-
iteria	Contact configuration	SPDT	DPDT	DPDT bifurcated	3PDT	4PDT	DPDT	3PDT	SPST-NO	SPST-NO/SPST- NC
Selection criteria	Contact material	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn	AgSnIn
Selec	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
	LED indication									
	Mechanical flag	-	_	-	-	_			_	-
	Momentary testbutton	-	-	-	-	_	_	_	_	_
Features	Momentary/ Lockable testbutton	_	_	_	_	_				
-eat	Label	-	-	-	-	_			_	-
_	Diode (DC coil)								Optional for socket	Optional for socket
	Varistor (AC coil)	-	-	-	-	-			-	-
	CR network (AC coil)	-			-	-	-	-	-	-
to t	Screw (plate clamp)									
Wiring to socket	Screw (box clamp)	-	-	_	-	-			-	-
Wir	Screw-less clamp	-	-	-	-	-	-	-	-	-
	Page/Quick Link	142/R224	-				143/R235		R234	

■ Standard

☐ Available

No/not available





The only truly industrial 6 mm relay

Having been designed from first principles, instead of being adapted from a PCB relay, Omron's G2RV series is the only genuine slim industrial relay on the market. As a result, the G2RV offers a wide array of benefits to machine manufacturers and panel builders. Just 6mm wide, the relay is ideal for compact panels and equipment, yet it offers all of the durability and reliability required for industrial applications.

- Push-in plus Technology easy wiring
- · Lockable test switch models available
- Large plug-in pins excellent connection
- LED/mechanical flag check operation
- Transparent housing check condition
- Slim outline space saving
- Special input type with gold plated contacts
- · G3RV compatible

Ordering information

Relay	Input voltage	Order code	Order code			
		Screw technology Pus	sh-in plus technology			
Standard type without lockable test switch	12 VDC	G2RV-SR700 DC12 G2F	RV-SR500 DC12			
	24 VDC	G2RV-SR700 DC24 G2F	RV-SR500 DC24			
	24 VAC/VDC	G2RV-SR700 AC/DC24 G2F	RV-SR500 AC/DC24			
	48 VAC/VDC	G2RV-SR700 AC/DC48 G2F	RV-SR500 AC/DC48			
	110 VAC	G2RV-SR700 AC110 G2F	G2RV-SR500 AC110			
	230 VAC	G2RV-SR700 AC230 G2F	G2RV-SR500 AC230			
Standard type with lockable test switch	24 VDC	G2RV-SR701 DC24 G2F	RV-SR501 DC24			
	24 VAC/VDC	G2RV-SR701 AC/DC24 G2F	RV-SR501 AC/DC24			
Input type	12 VDC	G2RV-SR700-AP DC12 G2F	RV-SR500-AP DC12			
	24 VDC	G2RV-SR700-AP DC24 G2F	RV-SR500-AP DC24			
	24 VAC/VDC	G2RV-SR700-AP AC/DC24 G2F	RV-SR500-AP AC/DC24			
	48 VAC/VDC	G2RV-SR700-AP AC/DC48 G2F	RV-SR500-AP AC/DC48			
	110 VAC	G2RV-SR700-AP AC110 G2F	RV-SR500-AP AC110			
	230 VAC	G2RV-SR700-AP AC230 G2F	RV-SR500-AP AC230			

Note: 100 V, 200 V available on request

Relay for Maintenance

Model Number Legend

G2RV	-1	-	S		-		-	G		
	(1)		(2)	(3)		(4)		(5)	((6)

(1) No. of poles

1: 1 pole

(2) Terminal S: plug-in

(3) Latching lever (Test switch)

Blank: Without latching lever I: With latching lever

(4) Contact material

 $\begin{array}{l} {\sf Blank: Ag \ alloy} \\ {\sf AP: Ag \ alloy} + {\sf Au \ plating} \end{array}$

(5) Types of relay for exchange G: G2RV-SR series equipped Relay

(6) Rated coil voltage Number: 11, 21, 48 VDC

List of Models

Туре	Latching Lever (Test switch)	Rated coil voltag	je (V)	Model	Order code
Standard	No	DC	11	G2RV-1-S-G DC11	G2RV-SR700/500 DC12V
			21	G2RV-1-S-G DC21	G2RV-SR700/500 DC24V
					G2RV-SR700/500 AC/DC24V
			48	G2RV-1-S-G DC48	G2RV-SR700/500 AC/DC48V
					G2RV-SR700/500 AC100V
					G2RV-SR700/500 AC110V
					G2RV-SR700/500 AC200V
					G2RV-SR700/500 AC230V
	Yes	DC	21	G2RV-1-SI-G DC21	G2RV-SR701/501 DC24V
					G2RV-SR701/501 AC/DC24V
Microload	No	DC	11	G2RV-1-S-AP-G DC11	G2RV-SR700/500-AP DC12V
			21	G2RV-1-S-AP-G DC21	G2RV-SR700/500-AP DC24V
					G2RV-SR700/500-AP AC/DC24V
			48	G2RV-1-S-AP-G DC48	G2RV-SR700/500-AP AC/DC48V
					G2RV-SR700/500-AP AC100V
					G2RV-SR700/500-AP AC110V
					G2RV-SR700/500-AP AC200V
					G2RV-SR700/500-AP AC230V



Accessories and Interface cables

Further more information on the line-up and specifications of accessories, please enter "R226" in the search field on our website industrial.omron.eu

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	440 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) NO contact: 70.000 operations min. NC contact: 50.000 operations min.	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 (with no icing condensation)				
Approved standards	UL, IEC/VDE, Lloyd's, and CE marking				
Size in mm (H×W×D)	90×6.2×78				

^{*1} If a gold layer is destroyed, contact ratings of standard type are applicable



Plug-in relay with enhanced features covers a wide range of applications

G2RS series, which comes as standard with a mechanical indicator and nameplate covering a wide range of interface applications.

Optionally available with gold clad contacts and diode, whilst the socket and crossbar range offer maximum flexibility during installation.

- SPDT type 10A / DPDT type 5 A
- Mechanical Flag, LED indicator and momentary / lockable testbutton optional
- · Transparent housing
- Screwless clamp terminal sockets available
- Space saving 16 mm width (including sockets)

Ordering information

Contact form	Diode	LED indicator	Test button	Gold clad 3 µm	Order code		
					(= coil voltage + AC/DC)	Common coil voltage	jes ^{*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	Order code								
	DIN rail	DIN rail								PCB
	Screwless clamp Screw (box clamp) (plate 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

For the new push-in plus technology socket go to PYF-__-PU/P2RF-__-PU on page 145.



Electromechanical relays

Specifications

Coil ratings

Rated voltage		Must operate voltage Must release voltage Max. 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 $(\cos \varphi = 1)$	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., D0	C: 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)	5.5x13x29			



Versatile plug-in relay that sets the standard

Over 1 billion pieces of this mini power relay have been manufactured since its introduction and have successfully been used in many different applications. Bifurcated contacts are optionally available to achieve reliable low current switching during the entire electrical life. Full range of sockets covering mounting by screw, box clamp and screw-less clamp method.

- DPDT type 10 A / 4PDT type 5 A
- Mechanical flag, LED indicator and momentary / lockable testbutton optional
- Transparent housing
- Low power switching (1 mA at 5 VDC) / Bifurcated 4PDT (0.1 mA at 1 VDC)
- Screw-less clamp terminal sockets available

Ordering information

Contact form	Diode	LED	Lockable test	Order code (= coil	voltage + AC/DC)		
		indicator	button	⊝ _ ⊕	(+) (-)	Common coil voltages *1	
				13 14 A1 A2	13 14 A1 A2	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	\Box		MY2N-D2(S)	-	24	-
DPDT	no	\Box	yes	MY2INS)	-	12, 24, 48	12, 24, 110/120, 220/240
DPDT				_	MY2IN1(S)	12, 24	-
DPDT	yes	\neg		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	\Box		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	Order code							
	Screw-less clamp Box clamp								
For type	Socket		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 for MY2IN	Socket	Metal spring clip	Plastic holding	Label	
		(set = 2 pcs)	(set = 2 pcs)			clip		
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	

For the new push-in plus technology socket go to PYF- $_$ -PU/P2RF- $_$ -PU on page 145.



Electromechanical relays

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	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 c		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

Туре	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	erminals		Order code *1	Common coil voltages ^{*2}		
			Plug-in/solder	PCB	Upper- mounting plug-in/solder	(= coil voltage + AC/DC)	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

Туре	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

				n	

Poles	Rate	d voltage	Must operate voltage	perate release voltage (approx.)		
			% of rated \	oltage/		
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-po	ole	Single contact 2-, 3-	or 4-pole	Bifurcated contacts	Bifurcated contacts 2-pole		
Load			Inductive load ($\cos \varphi = 0.4$; 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	7 A		
Max. switching voltage	250 VAC, 125 VDC		250 VAC, 125 VDC		250 VAC, 125 VDC			
Max. switching current	15 A	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: 200,00	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	LED indicator		Order code *1	Common coil voltages *2	
	test button			(= coil voltage + AC/DC)	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

Many various terminal arrangements possible, please see specifications.
 Other coil voltages available. Please see specifications.

Sockets & accessories

For type	Order code	Order code							
	DIN rail	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
		% of rated voltage			(approx.)
AC	6 V, 12 V, 24 V, 100 V, 110 V, 120 V, 200 V,	80% max.	30% min.	110%	2.3 VA (60 Hz)
	220 V, 230 V, 240 V				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 $(\cos \varphi = 1)$	Inductive load ($cos\phi = 0.4$; L/R = 7)				
Contact material	AgSnIn					
Rated load	NO: 10 A at 250 VAC NC: 5 A at 30 VDC	7 A at 250 VAC				
Rated carry current	10 A					
Max. switching voltage	250 VAC, 250 VDC	-				
Max. switching current	10 A					
Max. switching power	2,500 VA/ 300 W	1,250 VA/150 W				
Mechanical life	5,000,000 operations min.					
Electrical life	100.000 operations min.					
Technical data						
Operating time	AC: 20 ms max., DC: 30 ms max.					
Release time	20 ms max. (40 ms max. for built-	-in Diode relays)				
Dielectric strength	2,500 VAC (coil-contact)					
Ambient temperature	Operating: –40 to 60°C (with no i	cing or condensation)				
		34.5×34.5×53.3				

Dimension relay & socket

Туре	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)
PFA-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	Mounting				Order code *1	Common co	Common coil voltages *2	
	РСВ	W-bracket mounting	РСВ	Quick-connect	Screw	(= coil voltage + AC/DC)	DC	AC	
4PST-NO	yes	no	yes	no	no	G7J-4A-P	12, 24	200/240	
	no	no yes	no	 	yes	G7J-4A-B	24	-	
					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	-	
OPST-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.

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 volta	ige		
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 $\cos \varphi = 0.4$	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 operation	s 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)



^{*2} Other coil voltages available. Please see specifications.



Push-In Plus technology sockets

Sockets with Push-In Plus technology to save work added to series for MY and G2R-S relays

- Push-In Plus technology is used to save wiring work in comparison with traditional screw terminals
- No screw loosening means maintenance-free application
- Light insertion force and strong pull-out strength to achieve both less wiring work and high reliability
- 'Hand-free' structure that holds an inserted screwdriver to achieve easier wiring work for stranded wires
- Two wires can be independently inserted into each terminal hole
- DIN Track mounting or screw mounting

Ordering information

Applicable model (typical example)*			Socket	
			No. of poles	Order code ^{*2}
General Purpose Relays	MY Series	MY2	2	PYF-08-PU
		MY4	4	PYF-14-PU
Timers	H3Y Series	H3Y(N)-2-B	2	PYF-08-PU-L
	H3YN Series	H3Y(N)-4-B	4	PYF-14-PU-L
General Purpose Relays	G2RS (S) Series	G2R-1-S (S)	1	P2RF-05-PU
Timers	H3RN Series	H3RN-1-B		
General Purpose Relays	G2RS (S) Series	G2R-2-S (S)	2	P2RF-08-PU
Timers	H3RN Series	H3RN-2-B		
Liquid Leakage Sensors	K7L Series	K7LB		

^{*1} Refer to your OMRON website for information on other applicable models of the Products Related to Common Sockets and DIN Tracks.

Accessories (Order Separately)

Short Bars

Pitch	Applicable models	No. of poles	4.1 (1.4)	Minimum order (quantity)	Order code ^{*1}
7.75 mm	PYFPU and	2	Red (R)		PYDN-7.75-020_
	P2RFPU	3	Blue (S)		PYDN-7.75-030_
		4	Yellow (Y)		PYDN-7.75-040_
		20			PYDN-7.75-200_
31.0 mm	PYFPU	8			PYDN-31.0-080_
15.5 mm	P2RFPU	8			PYDN-15.5-080_

 $^{^{\}star}$ 1 Replace the _ in the order code with the code for the covering color.

Note: Use the Short Bars for crossover wiring within one socket or between sockets.

Labels

Applicable models	Description	Order code
PYFPU and P2RFPU	1 sheet (60 pieces)	XW5Z-P4.0LB1

Parts for DIN Track Mounting

Туре		Minimum order (quantity)	Order code
DIN Tracks	1 m	_	PFP-100N
	0.5 m		PFP-50N
End Plate		10	PFP-M
Spacer			PFP-S

Note: Refer to your OMRON website for details on the PFP-_.

Item	Model	PYF-08-PU (-L)	PYF-14-PU (-L)	P2RF-05-PU	P2RF-08-PU	
Ambient operating	temperature	−40 to 70°C		−40 to 70°C		
Ambient operating humidity		5 to 85%		5 to 85%		
Continuous carry current		10 A	6 A	10 A	6 A	
,	Between contact terminals of same polarity	2,000 VAC, 1 min	2,000 VAC, 1 min	1,000 VAC, 1 min	1,000 VAC, 1 min	
	Between contact terminals of different polarity	2,000 VAC, 1 min 2,000 VAC, 1 min		_	3,000 VAC, 1 min	
	Between coil and contact terminals	2,000 VAC, 1 min	2,000 VAC, 1 min	4,000 VAC, 1 min	4,000 VAC, 1 min	
Weight (approx.)		80 g	87 g	40 g	45 g	
Safety standard certification ratings		VDE0627 (IEC 61984): File No. Nr.B387 (License No.) UL508 (UL1059): File No. E87929 Vol.3 CSA C22.2 No.14 (CSA C22.2 No.158): File No. LR31928		VDE0627 (IEC 61984): File No. Nr.6166 (License No.) UL508 (UL1059): File No. E87929 Vol.3 CSA C22.2 No.14 (CSA C22.2 No.158): File No. LR31928		



^{*2} The PYF-__-PU-L Sockets do not have release levers.



I/O relay terminal

I/O relay terminals with 16 points and Push-In Plus technology blocks to downsize control panels and save labor

- I/O relay terminals with 16 points to mount G2RV slim I/O relays
- Push-In Plus technology used to save wiring work in comparison with traditional screw terminals
- · Work is reduced ever further with one-step cable connection to the PLC
- Diode provided for coil surge absorption
- Operation indicators for immediate recognition of I/O signal status
- Accepts G3RV Slim I/O SSRs
- · DIN-rail or screw mounting

Ordering information

I/O relay terminal

Terminals	Туре	Points	Internal I/O circuit common	Rated voltage	Order code
Push-in plus technology	Input ^{*1}	16	NPN (– common)	24 VDC	G70V-SID16P
			PNP (+ common)		G70V-SID16P-1
	Output*2		NPN (+ common)		G70V-SOC16P
			PNP (– common)		G70V-SOC16P-1

^{*1} Mountable Relays: G2RV-1-S-AP-G DC21V

Relay terminal sockets

Applicable I/O Relay Terminal	Туре	Common Processing in Connector	Order code
G70V-SID16P	Input	NPN (– common)	G70V-ZID16P
G70V-SID16P-1		PNP (+ common)	G70V-ZID16P-1
G70V-SOC16P	Output	NPN (+ common)	G70V-ZOM16P
G70V-SOC16P-1		PNP (– common)	G70V-ZOM16P-1

Note: Relays are not mounted to the G70V-ZID/ZOM16P(-1) Relay Terminal Sockets. Combine the Relay Terminal Sockets with Slim I/O Relays or Slim I/O SSRs.

Accessories

Mountable Relays

Applicable I/O Relay Terminal	Туре	Classification			Order code
G70V-SID16P(-1)	Input	Slim I/O Relays*1	Slim I/O Relays ^{*1}		
G70V-SOC16P(-1)	Output	Slim I/O Relays No Latching Lever*2			G2RV-1-S-G DC21
			3 - 1		G2RV-1-SI-G DC21
		Slim I/O SSRs			G3RV-202S DC24
				No zero cross function	G3RV-202SL DC24
			For DC		G3RV-D03SL DC24

^{*1} G2RV-1-S-AP-G Slim I/O Relays are mounted to G70V-SID16P(-1) I/O Relay Terminals as a standard feature.

Note: Note: To use Slim I/O SSRs, either remove the Slim I/O Relays to mount them or order a Relay Terminal Socket and I/O SSRs separately and combine them. When ordering, designate the rated voltage.

Labels

Minimum order (sheet) (quantity per sheet)	Order code
5 (1 sheet/72 pieces)	XW5Z-P2.5LB2

Parts for DIN Track Mounting

Туре		Minimum order (quantity)	Order code
DIN Tracks	1 m	-	PFP-100N
	0.5 m		PFP-50N
End Plate		10	PFP-M
Spacer			PFP-S

Refer to your OMRON website for details on the PFP-...



^{*2} Mountable Relays: G2RV-1-S-G DC21V

^{*2} G2RV-1-S-G Slim I/O Relays are mounted to G70V-SOC16P(-1) I/O Relay Terminals as a standard feature.

Applicable cables

Name		Appearance	Cable lengt	th L (mm)		Applicable connectors	Order code		
Cables with Loose Wires and	16 I/O points	End A End B	1,000			Various devices	XW2Z-RY100C		
Crimp Terminals		Device end I/O Relay Terminal	1,500				XW2Z-RY150C		
XW2Z-RY_C			2,000			1	XW2Z-RY200C		
		5	3,000	3,000		-	XW2Z-RY300C		
		300 L	-			_			
		300	5,000				XW2Z-RY500C		
Cables with Loose Wires XW2Z-RA_C	16 I/O points		2,000			Various devices	XW2Z-RA200C		
AWZZ-NA_C									
		L	5,000				XW2Z-RA500C		
		300							
Cables with Connectors (1:1)	16 I/O points	_	500			PLC I/O Units with	XW2Z-R50C		
XW2Z-R_C			1,000			Fujitsu connectors (1:1)	XW2Z-R100C		
			1,500				XW2Z-R150C		
			2,000				XW2Z-R200C		
			3,000				XW2Z-R300C		
			5,000				XW2Z-R500C		
Cables with Connectors (1:2)	32 input points	(A) ———	(A) 1,000	(B) 7		PLC I/O Units with	XW2Z-RI100C-75		
XW2Z-RI_C, XW2Z-RO_C			(A) 1,500	(B) 1	,000	Fujitsu connectors (1:2)	XW2Z-RI150C-100		
			(A) 1,500	(B) 1		4	XW2Z-RI150C-125		
			(A) 2,000	(B) 1		4	XW2Z-RI200C-175		
		(120)	(A) 3,000	(B) 2		4	XW2Z-RI300C-275		
			(A) 5,000	(B) 4		4	XW2Z-RI500C-475		
	32 output points	(B)	(A) 1,000	(B) 7		4	XW2Z-RO100C-75		
		Straight length (without bends)	(A) 1,500	(B) 1			XW2Z-RO150C-100		
			(A) 1,500	(B) 1		_	XW2Z-RO150C-125		
			(A) 2,000	(B) 1			XW2Z-RO200C-150		
			(A) 2,000	(B) 1		_	XW2Z-RO200C-175		
			(A) 3,000	(B) 2		_	XW2Z-RO300C-275		
			(A) 5,000	(B) 4			XW2Z-RO500C-475		
Cables with Connectors (1:3) XW2Z-R_C	48 I/O points	(A) (B)	(A) 1,500	(B) 1,250	(C) 1,000	PLC I/O Units with Fujitsu connectors (1:3)	XW2Z-R150C-125-100		
				(120)	(A) 2,000	(B) 1,750	(C) 1,500		XW2Z-R200C-175-150
			1						
		Straight length (without bends)	(A) 3,000	(B) 2,750	(C) 2,500		XW2Z-R300C-275-250		
Cables with Connectors (1:1)	16 input points		(A) 3,000 250	(B) 2,750	(C) 2,500	PLC I/O Units with	XW2Z-R300C-275-250 XW2Z-RI25C		
XW2Z-RI_C,	16 input points			(B) 2,750	(C) 2,500	PLC I/O Units with MIL connectors (1:1)			
	16 input points 16 output points		250	(B) 2,750	(C) 2,500		XW2Z-RI25C		
XW2Z-RI_C,			250 500	(B) 2,750	(C) 2,500		XW2Z-RI25C XW2Z-RI50C		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2)		Straight length (without bends)	250 500 250	(B) 2,750		MIL connectors (1:1) PLC I/O Units with	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1,	16 output points		250 500 250 500		50	MIL connectors (1:1)	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1,	16 output points	Straight length (without bends)	250 500 250 500 (A) 500	(B) 2	50	MIL connectors (1:1) PLC I/O Units with	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C XW2Z-RI50-25-D1		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2,	16 output points 32 input points	Straight length (without bends)	250 500 250 500 (A) 500 (A) 750	(B) 2 (B) 5	50 00 50	MIL connectors (1:1) PLC I/O Units with	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1,	16 output points 32 input points 32 output points 16 input points/	Straight length (without bends)	250 500 250 500 (A) 500 (A) 750 (A) 500	(B) 2 (B) 5 (B) 2	50 00 50 00	MIL connectors (1:1) PLC I/O Units with	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO50-25-D1		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2,	16 output points 32 input points 32 output points	Straight length (without bends)	250 500 250 500 (A) 500 (A) 750 (A) 500 (A) 750	(B) 2 (B) 5 (B) 2 (B) 5	50 00 50 00 50	MIL connectors (1:1) PLC I/O Units with	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO50-25-D1 XW2Z-RO75-50-D1		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2,	16 output points 32 input points 32 output points 16 input points/	Straight length (without bends)	250 500 250 500 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500	(B) 2 (B) 5: (B) 2: (B) 5: (B) 2:	50 00 50 00 50 00	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO50-25-D1 XW2Z-RO75-50-D1 XW2Z-RM50-25-D1		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2,	16 output points 32 input points 32 output points 16 input points/ 16 output points	Straight length (without bends)	250 500 250 500 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5	50 00 50 00 50 00 50	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2)	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO50-25-D1 XW2Z-RO75-50-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM75-50-D1		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2,	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/	Straight length (without bends) (A) (120) (B)	250 500 250 500 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 5	50 00 50 00 50 00 50 00 50	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with	XW2Z-RI25C XW2Z-RI50C XW2Z-RO5C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO50-25-D1 XW2Z-RO75-50-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM75-50-D1 XW2Z-RI50-25-D2		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2,	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points	Straight length (without bends) (A) (120) (B)	250 500 250 500 (A) 500 (A) 750 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 750 (A) 750	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5	50 000 50 000 50 000 50 000 50	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO50-25-D1 XW2Z-RO50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM75-50-D1 XW2Z-RM75-50-D1		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2, XW2Z-RMD2	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/	Straight length (without bends) (A) (120) (B) Straight length (without bends)	250 500 250 500 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2	50 00 50 00 50 00 50 00 50 00 50	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (PNP) (1:2) Mitsubishi Electric PLCs with	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO50-25-D1 XW2Z-RO50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM75-50-D1 XW2Z-RI50-25-D2 XW2Z-RI75-50-D2 XW2Z-RM50-25-D2		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RMD2, XW2Z-RMD2	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/ 16 output points/	Straight length (without bends) (A) (120) (B)	250 500 250 500 (A) 500 (A) 750 (A) 750	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5	50 00 50 00 50 00 50 00 50 00 50	PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (PNP) (1:2) Mitsubishi Electric PLCs with 32-point connectors (1:2)	XW2Z-RI25C XW2Z-RI50C XW2Z-RO50C XW2Z-RO50C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO50-25-D1 XW2Z-RO50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM75-50-D1 XW2Z-RI75-50-D2 XW2Z-RI75-50-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2, XW2Z-RMD2 Mitsubishi Electric PLC Connecting Cables XW2Z-RI_CMN,	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/ 16 output points/	Straight length (without bends) (A) (B) Straight length (without bends) End A End B	250 500 250 500 (A) 500 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 1,000 (A) 1,500	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 7	50 000 550 000 550 000 550 000 550 000 550	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (PNP) (1:2) Mitsubishi Electric PLCs with 32-point connectors (1:2) For inputs:	XW2Z-RI25C XW2Z-RI50C XW2Z-RO5C XW2Z-RO5C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO50-25-D1 XW2Z-RO50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D2 XW2Z-RI50-25-D2 XW2Z-RI50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM75-50-D2 XW2Z-RM75-50-D2 XW2Z-RI100C-75-MN XW2Z-RI150C-125-MN		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RMD2, XW2Z-RMD2	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/ 16 output points/	Straight length (without bends) (A) (120) (B) Straight length (without bends) End A Device end L (A) (B) Straight length (without bends)	250 500 250 500 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 750 (A) 1,000 (A) 1,500 (A) 2,000	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 7 (B) 1	50 00 50 00 50 00 50 00 50 00 50 00 50 00 50 00 50 00 50 00 50 00 50 00 50 00 50 00 50 00 0	PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (PNP) (1:2) Mitsubishi Electric PLCs with 32-point connectors (1:2)	XW2Z-RI25C XW2Z-RI50C XW2Z-R05C XW2Z-R05C XW2Z-R050C XW2Z-RI50-25-D1 XW2Z-R050-25-D1 XW2Z-R050-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM75-50-D1 XW2Z-RM75-50-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-DA XW2Z-RM50-25-MN		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2, XW2Z-RMD2 Mitsubishi Electric PLC Connecting Cables XW2Z-RI_CMN,	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/ 16 output points/ 16 output points/ 16 output points 32 input points	Straight length (without bends) (A) (120) (B) Straight length (without bends) End A Device end L (A) (B) Straight length (without bends)	250 500 250 500 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 1,500 (A) 2,000 (A) 3,000	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 7 (B) 1 (B) 1 (B) 2	50 00 50 5	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (PNP) (1:2) Mitsubishi Electric PLCs with 32-point connectors (1:2) For inputs: AX42, A1SX41, A1SX42	XW2Z-RI25C XW2Z-RI50C XW2Z-RO5C XW2Z-RO5C XW2Z-RO5C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO5C-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D2 XW2Z-RI50-25-D2 XW2Z-RI50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RI100C-75-MN XW2Z-RI100C-125-MN XW2Z-RI200C-175-MN XW2Z-RI200C-275-MN		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2, XW2Z-RMD2 Mitsubishi Electric PLC Connecting Cables XW2Z-RI_CMN,	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/ 16 output points/	Straight length (without bends) (A) (120) (B) Straight length (without bends) End A Device end L (A) (B) Straight length (without bends)	250 500 250 500 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 750 (A) 1,000 (A) 1,500 (A) 2,000	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 7 (B) 1	50 00 50 5	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (PNP) (1:2) Mitsubishi Electric PLCs with 32-point connectors (1:2) For inputs: AX42, A1SX41, A1SX42 For outputs:	XW2Z-RI25C XW2Z-RI50C XW2Z-R05C XW2Z-R05C XW2Z-R050C XW2Z-RI50-25-D1 XW2Z-R050-25-D1 XW2Z-R050-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM75-50-D1 XW2Z-RM75-50-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-DA XW2Z-RM50-25-MN		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2, XW2Z-RMD2 Mitsubishi Electric PLC Connecting Cables XW2Z-RI_CMN,	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/ 16 output points/ 16 output points/ 16 output points 32 input points	Straight length (without bends) (A) (120) (B) Straight length (without bends) End A Device end L (A) (B) Straight length (without bends)	250 500 250 500 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 500 (A) 750 (A) 1,500 (A) 2,000 (A) 3,000	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 7 (B) 1 (B) 1 (B) 2	50 00 50 5	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (PNP) (1:2) Mitsubishi Electric PLCs with 32-point connectors (1:2) For inputs: AX42, A1SX41, A1SX42 For outputs:	XW2Z-RI25C XW2Z-RI50C XW2Z-RO5C XW2Z-RO5C XW2Z-RO5C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO5C-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D2 XW2Z-RI50-25-D2 XW2Z-RI50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RI100C-75-MN XW2Z-RI100C-125-MN XW2Z-RI200C-175-MN XW2Z-RI200C-275-MN		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2, XW2Z-RMD2 Mitsubishi Electric PLC Connecting Cables XW2Z-RI_CMN,	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/ 16 output points/ 16 output points/ 16 output points 32 input points	Straight length (without bends) (A) (B) Straight length (without bends) End A End B Device end I/O Relay Terminal (A)	250 500 250 500 (A) 500 (A) 750 (A) 300 (A) 1,500 (A) 3,000 (A) 3,000 (A) 1,000	(B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 2 (B) 5 (B) 7 (B) 1 (B) 1 (B) 2 (B) 7	50 000 550 000	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (PNP) (1:2) Mitsubishi Electric PLCs with 32-point connectors (1:2) For inputs: AX42, A1SX41, A1SX42 For outputs:	XW2Z-RI25C XW2Z-RI50C XW2Z-RO25C XW2Z-RO50C XW2Z-RO50C XW2Z-RI50-25-D1 XW2Z-RI75-50-D1 XW2Z-RO75-50-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM50-25-D2 XW2Z-RI75-50-D2 XW2Z-RI75-50-D2 XW2Z-RI75-50-D2 XW2Z-RI75-50-D2 XW2Z-RI75-50-D2 XW2Z-RI75-50-D2 XW2Z-RI75-50-D2 XW2Z-RI150C-125-MN XW2Z-RI300C-275-MN XW2Z-RI300C-275-MN		
XW2Z-RI_C, XW2Z-RO_C Cables with Connectors (1:2) XW2Z-RID1, XW2Z-ROD1, XW2Z-RMD1, XW2Z-RID2, XW2Z-RMD2 Mitsubishi Electric PLC Connecting Cables XW2Z-RI_CMN,	16 output points 32 input points 32 output points 16 input points/ 16 output points 32 input points 16 input points/ 16 output points/ 16 output points/ 16 output points 32 input points	Straight length (without bends) (A) (B) Straight length (without bends) End A End B Device end I/O Relay Terminal (A)	250 500 250 500 (A) 500 (A) 500 (A) 750 (A) 1,000 (A) 1,500 (A) 1,000 (A) 1,000 (A) 1,000 (A) 1,000 (A) 1,500	(B) 2 (B) 50 (B) 2 (B) 50 (B) 2 (B) 51 (B) 2 (B) 51 (B) 7 (B) 1 (B) 1 (B) 2 (B) 7	50 000 550 000 550 000 550 000 550 000 550 7,750 7,750 50 2,250	MIL connectors (1:1) PLC I/O Units with MIL connectors (NPN) (1:2) PLC I/O Units with MIL connectors (PNP) (1:2) Mitsubishi Electric PLCs with 32-point connectors (1:2) For inputs: AX42, A1SX41, A1SX42 For outputs:	XW2Z-RI25C XW2Z-RI50C XW2Z-RO5C XW2Z-RO5C XW2Z-RO5C XW2Z-RI50-25-D1 XW2Z-RO50-25-D1 XW2Z-RO50-25-D1 XW2Z-RO50-25-D1 XW2Z-RM50-25-D1 XW2Z-RM75-50-D1 XW2Z-RI50-25-D2 XW2Z-RI50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-D2 XW2Z-RM50-25-DA XW2Z-RI150C-175-MN XW2Z-RI150C-175-MN XW2Z-RI300C-75-MN XW2Z-RI300C-75-MN XW2Z-RO100C-75-MN		



Name		Appearance	Cable length L (mm)	Applicable connectors	Order code
Schneider Electric	32 input points	(A)	500	Schneider Electric PLCs with	XW2Z-R050C-SCH-A
LC Connecting Cables			1,000	32-point connectors (1:2)	XW2Z-R100C-SCH-A
W2Z-R_C-SCH			2,000	For inputs: 140 DDI 353 00	XW2Z-R200C-SCH-A
			3,000	For outputs:	XW2Z-R300C-SCH-A
		(120)	5,000	140 DDO 353 00	XW2Z-R500C-SCH-A
	32 output points		500		XW2Z-R050C-SCH-B
	32 output points	(B)	1,000		XW2Z-R100C-SCH-B
		Straight length (without bends)	2.000	 	XW2Z-R200C-SCH-B
		Straight length (without behas)	3.000		XW2Z-R300C-SCH-B
			-,	 	
	451		5,000		XW2Z-R500C-SCH-B
	16 input points		500	Schneider Electric PLCs with 16-point connectors (1:1)	XW2Z-R050C-SCH-C
			1,000	For inputs:	XW2Z-R100C-SCH-C
			2,000	BMX DDI 1602	XW2Z-R200C-SCH-C
			3,000	For outputs:	XW2Z-R300C-SCH-C
			5,000	BMX DDO 1602	XW2Z-R500C-SCH-C
	16 output points		500		XW2Z-R050C-SCH-D
			1,000		XW2Z-R100C-SCH-D
			2,000		XW2Z-R200C-SCH-D
			3,000		XW2Z-R300C-SCH-D
			5,000		XW2Z-R500C-SCH-D
emens	32 input points	(A) (A) (120)	500	Siemens PLCs with	XW2Z-R050C-SIM-A
.C Connecting Cables			1,000	32-point connectors (1:2)	XW2Z-R100C-SIM-A
W2Z-R_C-SIM			2,000	For inputs:	XW2Z-R200C-SIM-A
			3,000	6ES7 321-1BL00-0AA0 For outputs:	XW2Z-R300C-SIM-A
			5,000	6ES7 322-1BL00-0AA0	XW2Z-R500C-SIM-A
	32 output points		500		XW2Z-R050C-SIM-B
	32 output points			 	
		(B)	1,000		XW2Z-R100C-SIM-B
		Straight length (without bends)	2,000		XW2Z-R200C-SIM-B
			3,000		XW2Z-R300C-SIM-B
			5,000		XW2Z-R500C-SIM-B
	16 input points	Іп л	500	Siemens PLCs with	XW2Z-R050C-SIM-C
			1,000	16-point connectors (1:1) For inputs:	XW2Z-R100C-SIM-C
			2,000	6ES7 321-1BH02-0AA0	XW2Z-R200C-SIM-C
			3,000		XW2Z-R300C-SIM-C
			5,000		XW2Z-R500C-SIM-C
	32 input points	[a (A) a]	500	Siemens PLCs with	XW2Z-R050C-SIM-D
		(A)	1,000	32-point connectors (1:2)	XW2Z-R100C-SIM-D
			2,000	For inputs: 6ES7 421-1BL-0AA0	XW2Z-R200C-SIM-D
			3,000	For outputs:	XW2Z-R300C-SIM-D
			5,000	6ES7 422-1BL-0AA0	XW2Z-R500C-SIM-D
	32 output points	(120)	500		XW2Z-R300C-SIM-E
	32 output points				
		← (B) →	1,000		XW2Z-R100C-SIM-E
		Straight length (without bends)	2,000		XW2Z-R200C-SIM-E
			3,000		XW2Z-R300C-SIM-E
	1		5,000		XW2Z-R500C-SIM-E

Further more information on the line-up and specifications of connecting cables, parts for DIN track mounting and labels, please enter "R242" in the search field on our website industrial.omron.eu

Item	Model	G70V-SID16P(-1) (Input, DC coil)	G70V-SOC16P(-1) (output, DC coil)			
Coil Ratings*1	Rated voltage (V)*2	24 VDC	(output, De con)			
	Rated current (mA)*2,*3	13.3				
	Coil resistance (Ω)	1575				
	Must operate of rated voltage	80% max.				
	Must release of rated voltage	10% min.				
	Maximum voltage of rated voltage*4	110%				
	Power consumption (mW)	Approx. 280				
Contact form		SPST-NO × 16	SPDT × 16			
Contact material		Ag alloy + Au plating	Ag alloy			
Contact resistance	e ^{*5}	150 mΩ max.				
Must Operate tim	e ^{*6}	20 ms max.				
Release time*6		40 ms max.				
Max. switching	Mechanical limit	18,000 operations/hour				
frequency	At rated load	1,800 operations/hr (under rated load)				
Insulation resistar	nce	100 mΩ max.				
Dielectric strengt	h	Between coil and contacts: 2,500 VAC for 1 min				
Ambient operatin	g temperature	−40 to 55°C (with no icing or condensation)				
LED color	Power supply	Green				
	I/O	Yellow				
Size in mm (H \times W	/×D)	90×143×56 (max.)				
Weight		Approx. 350 g	Approx. 370 g			

^{*1} The operating characteristics are measured at a coil temperature of 23°C.

*2 Measured at a coil temperature of 23°C with a tolerance of ±15% for coil resistance.

*3 The rated current includes the current for the indicators on the I/O relay terminal.

*4 The value for maximum voltage is the maximum value within the allowable voltage fluctuation range for the relay coil's operating power supply. Continuous operation at this voltage is not within product specifications.

*5 Measurement condition: 1 A at 5 VDC

*6 Ambient temperature: 23°C

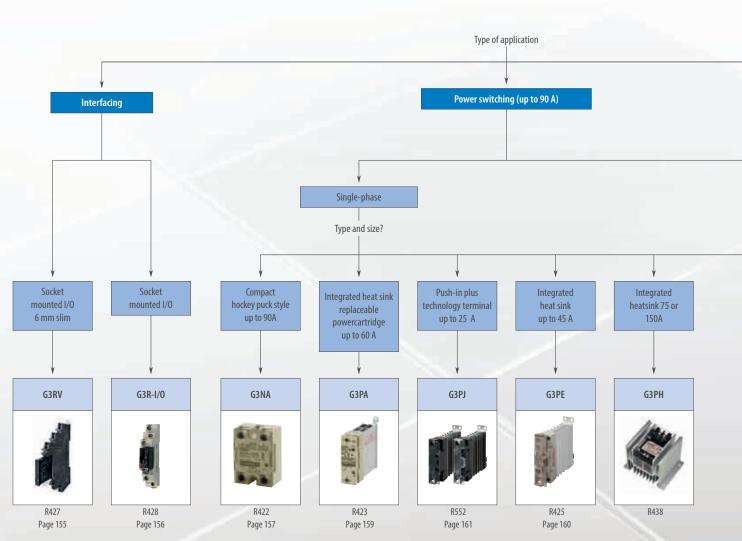
Solid state relays

COMPACT SOLID STATE RELAYS

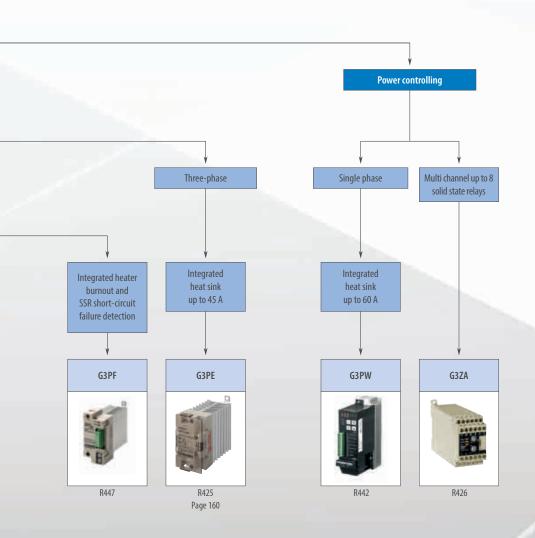
G3_series - Reliable interfacing and power switching

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







Category		Control panel mounti	ng type				
		4	CAD NO				
Model	Type of load	G3RV Output module	G3R-I/O Input Module	Output Module	G3NA Normal resistive	G3PA Normal resistive	Normal resistive
Selection criteria	Type of load	(interface)	(interface)	(interface)	Motor control	heaters	heaters
ion	1-phase control	_	-	-			•
elect	2-phase control	-	-	-	_	-	-
×	3-phase control	-	-	-	-	-	-
	Function	Signal switching	Signal switching	Signal switching	Heater control, motor control	Heater control	Heater control
	Max. current rating	2 A (AC); 3 A (DC)	100 mA	2 A	90 A	60 A	25A (Three close mounted SSRs)
	24 to 240	_	-	_		•	•
Load voltage/ current [VAC]	100 to 240	-	_	-	-	_	_
oad ve	100 to 480	-	-	-	-	-	-
25	200 to 480	-	-	-	-	-	-
Load voltage/ current [VDC]	5 to 200	3 to 26.4	4 to 32			-	-
	5 to 24 VDC	_	-			•	-
Input voltages [VDC or VAC]	12 to 24 VDC	12 VDC ±10%; 24 VDC ±10%	•	_	-		•
volt or V	24 VAC	■ 24 VAC/DC ±10%	-	-	-	•	-
Put /DC	100 to 120 VAC	■ 110 VAC ±10%		-		-	-
<u> </u>	200 to 240 VAC	■ 230 VAC ±10%		-		-	-
	Analog input	-	-	-	_	_	-
	Push-in plus technology			-	_	_	■ *1
	Screw wiring	•					•
	Built-in heat sink	_	-	_	_		
	Zero-crossing		-		-	-	
	Built-in varistor LED operation indicator	-	-	-	•	•	- -
	Protective cover	NA	NA	NA		-	
Features	3-phase loads via 3 single-phase SSRs	NA	NA	NA	-	-	•
Fe	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	-	_	_
	DIN-rail		-	-		•	-
ng	Dily Idii						
unting	Screw	_		-			
W Page/Quick Link			- 156/R428	-	- 157/R422	- 159/R423	- 161/R552

^{*1} For input terminal only



Control panel mounting type ower regulator Alloy heater Pure metal heater, nonmetal heater (Constant-current Normal resistors Depends on the SSR used Distributes loop/control output levels (mV%) to SSRs Normal resistive heaters Normal resistive heaters Normal resistive & lamp heaters models recommended.) Depends on the SSR used Depends on the SSR used П 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 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 П П



R438

160/R425





R442



R426



R447



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 plus technology and accessories for easy wiring

Ordering information

Input rated voltage	Output rated voltage	Output load voltage	Output load current	Functions	Order code	
		range			Screw technology	Push-In plus technology
12 DC	5 to 24 VDC	3 to 26.4 VDC	100 μA to 3 A	_	G3RV-SR700-D DC12	G3RV-SR500-D DC12
4 DC		(Ambient temperature = 25°C)	(Ambient temperature = 25°C)		G3RV-SR700-D DC24	G3RV-SR500-D DC24
10 AC					G3RV-SR700-D AC110	G3RV-SR500-D AC110
30 AC				G3RV-SR700-D AC230	G3RV-SR500-D AC230	
4 AC/DC					G3RV-SR700-D AC/DC24	G3RV-SR500-D AC/DC24
8 AC/DC					G3RV-SR700-D AC/DC48	G3RV-SR500-D AC/DC48
2 DC	100 to 240 VAC		With zero-cross	G3RV-SR700-A DC12	G3RV-SR500-A DC12	
4 DC	(50/60 Hz)		(Ambient temperature = 25°C)		G3RV-SR700-A DC24	G3RV-SR500-A DC24
10 AC					G3RV-SR700-A AC110	G3RV-SR500-A AC110
30 AC					G3RV-SR700-A AC230	G3RV-SR500-A AC230
4 AC/DC					G3RV-SR700-A AC/DC24	G3RV-SR500-A AC/DC24
8 AC/DC					G3RV-SR700-A AC/DC48	G3RV-SR500-A AC/DC48
2 DC				Without zero cross	G3RV-SR700-AL DC12	G3RV-SR500-AL DC12
4 DC					G3RV-SR700-AL DC24	G3RV-SR500-AL DC24
10 AC					G3RV-SR700-AL AC110	G3RV-SR500-AL AC110
30 AC					G3RV-SR700-AL AC230	G3RV-SR500-AL AC230
4 AC/DC					G3RV-SR700-AL AC/DC24	G3RV-SR500-AL AC/DC24
8 AC/DC					G3RV-SR700-AL AC/DC48	G3RV-SR500-AL AC/DC48

Note: 100 V, 200 V available on request

Accessories

Further more information on the line-up and specifications of accessories, please enter "R427" in the search field on our website industrial.omron.eu

Order code		G3RV-SR700/500-A	G3RV-SR700/500-D	
Output element		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)		



G3R-I/-O Panel mounted



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 (H×W×D)	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	(90.5x16x61	G3R-IAZR1SN-UTU
High-speed (1 kHz)	5 VDC (4 to 6 VDC)	8 mA max.	4 VDC max.	1 VDC min.			in combination with P2RF-05-Emounting	G3R-IDZR1SN-UTU
	12 to 24 VDC (6.6 to 32 VDC)		6.6 VDC max.	3.6 VDC min.			socket)	
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							Output				
function	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 (H×W×D)	Order code		
Yes	5 to 24 VDC	15 mA max.	4 VDC max.	1 VDC min.	100 to 240 VAC	0.05 to	30 A	29x13x28	G3R-OA202SZN-UTU		
No	(4 to 32 VDC)				(75 to 264 VAC)	2 A	(60 Hz, 1 cycle)	in combination with			
-		8 mA max.			5 to 48 VDC (4 to 60 VDC)	0.01 to 2 A	8 A (10 ms)	P2RF-05-Emounting socket)	G3R-ODX02SN-UTU		
_					48 to 200 VDC (40 to 200 VDC)	0.01 to 1.5 A	8 A (10 ms)	1	G3R-OD201SN-UTU		

Note: Ratings at an ambient temperature of 25°C

Socket & accessories

Order code								
DIN rail							PCB	
Screwless clamp Push-In plus Screw							Soldering	
Socket	Clip	Cross bar AC type	Cross bar DC type	Name plate	Socket	Socket	Socket	
P2RF-05-S	P2CM-S	P2RM-SR	P2RM-SB	R99-11	P2RF-05-PU	P2RF-05-E	P2R-05P	

	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 so	urce 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)						



 $^{^{\}ast 1}~$ The minimum current value is measured at 10 $^{\circ}\text{C}$ min.



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 outp	ut load	Zero cross function	Isolation	Rated input voltage	Must operate voltage	Must release voltage	Load current with/ without heatsink at 40 °C		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.	7		G3NA-205B-UTU AC100-120
				200 to 240 VAC	150 VAC max.	40 VAC min.	7		G3NA-205B-UTU AC200-240
	10 A	1	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
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
00 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



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.

- 20-60 A output current
- 24–480 VAC output voltages
- Applicable with 3-phase loads
- Replaceable power element cartridges

Ordering information

Rated output load		Zero cross	Rated input	Operating	Input	Voltage level	Voltage level		Order code
		function	voltage	voltage range	current impedance	Must operate voltage	Must release voltage	(H×W×D)	
24 to 240 VAC	40 A	Yes	5 to 24 VDC	4 to 30 VDC	7 mA max.	4 VDC max.	1 VDC min.	100×47×100	G3PA-240B-VD DC5-24
	60 A							100×110×100	G3PA-260B-VD DC5-24
	40 A		24 VAC	24 VAC 19.2 to 26.4 VAC	1.4 kΩ ±20%	19.2 VAC max.	4.8 VAC min.	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 pa	irts: Powe	r device cartridges		
Load voltage range	Carry current	Applicable SSR	Order code	
19 to 264 VAC	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			
20 A	G3PA-420B-VD, G3PA-420B-VD-2	G32A-D20			
30 A	G3PA-430B-VD, G3PA-430B-VD-2	G32A-D40			
40 A	G3PA-240B-VD, G3PA-240BL-VD				

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

hases	Rated voltage (operating voltage)	Rated output load	Permissible I ² t (half 60 Hz wave)	Applicable heater capacity AC1: resistive load)	Size in mm (H×W×D)	Number of poles	Order code
	100 to 240 VAC	15 A (at 40°C)	121 A ² s	3 kW (at 200 VAC)	100×22.5×100	1	G3PE-215B DC12-24
	(75 to 264 VAC)	25 A (at 40°C)	260 A ² s	5 kW (at 200 VAC)		1	G3PE-225B DC12-24
		35 A	1,260 A ² s	7 kW (at 200 VAC)	100×44.5×100	1	G3PE-235B DC12-24
		45 A		9 kW (at 200 VAC)		1	G3PE-245B DC12-24
	200 to 480 VAC	15 A (at 40°C)	128 A ² s	6 kW (at 400 VAC)	100×22.5×100	1	G3PE-515B DC12-24
	(180 to 528 VAC)	25 A (at 40°C)	1,350 A ² s	10 kW (at 400 VAC)		1	G3PE-525B DC12-24
		35 A		14 kW (at 400 VAC)	100×44.5×100	1	G3PE-535B DC12-24
		45 A	6,600 A ² s	18 kW (at 400 VAC)		1	G3PE-545B DC12-24
	200 to 480 VAC	15 A (at 40°C)	40°C) 260 A ² s	12.5 kW (at 480 VAC)	100×80×155	3	G3PE-515B-3N DC12-24
	(180 to 528 VAC)					2	G3PE-515B-2N DC12-24
		25 A (at 40°C)		20.7 kW (at 480 VAC)	120×80×155	3	G3PE-525B-3N DC12-24
					100×80×155	2	G3PE-525B-2N DC12-24
		35 A	1,260 A ² s	29 kW (at 480 VAC)	140×80×155	3	G3PE-535B-3N DC12-24
					120×80×155	2	G3PE-535B-2N DC12-24
		45 A	1	37.4 kW (at 480 VAC)	140×110×155	3	G3PE-545B-3N DC12-24
					140×80×155	2	G3PE-545B-2N DC12-24

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			





Solid state relays for heaters

Single-phase SSR for low heat generation enables carrying 25 A (G3PJ-_25B(-PU)) even for close mounting of three SSRs to contribute to downsizing of control panels. Models available with push-in plus input terminals.

- SCCR of 10 kA (UL 508)
- Surge pass protection improved surge dielectric strength for output currents. (OMRON testing)
- Both push-in plus and screw terminal input terminals available.
- Mount to DIN Track or with screws.
- RoHS compliant

Ordering information

Input terminal	Output terminal	Rated input voltage	Rated load voltage	Rated load current	*1	Size in mm (H×W×D)	Order code
				Close mounting (Three SSRs)	Separate mounting		
Screw terminals	Screw terminals	12 to 24 VDC	24 to 240 VAC	15 A	18 A		G3PJ-215B DC12-24
				25 A	27 A	(excl. DIN rail attachment)	G3PJ-225B DC12-24
			100 to 480 VAC	15 A	23 A	100×22.5×100 (incl. DIN rail attachment)	G3PJ-515B DC12-24
				25 A	27 A		G3PJ-525B DC12-24
Push-in plus			24 to 240 VAC	15 A	18 A	7	G3PJ-215B-PU DC12-24
				25 A	27 A	7	G3PJ-225B-PU DC12-24
			100 to 480 VAC	15 A	23 A	7	G3PJ-515B-PU DC12-24
				25 A	27 A	7	G3PJ-525B-PU DC12-24

 $[\]overline{^{*1}}$ Ambient temperature of 40°C. The applicable load current depends on the ambient temperature.

Item	G3PJ-2B(-PU)	G3PJ-5B(-PU)			
Rated input voltage	12 to 24 VDC	·			
Operating voltage range	9.6 to 30 VDC	.6 to 30 VDC			
Rated input current (impedance)	7 mA max.	mA max.			
Zero cross function	Yes	/es			
Must operate voltage	9.6 VDC max.	9.6 VDC max.			
Must release voltage	1 VDC min.	1 VDC min.			
Isolation method	Phototriac coupler				
Operation indicator	Yes (orange)				
Load voltage range	19 to 264 VAC, 50/60 Hz	75 to 528 VAC, 50/60 Hz			
Operate time	1/2 of load power source cycle +1 ms max.				
Release time	1/2 of load power source cycle +1 ms max.	1/2 of load power source cycle +1 ms max.			
Leakage current	10 mA (at 240 VAC)	10 mA (at 240 VAC) 20 mA max. (at 480 VAC)			
Ambient operating temperature	−30 to 100°C (with no icing compensation)				



Low voltage switchgear

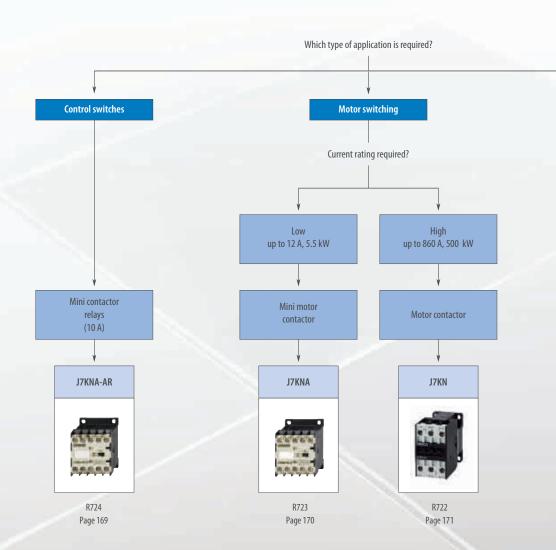
J7KN MOTOR CONTACTOR

J7KN — Motor contactors

The popular J7KN series offers many outstanding benefits, such as space-saving, small footprint, great reliability, and an ambient temperature rating up to +90°C. But now we've replaced it with a completely new design that extends its application range and will make your life even easier.

The new J7KN 10D to 22D series has the same footprint and severe ambient temperature rating, but has an improved design affording better protection, easier maintenance plus an integrated auxiliary double contact suitable for switching electronic circuits (17 V, 5 mA).

- Basic units can be combined with auxiliary contacts (top/side mounting)
- 3-main-pole and 4-main-pole versions are possible
- The power range covers 4 to 500 kW
- Different coil voltages (AC and DC)
- J7KN-10D to J7KN-22D models have integrated auxiliary contact for electronic circuits (3-pole versions)

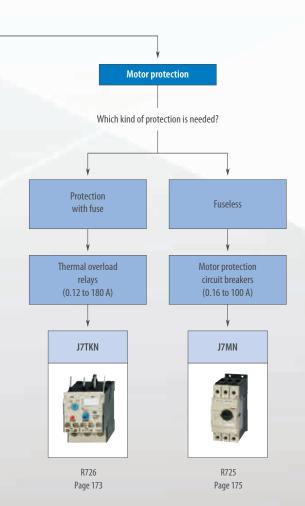










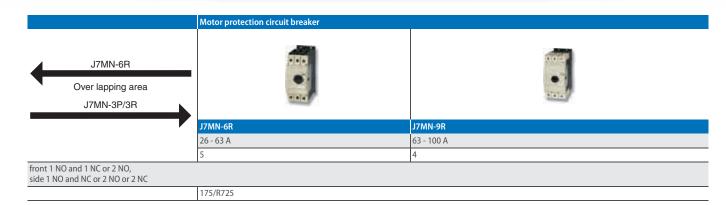


Cat	egory	Motor protection circuit breaker			
MPCB		Eman)			
	Туре	J7MN-3P/3R			
	Setting range current	0.16 - 32 A			
	Number of ranges	16			
	Auxiliary contact external	front 1 NO and 1 NC or 2 NO, side 1 NO and NC or 2 NO or 2 NC			
	Page/Quick Link	175/R725			

Cate	egory		Contactors					
					222			
Contactors	Туре		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	3 or 4		
	Auxiliary contacts	Included	-	1	1 NO or 1 NC			
	External 4 in different combinations		ions	4 contacts ^{*1}				
	Page/Quick Link		169/R724	170/R723	171/R722		171/R722	

Category		Thermal overload		
Thermal overload				
Pel	Туре		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		173/R726	173/R726

^{*1} Using J7KN with DC double wiring coils results in 1 aux. less



300 AH								
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		
171/R722			171/R722			171/R722	171/R722	

J7TKN-D	J7TKN-E
40 - 74 A	60 - 120 A
3	2
1 NO and 1 NC	1 NO and 1 NC
173/R726	173/R726
	40 - 74 A 3 1 NO and 1 NC

^{*1} Using J7KN with DC double wiring coils results in 1 aux. less

Contactors

Thermal overload

Cat	egory		Contactors				
ors					4		
Contactors	Туре		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	xiliary contacts Included -			-		
		External	front and side 6-contacts		front and side 8-contacts		
	Page/Quick Link		171/R722				

Cat	egory	Thermal overload					
Thermal overload		1					
her	Туре	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	173/R726					

Contactors





J7KN-316	J7KN-450-22	J7KN-550-22	J7KN-700-22	J7KN-860-22
160 kW	250 kW	300 kW	400 kW	500 kW
315 A	450 A	550 A	700 A	860 A
3	3	3	3	3
-	4	4	4	4
front and side 8-contacts	front 4-contacts	front 4-contacts	front 4-contacts	front 4-contacts
171/R722				

Thermal overload





J7TKN-G	J7TKN-H	
144 - 320 A	240 - 800 A	
2	3	
1 NO and 1 NC	1 NO and 1 NC	
173/R726		





Main mini contactor relay, 4-pole

Three basic units can be combined with different additional auxiliary contacts.
4-pole, 6-pole and 8-pole versions in different configurations are possible as well as different coil voltages (AC and DC). Accessories such as suppressors are available.

- Mirror contacts
- Screw fixing and snap fitting (35 mm DIN-rail)
- Rated current = 10 A (I_{th})
- Suitable for electronic devices (DIN 19240)
- Finger proof (BGV A2)

Ordering information

Operation	Conta	cts	Distinctive number	Ratings		Thermal rated	Order code	Coil vo	ltage ^{*1} ,				
			according to	AC15		current		replace with:					
	NO	NC	DIN EN 50011	230 V A	400 V A	I _{th} , A							
4-pole, with s	crew te	rminals						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	4	0	40 E	3	2	10	J7KNA-AR-40	-	-	-	24VS	-	
with diode	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		AC15 230 V	400 V	I _{th} , A	
		A	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

	Voltage marking	at the coil for	Rated control voltage U _s range for					
e.g. J7KNA-09-10-24	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, AC	3	Rated c	urrent	Auxiliary		Overload	Size in mm	Order code	Coil voltage ^{*1} ,					
		380 V			AC3	AC1	contac	t	relay	(H×W×D)		replac	e	with:			
		400 V 415 V	500 V	660 V 690 V	400 V	690 V											
		kW	kW	kW	A	Α	NO	NC				VAC				VDC	
AC/DC	3	4	4	4	9	20	1	0	J7TKN-A	57.5×45×49	J7KNA-09-10	24	110	230	400	24D	
solenoid							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	3	4	4	4	9	20	1	0	J7TKN-A		J7KNA-09-10	-	-	-	-	24VS	
with diode							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	3	4	4	4	9	20	0	1	J7TKN-A	57.5×94.5×50	J7KNA-09-01 R	24	110	230	400	24D	
solenoid	reversing	5.5	5.5	5.5	12	20	0	1	J7TKN-A		J7KNA-12-01 R	24	110	230	400	24D	
DC solenoid	contactors	contactors	4	4	4	9	20	0	1	J7TKN-A		J7KNA-09-01 R	-	-	-	-	24VS
with diode	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	Auxiliary contacts										
Contacts	Contacts			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 revers	sing contactors										
1	1	3 A	2 A	J73KN-AM-11V							
1	1	3 A	2 A	J73KN-AM-11X							
Link modules between MPC	B & contactors										
For MPCB J7MN-3P/J7MN-3F	ł		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											

Suffix to contactor type e.g. J7KNA-09-10-24	Voltage nat the coi		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 leff	at U _e = 690 VAC	165 A	165 A
Breaking	400 VAC	100 A	100 A
capacity l _{eff}	500 VAC	90 A	90 A
$\cos \phi = 0.65$	690 VAC	80 A	80 A
Mechanical life AC opera	ted	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 heavyduty 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		AC2, AC	3	Rated current	Auxili conta		Overload relay	Size in mm (H × W × D)	Order code	Coil	voltag	e ^{*1} , re	place ₋	w i	ith:
		rated motor current	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
ACOI DC		1071	4	5.5	5.5	25	0	1	- 37 11017 5	07 X 13 X 02.3	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	7		J7KN-18D-01	24	110	230	400	24D	110D
		22 A	11	10	10	32	1	0	7		J7KN-22D-10	24	110	230	400	24D	110D
			11	10	10	32	0	1	7		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		200 × 145 × 208	J7KN-176* ²	24	110	230	400	24	110
		210 A	110	160	160	350	0	0	J7TKN-G		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		10 A	4	5.5	5.5	25	1	0	J7TKN-B	67 × 45 × 82.5	J7KNG-10-10	-	-	-	-	24D	110D
operated			4	5.5	5.5	25	0	1			J7KNG-10-01	-	-	-	-	24D	110D
solenoid motor		14 A	5.5	7.5	7.5	25	1	0			J7KNG-14-10	-	-	-	-	24D	110D
contactor			5.5	7.5	7.5	25	0	1			J7KNG-14-01	-	-	-	-	24D	110D
		18 A	7.5	10	10	32	1	0			J7KNG-18-10	-	-	-	-	24D	110D
			7.5	10	10	32	0	1			J7KNG-18-01	-	-	-	-	24D	110D
		22 A	11	10	10	32	1	0			J7KNG-22-10	-	-	-	-	24D	110D
			11	10	10	32	0	1			J7KNG-22-01	-	-	-	-	24D	110D
		24 A	11	15	15	50	0	0	J7TKN-B	78 × 45 × 104.5	J7KNG-24	-	-	-	-	24D	110D
		32 A	15	18.5	18.5	65	0	0	J7TKN-C		J7KNG-32	-	-	-	-	24D	110D
		40 A	18.5	18.5	18.5	80	0	0			J7KNG-40	-	-	-	-	24D	110D

^{*1} Other coil voltages available on request



^{*2} Universal current (AC and DC)

Operation	Poles	AC3 400 V	Rating	AC2, AC3	Rated current	Auxiliary contact		Overload relay	Size in mm $(H \times W \times D)$	Order code	Coil voltage *1, replace with:					
		rated motor	380 V 400 V	AC1	AC1											
		current	415 V kW	400 V kW	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		10 A	4	17.5	25	0	0		$67 \times 45 \times 82.5$	J7KNG-10-4	_				24D	110D
solenoid mo-		14 A	5.5	17.5	25	0	0			J7KNG-14-4					24D	110D
tor contactor		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 ope	erational	current	Conta	cts	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

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 Suitable for contactors	Туре		Applicable coil voltage	Order code	
J7KNA(-AR)	AC/DC	RC-unit snap-on	12 to 48 V	J74KN-D-RC24	
	AC/DC	contactor	48 to 127 V	J74KN-D-RC110	
	AC/DC	1	110 to 250 V	J74KN-D-RC230	
J7KN-10D to -74	AC/DC	RC-unit snap-on	12 to 48 V	J74KN-C2-RC24	
	AC/DC	contactor	48 to 127 V	J74KN-C2-RC110	
	AC/DC	1	110 to 230 V	J74KN-C2-RC230	
	AC/DC		230 to 415 V	J74KN-C2-RC400	

Additional terminals single pole	Cable cross to clamp (r			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	J74KN-LG-10404
J7KN-210 to -316	one contactor	J74KN-LG-11457

Marking systems Description	Specification	Order code
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	Max. current	Order code
Function	contactors	(A)	
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	J7KN-10D to -22D	22	J74-WKSD-B2
(4 parts)	J7KN-24 to -40	40	J74-WKSD-C

Coil voltages	Suffix to contact	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 ($H \times W \times D$)	Order code
	D.O.L. (A)	Star-delta (A)	(incl. standard J7KN[A] contactor)	
7KNA-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
7KN-10D to J7KN-40	0.12 to 0.18	-	126.5 × 45 × 70 (J7KN-10D to J7KN-22D);	J7TKN-B-E18
	0.18 to 0.27	-	141.5 × 45 × 87.5 (J7KN-24 to J7KN-40)	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
7KN-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
7KN-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
7KN-151 to J7KN-176	120 to 180	208 to 312	290 × 110 × 162	J7TKN-F-180
7KN-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
7KN-450 to J7KN-860	240 to 360	416 to 623	372 × 1246 × 1225 (J7KN-450)	J7TKN-H-360
	360 to 540	623 to 935	395 × 1246 × 1225 (J7KN-550)	J7TKN-H-540
	540 to 800	935 to 1385	487 × 1280 × 1291 (J7KN-700) 540 × 1280 × 1291 (J7KN-860)	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

Туре		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	Operation	−25 to 60°C							−25 to 55°C
temperature	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 ter- minals, suit-	Busbar 18×4	Busbar 25×6	See accesso ries
	Flexible mm ²	0.75 to 4 0.5 to 2.5	1 to 4	0.75 to 6	6 to 25	able for bushing one	Screw M8	Screw M10	
	Flexible with multi-core cable end mm ²	0.5 to 2.5 0.5 to 1.5		0.75 to 6 41	4 to 25	connector 70 mm ² (stranded) per			
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	24 V	5 A	3 A	4 A		5 A	3 A		4 A
Utilization category AC15	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	24 V	1.2 A	1 A	1.2 A					
Utilization category DC13	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 Suitable for motors current 3 ~ 400 V kW			Short-circuit breaking	Size in mm ($H \times W \times D$)	Order code	
	3 ~ 400 V kW	Thermal overload release A	Instantaneous short-circuit release A	capacity at 3 ~ 400 V kA		
.16	_	0.10-0.16	2.1	100	98 × 45 × 75	J7MN-3P-E16
).25	0.06	0.16-0.25	3.3	100		J7MN-3P-E25
).4	0.09	0.25-0.4	5.2	100		J7MN-3P-E4
).63	0.18	0.4-0.63	8.2	100		J7MN-3P-E63
	0.25	0.63-1	13	100		J7MN-3P-1
.6	0.55	1–1.6	20.8	100		J7MN-3P-1E6
.5	0.75	1.6-2.5	32.5	100		J7MN-3P-2E5
	1.5	2.5-4	52	100		J7MN-3P-4
	2.2	4–6	78	100		J7MN-3P-6
	3	5–8	104	100		J7MN-3P-8
0	4	6–10	130	50		J7MN-3P-10
3	5.5	9–13	169	50		J7MN-3P-13
7	7.5	11–17	221	20		J7MN-3P-17
2	7.5	14-22	286	15		J7MN-3P-22
6	11	18–26	338	15		J7MN-3P-26
2	15	22–32	416	15		J7MN-3P-32
.16	_	0.10-0.16	2.1	100	98 × 45 × 100	J7MN-3R-E16
.25	0.06	0.16-0.25	3.3	100		J7MN-3R-E25
.4	0.09	0.25-0.4	5.2	100		J7MN-3R-E4
.63	0.18	0.4-0.63	8.2	100		J7MN-3R-E63
	0.25	0.63-1	13	100		J7MN-3R-1
.6	0.55	1–1.6	20.8	100		J7MN-3R-1E6
.5	0.75	1.6-2.5	32.5	100		J7MN-3R-2E5
	1.5	2.5–4	52	100		J7MN-3R-4
	2.2	4–6	78	100		J7MN-3R-6
	3	5–8	104	100		J7MN-3R-8
0	4	6–10	130	100		J7MN-3R-10
3	5.5	9–13	169	100		J7MN-3R-13
7	7.5	11–17	221	50		J7MN-3R-17
2	7.5	14–22	286	50		J7MN-3R-22
.6	11	18–26	338	50		J7MN-3R-26
32	15	22–32	416	50		J7MN-3R-32
6	12.5	18–26	338	50	140 × 55 × 144	J7MN-6R-26
2	15	22–32	416	50		J7MN-6R-32
0	18.5	28–40	520	50		J7MN-6R-40
0	22	34–50	650	50		J7MN-6R-50
3	30	45-63	819	50		J7MN-6R-63
3	30	45–63	819	50	165 × 70 × 171	J7MN-9R-63
5	37	55-75	975	50		J7MN-9R-75
10	45	70–90	1170	50		J7MN-9R-90
100	_	80–100	1300	50		J7MN-9R-100



Accessories

Description	Version		For circuit breaker	Order code
Transverse auxiliary contact block				
Contact block	1 NO + 1 NC		All	J77MN-11F
	2NO			J77MN-20F
	2NC		1	J77MN-02F
Auxiliary contact block for left hand side mounting (max. 2 μ	c. per circuit breaker)			
Contact block (9 mm)	1 NO + 1 NC		All	J77MN-11S
	2NO			J77MN-20S
	2NC			J77MN-02S
Signalling switch for left hand side mounting (max. 1 pc. per	circuit breaker)			
Signalling switch (18 mm)	1 NO + 1 NC any tripping	g condition	J7MN-3P/-3R	J77MN-TA-11S
			J7MN-6R/-9R	J77MN-TB-11S
	1 NO + 1 NC short circuit tripping condition		All	J77MN-T-11S
Undervoltage releases for right hand side mounting (max 1 $$			_	
	AC 50 Hz	AC 60 Hz		<u></u>
Trips the circuit breaker when the voltage is interrupted. Pre-	24 V	28 V	All	J77MN-U-24
ents the motor from being restarted accidentally when the oltage is restored, suitable for EMERGENCY STOP according to DE 0113	110-127 V	120 V		J77MN-U-110
	220-230 V	240-260 V		J77MN-U-230
	240 V	277 V		J77MN-U-240
	380-400 V	440–460 V		J77MN-U-400
	415-440 V	460–480 V		J77MN-U-415
Shunt releases for right hand side mounting (max 1 pc. per o	ircuit breaker)		_	
	AC 50 Hz	AC 60 Hz		
Trips the circuit breaker when the	24 V	28 V	All	J77MN-S-24
se coil is energized	110-127 V	120 V		J77MN-S-110
	220-230 V	240-260 V		J77MN-S-230
	240 V	277 V		J77MN-S-240
	380-400 V	440-460 V		J77MN-S-400
	415–440 V	460-480 V		J77MN-S-415
Terminal block				
Terminal block	Up to 600 V according to UL 489 not for transverse auxiliary contact block		J7MN-3R	J77MN-TB32
			J7MN-9R	J77MN-TB100

Insulated 3-Phase Busbar System IP20

Description	Connection type	Version	For Units (MPCB)	Order code
3-phase busbars;	Spade	for 2 units	J7MN-3P; J7MN-3R	J77MN-CPM-3-45-2S
modular spacing = 45 mm		for 3 units		J77MN-CPM-3-45-3S
		for 4 units		J77MN-CPM-3-45-4S
		for 5 units		J77MN-CPM-3-45-5S
Line side terminal 3-pole, connection from above; conductor cross-section solid or stranded 6–25 mm ² with end sleeve 4–16 mm ²	Spade	acc. IEC/EN 60947-1, 60947-2, 60947-4-1 and VDE 0660	J7MN-3P; J7MN-3R	J77MN-BTC-63-SE
Line side terminal 3-pole, connection from above; conductor cross-section solid or stranded 6–25 mm² with end sleeve 4–16 mm²	Spade	up to 600 V acc. UL 489	J7MN-3P; J7MN-3R	J77MN-BTC-63-SEV
Shrouds for unused terminals on busbar system	Spade		J7MN-3P; J7MN-3R	J77MN-TA-63S



Low voltage switchgear

Туре		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	

Monitoring products

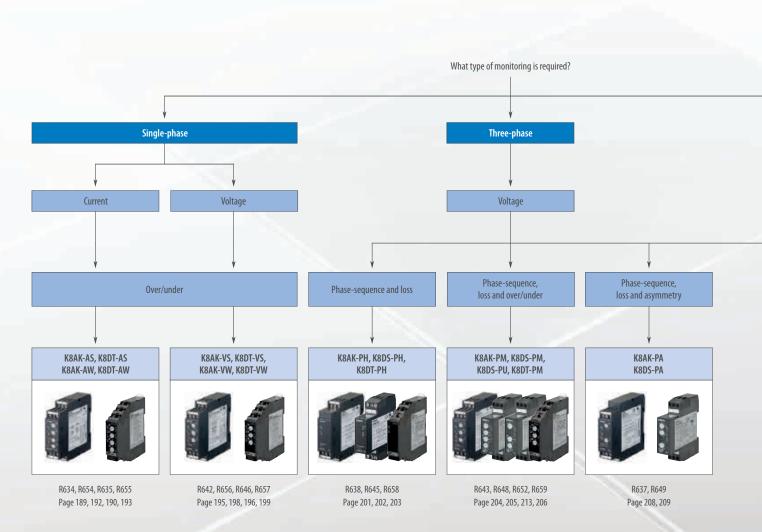
THE COMPLETE MONITORING RANGE

K8 series — The smart way to protect your system

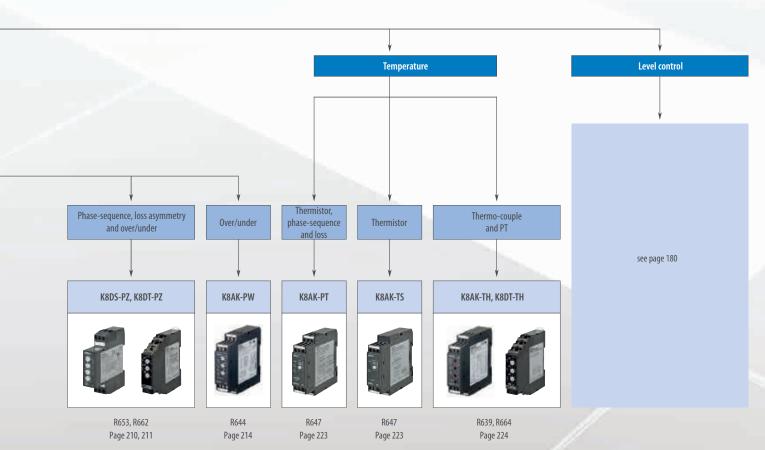
The K8 series offers you a flexible and complete one-stop shopping solution!

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.

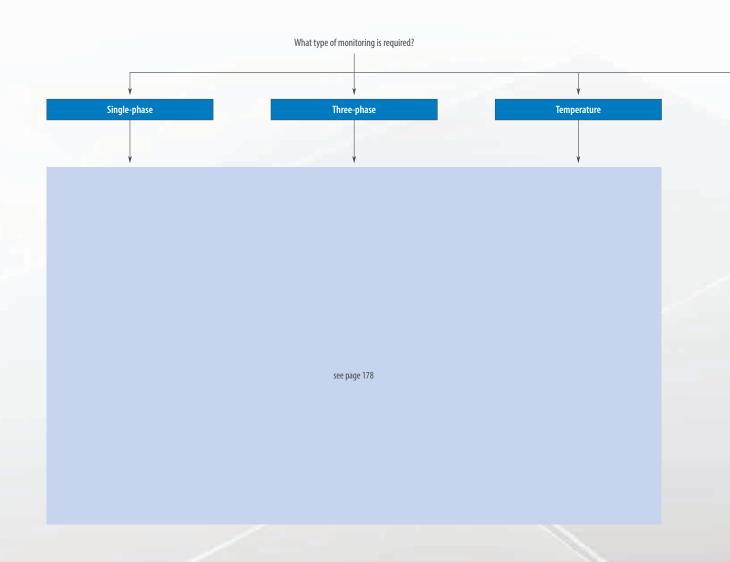
- 1-phase: full-span of range setting, all models with timer function
- 3-phase: wide range of global voltage settings
- Temperature monitoring relay: wide temperature range with precision increased
- Easy-to-set parameters
- Screwless terminal type with Push-in plus technology allows easy wiring.



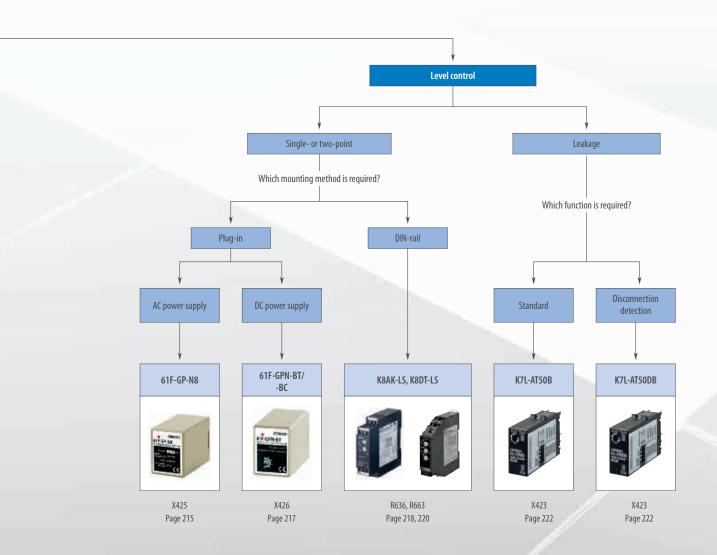




Monitoring products







Catego	ry	1-phase cu	urrent	1-phase vo	oltage	3-phase voltage phase-sequence/phas	e-loss	3-phase voltage phase-sequence/phas over/under	e-loss
		(Coooli		A. E (3)			12		12000
Model		K8AK-AS	K8AK-AW	K8AK-VS	K8AK-VW	K8AK-PH	K8DS-PH	K8AK-PM	K8DS-PM
Selection criteria	Specialty	Ideal for cu monitoring industrial h motors.		Ideal for vo monitoring industrial f equipment	for acilities and	ldeal for phase-sequen monitoring for industri equipment.		ldeal for monitoring 3- for industrial facilities a	
Sele	Sensing range (configurable)	20 mA to 8 100 or 200 current tra	A with	1 to 600 V		Same as supply voltage	2		
	24 VAC					-	-	-	-
	100 VAC	-	-	-	-	-	-	-	-
	110 VAC	-	-	-	-	-	-	-	-
	115 VAC	-	-	-	-	-	-	-	-
	120 VAC	-	-	-	-	-	-	-	-
Supply voltage AC	200 VAC	-	-	-	-	-	-	-	-
Itag	220 VAC	-	-	-	-	-	-	-	-
0 /	230 VAC	-	-	-	-		-	-	-
oply	240 VAC	-	-	-	-	-	-	-	-
Su	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 220 to 277 VAC	-	_	-	-	-	-	(-PM2, 3-wire)	•
PC S	24 VDC	•	•	•	•	_	_	(-PM2, 4-wire)	_
Supply voltage DC	12 to 24 VDC	-	-	-	-	_	-	_	_
	Transistor NPN	-	-	-	-	-	-	-	-
trol	Transistor PNP	-	-	-	-	-	-	-	-
Control	Relay	(1 SPDT)	(2 SPDT)	(1 SPDT)	(2 SPDT)	(1 DPDT)	(1 SPDT)	(2 SPDT)	(1 SPDT)
L/A	LED operation indicator								
Features	Adjustable sensitivity	-	_	_	-	_	-	-	_
Feat	Electrode types	_	_	_	_	_		_	
		100/053	102/2525	105/05/5	100/0515	201 /0620	202/0645	204/0642	205/0640
Page/Q	uick Link	189/R634	192/R635	195/R642	198/R646	201/R638	202/R645	204/R643	205/R648



3-phase voltage phase-sequence, loss and asymmetry		3-phase voltage, asymmetry, phase-sequence and phase-loss, asymmetry and over/ under	3-phase undervoltage, phase-sequence and phase-loss	3-phase voltage over/under	Temperature thermistor, phase- sequence and loss	Temperature thermistor	Temperature thermo-couple and PT
		1 3000		E			
K8AK-PA	K8DS-PA	K8DS-PZ	K8DS-PU	K8AK-PW	K8AK-PT	K8AK-TS	K8AK-TH
Ideal for 3-phase volt monitoring for indust equipment.	rial facilities and	Ideal for monitoring 3- for industrial facilities a	phase power supplies 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
					100 to 240 VAC 24 VAC/DC		24 VAC/DC
_	-	-	-	-			
_	-	-	-	-	-	-	-
_	-	-	-	-	-	-	-
_	-	-	-	-	-	-	-
_	-	-	-	-	-	-	-
_	-	-	-	-	-	-	-
_	-	-	-	-	-	-	-
_	-	-	-	-	-	-	-
_	-	-	-	-	-	-	-
_	-	-	-	-	•	•	•
	-	-	-	- (-PW1, 3-wire)	_	-	-
(-PA1, 4-wire)	-	-	-	(-PW1, 4-wire)	_	_	-
(-PA2, 3-wire)	-	•	•	(-PW2, 3-wire)	_	_	_
■ (-PA2, 4-wire)	-	<u>-</u>	_	■ (-PW2, 4-wire)	_	_	_
	-	_	_	_	•	•	•
-	-	-	-	-	-	_	-
-	-	_	-	-	-	-	-
-	-	-	-	-	-	-	-
(1 SPDT)	(1 SPDT)	(1 SPDT)	(1 SPDT)	(2 SPDT)	(1 SPDT)	(1 SPDT)	(1 SPDT)
-	-		-	-	•	-	-
-	-	-	-	-	-	-	-
_	_	-	-	-	-	_	-
208/R637	209/R649	210/R653	213/R652	214/R644	223/R647	223/R647	R639
200/1103/	209/11049	210/11033	213/11032	417/1077	223/1104/	22J/11UT/	11039





No/not available





Catego	ry	1-phase cu	irrent	1-phase vo	oltage	3-phase voltage phase-sequence / phase-loss	3-phase voltage phase-sequence / loss, over/under voltage	3-phase voltage phase-sequence / loss/Asymmetry, over/under voltage	Temperature thermo-couple and PT
Model		K8DT-AS	K8DT-AW	K8DT-VS	K8DT-VW	K8DT-PH	K8DT-PM	K8DT-PZ	K8DT-TH
Selection criteria	Specialty	Ideal for cu monitoring industrial h motors.	for	Ideal for vo monitoring industrial fo equipment	for acilities and	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.	Ideal for monitoring 3-phase power supplies for industrial facilities and equipment.	Compact and slim relay ideal for temperature alarms and monitoring
Select	Sensing range (configurable)	2 m to 500 mA AC/DC, 0.1 to 5 A AC/DC, 10 to 200 A AC/DC by CT		1 to 150 V AC/DC, 20 to 600 V AC/DC		3-phase 3 wires, 200 to 480 VAC		Thermo-couple (K, J, T, E), Pt100, Pt1000 Thermo-couple (K,J,T,E,B,R,S, PL II)	
	24 VAC					-	-	-	
	100 VAC	-	-	-	-	-	-	-	-
	110 VAC	-	-	-	-	-	-	-	-
	115 VAC	-	-	-	-	-	-	-	-
	120 VAC	-	-	-	-	-	-	-	-
AC	200 VAC	-	_	_	-	-	-	-	-
age	220 VAC	-	_	_	-	-	-	-	-
/olt	230 VAC	-	-	_	-	-	-	-	-
\S	240 VAC	-	_	_	-	-	-	-	-
Supply voltage AC	100 to 240 VAC					-	-	-	
01	200 to 480 VAC	-	-	_	-		-	-	_
	200 to 240 VAC	-	-	-	-	-			-
	115 to 138 VAC	-	_	_	-	-	-	-	-
	380 to 480 VAC	-	-	_	-	-	•	•	-
	220 to 277 VAC	-	-	-	-	-	-	-	-
ply Je DC	24 VDC	-	•	-	•	_	-	-	
Supply voltage DC	12 to 24 VDC	-	-	-	-	_	-	-	-
	Transistor NPN				•	•	•	•	•
trol	Transistor PNP								
= ==	Relay	(1 SPDT)	(1 SPDT)	(1 SPDT)	(1 SPDT)	(1 SPDT)	(1 SPDT)	(1 SPDT)	(1 SPDT)
S	LED operation indicator					•	-	-	-
Features	Adjustable sensitivity	-	-	-	-	-	-	-	-
Feat	Electrode types	_	_	_	_	_	_	_	_
		100/PC54	102/0655	106/0050	100/0057	202/0659	206/0650	211/0662	224/0664
rage/Q	uick Link	190/R654	193/R655	196/R656	199/R657	203/R658	206/R659	211/R662	224/R664









Category		Conductive level controller							
		OFFICE ST GP-MI ST GP	OREGINAL CONTROL CONTR	a common stiff Lawy dec					
Model		61F-GP-N8	61F-GPN-BT	61F-GPN-BC	K8DT-LS	K8AK-LS			
Selection criteria	Specialty	Single or two-point	AC sine wave between electrodes for stable detection with no electrolysis	AC sine wave between electrodes for stable detection with no electrolysis	ldeal for level control for industrial facilities and equipment	Ideal for level control for industrial facilities and equipment			
Sele	Sensing range (configurable)	4 to 50 kΩ	0 to 100 kΩ	1 to 100 kΩ	10 k to 100 kΩ	10 to 100 kΩ			
	24 VAC		-	-	•				
	100 VAC		-		-	-			
	110 VAC				-	-			
	115 VAC	-			-	-			
	120 VAC				-	-			
Supply voltage AC	200 VAC				-	-			
tage	220 VAC				-	-			
vo lt	230 VAC				-	-			
^d	240 VAC				-	-			
Sup	100 to 240 VAC	_			-				
	200 to 480 VAC	-			-	-			
	200 to 240 VAC	-			-	-			
	115 to 138 VAC	_			-	-			
	380 to 480 VAC	-	_		_	-			
	220 to 277 VAC	-			-	-			
Supply voltage DC	24 VDC	_	•	•					
Sup	12 to 24 VDC	-	_	_	_	_			
	Transistor NPN	-	-	•	•	-			
trol	Transistor PNP	1	-	-		-			
Control	Relay	=		=	(1 SPDT)	(1 SPDT)			
Š.	LED operation indicator	-	-	-	-				
Features	Adjustable sensitivity	-	•	•	-	-			
Fe	Electrode types	Electrode holder: PSS, PS-	-31, BF-1 and BS-1		-	-			
Page/C	Quick Link	215/X425	217/X426		220/R663	218/R636			



Liquid leakage sensor amplifier



K7L-AT50B	K7L-AT50DB
Sensor amplifier, AC sine wave between electrodes for stable detection with no electrolysis	Sensor amplifier with disconnection detection function
0 to 50 MΩ	1 to 50 MΩ
0 to 30 WZ2	1 (0 30 Will)
-	_
-	_
-	_
	•
Liquid leakage sensor band	F03-16PE
222/X423	

■ 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,	24 VAC/DC	K8AK-AS1 24 VAC/DC
10 to 100 mA AC/DC, 50 to 500 mA AC/DC	100 to 240 VAC	K8AK-AS1 100-240 VAC
0.1 to 1 A AC/DC,	24 VAC/DC	K8AK-AS2 24 VAC/DC
0.5 to 5 A AC/DC, 0.8 to 8 A AC/DC	100 to 240 VAC	K8AK-AS2 100-240 VAC
10 to 100 A AC,	24 VAC/DC	K8AK-AS3 24 VAC/DC
20 to 200 A AC	100 to 240 VAC	K8AK-AS3 100-240 VAC

Accessories

Current transformer	Input range	Applicable relay	Order code
O D	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		<u> </u>			
Ambient operating te	emperature	−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 f	requency	50/60 Hz±5 Hz (AC power supply)			
Output relays	Resistive load	5 A at 250 VAC or at 30 VDC			
(1 × SPDT, normally closed operation)	Maximum contact voltage	250 VAC or 30 VDC			
ciosed operation)	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	K8AK-AS1/-AS2	DC input or AC input (45 to 65 Hz)			
range	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 × [))	90 × 22.5 × 100			



K8DT-AS 1-phase control





Single-phase current relay

Detect errors in motors and other equipment through current changes. Use in either overcurrent or undercurrent mode.

- Monitor AC or DC currents with one relay.
- Use with commercially available CTs (CT secondary side: 0 to 1 A or 0 to 5 A).
- Settings for the operating value, hysteresis, startup lock time, and operating time.
- Width of 17.5 mm to reduce space required in panels.
- · Push-in plus Technology that reduce wiring work.
- UL listed for easy shipping to North America.
- Double-insertion holes for crossover wiring (all terminals).
- Models added with transistor outputs for superior contact reliability.
- RoHS compliant

Ordering information

Setting range	Power supply voltage	Output	Order code
2 to 20 mA AC/DC,	24 VAC/DC	Relay: SPDT contact output	K8DT-AS1CD
10 to 100 mA AC/DC,		Transistor: Open collector	K8DT-AS1TD
50 to 500 mA AC/DC	100 to 240 VAC	Relay: SPDT contact output	K8DT-AS1CA
		Transistor: Open collector	K8DT-AS1TA
0.1 to 1 A AC/DC,	24 VAC/DC	Relay: SPDT contact output	K8DT-AS2CD
0.5 to 5 A AC/DC		Transistor: Open collector	K8DT-AS2TD
	100 to 240 VAC	Relay: SPDT contact output	K8DT-AS2CA
		Transistor: Open collector	K8DT-AS2TA
10 to 100 A AC *1,	24 VAC/DC	Relay: SPDT contact output	K8DT-AS3CD
20 to 200 A AC *1		Transistor: Open collector	K8DT-AS3TD
	100 to 240 VAC	Relay: SPDT contact output	K8DT-AS3CA
		Transistor: Open collector	K8DT-AS3TA

^{*1} The K8DT-AS3_ is designed to be used in combination with an OMRON K8AC-CT200L Current Transformer (CT). (Direct input is not possible.)

Accessories

Omron CT

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

Commercially Available CTs

Appearance	CT current on secondary side	Applicable Relay
	0 to 1 A AC, 0 to 5 A AC	K8DT-AS2

ppearance	Order code
	Y92A-D1A



Monitoring products

Item		K8DT-AS1	K8DT-AS2	K8DT-AS3	
Power supply voltage K8DT-AS_D K8DT-AS_A		24 VAC 50/60 Hz, 24 VDC			
		100 to 240 VAC 50/60 Hz			
Power consumption		24 VAC/DC: 1.8 VA/1 W max. 100 to 240 VAC: 2.5 VA max.			
Operate (SV)	Operating value setting range	10% to 100% of the maximum value of the setting range 2 to 20 mA AC/DC 10 to 100 mA AC/DC 50 to 500 mA AC/DC	10% to 100% of the maximum value of the setting range 0.1 to 1 A AC/DC (Compatible with commercially available CTs.) 0.5 to 5 A AC/DC (Compatible with commercially available CTs.)	10% to 100% of the maximum value of th setting range When used with the OMRON CT (K8AC-CT200L). 10 to 100 A AC 20 to 200 A AC	
	Operating value	100% operation at set value			
Reset (HYS)	Hysteresis	5% to 50% of operating value			
	Resetting method	Manual reset/automatic reset (switchable)			
Operating time setting	g range (T)	0.1 to 30 s			
Startup lock time setti	ing range (LOCK)*1	0 to 30 s (The startup lock timer starts whe	n the input has reached approximately 30%	or more of the set value.)	
Indicators		Power (PWR): Green, Output (OUT): Yellow	, Alarm outputs (ALM): Red		
Output form		Relay: SPDT contact output Transistor: Open collector Switchable between normally open and no	ormally closed with a DIP switch setting.		
Output relays ratings	Resistive load	250 VAC 5 A or 30 VDC 5 A			
	Inductive load	250 VAC 1 A, 48 VDC 0.2 A			
	Minimum load	5 VDC, 10 mA (reference values)			
	Mechanical life	10 million operations min.			
	Electrical life	5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC or 30 VDC:100,000 operation			
Transistor output	Contact form	SPST-NO (Open collector)			
ratings	Rated voltage	24 VDC (maximum voltage: 26.4 VDC)			
	Maximum current	50 mA DC			
Ambient operating ter	mperature	-20 to 60°C (with no condensation or icing	1)		
Storage temperature		-25 to 65°C (with no condensation or icing	1)		
Case material		PC, UL 94 V-0			
Weight		Approx. 100 g			
Size in mm (H \times W \times D)	9)	90×17.5×90			
Operating voltage ran	ige	85% to 110% of power supply voltage			
Rated power supply fr	equency	50/60 Hz ±5 Hz			
Input frequency range	1	DC input or AC input (45 to 65 Hz)		AC input (45 to 65 Hz)	
Overload capacity ^{*2}		Continuous input at 120% of maximum input, 1 s at 150% Continuous input at 120%, 30		Continuous input at 120%, 30 s at 200%, and 1 s at 600% with an OMRON CT (K8AC-CT200L)	
Repeat error	Operating value	±0.5% full scale (at 25°C and 65% humidity	, rated power supply voltage)		
ļ	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)			
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2,	, Overvoltage category III)		
	EMC	EN 60947-5-1			
	Cafatu atau danda	UL 60947-5-1 (Listing), Korean Radio Waves Act (Act 10564), CCC (GB14048.5)			
1	Safety standards	TOE 00547 5 1 (Eisting), Norcan hadio wave	Terminals: IP20		

^{*1} Enabled only for overcurrent operation.
*2 Overload capacity of primary side of CT.

K8AK-AW 1-phase control



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,	24 VAC/DC	K8AK-AW2 24 VAC/DC
0.5 to 5 A AC/DC	100 to 240 VAC	K8AK-AW2 100-240 VAC
10 to 100 A AC,	24 VAC/DC	K8AK-AW3 24 VAC/DC
20 to 200 A AC	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)

Ambient operating te	mperature	−20 to 60°C (with no condensation or icing)
Storage temperature		−25 to 65°C (with no condensation or icing)
Operating voltage ran	ige	85% to 110% of rated operating voltage
Rated power supply for	requency	50/60 Hz±5 Hz (AC power supply)
Output relays	Resistive load	5 A at 250 VAC or at 30 VDC
(1 × SPDT, normally closed operation)	Maximum contact voltage	250 VAC or 30 VDC
ciosed operation)	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	<u> </u>	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 I	ock (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	K8AK-AW1/-AW2	DC input or AC input (45 to 65 Hz)
range	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 overcurrent/undercurrent relay

Detect errors in motors and other equipment through current changes. Monitor for overcurrents and undercurrents simultaneously with one relay.

- Monitor AC or DC currents with one relay
- Use with commercially available CTs (CT secondary side: 0 to 1 A or 0 to 5 A)
- Width of 17.5 mm to reduce space required in panels
- Push-in plus Technology that reduce wiring work
- UL listed for easy shipping to North America
- Double-insertion holes for crossover wiring (all terminals)
- Models added with transistor outputs for superior contact reliability
- RoHS compliant

Ordering information

Setting range	Power supply voltage	Output	Order code
2 to 20 mA AC/DC 10 to 100 mA AC/DC	24 VAC/DC	Relay: SPDT contact output	K8DT-AW1CD
		Transistor: Open collector	K8DT-AW1TD
50 to 500 mA AC/DC	100 to 240 VAC	Relay: SPDT contact output	K8DT-AW1CA
		Transistor: Open collector	K8DT-AW1TA
0.1 to 1 A AC/DC	24 VAC/DC	Relay: SPDT contact output	K8DT-AW2CD
0.5 to 5 A AC/DC		Transistor: Open collector	K8DT-AW2TD
	100 to 240 VAC	Relay: SPDT contact output	K8DT-AW2CA
		Transistor: Open collector	K8DT-AW2TA
0 to 100 A AC ^{*1}	24 VAC/DC	Relay: SPDT contact output	K8DT-AW3CD
20 to 200 A AC*1		Transistor: Open collector	K8DT-AW3TD
	100 to 240 VAC	Relay: SPDT contact output	K8DT-AW3CA
		Transistor: Open collector	K8DT-AW3TA

The K8DT-AW3_ is designed to be used in combination with an OMRON K8AC-CT200L Current Transformer (CT). (Direct input is not possible.)

Accessories

Omron CT

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

Commercially Available CTs

Appearance	CT current on secondary side	Applicable Relay
	0 to 1 A AC, 0 to 5 A AC	K8DT-AW2

Y92A-D1A	ppearance	Order code
		Y92A-D1A

Item		K8DT-AW1	K8DT-AW2	K8DT-AW3		
Power supply voltage K8DT-AWD K8DT-AWA		24 VAC 50/60 Hz, 24 VDC				
		100 to 240 VAC 50/60 Hz				
Power consumption		24 VAC/DC: 1.8 VA/1 W max. 100 to 240 VAC: 2.5 VA max.				
Operate (AL1, AL2)	Operating value setting range	10% to 100% of the maximum value of the setting range 2 to 20 mA AC/DC 10 to 100 mA AC/DC 50 to 500 mA AC/DC	10% to 100% of the maximum value of the setting range 0.1 to 1 A AC/DC (Compatible with commercially available CTs.) 0.5 to 5 A AC/DC (Compatible with commercially available CTs.)	10% to 100% of the maximum value of the setting range When used with the OMRON CT (K8AC-CT200L). 10 to 100 A AC 20 to 200 A AC		
	Operating value	100% operation at set value				
Reset	Reset value	5% of operating value (fixed)				
	Resetting method	Manual reset/automatic reset (switchable)				
Operating time setting	g range (T)	0.1 to 30 s				
Startup lock time setti	ing range (LOCK) ^{*1}	0 to 30 s (The startup lock timer starts whe	n the input has reached approximately 30%	or more of the set value.)		
Indicators		Power (PWR): Green, Output (OUT): Yellow	, Alarm output 1 (ALM1): Red, Alarm output	2 (ALM2): Red		
Output form		Relay: SPDT contact output Transistor: Open collector				
Output relays ratings	Resistive load	250 VAC 5 A or 30 VDC 5 A				
	Inductive load	250 VAC 1 A, 48 VDC 0.2 A				
	Minimum load	5 VDC, 10 mA (reference values)				
	Mechanical life	10 million operations min.				
	Electrical life	5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC or 30 VDC:100,000 operation				
Transistor output	Contact form	SPST-NO (Open collector)				
ratings	Rated voltage	24 VDC (maximum voltage: 26.4 VDC)				
	Maximum current	50 mA DC				
Ambient operating te	mperature	–20 to 60°C (with no condensation or icing	1)			
Storage temperature		–25 to 65°C (with no condensation or icing	1)			
Case material		PC, UL 94 V-0				
Weight		Approx. 100 g				
Size in mm (H \times W \times D	9)	90×17.5×90				
Operating voltage ran	ige	85% to 110% of power supply voltage				
Rated power supply fr	equency	50/60 Hz ±5 Hz				
Input frequency range	2	DC input or AC input (45 to 65 Hz)		AC input (45 to 65 Hz)		
Overload capacity*2		Continuous input at 120% of maximum input at 1	out, 1 s at 150%	Continuous input at 120%, 30 s at 200%, and 1 s at 600% with an OMRON CT (K8AC-CT200L)		
Repeat error	Operating value	±0.5% full scale (at 25°C and 65% humidity, rated power supply voltage)				
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)				
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2,	, Overvoltage category III)			
	EMC	EN 60947-5-1				
	Safety standards	UL 60947-5-1 (Listing), Korean Radio Wave	es Act (Act 10564), CCC (GB14048.5)			
Degree of protection		Terminals: IP20				

^{*1} Enabled only for overcurrent operation.
*2 Overload capacity of primary side of CT.





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,	24 VAC/DC	K8AK-VS2 24 VAC/DC
3 to 30 VAC/DC, 15 to 150 VAC/DC	100 to 240 VAC	K8AK-VS2 100-240 VAC
20 to 200 VAC/DC,	24 VAC/DC	K8AK-VS3 24 VAC/DC
30 to 300 VAC/DC, 60 to 600 VAC/DC	100 to 240 VAC	K8AK-VS3 100-240 VAC

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 rang	e	85% to 110% of rated operating voltage
Rated power supply free	quency	50/60 Hz±5 Hz (AC power supply)
Output relays	Resistive load	5 A at 250 VAC or at 30 VDC
(1 × SPDT, normally	Maximum contact voltage	250 VAC or 30 VDC
closed operation)	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 ($H \times W \times D$)		90 × 22.5 × 100



K8DT-VS 1-phase control





Detect abnormal voltages applies to equipment to protect against equipment failure. Use in either overvoltage or undervoltage mode.

- Monitor AC or DC voltages with one relay
- Settings for the operating value, hysteresis, and operating time
- Width of 17.5 mm to reduce space required in panels
- Push-in plus Technology that reduce wiring work
- UL listed for easy shipping to North America
- Double-insertion holes for crossover wiring (all terminals)
- Models added with transistor outputs for superior contact reliability
- · RoHS compliant



Ordering information

Setting range	Power supply voltage	Output	Order code
1 to 10 V AC/DC 3 to 30 V AC/DC 15 to 150 V AC/DC	24 VAC/DC	Relay: SPDT contact output	K8DT-VS2CD
		Transistor: Open collector	K8DT-VS2TD
	100 to 240 VAC	Relay: SPDT contact output	K8DT-VS2CA
		Transistor: Open collector	K8DT-VS2TA
20 to 200 V AC/DC	24 VAC/DC	Relay: SPDT contact output	K8DT-VS3CD
30 to 300 V AC/DC 60 to 600 V AC/DC		Transistor: Open collector	K8DT-VS3TD
	100 to 240 VAC	Relay: SPDT contact output	K8DT-VS3CA
		Transistor: Open collector	K8DT-VS3TA

Accessories

Appearance	Order code
	Y92A-D1A



Monitoring products

ltem		K8DT-VS2	K8DT-VS3
Power supply voltage	K8DT-VSD	24 VAC 50/60 Hz, 24 VDC	
	K8DT-VSA	100 to 240 VAC 50/60 Hz	
Power consumption		24 VAC/DC: 1.8 VA/1 W max. 100 to 240 VAC: 2.5 VA max.	
Operate (SV)	Operating value setting range	10% to 100% of the maximum value of the setting range 1 to 10 VAC/DC 3 to 30 VAC/DC 15 to 150 VAC/DC	10% to 100% of the maximum value of the setting range 20 to 200 VAC/DC 30 to 300 VAC/DC 60 to 600 VAC/DC
	Operating value	100% operation at set value	·
Reset (HYS)	Reset value	5% to 50% of operating value	
	Resetting method	Manual reset/automatic reset (switchable)	
Operating time setting	g range (T)	0.1 to 30 s	
Power ON lock time		1 s or 5 s (Switched using DIP switch.)	
Indicators		Power (PWR): Green, Relay output (RY): Yellow, Alarm output	(ALM): Red
Output form		Relay: SPDT contact output Transistor: Open collector Switchable between normally open and normally closed with	a DIP switch setting.
Output relays ratings	Resistive load	5 A at 250 VAC 5 A at 30 VDC	
	Inductive load	1 A at 250 VAC 0.2 A at 48 VDC	
	Minimum load	5 VDC, 10 mA (reference values)	
	Mechanical life	10 million operations min.	
	Electrical life	5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC or 30 VDC:100,000 operation	
Transistor output	Contact form	SPST-NO (Open collector)	
ratings	Rated voltage	24 VDC (maximum voltage: 26.4 VDC)	
	Maximum current	50 mA DC	
Ambient operating ter	mperature	−20 to 60°C (with no condensation or icing)	
Storage temperature		−25 to 65°C (with no condensation or icing)	
Case material		PC, UL 94 V-0	
Weight		Approx. 100 g	
Size in mm (H \times W \times D)	90×17.5×90	
Operating voltage ran	ge	85% to 110% of power supply voltage	
Rated power supply fr	equency	50/60 Hz ±5 Hz	
Input frequency range		40 to 500 Hz	
Overload capacity		Continuous input at 115% of maximum input, 10 s at 125% (u	p to 600 VAC)
Repeat error	Operating value	±0.5% full scale (at 25°C and 65% humidity, rated power supp	oly voltage)
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)	
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, Overvoltage category III)	
	EMC	EN 60947-5-1	
	Safety standards	UL 60947-5-1 (Listing), Korean Radio Waves Act (Act 10564), (CCC (GB14048.5)
Degree of protection		Terminals: IP20	<u> </u>



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.

1-phase control

- 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,	24 V AC/DC	K8AK-VW3 24 VAC/DC
30 to 300 VAC/DC, 60 to 600 VAC/DC	100 to 240 VAC	K8AK-VW3 100-240 VAC

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 fre	quency	50/60 Hz±5 Hz (AC power supply)
Output relays	Resistive load	5 A at 250 VAC or at 30 VDC
(2 × SPDT, normally	Maximum contact voltage	250 VAC or 30 VDC
closed operation)	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	Operating value setting range	10% to 100% of maximum measuring voltage
(AL1 and AL2)	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	$\pm 0.5\%$ 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 \times W \times D)		90 × 22.5 × 100





Single-phase overvoltage/undervoltage relay

Detect abnormal voltages applies to equipment to protect against equipment failure. Monitor for overvoltages and undervoltages simultaneously with one relay.

- Monitor AC or DC voltages with one relay
- Settings for the operating value, hysteresis, and operating time
- Width of 17.5 mm to reduce space required in panels
- Push-in plus Technology that reduce wiring work
- UL listed for easy shipping to North America
- Double-insertion holes for crossover wiring (all terminals)
- Models added with transistor outputs for superior contact reliability
- · RoHS compliant

Ordering information

Value Desigi

Setting range	Power supply voltage	Output	Order code
1 to 10 V AC/DC	24 VAC/DC	Relay: SPDT contact output	K8DT-VW2CD
3 to 30 V AC/DC		Transistor: Open collector	K8DT-VW2TD
15 to 150 V AC/DC	100 to 240 VAC	Relay: SPDT contact output	K8DT-VW2CA
		Transistor: Open collector	K8DT-VW2TA
20 to 200 V AC/DC	24 VAC/DC	Relay: SPDT contact output	K8DT-VW3CD
30 to 300 V AC/DC		Transistor: Open collector	K8DT-VW3TD
60 to 600 V AC/DC	100 to 240 VAC	Relay: SPDT contact output	K8DT-VW3CA
		Transistor: Open collector	K8DT-VW3TA

Accessories

Appearance	Order code
	Y92A-D1A



Item		K8DT-VW2	K8DT-VW3
Power supply voltage	K8DT-VW_D	24 VAC 50/60 Hz, 24 VDC	
	K8DT-VAA	100 to 240 VAC 50/60 Hz	
Power consumption		24 VAC/DC: 1.8 VA/1 W max. 100 to 240 VAC: 2.5 VA max.	
Operate (AL1, AL2)	Operating value setting range	10% to 100% of the maximum value of the setting range 1 to 10 VAC/DC 3 to 30 VAC/DC 15 to 150 VAC/DC	10% to 100% of the maximum value of the setting range 20 to 200 VAC/DC 30 to 300 VAC/DC 60 to 600 VAC/DC
	Operating value	100% operation at set value	·
Reset (HYS)	Reset value	5% of operating value (fixed)	
	Resetting method	Manual reset/automatic reset (switchable)	
Operating time settin	g range (T)	0.1 to 30 s	
Power ON lock time		1 s or 5 s (Switched using DIP switch.)	
Indicators		Power (PWR): Green, Relay output (RY): Yellow, Alarm output	1 (AL1): Red, Alarm output2 (AL2): Red
Output form		Relay: SPDT contact output Transistor: Open collector	
Output relays ratings	Resistive load	5 A at 250 VAC 5 A at 30 VDC	
	Inductive load	1 A at 250 VAC 0.2 A at 48 VDC	
	Minimum load	5 VDC, 10 mA (reference values)	
	Mechanical life	10 million operations min.	
	Electrical life	5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC or 30 VDC:100,000 operation	
Transistor output	Contact form	SPST-NO (Open collector)	
ratings	Rated voltage	24 VDC (maximum voltage: 26.4 VDC)	
	Maximum current	50 mA DC	
Ambient operating te	emperature	–20 to 60°C (with no condensation or icing)	
Storage temperature		−25 to 65°C (with no condensation or icing)	
Case material		PC, UL 94 V-0	
Weight		Approx. 100 g	
Size in mm ($H \times W \times D$	0)	90×17.5×90	
Operating voltage rar	nge	85% to 110% of power supply voltage	
Rated power supply f	requency	50/60 Hz ±5 Hz	
Input frequency range	e	40 to 500 Hz	
Overload capacity		Continuous input at 115% of maximum input, 10 s at 125% (up to 600 VAC)	
Repeat error	Operating value	±0.5% full scale (at 25°C and 65% humidity, rated power supply voltage)	
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage)	
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, Overvoltage category III)	
	EMC	EN 60947-5-1	
	Safety standards	UL 60947-5-1 (Listing), Korean Radio Waves Act (Act 10564), CCC (GB14048.5)	
Degree of protection		Terminals: IP20	





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 tem	perature	−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	Resistive load	5 A at 250 VAC or at 30 VDC
(1 × DPDT, normally	Maximum contact voltage	250 VAC or 30 VDC
closed operation)	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 ph	ase 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 ($H \times W \times D$)		90 × 22.5 × 100



K8DS-PH 3-phase control



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 tem	perature	−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	Resistive load	5 A at 250 VAC or at 30 VDC
(1 × SPDT, normally	Maximum contact voltage	250 VAC or 30 VDC
closed operation)	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 ph	ase 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 $(H \times W \times D)$		80 × 17.5 × 74 mm





Phase-sequence phase-loss relay

Protect motors and other equipment from unstable voltages in the power supply system. Protect motors and other equipment by detecting phase sequence and phase loss for three-phase power supplies.

- Phase loss detection while the motor is operating
- Global application with power supply range of 200 to 480 V with one relay
- Greater resistance to inverter noise
- Width of 17.5 mm to reduce space required in panels
- Push-in plus Technology that reduce wiring work
- UL listed for easy shipping to North America
- Double-insertion holes for crossover wiring (all terminals)
- Models added with transistor outputs for superior contact reliability
- RoHS compliant

Ordering information

Rated input voltage*1	Relay output	Order code
3-phase, 3-wire 200 to 480 VAC	Relay: SPDT contact output	K8DT-PH1CN
	Transistor: Open collector	K8DT-PH1TN

^{*1} The power supply voltage is the same as the rated input voltage.

Accessories

Front Cover (Order separately)

Appearance	Order code
	Y92A-D1A

Rated input voltage		3-phase, 200 to 480 VAC (3-wire)	
Input load		Approx. 2.6 VA	
Operating time	Phase sequence	0.1 s±0.05 s	
	Phase loss	0.1 s max. (when the voltage changes rapidly from 100% to 0% of rated voltage)	
Reset method		Automatic reset	
Indicators		Power (PWR): Green, Output (OUT): Yellow	
Output form		Relay: SPDT contact output Transistor: Open collector	
Output relay ratings Resistive load		5 A at 250 VAC 5 A at 30 VDC	
	Inductive load	1 A at 250 VAC 0.2 A at 48 VDC	
	Minimum load	5 VDC, 10 mA (reference values)	
	Mechanical life	10 million operations min.	
	Electrical life	5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC or 30 VDC: 100,000 operations	
Transistor output	Contact form	SPST-NO (Open collector)	
ratings	Rated voltage	24 VDC (maximum voltage: 26.4 VDC)	
	Maximum current	50 mA DC	
Ambient operating te	mperature	−20 to 60°C (with no condensation or icing)	
Storage temperature		−25 to 65°C (with no condensation or icing)	
Case material		PC, UL 94 V-0	
Weight		Approx. 100 g	
Size in mm (H \times W \times [))	90×17.5×90	
Input frequency rang	e	45 to 65 Hz	
Overload capacity		Continuous 528 V	
Phase loss detection level		80%±10% of rated input Calculation Formula = 1 – ((Highest phase-to-phase voltage – Lowest phase-to-phase voltage)/Average three-phase phase-to-phase voltage)	
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, Overvoltage category III)	
	EMC	EN 60947-5-1	
	Safety standards	UL 60947-5-1 (Listing), Korean Radio Waves Act (Act 10564), CCC (GB14048.5), LR (Category ENV1.2)*1	
Degree of protection		Terminals: IP20	

^{*1} Certification is pending for LR



K8AK-PM 3-phase control



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	

Ambient operating temp	perature	−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	Resistive load	5 A at 250 VAC or at 30 VDC	
(2 × SPDT, normally	Maximum contact voltage	250 VAC or 30 VDC	
closed operation)	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 \times W \times D)		90 × 22.5 × 100	
*1 =1	5 - 5 d d d 5 d 5 d		

^{*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

Ambient operating temp	erature	−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	Resistive load	5 A at 250 VAC or at 30 VDC	
(1 × SPDT, normally	Maximum contact voltage	250 VAC or 30 VDC	
closed operation)	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	$\pm 0.5\%$ 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 \times W \times D)		80 × 17.5 × 74	



K8DT-PM 3-phase control





Three-phase voltage and phase-sequence phase-loss relav

Protect motors and other equipment from unstable voltages in the power supply system. Protect motors and other equipment by detecting overvoltages, undervoltages, phase sequence, and phase loss for three-phase power supplies.

- Phase loss detection while the motor is operating
- Widely applies 3-phase 3-wire system (Changed with a DIP switch)
- · Greater resistance to inverter noise
- Width of 17.5 mm to reduce space required in panels
- Push-in plus Technology that reduce wiring work
- UL listed for easy shipping to North America
- Double-insertion holes for crossover wiring (all terminals)
- · Models added with transistor outputs for superior contact reliability
- · RoHS compliant

Ordering information

Rated input voltage*1	Relay output	Order code
3-phase 3-wire 200, 220, 230, 240 VAC	Relay: SPDT contact output	K8DT-PM1CN
	Transistor: Open collector	K8DT-PM1TN
3-phase 3-wire 380, 400, 415, 480 VAC	Relay: SPDT contact output	K8DT-PM2CN
	Transistor: Open collector	K8DT-PM2TN

^{*1} The power supply voltage is the same as the rated input voltage.

Note: The input range is set with a DIP switch.

Accessories

Appearance	Order code
	Y92A-D1A



Monitoring products

Item		K8DT-PM1	K8DT-PM2	
Rated input voltage		Three-phase, three-wire Mode: 200, 220, 230, or 240 VAC	Three-phase, three-wire Mode: 380, 400, 415, or 480 VAC	
Input load		Approx. 1.7 VA	Approx. 2.7 VA	
Operating value settir	ng range	Overvoltage -30% to 30% of rated input voltage Undervoltage -30% to 30% of rated input voltage The rated input voltage can be switched by using the DIP swi	tches.	
Operating value		Operates at 100% of set value.		
Reset value		5% of operating value (fixed)		
Reset method		Automatic reset		
Operating time	Overvoltage/Undervoltage	0.1 to 30 s		
etting range	Phase sequence	0.1 s±0.05 s		
	Phase loss	0.1 s max.		
Power ON lock time	•	1 s/5 s (switched by using the DIP switch)		
ndicators		Power (PWR): Green, Output (OUT): Yellow, OVER: Red, UNDR	: Red	
Output form		Relay: SPDT contact output Transistor: Open collector		
Output relay ratings	Resistive load	5 A at 250 VAC 5 A at 30 VDC		
	Inductive load	1 A at 250 VAC 0.2 A at 48 VDC		
	Minimum load	5 VDC, 10 mA (reference values)		
	Mechanical life	10 million operations min.		
	Electrical life	5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC or 30 VDC: 100,000 operations		
Transistor output	Contact form	SPST-NO (Open collector)		
atings	Rated voltage	24 VDC (maximum voltage: 26.4 VDC)		
	Maximum current	50 mA DC		
Ambient operating te	mperature	−20 to 60°C (with no condensation or icing)		
Storage temperature		−25 to 65°C (with no condensation or icing)		
Case material		PC, UL 94 V-0		
Weight		Approx. 100 g		
Size in mm (H \times W \times D))	90×17.5×90		
nput frequency		50/60 Hz		
Overload capacity		Continuous 528 V		
Repeat accuracy	Operating value	±0.5% full scale (at 25°C and 65% humidity, rated power supply voltage)		
	Operating time	±50 ms (at 25°C and 65% humidity, rated power supply volta	±50 ms (at 25°C and 65% humidity, rated power supply voltage)	
Applicable standards	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, Overvoltage cated	jory III)	
	EMC	EN 60947-5-1		
	Safety standards	UL 60947-5-1 (Listing), Korean Radio Waves Act (Act 10564),	CCC (GB14048.5), LR (Category ENV1.2)*1	
Degree of protection		Terminals: IP20		

^{*1} Certification is pending for LR.

K8AK-PA 3-phase control



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	

Ambient operating tem	perature	−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	Resistive load	5 A at 250 VAC or at 30 VDC	
(1 × SPDT, normally	Maximum contact voltage	250 VAC or 30 VDC	
closed operation)	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	Operating value setting range	Asymmetry rate: 2% to 22%	
(ASY.)	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 $(H \times W \times D)$	•	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

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	Resistive load	5 A at 250 VAC or at 30 VDC	
closed operation)	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	Operating value setting range	Asymmetry rate: 2% to 22%	
(ASY.)	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 exceed 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 $(H \times W \times D)$		80 × 17.5 × 74 mm	



K8DS-PZ 3-phase control



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

The K8DS-PZ is the simplified 3-phase monitoring relay, 3-wire circuits within 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 temp	perature	−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	Operating value setting range	Overvoltage/undervoltage: 2% to 30% of rated input voltage	
or undervoltage)	Operating value	100% operation at set value	
Asymmetry operation	Operating value setting range	Asymmetry rate: 5% to 22%	
(ASY.)	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 exceet 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)		1s±0.5s	
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	





Three-phase voltage, asymmetry, and phase-sequence phase-loss relay

Protect motors and other equipment from unstable voltages in the power supply system. Detect overvoltages, undervoltages, voltage asymmetry, phase sequence, and phase loss for three-phase power supplies.

- Phase loss detection while the motor is operating
- Widely applies 3-phase 3-wire system (Changed with a DIP switch)
- Greater resistance to inverter noise
- Width of 17.5 mm to reduce space required in panels
- Push-in plus Technology that reduce wiring work
- UL listed for easy shipping to North America
- Double-insertion holes for crossover wiring (all terminals)
- · Models added with transistor outputs for superior contact reliability
- · RoHS compliant

Ordering information

Rated input voltage ^{*1}	Relay output	Order code
3-phase 3-wire mode 200, 220, 230, 240 VAC	Relay: SPDT contact output	K8DT-PZ1CN
	Transistor: Open collector	K8DT-PZ1TN
3-phase 3-wire mode 380, 400, 415, 480 VAC	Relay: SPDT contact output	K8DT-PZ2CN
	Transistor: Open collector	K8DT-PZ2TN

^{*1} The power supply voltage is the same as the rated input voltage.

Note: The input range is set with a rotary switch.

Accessories

Appearance	Order code
	Y92A-D1A



Rated input voltage Input load Operating value setting Operating value Reset value	range	Three-phase, three-wire Mode: 200, 220, 230, or 240 VAC Approx. 1.7 VA Overvoltage/Undervoltage 2% to 30% of rated input voltage Asymmetry 5% to 22% of rated input voltage The rated input voltage can be switched by using the DIP swit Overvoltage/Undervoltage Operates at 100% of set value. Asymmetry Asymmetry operating value = Rated input voltage × Asymme The asymmetry operating value as value.	try set value (%)		
Operating value setting Operating value	range	Overvoltage/Undervoltage 2% to 30% of rated input voltage Asymmetry 5% to 22% of frated input voltage The rated input voltage can be switched by using the DIP swit Overvoltage/Undervoltage Operates at 100% of set value. Asymmetry Asymmetry operating value = Rated input voltage × Asymme The asymmetry operation will function when the potential diff	ches. try set value (%)		
Operating value	range	2% to 30% of rated input voltage Asymmetry 5% to 22% of rated input voltage The rated input voltage can be switched by using the DIP swit Overvoltage/Undervoltage Operates at 100% of set value. Asymmetry Asymmetry operating value = Rated input voltage × Asymme The asymmetry operation will function when the potential diff	try set value (%)		
		Operates at 100% of set value. Asymmetry Asymmetry operating value = Rated input voltage × Asymme The asymmetry operation will function when the potential diff			
Reset value		ceeds the asymmetry operating value.	erence between the highest and lowest voltage phases equals or ex-		
		2% of operating value (fixed)			
Reset method		Automatic reset			
Operating time 0	Overvoltage/Undervoltage	0.1 to 30 s			
setting range A	symmetry	0.1 to 30 s			
<u> </u>	hase sequence	0.1 s±0.05 s			
<u> </u>	Phase loss	0.1 s max.			
Power ON lock time (LOCK)		1 s/5 s (switched by using the DIP switch)			
Indicators		Power (PWR): Green, Output (OUT): Yellow, Alarm outputs (ALM): Red			
Output form		Relay: SPDT contact output Transistor: Open collector			
Output relay ratings R	lesistive load	5 A at 250 VAC 5 A at 30 VDC			
Ir	nductive load	1 A at 250 VAC 0.2 A at 48 VDC			
N	Ninimum load	5 VDC, 10 mA (reference values)			
N	Nechanical life	10 million operations min.			
E	lectrical life	5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC or 30 VDC: 100,000 operations			
Transistor output C	Contact form	SPST-NO (Open collector)			
ratings	lated voltage	24 VDC (maximum voltage: 26.4 VDC)			
N	Naximum current	50 mA DC			
Ambient operating temp	perature	−20 to 60°C (with no condensation or icing)			
Storage temperature		−25 to 65°C (with no condensation or icing)			
Case material		PC, UL 94 V-0			
Weight		Approx. 100 g			
Size in mm (H \times W \times D)		90×17.5×90			
Input frequency		50/60 Hz			
Overload capacity		Continuous 528 V			
	perating value	±0.5% full scale (at 25°C and 65% humidity, rated power supp	ly voltage)		
· · · -	perating time	±50 ms (at 25°C and 65% humidity, rated power supply voltage			
	Conforming standards	EN 60947-5-1 Installation environment (pollution level 2, Overvoltage category III)			
E	MC	EN 60947-5-1	- ·		
<u> </u>	afety standards	UL 60947-5-1 (Listing), Korean Radio Waves Act (Act 10564), CCC (GB 14048.5), LR (Category ENV1.2)*1			
Degree of protection			Terminals: IP20		

^{*1} Certification is pending for LR.



3-phase undervoltage and phase-sequence phase-loss

The K8DS-PU is the simplified 3-phase monitoring relay, 3-wire circuits within one unit. It can monitor undervoltages, 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

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	Operating value setting range	Undervoltage = -30% to 25% of maximum rated input voltage	
or undervoltage)	Operating value	100% operation at set value	
Reset (HYS.)	Hysteresis	5% of operating value (fixed)	
	Resetting method	Automatic reset	
Operating time (T)	Undervoltage	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	Resistive load	5 A at 250 VAC or at 30 VDC
	Maximum contact voltage	250 VAC or 30 VDC
closed operation)	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 \times W \times D)	•	90 × 22.5 × 100
×4		

^{*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 k Ω , 70 to 300 k Ω
- Detection method: Conductive
- · Probes need to be ordered separately
- Conforms to EMC and LVD directives, UL/CSA approved

Ordering information

Application	Туре		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	Long-distance type	2 km ^{*1}	61F-GP-N8L 230AC 2KM	
between receiver tanks and supply tanks is long or where remote control is required		4 km*1	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,	Low sensitivity type		61F-GP-N8D 24AC	
alkali chemicals			61F-GP-N8D 110AC	
			61F-GP-N8D 230AC	
Ordinary purified or sewage water, with two-wired-type electrode holder	Two-wired type		61F-GP-N8R 24AC	
(incorporating a resistor of 6.8 kΩ)			61F-GP-N8R 110AC	
			61F-GP-N8R 230AC	
DIN-rail mounting socket			PF083A-E	
Back-connecting socket			PL08	

^{*1} There are other models available on request. Please contact your Omron representative for special request.

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	Electrode (1 m long)	1 line	-	F03-01 SUS201
	to SUS 304	Connecting nut	-		F03-02 SUS201
	(AISI-304)	Lock nut	-		F03-03 SUS201
Purified city water, industrial water, sewage,	SUS316	Electrode (1 m long)	2 lines		F03-01 SUS316
dilute alkaline solution	(AISI-316)	Connecting nut	_	6	F03-02 SUS316
		Lock nut	-	316	F03-03 SUS316



61F-GP-N8 Level control

Item	61F-GP-N8	61F-GP-N8L	61F-GP-N8H	61F-GP-N8D	61F-GP-N8R		
Supply voltage	24, 100, 110, 120, 200,	24, 100, 110, 120, 200, 220, 230 or 240 VAC; 50/60 Hz					
Operating voltage range	85 to 110% of rated vo	ltage					
Interelectrode voltage	8 VAC		24 VAC	8 VAC			
Interelectrode current	Approx. 1 mA AC max.	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., re	elease: 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	e load: cosφ = 0.4), 3 A, 250 VAC (res	sistive load)				
Ambient temperature	Operating: -10 to 55°C						
Life expectancy	Electrical: 100,000 ope	Electrical: 100,000 operations min., mechanical: 5,000,000 operations min					
Size in mm (H×W×D)	49.9×38×70						





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 $k\Omega$
- 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	e	Number of electrodes	Order code
For city water and other general use. Easy-to-replace separate versions for maintenance.	Flange	Phenol resin	70°C	70°C		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 wa electrode holder s	ater drips or vapour on the 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	In	ndication mark	Inscription	Order code
Purified city water, industrial water, sewage	Equivalent to SUS	Electrode (1 m l	long) 1	line		F03-01 SUS201
	304	Connecting nut	t –		-	F03-02 SUS201
	(AISI-304)	Lock nut			-	F03-03 SUS201
Purified city water, industrial water, sewage,	SUS316	Electrode (1 m l	long) 2	lines	-	F03-01 SUS316
dilute alkaline solution	(AISI-316)	Connecting nut	t –		6	F03-02 SUS316
		Lock nut	-	•	316	F03-03 SUS316

Specifications .				
İtem	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: \pm 10 k Ω , for scale of 100: \pm 10 k Ω			
Release resistance	200% max. of the operation resistance	200% max. of the operation resistance		
Switching between supply and drainage	Terminals 7 and 8 open: Automatic drainage open	eration; 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: $cos \phi = 0.4$)		
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	−10 to 55°C		
Response time	Operating: 1.5 s max., releasing: 3.0 s max.	Operating: 1.5 s max., releasing: 3.0 s max.		
Size in mm (HxWxD)	49.9x38x70			



K8AK-LS Level control



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

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		
Jse for sewage, sea water, etc., naving 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	Electrode (1 m long)	1 line	-	F03-01 SUS201		
	SUS304	Connecting nut	-	-	F03-02 SUS201		
	(AISI-304)	Lock nut	-	-	F03-03 SUS201		
Purified city water, industrial water, sewage,	SUS316	Electrode (1 m long)	2 lines	_	F03-01 SUS316		
lilute alkaline solution	(AISI-316)	Connecting nut		6	F03-02 SUS316		
		Lock nut		316	F03-03 SUS316		



Monitoring products

ltem		K8AK-LS	
Ambient operating to	emperature	–20 to 60°C (with no condensation or icing)	
Storage temperature	!	–25 to 65°C (with no condensation or icing)	
Operating voltage ra	nge	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	

K8DT-LS Level control



17.5 mm wide conductive level controller

Ideal for water level control. Sensitivity adjustment and timer for easy usage.

- Sensitivity adjustment from 10k to 100 $k\Omega$
- · Enables easy onsite adjustment
- ON-delay timer from 0.1 to 10 s
- Ideal as countermeasure for waves on liquid surfaces
- Width of 17.5 mm to reduce space required in panels
- Push-in plus Technology that reduce wiring work
- UL listed for easy shipping to North America
- Double-insertion holes for crossover wiring (all terminals)
- Models with transistor outputs added for low contact wear
- RoHS compliant



Ordering information

Power supply voltage	Relay output	Order code
24 VAC/DC	Relay: SPDT contact output	K8DT-LS1CD
	Transistor: Open collector	K8DT-LS1TD
100 to 240 VAC	Relay: SPDT contact output	K8DT-LS1CA
	Transistor: Open collector	K8DT-LS1TA

Accessories (Order separately)

Туре	Application	Order code
Front cover		Y92A-D1A
Electrode holders/underwater electrodes	For general-purpose use, such as water supply lines	PS-3S/-4S/-5S
	For areas with limited space	PS-31 SUS304, 300 mm
	For liquids with low resistance	BF-1
	When mounting strength is required	BF-3/-5
	For resistance to high-temperature or high-pressure liquids	BS-1
	For resistance against corrosion	BS-1T
	For installation at long distances from the liquid level	PH-1/-2
Electrode rods (Set with the connection nuts, lock nuts, and	Purified water service, industrial water, and sewage	F03-60 SUS304
ightening screws)	Purified water service, industrial water, sewage, and weak alkaline solutions	F03-60 SUS316
Protective cover	Electrode holders for the PS or BF series	F03-11
Mounting piece	Electrode Holder for the PS Series	F03-12
Separator	To prevent contact between electrodes, one pole	F03-14 1P
	To prevent contact between electrodes, three poles	F03-14 3P
	To prevent contact between electrodes, five poles	F03-14 5P



Monitoring products

ltem		K8DT-LS1	K8DT-LS2				
Power supply voltag	ge	24 VAC 50/60 Hz, 24 VDC	100 to 240 VAC 50/60 Hz				
Voltage across elect	rodes	5 V p-p (Approx. 20 Hz)					
Power consumption	1	1.8 VA/1 W max.	2.5 VA max.				
Operating resistance	e	10k to 100 k Ω (variable)					
Reset resistance		250 k Ω max.					
Response time		Approx. 0.1 to 10 s (variable)					
Length of cable		100 m max. (fully insulated 3-core 0.75-mm ² cal	btyre cable, 600 V)				
Indicators		Power PWR: Green, Output (OUT): Yellow					
Output form		Relay: SPDT contact output Transistor: Open collector					
Output contact ratings	Resistive load	5 A at 250 VAC 5 A at 30 VDC					
	Inductive load	1 A at 250 VAC 0.2 A at 48 VDC					
Minimum load		5 VDC, 10 mA (reference values)	5 VDC, 10 mA (reference values)				
	Mechanical life	10 million operations min.					
	Electrical life	5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC or 30 VDC: 100,000 operations					
Transistor output	Contact form	SPST-NO (Open collector)					
ratings	Rated voltage	24 VDC (maximum voltage: 26.4 VDC)					
	Maximum current	50 mA DC					
Ambient operating	temperature	-20 to 60°C (with no condensation or icing)	−20 to 60°C (with no condensation or icing)				
Storage temperatur	e	-25 to 65°C (with no condensation or icing)	−25 to 65°C (with no condensation or icing)				
Case material		PC, UL 94 V-0	PC, UL 94 V-0				
Weight		Approx. 100 g	Approx. 100 g				
Size in mm (H $ imes$ W $ imes$: D)	90×17.5×90					
Operating voltage r	ange	85% to 110% of rated voltage					
Applicable standards	Approved standards	EN 61010-1 Installation environment: pollution level 2, Over	voltage category II				
	EMC	EN 61326-1 ^{*1}					
	Safety standards	UL 61010-1 (Listing), Korean Radio Waves Act (Act 10564), CCC: GB14048.5					
Degree of protection	n	Terminals: IP20					

^{*1} Industrial Electromagnetic Environment (EN/IEC 61326-1, Table 2)

K7L Level control



Ultra-miniature liquid leakage sensor amplifier

The Plug-in socket with Push-in plus technology, P2RF-08-PU is available for easy wiring. K7L detects a wide variety of liquids, ranging from water to liquid chemicals with low conductivity.

- Operation range: Up to 50 $M\Omega$
- 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

Value Desig

Product name ^{*1}		Characteristics	Order code
Liquid leakage sensor amplifier		Standard (250 k Ω up to 50 M Ω)	K7L-AT50B
		Standard (1 $M\Omega$, long distance wiring)	K7L-UB
		With disconnection function set (250 k Ω up to 50M Ω)	K7L-AT50DB
		With disconnection function set (1 $M\Omega$, long distance wiring)	K7L-UDB
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

^{*1} There are other models available on request (with screw socket compatibility). Please contact your Omron representative for special request.

Accessories

Product name*1		Characteristics	Order code
Terminal blocks (10 pcs)			F03-20
DIN-rail mounted socket		With finger protection	P2RF-08-E
		Without finger protection	P2RF-08
Plug-in socket		Screwless socket with Push-in plus technology	P2RF-08-PU
Mounting brackets and	Sensing band stickers	Used for F03-16SF(C)	F03-25
stickers		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

^{*1} There are other models available on request (with screw socket compatibility). Please contact your Omron representative for special request.

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 k Ω
	Range 1: 0 to 600 kΩ
	Range 2: 0 to 5 $M\Omega$
	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	Detection signal: 10 VDC max., 200 ms, detection time: 10 s max.
(K7L-AT50D & K7L-AT50D-S only)	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 of the 3-phase motor's operation

- DIN 22.5-mm-sized
- 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	
Phase sequence, phase loss and temperature monitoring	100 to 240 VAC	K8AK-PT1 100-240 VAC
Temperature monitoring		K8AK-TS1 100-240 VAC
	24 VAC/DC	K8AK-TS1 24 VAC/DC

perature	−20 to 60°C (with no condensation or icing)		
	−25 to 65°C (with no condensation or icing)		
	50/60 Hz (AC power supply)		
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		
	Terminal section: IP20		
	PC and ABS UL94 V-0		
	Approx. 150 g		
	3-phase, 3-wire mode: 200 to 480 VAC		
	Manual reset/automatic reset (switchable) ^{*1}		
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.		
•	Continuous input: 528 V		
	Power (PWR): Green, PH alarm outputs (ALM): Red, TS alarm outputs (ALM): Red		
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		
•	90 × 22.5 × 100		
	Resistive load Maximum contact voltage Maximum contact current Maximum switching capacity Mechanical life Electrical life Phase-sequence on three-phase voltage input Phase loss on three-phase voltage input PTC thermistor input Conforming standards EMC		

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







Temperature monitoring relay

Ideal to prevent heater overheating. Self-latching output to contribute to safe equipment operation.

- Set the temperature with ultra-simple rotary switches
- Digitally set the temperature to between 0 and 999°C in 1°C increments (K8DT-TH1 $_$), or between 0 and 1,800°C in 10°C increments (K8DT-TH2 $_$)
- Connect a thermocouple or platinum resistance thermometer
- Width of 17.5 mm to reduce space required in panels
- Push-in plus Technology that reduce wiring work
- · UL listed for easy shipping to North America
- Double-insertion holes for crossover wiring (all terminals)
- · Models added with transistor outputs for superior contact reliability

Ordering information

Value Desigr

Power supply voltage	Input types	Setting units (setting range)	Output types	Order code
24 VAC/DC	Thermocouple or platinum resistance	tance Setting unit: 1°C or 1°F (0 to 999°C/°F)	Relay: SPDT contact output	K8DT-TH1CD
	thermometer		Transistor: Open collector	K8DT-TH1TD
100-240 VAC			Relay: SPDT contact output	K8DT-TH1CA
			Transistor: Open collector	K8DT-TH1TA
24 VAC/DC	Thermocouple	Setting unit: 10°C/°F	Relay: SPDT contact output	K8DT-TH2CD
			Transistor: Open collector	K8DT-TH2TD
100-240 VAC			Relay: SPDT contact output	K8DT-TH2CA
			Transistor: Open collector	K8DT-TH2TA

Accessories

Front Cover (Order separately)

Appearance	Order code
	Y92A-D1A



Monitoring products

Item		K8DT-TH1	K8DT-TH2			
Power supply voltage		K8DT-THD: 24 VAC 50/60 Hz or 24 VDC K8DT-THA: 100 to 240 VAC 50/60 Hz				
Allowable voltage range		85% to 110% of power supply voltage	85% to 110% of power supply voltage			
Power consumption		24 VAC or 24 VDC: 2.1 VA max. or 1.2 W max. 100 to 240 VAC: 3.1 VA max.				
Sensor inputs		Thermocouple: K, J, T, E; Platinum-resistance thermometer: Pt100, Pt1000	Thermocouple: K, J, T, E, B, R, S, PL II			
Setting method		Set of three rotary DIP switches				
Indicators		Power (PWR): Green, Alarm (ALM): Red				
Output form		Relay: SPDT contact output Transistor: Open collector				
Output relay ratings	Resistive load	5 A at 250 VAC 5 A at 30 VDC				
	Inductive load	1 A at 250 VAC 0.2 A at 48 VDC				
	Minimum load	5 VDC, 10 mA (reference values)				
	Mechanical life	10 million operations min.				
	Electrical life	5 A at 250 VAC or 30 VDC: 50,000 operations 3 A at 250 VAC/30 VDC: 100,000 operations				
Transistor output	Contact form	SPST-NO (Open collector)				
ratings	Rated voltage	24 VDC (maximum voltage: 26.4 VDC)				
	Maximum current	50 mA DC				
Ambient operating te	mperature	-20 to 60° C (with no condensation or icing)				
Storage temperature		−25 to 65°C (with no condensation or icing)				
Case material		PC, UL 94 V-0	PC, UL 94 V-0			
Weight		Approx. 100 g				
Size in mm (H \times W \times D))	90×17.5×90				
Measurement accurac	Су	$\pm 1\%$ of the setting range or ± 4 °C, whichever is larger.	$\pm 1\%$ of the setting range ($\pm 1\%$ FS).			
Hysteresis width		2°C	2°C			
Sampling cycle		100 ms	100 ms			
Applicable standards	Approved standards	EN 61010-1 Installation environment: Overvoltage category II, pollution	l level 2			
	EMC	EN 61326-1 ^{*1}				
	Safety standards	UL 61010-1 (Listing), Korean Radio Waves Act (Act 10564)				
Degree of protection		Terminals: IP20				

^{*1} Industrial Electromagnetic Environment (EN/IEC 61326-1, Table 2)

Pushbutton switches

FULL RANGE OF 16 AND 22 MM ASSEMBLED AND SUB-ASSEMBLED PUSHBUTTON SWITCHES AND INDICATORS WITH PUSH-IN AND SCREW TERMINALS

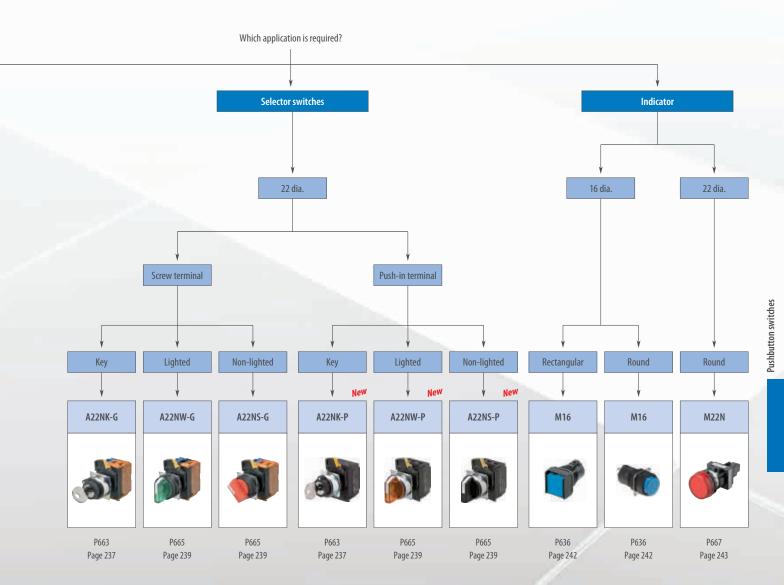
A22N pushbuttons with round plastic, brushed metal or metal bezels

Complete line of 22 mm pushbuttons, selectors, keyed selectors and indicator lights. These reliable switches are offered in a wide range of shapes and colors

- · Aesthetic design
- · Reduced mounting depth
- Quick, easy and tool-free assembly









Category			Pushbutton switch		Indicator	
Mod	el		A16	A22N	M16	M22N
		Mounting	Nut-mounting	lan.	T _e	Too.
Colortion	criteria	Size Shape	16 mm	22 mm	16 mm	22 mm
	# p	Red		-		-
	Incandescent lamp-lighted	Yellow		-		-
	ande p-lic	Green	-	-	-	-
	Inco	White Blue	•	_	•	_
		Red	-	- -	-	-
Pushbutton color	ted	Yellow	-	<u> </u>	-	-
ono	LED-lighted	Green				
butt	Θ	White	•	-		
nsh		Blue				
-		Red		•	-	-
	ted	Yellow	-	-	-	-
	Non-lighted	Green		-	-	-
	Non	White Blue	-	•	_	_
	_	Black	- -	-	_	_
		Momentary operation		•	_	-
	es	Self-holding	•	•	-	-
	Features	Number of contacts	2	6	_	-
	P	IP rating	IP40, IP65	IP66	IP40, IP65	IP66
		Legend plate	-	•	•	
	₹	125 VAC 250 VAC	5	10	-	-
	ings	30 VDC	3	6	_	_
	Switch ratings [A]	Rated resistive load	5 A at 125 VAC, 3 A at 250 VAC, 3 A at 30 VDC	10 A at 120 VAC 6 A at 240 VAC	-	-
	s	Solder	•	-	•	-
	Terminal	PCB	-	-	•	-
	Tel	Screw-less Clamp	-	-	•	•
	tage	5 VDC		•		
	Operating voltage	12 VDC	•			•
	ratin	24 VDC				
	Ope	120/240 VAC	-	•	-	
		SPDT	-	-	-	-
		DPDT SPET NO.	•	-	-	
	Form	SPST-NO SPST-NC	_		_	_
	2	SPST-NO + SPST-NC	_	-	_	_
		DPST-NO	-	-	_	-
		DPST-NC	-		-	-
Page	/Quick		232/P632	234/P659	242/P636	243/P667
			•			











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	Туре	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

Rated voltage	Resistive load		
	A165E series	A165EU 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
	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 M Ω 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	SPST-NC	Red	A22E-S-01
Push-lock	SPST-NO/SPST-NC		A22E-S-11
Turn-reset	DPST-NC		A22E-S-02
40-dia. head	SPST-NC		A22E-M-01
Push-lock	SPST-NO/SPST-NC		A22E-M-11
Turn-reset	DPST-NC		A22E-M-02
60-dia. head	SPST-NC		A22E-L-01
Push-lock	SPST-NO/SPST-NC		A22E-L-11
Turn-reset	DPST-NC		A22E-L-02

Lighted models

Description	Output	Lighting	Rated voltage	Color of cap	Order code
40-dia. head	SPST-NC	LED	24 VAC/VDC	Red	A22EL-M-24A-01
Push-lock Turn-reset	SPST-NO/SPST-NC		24 VAC/VDC		A22EL-M-24A-11
	DPST-NC		24 VAC/VDC]	A22EL-M-24A-02
40-dia. head	SPST-NC		220 VAC]	A22EL-M-T2-01
Push-lock	SPST-NO/SPST-NC		220 VAC	1	A22EL-M-T2-11
Turn-reset	DPST-NC		220 VAC	1	A22EL-M-T2-02

Accessories (Order separately)

Item	Classification	Remarks	Order code
Control boxes	One hole	Material: Polycarbonate resin	A22Z-B101
(enclosures)	One hole, yellow box (for emergency stop)		A22Z-B101Y
	Two holes		A22Z-B102
	Three holes		A22Z-B103
Legend plates for	60-dia. black letters on yellow back-ground	"EMERGENCY STOP" is indicated on the plate.	A22Z-3466-1
emergency stop	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	Rated voltage	Rated cu	Rated current (A)			
current		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 stre	ength	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 pro	otection	IP65 (oil-resistant)		





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

Туре	Color	Order code		
		Degree of protection: O		
		Rectangular	Square	Round
Non-lighted	Red	A165L-JR	A165L-AR	A165L-TR
LED	Yellow	A165L-JY	A165L-AY	A165L-TY
Incandescent lamp	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			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		
	5	microload (com-	SPDT	Solder terminal	A16-1
			DPDT		A16-2
Milet			SPDT	PCB terminal	A16-1P
			DPDT		A16-2P
			DPDT	Screw- less clamp	A16-2S

Lamps

Туре	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	
Туре		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.

Switches with reduced voltage lighting

Appearance	Classi	fication			Order code
40	100 V	Standard load/ microload	SPDT	Solder terminal	A16-T1-1
		(common use)	DPDT		A16-T1-2
	100 V		DPDT	Screw-less clamp	A16-T1-2S
	200 V				A16-T2-2S



Pushbutton switches

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

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.		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)		Approx. 10 g (in the case of a lighted DPDT switch with solder terminals)	
, ,		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 Twisted wire		0.3 mm ²	0.5 mm ²	0.75 mm ²	1.25 mm ²	
and tensile	Solid wire	0.5 mm dia.	0.8 mm dia.	1.0 mm dia.		
strength Tensile strength		10 N	20 N	30 N	40 N	
Length of exposed wire		10 ±1 mm	•	•		



22-mm Pushbutton switches with universal design

Round pushbutton switches available with a choice of plastic, brushed metal and metal bezels for both lighted and non-lighted options. Emphasis has been placed on color coding, workability and design.

- Variety of bezel and color options with aesthetic design
- Mounting depth less than 46.8 mm below panel
- Up to 6 contact blocks (3 contact blocks across and 2 rows deep)
- Symmetrical contact block
- Push-in Plus terminal block type
- · Snap-in switch unit for quick and easy mounting
- RoHS compliant

Ordering information

Lighted/	Bezel material	Top shape	Contacts group 102*1	LED	Color	Order code ^{*2}	
Non-Lighted						Operational mode	
						Momentary	Alternate
Lighted	Plastic	Full guard	1NO 1NC	24 V	Green	A22NL-BGM-TGA-G102-GC	A22NL-BGA-TGA-G102-GC
		Flat	1NO 1NC	200-240 VAC	Red	A22NL-BNM-TRA-G102-RE	A22NL-BNA-TRA-G102-RE
	Metal	Flat	1NO 1NC	24 V	Green	A22NL-RNM-TGA-G102-GC	A22NL-RNA-TGA-G102-GC
		Projected	1NO 1NC	200-240 VAC	Red	A22NL-RPM-TRA-G102-RE	A22NL-RPA-TRA-G102-RE
	Brushed metal	Full guard	1NO 1NC	24 V	Green	A22NL-MGM-TGA-G102-GC	A22NL-MGA-TGA-G102-GC
		Projected	1NO 1NC	200-240 VAC	Red	A22NL-MPM-TRA-G102-RE	A22NL-MPA-TRA-G102-RE
Non-lighted	Plastic	Flat	1NO 1NC	_	Red	A22NN-BNM-NRA-G102-NN	A22NN-BNA-NRA-G102-NN
		Projected	1NO 1NC	_	Black	A22NN-BPM-NBA-G102-NN	A22NN-BPA-NBA-G102-NN
	Metal	Flat	1NO 1NC	_	Green	A22NN-RNM-NGA-G102-NN	A22NN-RNA-NGA-G102-NN
		Projected	1NO 1NC	_	Red	A22NN-RPM-NRA-G102-NN	A22NN-RPA-NRA-G102-NN
	Brushed metal	Flat	1NO 1NC	_	White	A22NN-MNM-NWA-G102-NN	A22NN-MNA-NWA-G102-NN
		Projected	1NO 1NC	_	Yellow	A22NN-MPM-NYA-G102-NN	A22NN-MPM-NYA-G102-NN

^{*1} Contacts

Code	Contact blocks		Unit position					
			Non-lighted		Lighted			
	NO	NC	(1)	(2)	(3)	(1)	(2)	(3)
100	1	0	NO	-	-	NO	Lighting Unit	-
002	0	1	-	-	NC	-	Lighting Unit	NC
101	2	0	NO	-	NO	NO	Lighting Unit	NO
102	1	1	NO	-	NC	NO	Lighting Unit	NC
202	0	2	NC	-	NC	NC	Lighting Unit	NC

List of models

LISC OF HIOGEIS			
	Screw terminal blocks/	Push-In Plus terminal bl	ocks
	Plastic bezels	Brushed Metal bezels	Metal bezels
Flat	A22NBN	A22NMN	A22NRN
			TO ST
Projected	A22NBP	A22NMP	A22NRP
Full guard	A22NBG	A22NMG	

Terminal connection diagrams

Non-lighted switches (2NO/1NC) Contact configuration code:112	Lighted switches (1NO/1NC) Contact configuration code:102
Bottom View	Bottom View
① ③ ③ ——————————————————————————————————	(1) (X) (3) (LED Lamp 4) (4)

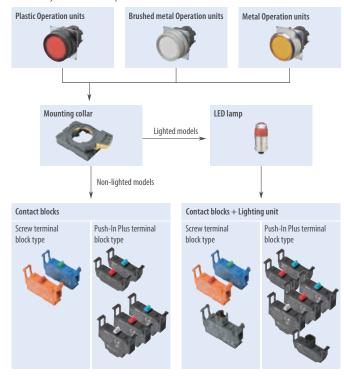
G: General/Screw terminal block

P: General/Push-In Plus terminal block

Subassemblies

Switch structure

You can order Operation units, LED lamp, Mounting collars, and Contact blocks individually. Use them in combination for models that are not available as assembled switches. They can also be used as inventory for maintenance parts.



Reference for:	A22NL-BGM-TGA-G102-G Momentary	A22NL-BGA-TGA-P102-GC Alternate
Operational unit	A22NZ-BNM-TRA	A22NZ-BNA-TGA
Mounting collar	A22NZ-H-01	
Contact block SPST-NO	A22NZ-S-G1A	A22NZ-S-P1A
Contact block SPST-NC	A22NZ-S-G1B	A22NZ-S-P1B
Lighting unit 24 VAC/VDC	A22NZ-T-C	A22NZ-T-CP
LED lamp 24 VAC/DC	A22NZ-L-RC	





Operational units

Lighted/	Bezel	Shape	Color	Order code		
Non-Lighted	Non-Lighted material			Momentary	Alternate	
Lighted	Plastic	Full guard	Green	A22NZ-BGM-TGA	A22NZ-BGA-TGA	
		Flat	Red	A22NZ-BNM-TRA	A22NZ-BNA-TRA	
	Metal	Flat	Green	A22NZ-RNM-TGA	A22NZ-RNA-TGA	
		Projected	Red	A22NZ-RPM-TRA	A22NZ-RPA-TRA	
	Brushed	Projected	Yellow	A22NZ-MPM-TYA	A22NZ-MPA-TYA	
	metal	Full guard	Blue	A22NZ-MGM-TAA	A22NZ-MGA-TAA	
Non-lighted	Plastic	Flat	Red	A22NZ-BNM-NRA	A22NZ-BNA-NRA	
		Projected	Black	A22NZ-BPM-NBA	A22NZ-BPA-NBA	
	Metal	Flat	Green	A22NZ-RNM-NGA	A22NZ-RNA-NGA	
		Projected	Red	A22NZ-RPM-NRA	A22NZ-RPA-NRA	
	Brushed	Flat	White	A22NZ-MNM-NWA	A22NZ-MNA-NWA	
	metal	Projected	Yellow	A22NZ-MPM-NYA	A22NZ-MPA-NYA	

Mounting collar

Appearance	Order code
9	A22NZ-H-01

Contact blocks

Appearance	Terminal specification	Contacts	Order code
1	Screw terminal block	SPST-NO (blue)	A22NZ-S-G1A
		SPST-NC (orange)	A22NZ-S-G1B
1	Push-In Plus terminal block	SPST-NO (blue)	A22NZ-S-P1A
1		SPST-NC (red)	A22NZ-S-P1B
11	Push-In Plus terminal block	DPST-NO (blue)	A22NZ-S-P2A
		DPST-NC (red)	A22NZ-S-P2B
		SPST-NO/SPST-NC (white)	A22NZ-S-P2C

Lighting units

Appearance	Terminal specification	Applied voltage	Order code
1-	Screw terminal block	24 VAC/DC	A22NZ-T-C
100		100/110/120 VAC	A22NZ-T-D
-		200/220/230/ 240 VAC	A22NZ-T-E
la.	Push-In Plus terminal block	24 VAC/DC	A22NZ-T-CP
		100/110/120 VAC	A22NZ-T-DP
		200/220/230/ 240 VAC	A22NZ-T-EP

LED lamp

Appearance	Color	Order code				
		24 VAC/DC	100/110/120 VAC	200/220/230/ 240 VAC		
	Red	A22NZ-L-RC	A22NZ-L-RD	A22NZ-L-RE		
	Green	A22NZ-L-GC	A22NZ-L-GD	A22NZ-L-GE		
	Yellow	A22NZ-L-YC	A22NZ-L-YD	A22NZ-L-YE		
-	White	A22NZ-L-WC	A22NZ-L-WD	A22NZ-L-WE		
	Blue	A22NZ-L-AC	A22NZ-L-AD	A22NZ-L-AE		
	Orange	A22NZ-L-OC	A22NZ-L-OD	A22NZ-L-OE		



Accessories (Order separately)

Item	Appearance	Description	Order code
Reinforce- ment plate	A STATE OF THE PARTY	Used to ensure robustness or when the second or third level of contact blocks are attached.	A22NZ-A-C01
Tightening wrench		Used to tighten mounting nuts from the back of the panel.	A22NZ-A-301
LED lamp ex- tractor	0	Made of rubber and used to easily remove and attach LED lamps.	A22NZ-A-302
Control Box	0.	Used to install one pushbutton.	A22NZ-A-B01Y

Item	Appearance	Description	Order code	
Legend plate frame	Ø	Legend Plate with no text on black background. For 22.3-mm panel hole diameter		A22NZ-A-50103
Legend plates	\sim	Without text	White	A22Z-3443W
			Black	A22Z-3443B
			Transparent	A22Z-3443C
		White text on red background	"STOP"	A22Z-3443R-4
		White text on black background	"START"	A22Z-3443B-3

Item		Non-lighted models	Lighted models	
Allowable operating Mechanical		60 operations/minute max.		
frequency	Electrical	30 operations/minute max.		
Insulation resistance		100 MΩ min. (at 500 VDC)	Not available for lighting units	
Contact resistance		100 m Ω max. (initial value)		
Dielectric strength	Between terminals of same polarity*1	2,500 VAC at 50/60 Hz for 1 min	Not available for lighting units	
	Between each terminal and ground	2,500 VAC at 50/60 Hz for 1 min		
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude (malfunction within	1 ms)	
Shock resistance	Malfunction	1,000 m/s ² max. (malfunction within 1 ms)		
Durability	Mechanical	Momentary action: 5,000,000 operations min. Alternate action: 500,000 operations min.		
	Electrical	500,000 operations min. (250 VAC, 3 A, with an inductive load having power factor $\cos \theta = 0.4$)		

^{*1} Push-In Plus terminal block type: 1,000 VAC at 50/60 Hz for 1 min.





22 mm dia. keyed selector switches with flexible bezel options

These reliable keyed switches are offered in a full range of 2 or 3 release positions with either manual or auto reset operations.

- Extra security available with keyed selector switches, only authorized key-holders can change settings
- 2- and 3-position switches with manual or automatic reset
- Mounting depth less than 46.8 mm behind panel
- Up to 6 contact blocks (3 contact blocks across and 2 rows deep)
- Symmetrical contact block
- Push-in Plus terminal block type
- · Snap-in switch unit for quick and easy mounting
- RoHS compliant

Ordering information

Bezel material	Reset	Release position	Contacts group 102*1	Order code ^{*2}	
				Operational mode (Positions)	
				2 positions	3 positions
Plastic	Manual	All	1NO 1NC	A22NK-2BM-01AA-G102	A22NK-3BM-01AA-G102
	Auto reset on left	Left	1NO 1NC	A22NK-2BL-01BA-G102	A22NK-3BL-01BA-G102
Metal	Manual	All	1NO 1NC	A22NK-2RM-01AA-G102	A22NK-3RM-01AA-G102
	Auto reset on left	Left	1NO 1NC	A22NK-2RL-01BA-G102	A22NK-3RL-01BA-G102
Brushed metal	Manual	All	1NO 1NC	A22NK-2MM-01AA-G102	A22NK-3MM-01AA-G102
	Auto reset on left	Left	1NO 1NC	A22NK-2ML-01BA-G102	A22NK-3ML-01BA-G102

^{*1} Contacts

Code	Cont block		Unit	The state of the s		Two positions	Three positions
	NO	NC	1	2	3		
100	1	0	NO	-	-	Yes	-
002	0	1	-	-	NC	Yes	-
101	2	0	NO	-	NO	Yes	Yes
102	1	1	NO	-	NC	Yes	Yes
201	1	1	NC	-	NO	-	Yes
202	0	2	NC	-	NC	Yes	Yes
110	2	0	NO	NO	-	-	Yes
111	3	0	NO	NO	NO	Yes	Yes

G: General/Screw terminal block P: General/Push-In Plus terminal block

List of models

List of illouding			
	Screw terminal blocks/	Push-In Plus terminal bl	ocks
	Plastic bezels	Brushed metal bezels	Metal bezels
	A22NKB	A22NKM	A22NKR
2 positions			
3 positions (Push-In terminals)			

Operation angle

Two Positions



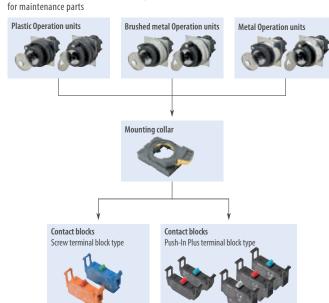




Subassemblies

Switch structure

You can order Operation Units, Mounting Collars, and Contact Blocks individually. Use them in combination for models that are not available as assembled Switches. They can also be used as inventory for maintenance parts



Reference for:	A22NK-2BM-01AA-G122 2 positions Manual	A22NK-3RB-01DA-P122 3 positions (Push-In terminals) Auto reset on L/R
	Plastic	Metal
Release position	All	Center
Operational unit	A22NZ-2BM-01AA	A22NZ-3RB-01DA
Mounting Collar	A22NZ-H-01	
Contact block SPST-NO	A22NZ-S-G1A	A22NZ-S-P1A
Contact block SPST-NC × 2	A22NZ-S-G1B	A22NZ-S-P1B





Operational units

Bezel	Reset	Release	Order code		
material	naterial position		Operational mode (Positions)		
			2 positions	3 positions	
Plastic	Manual	All	A22NZ-2BM-01AA	A22NZ-3BM-01AA	
	Auto reset on left	Left	A22NZ-2BL-01BA	A22NZ-3BL-01BA	
Metal	Manual	All	A22NZ-2RM-01AA	A22NZ-3RM-01AA	
	Auto reset on left	Left	A22NZ-2RL-01BA	A22NZ-3RL-01BA	
Brushed	Manual	All	A22NZ-2MM-01AA	A22NZ-3MM-01AA	
metal	Auto reset on left	Left	A22NZ-2ML-01BA	A22NZ-3ML-01BA	

Mounting collar

Appearance	Order code
0	A22NZ-H-01

Contact blocks

Appearance	Terminal specification	Contacts	Order code
1	Screw terminal block	SPST-NO (blue)	A22NZ-S-G1A
		SPST-NC (orange)	A22NZ-S-G1B
1.1	Push-In Plus terminal block	SPST-NO (blue)	A22NZ-S-P1A
The state of the s		SPST-NC (red)	A22NZ-S-P1B
11	Push-In Plus terminal block	DPST-NO (blue)	A22NZ-S-P2A
		DPST-NC (red)	A22NZ-S-P2B
		SPST-NO/SPST-NC (white)	A22NZ-S-P2C

Accessories (Order separately)

Item	Appearance	Description	Order code
Reinforce- ment plate	A STATE OF THE PARTY	Used to insure robustness or when the second of third level of contact blocks are attached.	A22NZ-A-C01
Tightening wrench		Used to tighten mounting nuts from the back of the panel.	A22NZ-A-301
Key		Up to 6 different keys	A22NZ-K-01
Control Box	0.	Used to install of one pushbutton.	A22NZ-A-B01Y

Item	Appearance	Description		Order code
Legend plate frame		Legend Plate with no t background included. panel hole diameter	A22NZ-A-50103	
Legend plates	\sim	Without text	White	A22Z-3443W
			Black	A22Z-3443B
			Transparent	A22Z-3443C
		White text on red background	"STOP"	A22Z-3443R-4
		White text on black background	"START"	A22Z-3443B-3

Specifications

Key-type selector switches

Item		Switches with 2 positions	Switches with 3 positions				
Allowable operating	Mechanical	30 operations/min max.					
frequency	Electrical	30 operations/min max.					
Insulated resistance		100 mΩ min. (initial value)					
Dielectric strength	Between terminals of same polarity	2,500 VAC at 50/60 Hz for 1 min					
	Between each terminal and ground	2,500 VAC at 50/60 Hz for 1 min					
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms)					
Shock resistance	Malfunction	1,000 m/s² max. (malfunction within 1 ms)					
Durability	Mechanical	500,000 operations min.	300,000 operations min.				
Electrical		500,000 operations min.	300,000 operations min.				







Selector switches with universal design, emphasis on color coding, workability and safety

Complete line of 22 mm selectors. These reliable switches are offered in a wide range of colors and bezel material.

- Knob style selector switches provide users with a reliable way to start or choose between machine operations
- 2 and 3-position switches with manual or automatic reset
- Mounting depth less than 46.8 mm behind panel
- Up to 6 contact blocks (3 contact blocks across and 2 rows deep)
- Symmetrical contact block
- Push-In Plus terminal block type
- · Snap-in switch unit for quick and easy mounting
- RoHS compliant

Ordering information

Lighted/	Bezel material	Reset	Contacts group 102*1	LED	Color	Order code ^{*2}		
Non-Lighted						Operational mode (Positions)		
						2 positions	3 positions	
Lighted	Plastic	Manual	1NO 1NC	24 VDC	Green	A22NW-2BM-TGA-G102-GC	A22NW-3BM-TGA-G102-GC	
		Auto reset on Left	1NO 1NC	200 to 240 VAC	Red	A22NW-2BL-TRA-G102-RE	A22NW-3BL-TRA-G102-RE	
	Metal	Manual	1NO 1NC	24 VDC	Green	A22NW-2RM-TGA-G102-GC	A22NW-3RM-TGA-G102-GC	
		Auto reset on Left	1NO 1NC	200 to 240 VAC	Red	A22NW-2RL-TRA-G102-RE	A22NW-3RL-TRA-G102-RE	
	Brushed metal	Manual	1NO 1NC	24 VDC	Green	A22NW-2MM-TGA-G102-GC	A22NW-3MM-TGA-G102-GC	
		Auto reset on Left	1NO 1NC	200 to 240 VAC	Red	A22NW-2ML-TRA-G102-RC	A22NW-3ML-TRA-G102-RC	
Non-lighted	Plastic	Manual	1NO 1NC		Green	A22NS-2BM-NGA-G102-NN	A22NS-3BM-NGA-G102-NN	
		Auto reset on Left	1NO 1NC		Red	A22NS-2BL-NRA-G102-NN	A22NS-3BL-NRA-G102-NN	
	Metal	Manual	1NO 1NC		Yellow	A22NS-3BL-NRA-G102-NN	A22NS-3RM-NYA-G102-NN	
		Auto reset on L/R	1NO 1NC		Black	-	A22NS-3RB-NBA-G102-NN	
	Brushed metal	Manual	1NO 1NC		Green	A22NS-2MM-NGA-G102-NN	A22NS-3MM-NGA-G102-NN	
		Auto reset on L/R	1NO 1NC	-	Red	-	A22NS-3MB-NRA-G102-NN	

^{*1} Contacts

Code	blocks		lighte	d			Lighted					
			Unit position		No. of positions		Unit position			No. of positions		
	NO	NC	(1)	(2)	(3)	Two positions	Three positions	(1)	(2)	(3)	Two positions	Three positions
100	1	0	NO	-	-	Yes	_	NO	Lighting unit	-	Yes	-
002	0	1	-	-	NC	Yes	-	-	Lighting unit	NC	Yes	-
101	2	0	NO	-	NO	Yes	Yes	NO	Lighting unit	NO	Yes	Yes
102	1	1	NO	-	NC	Yes	Yes	NO	Lighting unit	NC	Yes	Yes
201	1	1	NC	-	NO	-	Yes	NC	Lighting unit	NO	-	Yes
202	0	2	NC	-	NC	Yes	Yes	NC	Lighting unit	NC	Yes	Yes

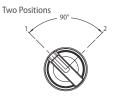
^{*2} A 2 2 N W - 2 B M - N R A - P 1 0 1 - R A (1) (2) (3) (4) (5) (6) (7) (8) (9)

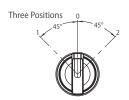
P: General/Push-In Plus terminal bloo

List of models

	Screw terminal blocks/Push-In Plus terminal blocks							
	Non-lighted		Lighted					
Plastic bezels	A22NSB		A22NWB					
	Two positions	Three positions	Two positions	Three positions				
Brushed metal	A22NSM		A22NWM					
bezels	Two positions	Three positions	Two positions	Three positions				
Metal bezels	A22NSR		A22NWR					
	Two positions	Three positions	Two positions	Three positions				

Operation angle



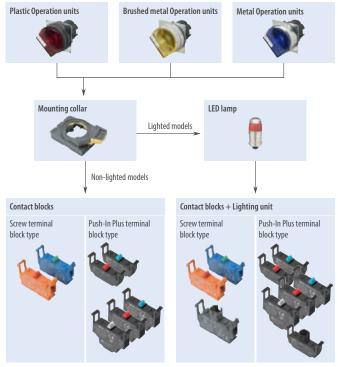


G: General/Screw terminal block

Subassemblies

Switch structure

You can order Operation units, LED lamp, Mounting collars, and Contact blocks individually. Use them in combination for models that are not available as assembled switches. They can also be used as inventory for maintenance parts.



Reference for:	A22NW-2BM-TRA-G102-GC 2 positions Manual	A22NW-3BB-TGA-P102-GC 3 positions Auto reset on L/R
Operational unit	A22NZ-2BM-TGA	A22NZ-3BB-TGA
Mounting collar	A22NZ-H-01	
Contact block SPST-NO	A22NZ-S-G1A	A22NZ-S-P1A
Contact block SPST-NC	A22NZ-S-G1B	A22NZ-S-P1B
Lighting unit 24 VAC/VDC	A22NZ-T-C	A22NZ-T-CP
LED lamp 24 VAC/DC	A22NZ-L-GC	





Operational units

Lighted/	Bezel	Reset	Color	Order code		
Non-Lighted	material			Operational mode	(Positions)	
				2 positions	3 positions	
Lighted	Plastic	Manual	Green	A22NZ-2BM-TGA	A22NZ-3BM-TGA	
		Auto reset on Left	Red	A22NZ-2BL-TRA	A22NZ-3BL-TRA	
	Metal	Manual	Green	A22NZ-2RM-TGA	A22NZ-3RM-TGA	
		Auto reset on Left	Red	A22NZ-2RL-TRA	A22NZ-3RL-TRA	
	Brushed metal	Manual	Green	A22NZ-2MM-TGA	A22NZ-3MM-TGA	
		Auto reset on Left	Red	A22NZ-2ML-TRA	A22NZ-3ML-TRA	
Non-lighted	Plastic	Manual	Green	A22NZ-2BM-NGA	A22NZ-3BM-NGA	
		Auto reset on Left	Red	A22NZ-2BL-NRA	A22NZ-3BL-NRA	
	Metal	Manual	Yellow	A22NZ-2RM-NYA	A22NZ-3RM-NYA	
		Auto reset on L/R	Black	-	A22NZ-3RB-NBA	
	Brushed	Manual	Green	A22NZ-2MM-NGA	A22NZ-3MM-NGA	
	metal	Auto reset on L/R	Red	-	A22NZ-3MB-NRA	

Mounting collar

•	
Appearance	Order code
0	A22NZ-H-01

Contact blocks

Appearance	Terminal specification	Contacts	Order code
1	Screw terminal block	SPST-NO (blue)	A22NZ-S-G1A
1		SPST-NC (orange)	A22NZ-S-G1B
	Push-In Plus terminal block	SPST-NO (blue)	A22NZ-S-P1A
A STATE OF THE STA		SPST-NC (red)	A22NZ-S-P1B
11	Push-In Plus terminal block	DPST-NO (blue)	A22NZ-S-P2A
1		DPST-NC (red)	A22NZ-S-P2B
		SPST-NO/SPST-NC (white)	A22NZ-S-P2C

Lighting units

Appearance Terminal specification		Applied voltage	Order code
1	Screw terminal block	24 VAC/DC	A22NZ-T-C
		100/110/120 VAC	A22NZ-T-D
		200/220/230/ 240 VAC	A22NZ-T-E
1 -	Push-In Plus terminal	24 VAC/DC	A22NZ-T-CP
	block	100/110/120 VAC	A22NZ-T-DP
		200/220/230/ 240 VAC	A22NZ-T-EP

LED lamp

Appearance	Color	Order code		
		24 VAC/DC	100/110/120 VAC	200/220/230/ 240 VAC
£3	Red	A22NZ-L-RC	A22NZ-L-RD	A22NZ-L-RE
	Green	A22NZ-L-GC	A22NZ-L-GD	A22NZ-L-GE
111	Yellow	A22NZ-L-YC	A22NZ-L-YD	A22NZ-L-YE
	White	A22NZ-L-WC	A22NZ-L-WD	A22NZ-L-WE
	Blue	A22NZ-L-AC	A22NZ-L-AD	A22NZ-L-AE
	Orange	A22NZ-L-OC	A22NZ-L-OD	A22NZ-L-OE



Pushbutton switches

Accessories (Order separately)

Item	Appearance	Description	Order code
Reinforce- ment plate	A delay	Used to ensure robustness or when the second of third level of contact blocks are attached.	A22NZ-A-C01
Tightening wrench		Used to tighten mounting nuts from the back of the panel.	A22NZ-A-301
LED lamp ex- tractor		Made of rubber and used to easily remove and attach LED lamps.	A22NZ-A-302
Control Box	0.	Used to install one pushbutton.	A22NZ-A-B01Y

Item	Appearance	Description		Order code
Legend plate frame	Ø	Legend Plate with no text on black background. For 22.3-mm panel hole diameter		A22NZ-A-50103
Legend plates	\sim	Without text	White	A22Z-3443W
			Black	A22Z-3443B
			Transparent	A22Z-3443C
		White text on red background	"STOP"	A22Z-3443R-4
		White text on black background	"START"	A22Z-3443B-3

Specifications

Selector switches

ltem		Non-lighted models	Lighted models	
Allowable operating	Mechanical	30 operations/min max.		
frequency	Electrical	30 operations/min max.		
Insulated resistance		100 MΩ min. (at 500 VDC)		
Dielectric strength	Between terminals of same polarity	2,500 VAC at 50/60 Hz for 1 min		
Between each terminal and ground		2,500 VAC at 50/60 Hz for 1 min		
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms)		
Shock resistance	Malfunction	1,000 m/s² max. (malfunction within 1 ms)		
Durability	Mechanical	500,000 operations min. (3 positions: 300,000 operations min.)		
	Electrical	500,000 operations min. (3 positions: 300,000 operations min.)		



Indicators with a mounting aperture of 16 mm

The M16 series of nut-mounted indicators comes in rectangular, square and round versions. Due to its modular construction, assembly is quick and easy. M16 comes in a wide variety of control and signal devices with a wide range of switching capacities, from general load to micro load.

- · LED, incandescent and neon lamp
- Snap-in switch unit
- Short mounting depth, less than 28.5 mm below panel
- High reliability, IP65
- UL, CSA and VDE approved, conforms to EN60947-5-1

Ordering information

Pushbutton

Туре	Display color	Order	Order code		
			IP65 oil-resistant		
		Rectan	ngular	Square	Round
LED	Red	A165L-	JR	A165L-AR	A165L-TR
Incandescent lamp	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
la anada anada la ana	Green	A165L-	JGY	A165L-AGY	A165L-TGY
	Green	A165L-	JG	A165L-AG	A165L-TG

Lamp

Туре	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
Туре		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	PCB terminals				
Screw-less clamp	Screw-less clamp				
Solder terminals V	oltage-reduction	100 V	M16-T1		
Screw-less clamp	ghting	100 V	M16-T1-S		
			M16-T2-S		

Specifications

Allowable operating	Mechanical	Momentary operation: 120 operations/minute max., alternate operation: 60 operations/minute max.	
frequency	Electrical	20 operations/minute max.	
Durability Mechanical		Momentary operation: 2,000,000 operations min., alternate operation: 200,000 operations min.	
	Electrical	100,000 operations min.	
Degree of contamination		3 (IEC947-5-1)	
Ambient temperature		Operating: -10 to 55°C (with no icing or condensation) Storage: -25 to 65°C (with no icing or condensation)	
Weight		Approx. 10 g (in the case of a lighted DPDT switch with solder terminals)	
Size in mm		Round/square:18Hx18Wx28.5D rectangular:18Hx24Wx28.5D	

Agency	Standards	File number
UL, cUL	UL508	E41515

Ratings

Superbright LED					
Rated voltage	Rated current	Operating voltage	Built-in limiting resistance		
5 VDC	30 mA (15 mA)	5 VDC ±5%	33 Ω (68 Ω)		
12 VDC	15 mA	12 VDC ±5%	270 Ω (560 Ω)		
24 VDC	10 mA	24 VDC ±5%	1,600 Ω (2,000 Ω)		

Incandescent lamp				
Rated voltage	Rated current	Operating voltage		
6 VAC/VDC	60 mA	5 VAC/VDC		
14 VAC/VDC	40 mA	12 VAC/VDC		
28 VAC/VDC	24 mA	24 VAC/VDC		





22 mm IP66 indicator lights show status of machinery and processes on control panels.

Complete line of 22 mm pushbuttons, selectors, keyed selectors and indicators. These reliable panel indicators are offered in a wide range of shapes and colors.

- The bright LED light source is easy to see under most lighting conditions
- Variety of model and color options
- Easy mounting and removal of socket unit
- Push-in Plus terminal block type
- Short mounting depth, less than 49.2 mm behind panel

Ordering information

Appearance	Rated voltage	(2)(2) Indicator color	(4) LED lamp color	Order code
Plastic flat	24 VAC/DC	TR: Transparent red	R: Red	M22N-BN-(2)(2)A-(4)C
400		TG: Transparent green TY: Transparent yellow	G: Green Y: Yellow	M22N-BN-(2)(2)A-(4)C-P
	100, 110, or 120 VAC	TW: Transparent yellow TW: Transparent white	W: White	M22N-BN-(2)(2)A-(4)D
		TA: Transparent blue	A: Blue	M22N-BN-(2)(2)A-(4)D-P
	200, 220, 230, or 240 VAC	TO: Transparent orange	O: Orange	M22N-BN-(2)(2)A-(4)E
				M22N-BN-(2)(2)A-(4)E-P
Plastic projected	24 VAC/DC			M22N-BP-(2)(2)A-(4)C
6-40				M22N-BP-(2)(2)A-(4)C-P
	100, 110, or 120 VAC			M22N-BP-(2)(2)A-(4)D
				M22N-BP-(2)(2)A-(4)D-P
	200, 220, 230, or 240 VAC			M22N-BP-(2)(2)A-(4)E
				M22N-BP-(2)(2)A-(4)E-P
Plastic semi-spherical	24 VAC/DC			M22N-BG-(2)(2)A-(4)C
4.00				M22N-BG-(2)(2)A-(4)C-P
	100, 110, or 120 VAC			M22N-BG-(2)(2)A-(4)D
				M22N-BG-(2)(2)A-(4)D-P
	200, 220, 230, or 240 VAC			M22N-BG-(2)(2)A-(4)E
				M22N-BG-(2)(2)A-(4)E-P
Plastic flat etched	24 VAC/DC			M22N-BC-(2)(2)A-(4)C
6-40				M22N-BC-(2)(2)A-(4)C-P
	100, 110, or 120 VAC			M22N-BC-(2)(2)A-(4)D
				M22N-BC-(2)(2)A-(4)D-P
	200, 220, 230, or 240 VAC			M22N-BC-(2)(2)A-(4)E
				M22N-BC-(2)(2)A-(4)E-P

Order codes for sets

M 2 2 N - B C - T R A - R A - P (2) (3) (4) (5) (6)* * Terminals specifications

Code	Specification				
No Code	Screw Terminal Block				
Р	Push-In Plus Terminal Block				



Specifications

Characteristics

Citaracteristics						
ltem Type		Indicator				
Insulation resistance		100 MΩ min. (at 500 VDC)				
Dielectric strength	Between terminals of same polarity	2,500 VAC at 50/60 Hz for 1 min				
	Between each terminal and ground	2,500 VAC at 50/60 Hz for 1 min				
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude				
Shock resistance	Malfunction	1,000 m/s ² max.				
Ambient operating temperature*1		−25 to 55°C				
Ambient operating humidity		35% to 85% RH				
Ambient storage temperature*1		−40 to 80°C				
Degree of protection*2		IP66, NEMA 4X, NEMA13				
Electric shock protection class		Class II				



^{*1} With no icing or condensation.
*2 Degree of protection from the front of the panel.

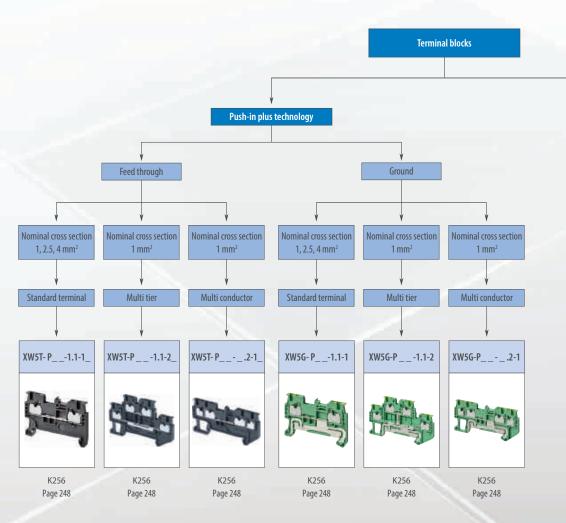
Terminal blocks

XW5_

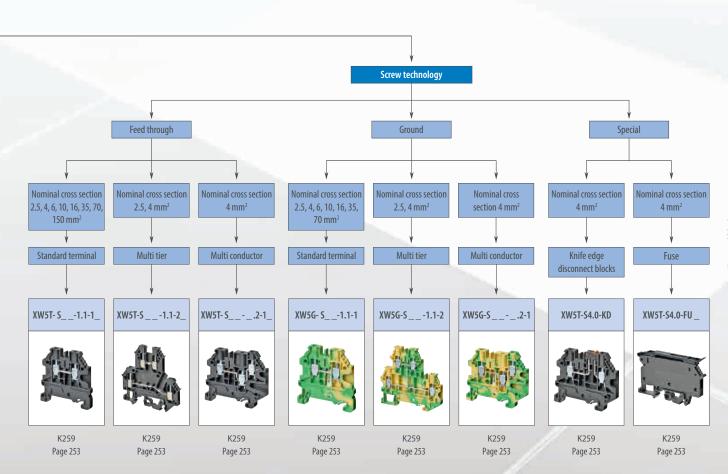
Small dimensions and high performance

A complete range of terminal blocks with cross sections up to 150 mm² with a high quality wiring technology.

- Push-in plus technology
- · Easy wiring
- Robust design







Selection table

Catego	ory	Push-in	Push-in									
Model		XW5T- P1.1-1_	XW5T-P1.1-2_	XW5T- P2-1_	XW5G- P1.1-1	XW5G-P1.1-2	XW5G-P2-1					
	Standard terminal		-	-		-	-					
	Ground blocks	-	-	-								
	Multi tier terminal	-		_	-		_					
eral	Vertical connection	-	-	-	-	•	-					
General	Multi conductor	-	-		-	-						
Ü	Knife edge disconnect	-	-	-	-	-	-					
	Fuse blocks	-	-	-	-	-	-					
	Color	Dark grey, Blue	Dark grey, Blue	Dark grey, Blue	Green/Yellow	Green/Yellow	Green/Yellow					
ons	Width	3.5 to 6.2 mm	3.5 mm	3.5 mm	3.5 to 6.2 mm	3.5 mm	3.5 mm					
Dimensions	Length	45 to 56 mm	65.7 mm	54.1 to 63.2 mm	45 to 56 mm	65.7 mm	54.1 to 63.2 mm					
Dim	Height	30.5 to 35.25 mm	41.1 mm	30.5 mm	30.5 to 35.25 mm	41.1 mm	30.5 mm					
Page/Q	Quick Link	248/K256	248/K256	248/K256	248/K256	248/K256	248/K256					

Screw	I	I	I	I	I		
XW5T- S1.1-1_	XW5T-S1.1-2_	XW5T- S2-1_	XW5G- S1.1-1	XW5G-S1.1-2	XW5G-S2-1	XW5T-S4.0-KD	XW5T-S4.0-FU_
	-	-		-	-	-	-
_	-	-			•	-	-
-		-	-	-	-		
_		-	-		-		
-	-		-	-			
_	-	-	-	-	-		
-	-	-	-	-	-		
Dark grey, Blue	Dark grey, Black	Dark grey, Blue	Green/Yellow	Green/Yellow	Green/Yellow	Gray	Gray
5 to 28 mm	5 to 6 mm	6 mm	5 to 24 mm	6 mm	6 mm	6 mm	8 to 10 mm
48 to 96 mm	66 to 72 mm	56 to 68 mm	48 to 75 mm	72 mm	56 to 68 mm	56 mm	77 mm
48 to 99 mm	64 to 67 mm	50 mm	48 to 81 mm	67 mm	50 mm	50 mm	54 mm
253/K259	253/K259	253/K259	253/K259	253/K259	253/K259	253/K259	253/K259

■ Standard

☐ Available

No/not available

XW5_-P Terminal blocks



Push-in Plus terminal blocks to downsize control panels and save work

- Light insertion force, only 8 N, reduces wiring effort and time.
- Push-in Plus terminal blocks are more compact than traditional screw terminal blocks.
- Slim models available down to a width of 3.5 mm to help downsize control panels.
- Light insertion force and strong holding strength to achieve both less wiring work and high reliability.
- No loosening means maintenance-free application.

Ordering information

Classification	Product type	Nominal cross section (mm²)	Number of levels	Number of cramp position per level	Color	Insulating material	Flammability rating according to UL94	Pack (pcs.)	Weight (gram)	Order code
Feed Through Ter-	Standard termi-	1.0	1	2	Dark grey	PA	V0	50	3.3	XW5T-P1.5-1.1-1
minal blocks	nals	2.5	1	2]	PA	V0	50	6.3	XW5T-P2.5-1.1-1
		4	1	2]	PA	V0	50	8.4	XW5T-P4.0-1.1-1
		1.0	1	2	Blue	PA	V0	50	3.3	XW5T-P1.5-1.1-1BL
		2.5	1	2]	PA	V0	50	6.3	XW5T-P2.5-1.1-1BL
		4	1	2	1	PA	V0	50	8.4	XW5T-P4.0-1.1-1BL
	Multi tiers termi- nal	1.0	2	2	Dark grey	PA	V0	50	6.5	XW5T-P1.5-1.1-2
		1.0	2	2	Blue	PA	V0	50	6.5	XW5T-P1.5-1.1-2BL
	Multi conductor	1.0	1	3	Dark grey	PA	V0	50	4.1	XW5T-P1.5-1.2-1
	terminals	1.0	1	3	Blue	PA	V0	50	4.1	XW5T-P1.5-1.2-1BL
		1.0	1	4	Dark grey	PA	V0	50	4.9	XW5T-P1.5-2.2-1
		1.0	1	4	Blue	PA	V0	50	4.9	XW5T-P1.5-2.2-1BL
Grounding Termi-	Standard termi-	1.0	1	2	Green/yellow	PA	V0	50	4.7	XW5G-P1.5-1.1-1
nal blocks	nals	2.5	1	2	1	PA	V0	50	9.9	XW5G-P2.5-1.1-1
		4	1	2	1	PA	V0	50	11.8	XW5G-P4.0-1.1-1
	Multi tiers termi- nal	1.0	2	2		PA	V0	50	8.1	XW5G-P1.5-1.1-2
	Multi conductor	1.0	1	3	1	PA	V0	50	5.5	XW5G-P1.5-1.2-1
	terminals	1.0	1	4	1	PA	V0	50	6.3	XW5G-P1.5-2.2-1

Accessories

Short bars

Applicable terminal blocks	No. of poles	Colors	Order code		
XW5T-P1.5 or	2	Red (RD)	XW5S-P1.5-2		
XW5G-P1.5	3	Blue(BL)	XW5S-P1.5-3		
	4	Yellow (YL)	XW5S-P1.5-4		
	5		XW5S-P1.5-5		
	10		XW5S-P1.5-10		
XW5T-P2.5 or	2	Red (RD)	XW5S-P2.5-2		
XW5G-P2.5	3	Blue(BL) Yellow (YL)	XW5S-P2.5-3		
	4		XW5S-P2.5-4		
	5		XW5S-P2.5-5		
	10		XW5S-P2.5-10		
XW5T-P4.0 or	2	Red (RD)	XW5S-P4.0-2		
XW5G-P4.0	3	Blue(BL)	XW5S-P4.0-3		
	4	Yellow (YL)	XW5S-P4.0-4		
	5		XW5S-P4.0-5		
	10		XW5S-P4.0-10		

Labels

Applicable terminal blocks	Description	Order code
XW5T-P1.5	For Top 1 sheet (102 pieces)	XW5Z-P1.5LB1
	For Side 1 sheet (108 pieces)	XW5Z-P1.5LB2
XW5T-P2.5	For Top 1 sheet (72 pieces)	XW5Z-P2.5LB1
	For Side 1 sheet (72 pieces)	XW5Z-P2.5LB2
XW5T-P4.0	For Top 1 sheet (60 pieces)	XW5Z-P4.0LB1
	For Side 1 sheet (60 pieces)	XW5Z-P4.0LB2

End cover

Applicable terminal blocks	Order code
XW5P1.5-1.1-1	XW5E-P1.5-1.1-1
XW5P1.5-1.1-2	XW5E-P1.5-1.1-2
XW5P1.5-1.2-1	XW5E-P1.5-1.2-1
XW5P1.5-2.2-1	XW5E-P1.5-2.2-1
XW5P2.5-1.1-1	XW5E-P2.5-1.1-1
XW5P4.0-1.1-1	XW5E-P4.0-1.1-1

End brackets/Separator plates

Name	Width (mm)	Order code	
End Brackets	6	XW5Z-EP6	
Separator Plates	12	XW5Z-EP12	



Specifications

Feed through terminal blocks

Mode	el	XW5T-P1.5	-1.1-1 (BL)			XW5T-P2.5-1.1-1 (BL)	XW5T-P4.0-1.1-1 (BL)	
Appe	arance							
Interi	nal wiring	1 tier, 1:1	0—	— 0		1 tier, 1:1	1 tier, 1:1	
	Nominal cross section	1.0 mm ²				2.5 mm ²	4 mm ²	
	Minimum conductor cross section solid	0.14 mm ²				0.14 mm ²	0.2 mm ²	
	Maximum conductor cross section solid	1.5 mm ²				4.0 mm ²	6.0 mm ²	
sizes	Minimum conductor cross section fine stranded	0.08 mm ²				0.14 mm ²	0.2 mm ²	
le wire	Maximum conductor cross section fine stranded	1.5 mm ²				2.5 mm ²	4.0 mm ²	
jld	Minimum conductor cross section (flex., stranded) with ferrule with Plastic sleeve	0.14 mm ²				0.14 mm ²	0.2 mm ²	
	Maximum conductor cross section (flex., stranded) with ferrule with Plastic sleeve	1.0 mm ²				2.5 mm ²	4.0 mm ²	
	Conductor cross section AWG	AWG28 to A	WG14			AWG26 to AWG12	AWG24 to AWG10	
	Wire strip length	8 mm				10 mm	12 mm	
Dime	nsions (mm)	3.5×45×30.	3.5×45×30.5			5.2×48.8×35.25	6.2×56.1×35.25	
Mour	nting rail	TH35				TH35	TH35	
IEC ra	ited voltage	500 V	500 V			800 V	800 V	
IEC ra	ted current	13.5 A (17.5	A*1)			24 A	32 A	
Usag	e Group (UG)	B, C	D			B, C		
UL ra	ted voltage	300 V	51-150 V	151-300 V	301-600 V	600 V		
UL ra	ted current	15 A (SOL) 10 A (STR)	15 A (SOL) 10 A (STR)	10 A	5 A	20 A/AWG12 (SOL), 15 A/AWG14 (STR)	30 A/AWG10 (SOL), 20 A/AWG12 (STR)	
Rated	l impulse voltage	6 kV				8 kV	8 kV	
			1,890 VAC for 60 min (leakage current: 1 mA max.)			2,000 VAC for 60 min (leakage current: 1 mA max.)	2,000 VAC for 60 min (leakage current: 1 mA max.)	
End cover XW5E-P1.5-1.1-1			XW5E-P2.5-1.1-1	XW5E-P4.0-1.1-1				
Special tool XW		XW4Z-00B	XW4Z-00B			XW4Z-00B	XW4Z-00B	
Appli	cable nameplates	XW5Z-P1.5LB_ or commercially available name- plate with 9.5 mm width and 0.5 mm thickness				XW5Z-P2.5LB_ or commercially available name- plate with 9.5 mm width and 0.5 mm thickness	XW5Z-P4.0LB_ or commercially available name- plate with 9.5 mm width and 0.5 mm thickness	
Appli	cable Short bars	XW5S-P1.5 (_: Poles = 2, 3, 4, 5 or 10)				XW5S-P2.5 (_: Poles = 2, 3, 4, 5 or 10)	XW5S-P4.0 (_: Poles = 2, 3, 4, 5 or 10)	

^{*1} Rated current with 1.5 mm² conductor cross section wire.

Mode	el	XW5T-P1.5-1.1-2 (BL)		XW5T-P1.5-1.2-1 (BL)		XW5T-P1.5	-2.2-1 (BL)
Appe	earance						
Interi	nal wiring	2 tiers, 1:1		1 tier, 1:2	-0-0	1 tier, 2:2	0-0-0-0
	Nominal cross section	1.0 mm ²		1.0 mm ²		1.0 mm ²	
	Minimum conductor cross section solid	0.14 mm ²		0.14 mm ²		0.14 mm ²	
	Maximum conductor cross section solid	1.5 mm ²		1.5 mm ²		1.5 mm ²	
e sizes	Minimum conductor cross section fine stranded	0.08 mm ²		0.08 mm ²		0.08 mm ²	
ole wire	Maximum conductor cross section fine stranded	1.5 mm ²		1.5 mm ²		1.5 mm ²	
Applicable wire sizes	Minimum conductor cross section (flex., stranded) with ferrule with Plastic sleeve	0.14 mm ²		0.14 mm ²		0.14 mm ²	
	Maximum conductor cross section (flex., stranded) with ferrule with Plastic sleeve	1.0 mm ²		1.0 mm ²		1.0 mm ²	
	Conductor cross section AWG	AWG28 to AWG14		AWG28 to AWG14		AWG28 to A	WG14
	Wire strip length	8 mm		8 mm		8 mm	
Dime	nsions	3.5×65.7×41.1		3.5×54.1×30.5		3.5×63.2×30.5	
Mour	nting rail	TH35		TH35		TH35	
IEC ra	ated voltage	500 V		500 V		500 V	
IEC ra	nted current	13.5 A (17.5 A ^{*1})		13.5 A (17.5 A ^{*1})		13.5 A (17.5 A ^{*1})	
	e Group (UG)	В, С	D				
	ted voltage	300 V	51-150 V		151-300 V		301-600 V
	ted current	15 A (SOL), 10 A (STR)	15 A (SOL),	1	10 A	1	5 A
Rated impulse voltage		6 kV		6 kV		6 kV	
Dielectric strength		1,890 VAC for 60 min (leakage current: 1 mA max.)		1,890 VAC for 60 min (leakage current: 1 mA n	nax.)	+	rrent: 1 mA max.)
End cover		XW5E-P1.5-1.1-2		XW5E-P1.5-1.2-1		XW5E-P1.5-	2.2-1
	ial tool	XW4Z-00B		XW4Z-00B		XW4Z-00B	
Appli	icable nameplates	XW5Z-P1.5LB_ or commercially ava plate with 9.5 mm width and 0.5 mr		XW5Z-P1.5LB_ or comm plate with 9.5 mm width			B_ or commercially available name- 0.5 mm width and 0.5 mm thickness
Appli	icable Short bars	XW5S-P1.5 (_: Poles = 2, 3, 4, 5 or 10)		XW5S-P1.5 (_: Poles = 2, 3, 4, 5 or 10)		XW5S-P1.5 (_: Poles = 2, 3, 4, 5 or 10)	

^{*1} Rated current with 1.5 mm² conductor cross section wire.

Grounding terminal blocks

Model		XW5G-P1.5-1.1-1	XW5G-P2.5-1.1-1	XW5G-P4.0-1.1-1		
Appearance						
Inter	nal wiring	1 tier, 1:1	1 tier, 1:1	1 tier, 1:1		
	Nominal cross section	1.0 mm ²	2.5 mm ²	4 mm ²		
	Minimum conductor cross section solid	0.14 mm ²	0.14 mm ²	0.2 mm ²		
	Maximum conductor cross section solid	1.5 mm ²	4.0 mm ²	6.0 mm ²		
sizes	Minimum conductor cross section fine stranded	0.08 mm ²	0.14 mm ²	0.2 mm ²		
ole wire	Maximum conductor cross section fine stranded	1.5 mm ²	2.5 mm ²	4.0 mm ²		
Applicable wire sizes	Minimum conductor cross section (flex., stranded) with ferrule with Plastic sleeve	0.14 mm ²	0.14 mm ²	0.2 mm ²		
	Maximum conductor cross section (flex., stranded) with ferrule with Plastic sleeve	1.0 mm ²	2.5 mm ²	4.0 mm ²		
	Conductor cross section AWG	AWG28 to AWG14	AWG26 to AWG12	AWG24 to AWG10		
	Wire strip length	8 mm	10 mm	12 mm		
Dime	nsions	3.5×45×30.5	5.2×48.8×35.25	6.2×56.1×35.25		
Mour	nting rail	TH35	TH35	TH35		
IEC ra	ited voltage	500 V	800 V	800 V		
IEC ra	ited current		-	-		
UL ra	ted voltage	600 V	600 V	600 V		
UL ra	ted current	-	-	-		
Rated	l impulse voltage	6 kV	8 kV	8 kV		
Dielectric strength		1,890 VAC for 60 min (leakage current: 1 mA max.)	2,000 VAC for 60 min (leakage current: 1 mA max.)	2,000 VAC for 60 min (leakage current: 1 mA max.)		
End c	over	XW5E-P1.5-1.1-1	XW5E-P2.5-1.1-1	XW5E-P4.0-1.1-1		
Speci	al tool	XW4Z-00B	XW4Z-00B	XW4Z-00B		
Appli	cable nameplates	XW5Z-P1.5LB_ or commercially available name- plate with 9.5 mm width and 0.5 mm thickness	XW5Z-P2.5LB_ or commercially available name- plate with 9.5 mm width and 0.5 mm thickness	XW5Z-P4.0LB_ or commercially available name- plate with 9.5 mm width and 0.5 mm thickness		
Appli	cable Short bars	XW5S-P1.5 (_: Poles = 2, 3, 4, 5 or 10)	XW5S-P2.5 (_: Poles = 2, 3, 4, 5 or 10)	XW5S-P4.0 (_: Poles = 2, 3, 4, 5 or 10)		

Mode	el	XW5G-P1.5-1.1-2	XW5G-P1.5-1.2-1	XW5G-P1.5-2.2-1	
Appe	arance and internal wiring				
Inter	nal wiring	2 tiers, 1:1	1 tier, 1:2	1 tier, 2:2	
	Nominal cross section	1.0 mm ²	1.0 mm ²	1.0 mm ²	
	Minimum conductor cross section solid	0.14 mm ²	0.14 mm ²	0.14 mm ²	
	Maximum conductor cross section solid	1.5 mm ²	1.5 mm ²	1.5 mm ²	
sizes	Minimum conductor cross section fine stranded	0.08 mm ²	0.08 mm ²	0.08 mm ²	
ole wire	Maximum conductor cross section fine stranded	1.5 mm ²	1.5 mm ²	1.5 mm ²	
Applicable wire sizes	Minimum conductor cross section (flex., stranded) with ferrule with Plastic sleeve	0.14 mm ²	0.14 mm ²	0.14 mm ²	
	Maximum conductor cross section (flex., stranded) with ferrule with Plastic sleeve	1.0 mm ²	1.0 mm ²	1.0 mm ²	
	Conductor cross section AWG	AWG28 to AWG14	AWG28 to AWG14	AWG28 to AWG14	
	Wire strip length	8 mm	8 mm	8 mm	
Dime	nsions	3.5×65.7×41.1	3.5×54.1×30.5	3.5×63.2×30.5	
Mour	nting rail	TH35	TH35	TH35	
IEC ra	ited voltage	500 V	500 V	500 V	
IEC ra	ted current	_	_	_	
UL ra	ted voltage	600 V	600 V	600 V	
UL ra	ted current	_	_	_	
Rate	l impulse voltage	6 kV	6 kV	6 kV	
Diele	ctric strength	1,890 VAC for 60 min (leakage current: 1 mA max.)	1,890 VAC for 60 min (leakage current: 1 mA max.)	1,890 VAC for 60 min (leakage current: 1 mA max.)	
End c	over	XW5E-P1.5-1.1-2	XW5E-P1.5-1.2-1	XW5E-P1.5-2.2-1	
Speci	al tool	XW4Z-00B	XW4Z-00B	XW4Z-00B	
Appli	cable nameplates	XW5Z-P1.5LB_ or commercially available name- plate with 9.5 mm width and 0.5 mm thickness	XW5Z-P1.5LB_ or commercially available name- plate with 9.5 mm width and 0.5 mm thickness	XW5Z-P1.5LB_ or commercially available name- plate with 9.5 mm width and 0.5 mm thickness	
Appli	cable Short bars	XW5S-P1.5 (_: Poles = 2, 3, 4, 5 or 10)	XW5S-P1.5 (_: Poles = 2, 3, 4, 5 or 10)	XW5S-P1.5 (_: Poles = 2, 3, 4, 5 or 10)	

Short bars

Model	XW5S-P1.5	XW5S-P2.5	XW5S-P4.0
Rated voltage	500 V	800 V	
Rated current	17.5 A	24 A	32 A



Global-standard DIN terminal blocks for control panels

- · Wires held with screws.
- Compatible with a wide range of wire sizes with a nominal cross section from 2.5 to 150 $\mbox{mm}^2.$
- Terminal blocks with fuses and disconnect terminal blocks are available.

Ordering information

Classification	Product Type	Nominal Cross Section (mm²)	Number of levels	Number of cramp position per level	Color	Insulating material	Flammability Rating according to UL94	Pack (pcs.)	Weight (gram)	Order code
Feed Through	Standard terminals	2.5	1	2	Dark gray	PA	V0	100	8	XW5T-S2.5-1.1-1
erminal blocks		2.5	1	2	Blue	PA	V0	100	8	XW5T-S2.5-1.1-1
		4.0	1	2	Dark gray	PA	V0	100	9	XW5T-S4.0-1.1-1
		4.0	1	2	Blue	PA	V0	100	9	XW5T-S4.0-1.1-1
		6.0	1	2	Dark gray	PA	V0	100	14	XW5T-S6.0-1.1-1
		6.0	1	2	Blue	PA	V0	100	14	XW5T-S6.0-1.1-1
		10.0	1	2	Dark gray	PA	V0	50	17	XW5T-S10-1.1-1
		10.0	1	2	Blue	PA	V0	50	17	XW5T-S10-1.1-1E
		16.0	1	2	Dark gray	PA	V0	50	37	XW5T-S16-1.1-1
		16.0	1	2	Blue	PA	V0	50	37	XW5T-S16-1.1-1E
		35.0	1	2	Dark gray	PA	V0	20	74	XW5T-S35-1.1-1
		35.0	1	2	Blue	PA	V0	20	74	XW5T-S35-1.1-1B
		70.0	1	2	Dark gray	PA	V0	20	177	XW5T-S70-1.1-1
		70.0	1	2	Blue	PA	V0	20	177	XW5T-S70-1.1-1E
		150.0	1	2	Dark gray	PA	V0	10	281	XW5T-S150-1.1-1
		150.0	1	2	Blue	PA	V0	10	282	XW5T-S150-1.1-1
	Multi tiers terminal	2.5	2	2	Dark gray	PA	V0	100	13	XW5T-S2.5-1.1-2
		2.5	2	2	Black	PA	V0	100	15	XW5T-S2.5-1.1-2
		4.0	2	2	Dark gray	PA	V0	100	19	XW5T-S4.0-1.1-2
		4.0	2	2	Black	PA	V0	100	20	XW5T-S4.0-1.1-2
	Multi conductor	4.0	1	3	Dark gray	PA	V0	100	13	XW5T-S4.0-1.2-1
	terminals	4.0	1	4	1	PA	V0	100	17	XW5T-S4.0-2.2-1
		4.0	1	3	Blue	PA	V0	100	13	XW5T-S4.0-1.2-1
		4.0	1	4	1	PA	V0	100	17	XW5T-S4.0-2.2-1
irounding	Standard terminals	2.5	1	2	Green/ yellow	PA	V0	100	10	XW5G-S2.5-1.1-1
erminal blocks		4.0	1	2	1	PA	V0	100	12	XW5G-S4.0-1.1-1
		6.0	1	2	1	PA	V0	100	20	XW5G-S6.0-1.1-1
		10.0	1	2	1	PA	V0	50	23	XW5G-S10-1.1-1
		16.0	1	2	1	PA	V0	50	47	XW5G-S16-1.1-1
		35.0	1	2	1	PA	V0	20	123	XW5G-S35-1.1-1
		70.0	1	2	1	PA	V0	20	240	XW5G-S70-1.1-1
	Multi tiers terminal	4.0	2	2	1	PA	V0	100	23	XW5G-S4.0-1.1-2
	Multi conductor	4.0	1	3	1	PA	V0	100	16	XW5G-S4.0-1.2-1
	terminals	4.0	1	4	1	PA	V0	100	20	XW5G-S4.0-2.2-1
pecial	Knife edge	4.0	1	2	Dark gray	PA	V0	50	19	XW5T-S4.0-FU5
erminals	disconnect block	4.0	1	2	1 .	PA	V0	50	22	XW5T-S4.0-FU6
	Fuse terminal	4.0	1	2	1	PA	V0	100	12	XW5T-S4.0-KD

XW5_-S Terminal blocks

Accessories

Short Bars

Applicable terminal blocks	No. of poles	Color	Pack (pcs.)	Order code
XW5S2.5	2	Yellow (YL)	10	XW5S-S2.5-2
	3		10	XW5S-S2.5-3
	4		10	XW5S-S2.5-4
	5		10	XW5S-S2.5-5
	10		20	XW5S-S2.5-10
XW5S4.0	2	Yellow (YL)	10	XW5S-S4.0-2
	3		10	XW5S-S4.0-3
	4		10	XW5S-S4.0-4
	5		10	XW5S-S4.0-5
	10		20	XW5S-S4.0-10
XW5S6.0	2	Yellow (YL)	10	XW5S-S6.0-2
	3		10	XW5S-S6.0-3
	4		10	XW5S-S6.0-4
	5		10	XW5S-S6.0-5
XW5S10	2	Yellow (YL)	10	XW5S-S10-2
XW5S16	2	Yellow (YL)	10	XW5S-S16-2

Cross connector with screw

Applicable terminal blocks	No. of poles	Color	Pack (pcs.)	Order code
XW5S2.5-1.1-2_	2	Yellow (YL)	10	XW5S-S2.5-2N
	3		10	XW5S-S2.5-3N
	4		10	XW5S-S2.5-4N
	5		10	XW5S-S2.5-5N
	10		10	XW5S-S2.5-10N

End covers

Applicable terminal blocks	Pack (pcs.)	Order code
XW5S2.5-1.1 XW5S4.0-1.1 XW5S6.0-1.1 XW5S10-1.1	10	XW5E-S2.5
XW5T-S16-1.1	10	XW5E-S16
XW5T-S4.0-KD XW5S4.0-1.2-1	10	XW5E-S4.0-1.2-1
XW5S4.0-2.2-1	10	XW5E-S4.0-2.2-1
XW5S4.0-1.1-2_	10	XW5E-S4.0-1.1-2
XW5T-S2.5-1.1-2_	10	XW5E-S2.5N

Separator plates

Applicable terminal blocks	Pack (pcs.)	Order code
XW5S2.5-1.1 XW5S4.0-1.1 XW5S6.0-1.1 XW5S10-1.1	10	XW5Z-S2.5PT

Labels

Applicable terminal blocks	Marking	Pack (pcs.)	Order code
XW5S2.5	None	25	XW5Z-S2.5LB
XXX3_ 32.3 _	1-10	25	XW5Z-S2.5LB-1-10
	11-20	25	XW5Z-S2.5LB-11-20
	21-30	25	XW5Z-S2.5LB-21-30
	31-40	25	XW5Z-S2.5LB-31-40
	41-50	25	XW5Z-S2.5LB-41-50
	51-60	25	XW5Z-S2.5LB-51-60
	61-70	25	XW5Z-S2.5LB-61-70
	71-80	25	XW5Z-S2.5LB-71-80
	81-90	25	XW5Z-S2.5LB-81-90
	91-100	25	XW5Z-S2.5LB-91-100
	1-100	1*1	XW5Z-S2.5LB-1-100
XW5 -S4.0-	None	25	XW5Z-S4.0LB
XXX3_ 3	1-10	25	XW5Z-S4.0LB-1-10
	11-20	25	XW5Z-S4.0LB-11-20
	21-30	25	XW5Z-S4.0LB-21-30
	31-40	25	XW5Z-S4.0LB-31-40
	41-50	25	XW5Z-S4.0LB-41-50
	51-60	25	XW5Z-S4.0LB-51-60
	61-70	25	XW5Z-S4.0LB-61-70
	71-80	25	XW5Z-S4.0LB-71-80
	81-90	25	XW5Z-S4.0LB-81-90
	91-100	25	XW5Z-S4.0LB-91-100
	1-100	1*1	XW5Z-S4.0LB-1-100
XW5 -S6.0-	None	25	XW5Z-S6.0LB
	1-10	25	XW5Z-S6.0LB-1-10
	11-20	25	XW5Z-S6.0LB-11-20
	21-30	25	XW5Z-S6.0LB-21-30
	31-40	25	XW5Z-S6.0LB-31-40
	41-50	25	XW5Z-S6.0LB-41-50
	51-60	25	XW5Z-S6.0LB-51-60
	61-70	25	XW5Z-S6.0LB-61-70
	71-80	25	XW5Z-S6.0LB-71-80
	81-90	25	XW5Z-S6.0LB-81-90
	91-100	25	XW5Z-S6.0LB-91-100
	1-100	1*1	XW5Z-S6.0LB-1-100

^{*1} Box including 250 pcs.



Specifications

Feed through terminal blocks

		XW5T-S2.5-1.1-1(BL)	XW5T-S4.0-1.1-1(BL)	XW5T-S6.0-1.1-1(BL)	XW5T-S10-1.1-1(BL)	XW5T-S16-1.1-1(BL)	XW5T-S35-1.1-1(BL)	XW5T-S70-1.1-1(BL)
App	pearance	490	150	66		66		
		749	275	20/3	2003	2-20-1	A STATE OF THE PARTY OF THE PAR	All Car
Inte	ernal wiring	1 tier, 1:1	1 tier, 1:1	1 tier, 1:1	1 tier, 1:1	1 tier, 1:1	1 tier, 1:1	1 tier, 1:1
	Nominal cross section	2.5 mm ²	4.0 mm ²	6.0 mm ²	10 mm ²	16 mm ²	35 mm ²	70 mm ²
	Minimum conductor cross section solid	0.14 mm ²	0.14 mm ²	0.2 mm ²	0.5 mm ²	1.5 mm ²	10 mm ²	-
	Maximum conductor cross section solid	4.0 mm ²	6.0 mm ²	10 mm ²	16 mm ²	16 mm ²	10 mm ²	-
S	Minimum conductor cross section fine stranded	0.14 mm ²	0.14 mm ²	0.2 mm ²	0.5 mm ²	4.0 mm ²	10 mm ²	10 mm ²
wire sizes	Maximum conductor cross section fine stranded	4.0 mm ²	6.0 mm ²	10 mm ²	16 mm ²	25 mm ²	35 mm ²	70 mm ²
App	Minimum conductor cross section (flex., stranded) with cable end sleeve	0.5 mm ²	0.5 mm ²	0.5 mm ²	0.5 mm ²	1.5 mm ²	_	_
	Maximum conductor cross section (flex., stranded) with cable end sleeve	2.5 mm ²	4.0 mm ²	6.0 mm ²	10 mm ²	16 mm ²	-	-
	Conductor cross section AWG	AWG26 to AWG12	AWG26 to AWG10	AWG24 to AWG8	AWG20 to AWG6	AWG14 to AWG4	AWG10 to AWG 1/0	AWG6 to AWG 2/0
	Wire strip length	9 mm	9 mm	11 mm	13 mm	15 mm	18 mm	24 mm
Tigl	htening torque	0.4 Nm	0.5 Nm	1.2 Nm	1.2 Nm	2 Nm	3 Nm	6 Nm
Din	nensions	5×48.2×56	6×48.2×56	8×48.2×56	10×48.2×56.2	12×58.5×62	16×63×75.1	24×75.2×88.7
Мо	unting rail	TH35	TH35	TH35	TH35	TH35	TH35	TH35
IEC	rated voltage	1,000 V	1,000 V	1,000 V	1,000 V	1,000 V	800 V	800 V
IEC	rated current	24 A	32 A	41 A	57 A	76 A	124 A	179 A
Rat	ed impulse voltage	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV	8 kV
UL	rated voltage	600 V	600 V	600 V	600 V	600 V	600 V	600 V
ULı	rated current	20 A	30 A	50 A	65 A	85 A	150 A	175 A
End	l Covers	XW5E-S2.5-1.1-1	XW5E-S2.5-1.1-1	XW5E-S2.5-1.1-1	XW5E-S2.5-1.1-1	XW5E-S16		
App	olicable nameplates	XW5Z-S2.5LB	XW5Z-S4.0LB_	XW5Z-S6.0LB_	_	-	_	_
App	olicable Short Bars	XW5S-S4.0 (_: Poles = 2, 3, 4, 5 or 10)	XW5S-S4.0 (_: Poles = 2, 3, 4, 5 or 10)	XW5S-S6.0 (_: Poles = 2,3, 4, or 5)	XW5S-S10 (_: Poles = 2)	XW5S-S16 (_: Poles = 2)	-	-

Terminal blocks

		XW5T-S150-1.1-1(BL)	XW5T-S2.5-1.1-2	XW5T-S2.5-1.1-2V	XW5T-S4.0-1.2-1(BL)	XW5T-S4.0-2.2-1(BL)	XW5T-S4.0-1.1-2	XW5T-S4.0-1.1-2V
Арр	pearance	100						
Inte	ernal wiring	1 tier, 1:1	2 tiers, 2:2	2 tiers, 2:2	1 tier, 1:2	1 tier, 2:2	2 tiers, 1:1	2 tiers, 1:1
	Nominal cross section	150 mm ²	2.5 mm ²	2.5 mm ²	4.0 mm ²	4.0 mm ²	4.0 mm ²	4.0 mm ²
	Minimum conductor cross section solid	_	0.2 mm ²	0.2 mm ²	0.14 mm ²	0.14 mm ²	0.14 mm ²	0.14 mm ²
	Maximum conductor cross section solid	_	4.0 mm ²	4.0 mm ²	6.0 mm ²	6.0 mm ²	6.0 mm ²	6.0 mm ²
S	Minimum conductor cross section fine stranded	35 mm ²	0.14 mm ²	0.14 mm ²	0.14 mm ²	0.14 mm ²	0.14 mm ²	0.14 mm ²
wire sizes	Maximum conductor cross section fine stranded	150 mm ²	2.5 mm ²	2.5 mm ²	6.0 mm ²	6.0 mm ²	6.0 mm ²	6.0 mm ²
Applicable wire	Minimum conductor cross section (flex., stranded) with cable end sleeve	-	-	_	0.5 mm ²	0.5 mm ²	0.5 mm ²	0.5 mm ²
	Maximum conductor cross section (flex., stranded) with cable end sleeve	-	_	_	4.0 mm ²	4.0 mm ²	4.0 mm ²	4.0 mm ²
	Conductor cross section AWG	AWG 2/0 to 350 kcmil	AWG22 to AWG12	AWG22 to AWG12	AWG26 to AWG10	AWG26 to AWG10	AWG26 to AWG10	AWG26 to AWG10
	Wire strip length	30 mm	8 mm	8 mm	9 mm	9 mm	9 mm	9 mm
Tig	ntening torque	10 Nm	0.4 Nm	0.4 Nm	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm
Din	nensions	28×96×106.1	5×65.8×71.4	5×65.8×71.4	6×58×56	6×69×58	6×73×75	6×73×75
Мо	unting rail	TH35	TH35	TH35	TH35	TH35	TH35	TH35
IEC	rated voltage	1,000 V	500 V	500 V	500 V	500 V	800 V	800 V
IEC	rated current	309 A	24 A	24 A	32 A	32 A	32 A	32 A
Rat	ed impulse voltage	8 kV	6 kV	6 kV	6 kV	6 kV	8 kV	8 kV
UL	rated voltage	600 V	600 V	600 V	300 V	300 V	300 V	300 V
UL	rated current	335 A	20 A	20 A	30 A	30 A	30 A	30 A
Enc	Covers	_	XW5E-S2.5N	XW5E-S2.5N	XW5E-S4.0-1.2-1	XW5E-S4.0-2.2-1	XW5E-S4.0-1.1-2	XW5E-S4.0-1.1-2
App	olicable nameplates	_	XW5Z-2.5LB_	XW5Z-2.5LB_	XW5Z-4.0LB_	XW5Z-4.0LB_	XW5Z-4.0LB_	XW5Z-4.0LB_
App	olicable Short Bars	-	XW5S-S2.5N (_: Poles = 2, 3, 4, 5, or 10)	XW5S-S2.5N (_: Poles = 2, 3, 4, 5, or 10)	XW5S-S4.0 (_: Poles = 2, 3, 4, 5, or 10)	XW5S-S4.0 (_: Poles = 2, 3, 4, 5, or 10)	XW5S-S4.0 (_: Poles = 2, 3, 4, 5, or 10)	XW5S-S4.0 (_: Poles = 2, 3, 4, 5, or 10)

Grounding terminal blocks

	XW5G-S2.5-1.1-1	XW5G-S4.0-1.1-1	XW5G-S6.0-1.1-1	XW5G-S10-1.1-1	XW5G-S16-1.1-1
Appearance					
Internal wiring	1 tier, 1:1	1 tier, 1:1	1 tier, 1:1	1 tier, 1:1	1 tier, 1:1
Nominal cross section	2.5 mm ²	4.0 mm ²	6.0 mm ²	10 mm ²	16 mm ²
Minimum conductor cross section solid	0.14 mm ²	0.14 mm ²	0.2 mm ²	0.5 mm ²	1.5 mm ²
Maximum conductor cross section solid	4.0 mm ²	6.0 mm ²	10 mm ²	16 mm ²	16 mm ²
Minimum conductor cross section fine stranded	0.14 mm ²	0.14 mm ²	0.2 mm ²	0.5 mm ²	4.0 mm ²
Maximum conductor cross section fine stranded	4.0 mm ²	6.0 mm ²	10 mm ²	16 mm ²	25 mm ²
Maximum conductor cross section fine stranded cross section (flex., stranded) with cable end sleeve	0.5 mm ²	0.5 mm ²	0.5 mm ²	0.5 mm ²	1.5 mm ²
Maximum conductor cross section (flex., stranded) with cable end sleeve	2.5 mm ²	4.0 mm ²	6.0 mm ²	10 mm ²	16 mm ²
Conductor cross section AWG	AWG26 to AWG12	AWG26 to AWG10	AWG24 to AWG8	AWG20 to AWG6	AWG14 to AWG4
Wire strip length	9 mm	9 mm	11 mm	13 mm	15 mm
Γightening torque	0.4 Nm	0.5 Nm	1.2 Nm	1.2 Nm	2 Nm
Dimensions	5×48.2×56	6×48.2×56	8×48.2×56	10×48.2×56.2	12×58.5×62
Mounting rail	TH35	TH35	TH35	TH35	TH35
EC rated voltage	1,000 V	1,000 V	1,000 V	1,000 V	1000 V
IEC rated current	-	-	-	-	-
Rated impulse voltage	8 kV	8 kV	8 kV	8 kV	8 kV
UL rated voltage	600 V	600 V	600 V	600 V	600 V
UL rated current	-	-	-	-	-
End Covers	XW5E-S2.5	XW5E-S2.5	XW5E-S2.5	XW5E-S2.5	XW5E-S16
Applicable nameplates	XW5Z-S2.5LB_	XW5Z-S4.0LB_	XW5Z-S6.0LB_	-	-
Applicable Short Bars	-	-	-	-	-

XW5_-S Terminal blocks

		XW5G-S35-1.1-1	XW5G-S70-1.1-1	XW5G-S4.0-1.2-1	XW5G-S4.0-2.2-1	XW5G-S4.0-1.1-2
Ар	pearance					
Into	ernal wiring	1 tier, 1:1	1 tier, 1:1	1 tier, 1:2	1 tier, 2:2	2 tiers, 1:1
	Nominal cross section	35 mm²	70 mm ²	4.0 mm ²	4.0 mm ²	4.0 mm ²
	Minimum conductor cross section solid	10 mm ²	-	0.14 mm ²	0.14 mm ²	0.14 mm ²
	Maximum conductor cross section solid	35 mm ²	-	6 mm ²	6 mm ²	6 mm ²
s	Minimum conductor cross section fine stranded	10 mm ²	10 mm ²	0.14 mm ²	0.14 mm ²	0.14 mm ²
wire size	Maximum conductor cross section fine stranded	35 mm ²	70 mm ²	6 mm ²	6 mm ²	6 mm ²
Applicable wire sizes	Minimum conductor cross section (flex., stranded) with cable end sleeve	_	-	0.5 mm ²	0.5 mm ²	0.5 mm ²
	Maximum conductor cross section (flex., stranded) with cable end sleeve	_	-	4 mm ²	4 mm ²	4 mm ²
	Conductor cross section AWG	AWG10 to AWG2	AWG6 to AWG 2/0	AWG26 to AWG10	AWG26 to AWG10	AWG26 to AWG10
	Wire strip length	20 mm	24 mm	9 mm	9 mm	9 mm
Tig	htening torque	3 Nm	6 Nm	0.5 Nm	0.5 Nm	0.5 Nm
Din	nensions	16×63×75.1	24×75.2×88.7	6×58×56	6×69×58	6×73×75
Мо	unting rail	TH35	TH35	TH35	TH35	TH35
IEC	rated voltage	800 V	800 V	500 V	500 V	800 V
IEC	rated current	-	-	-	-	-
Rat	ed impulse voltage	8 kV	8 kV	6 kV	6 kV	8 kV
UL	rated voltage	600 V	600 V	300 V	300 V	300 V
UL	rated current	_	_	-	_	-
End	d Covers	-	-	XW5E-S4.0-1.2-1	XW5E-S4.0-2.2-1	XW5E-S4.0-1.1-2
Ар	plicable nameplates	-	-	XW5Z-4.0LB_	XW5Z-4.0LB_	XW5Z-4.0LB_
Ap	plicable Short Bars	-	-	_	-	-

Terminal blocks with fuses

Мо	del	XW5T-S4.0-FU5	XW5T-S4.0-FU6
Арі	pearance		In the second
Inte	ernal wiring	1 tier, 1:1	1 tier, 1:1
	Nominal cross section	4.0 mm ²	4.0 mm ²
	Minimum conductor cross section solid	0.5 mm ²	0.5 mm ²
	Maximum conductor cross section solid	6 mm ²	6 mm ²
S	Minimum conductor cross section fine stranded	0.5 mm ²	0.5 mm ²
e wire size	Maximum conductor cross section fine stranded	4 mm ²	4 mm ²
Applicable wire sizes	Minimum conductor cross section (flex., stranded) with cable end sleeve	_	-
	Maximum conductor cross section (flex., stranded) with cable end sleeve	_	-
	Conductor cross section AWG	AWG22 to AWG10	AWG22 to AWG10
	Wire strip length	8 mm	8 mm
Tig	htening torque	0.5 Nm	0.5 Nm
Din	nensions	8×77.2×62	10×77.2×62
Мо	unting rail	TH35	TH35
IEC	rated voltage	800 V	800 V
IEC	rated current	6.3 A	10 A
Rat	ed impulse voltage	8 kV	8 kV
UL	rated voltage	600 V	600 V
UL	rated current	15 A	15 A
Enc	l Covers	_	_
Ap	olicable nameplates	-	-
Apı	olicable Short Bars	_	-

Technical Information for XW5T-S4.0-FU5, XW5T-S4.0-FU6

The fuse blocks of this type have a flip top disconnect lever. It accepts miniature fuses of 5×20, 5×25 and 5×30 mm (terminal width: 8 mm) or 6.3×32 mm (terminal width: 10 mm). The hinged lever has latch points both in the open and in the closed position, and can be sealed. Depending on the application and the installation method, the circumstances for increased temperature must be checked in the closed fuse holders. Higher ambient temperatures are an additional load for the fuse inserts. Therefore, the reduction of the rated current must be considered accordingly in these applications.

Disconnect terminal blocks

Мо	del	XW5T-S4.0-KD
Арі	pearance	
Inte	ernal wiring	1 tier, 1:1
	Nominal cross section	4.0 mm ²
	Minimum conductor cross section solid	0.14 mm ²
	Maximum conductor cross section solid	6 mm²
S	Minimum conductor cross section fine stranded	0.14 mm ²
Applicable wire sizes	Maximum conductor cross section fine stranded	6 mm ²
Applicable	Minimum conductor cross section (flex., stranded) with cable end sleeve	0.5 mm ²
	Maximum conductor cross section (flex., stranded) with cable end sleeve	4 mm ²
	Conductor cross section AWG	AWG26 to AWG10
	Wire strip length	9 mm
Tig	htening torque	0.5 Nm
Din	nensions	6×58×58
Мо	unting rail	TH35
IEC	rated voltage	500 V
IEC	rated current	20 A
Rat	ed impulse voltage	6 kV
UL	rated voltage	300 V
UL	rated current	16 A
End	d Covers	XW5E-S4.0-1.2-1
App	olicable nameplates	XW5Z-S4.0LB_
App	olicable Short Bars	XW5S-S4.0

Short Bars

Model	XW5S-S2.5	XW5S-S4.0	XW5S-S6.0	XW5S-S10	XW5S-S16			
IEC rated voltage	600 V		1,000 V	•				
IEC rated current	20 A	30 A	50 A	57 A	76 A			
UL rated voltage	600 V							
UL rated current	20 A	30 A	50 A	65 A	85 A			
Compliant standards	UL	UL						
	IEC60947-7-1	IEC60947-7-1						

Characteristics

Operating temperature range	-40 to 60°C (with no condensation or icing)
Insulating material	PA
Flammability rating according to UL 94	VO
Operating humidity	range 5% to 95%
Compliant standards	cULus (UL 1059), IEC 60947-7-1 and IEC 60947-7-2
Vibration resistance	5 to 150 Hz 0.964 (m/s²)²/Hz
Shock resistance	50 m/s ² 30 ms according EN 61373





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

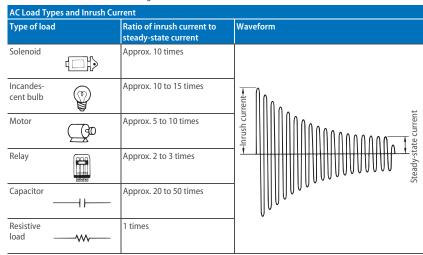
Nichrome heaters and other loads to which the same current continues to flow when voltage is applied

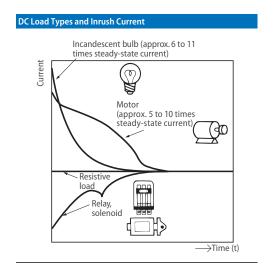
2. Inductive Loads

Motors, solenoids, and other loads with inrush current

3. Lamp and Capacitor Loads

Loads with inrush current even larger than with inductive loads





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:

rypical sarge	Suppressor Examples.				
Item	Circuit example	Applicability		Features and remarks	Element selection guidelines
Type		AC	DC		
CR type	Power Supply Induced load	* (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 loa characteristics and variations in characteristics. Capacitor C suppresses the discharge when the contacts are opened, while the resistor R limits the current applie
	Power supply R Induced load	OK	OK	The release time of the contacts will be increased if the load is a Relay or solenoid.	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.
Diode type	Power Induced load	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.

Appendix

Item	Circuit example	Applic	ability	Features and remarks	Element selection guidelines
Type		AC	DC		
Diode + Zener diode type	Power supply Induced load	NG	OK	This circuit effectively shortens the release time in applications where the release time of a diode circuit is too slow.	
Varistor type	Power supply Induced load	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.	Vc > (Supply voltage \times 1.5) If Vc is set too high, its effectiveness will be reduced

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: $24 \text{ V} \times 4.2 \text{ A} = 100.8 \text{ W}$

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 $25.2 \text{ W} = 25.2 \times 0.24 \text{ cal/s} = 6.05 \text{ cal/s}$



Power Supply – Overload Protection Function

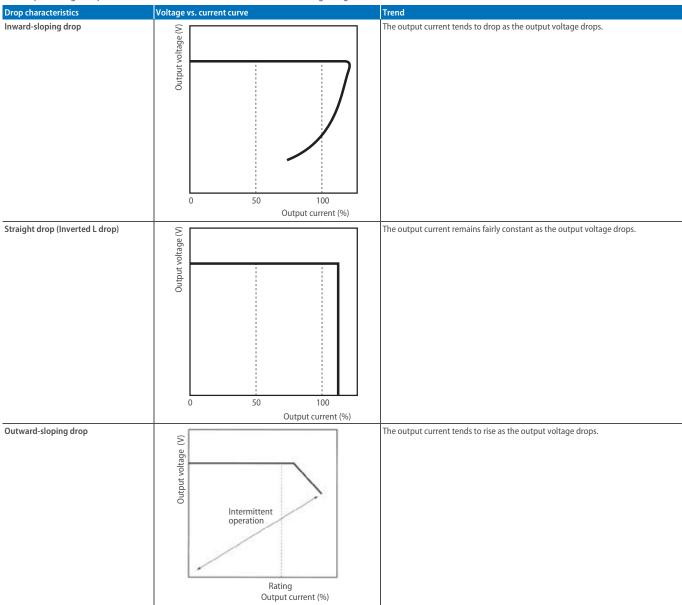
Question: What is overload protection function?

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.

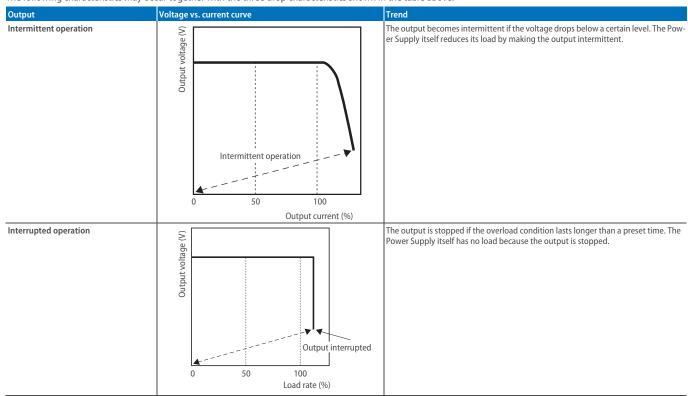
The output voltage drop characteristics can be divided into the three following categories.



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).

Appendix

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



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)

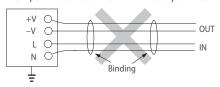
Question: What is the proper wiring method to use when wiring the input and output?

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.

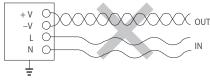
If the input wires are bundled with the output wires or wired too close together, noise will be induced in the output lines.

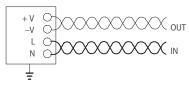




Use heavy-gauge, short input wires.

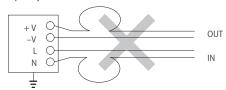
The input wires are a source of radiation noise, so use heavy gauge, short input wires.





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

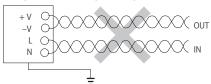
If there are loops in the wiring, the Power Supply may become a radiation noise source for other electronic devices and the loops may act as antennae that induce high-frequency noise.





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.

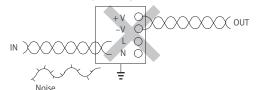


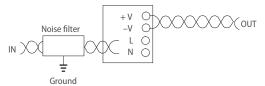


Connect a noise filter

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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#	G9SX	KM1-PMU1A
π	G9SX-GS/A4EG	KM1-PMU2A
445 60 110		
61F-GP-N8	G9SX-LM	KM50
61F-GPN-BC	G9SX-NS	KM-N2
61F-GPN-BT	G9SX-SM	KM-N3-FLK
011 0111 01 111111111111111111111111111	025X 3III	101113 1211
A	Н	L
A16	H3CR	LY 142
A165E	H3DK	
A22E	H3DS	
A22N	H3DT	M
A22NK	H3RNB	
A22NS	H3YN-B	M16
A22NW	H5CX	M22N
Accurax G5	H7CX	MKS
Servo drives	H7EC	MKS(X)
	H7ER	MX2
	H7ET	MY
D	H8GN	
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DII 2DIII	H8PS	
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	1	NE1A-SCPU0
C	-	NJ series
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C.L.: V0 (FIA)	ir c Machine Controller 19	
CelciuX° (EJ1) 61		NJ3
		NJ5
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0.457.566	J7KN	NX7
D6FZ-FGS	J7KNA	NX7 series
D6FZ-FGT	J7KNA-AR	NX-S
D6FZ-FGX21	J7MN	
DST1 expansion units of NE1A	J7TKN	
DOTT EXPUISION UNITS OF NETA	7/1MC	D.
		P
_	14	0205 011
E	K	P2RFPU
		PRT1-SCU11
E5_C	K3GN	PYFPU
E5_C		PYFPU
E5_C-T	K3HB-C	PYFPU
E5_C-T	K3HB-C	
ES_C-T 57 ES_N-H 45 ES_N-HT 45	K3HB-C 120 K3HB-H 118 K3HB-P 120	PYFPU
ES_C-T 57 ES_N-H 45 ES_N-HT 45 ES_R 59	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120	S
ES_C-T 57 ES_N-H 45 ES_N-HT 45	K3HB-C 120 K3HB-H 118 K3HB-P 120	S S8BA
ES_C-T 57 ES_N-H 45 ES_N-HT 45 ES_R 59	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120	S
ES_C-T 57 ES_N-H 45 ES_N-HT 45 ES_R 59 ES_R-T 59 E52-E 63	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118	S S8BA
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118	\$ \$8BA
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5CB 51	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117	\$ \$8BA
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117	S S8BA
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5C8 51 E5CSV 50 EJ1N-HFU-ETN 65	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117	S S8BA 67, 81 S8EX 70 S8FS-C 66 S8IX-G 77 S8IX-P 79 S8M 88
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117	SS S8BA 67, 88 S8EX 70 S8FS-C 66 S8JX-G 7- S8JX-P 7- S8M 88 S8T-DCBU-01 76
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5GB 51 E5CSV 50 EJ1N-HFU-ETN 65 ES1B 64	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3HB-X 117 K3MA-F 117 K3MA-J 117 K3MA-L 117 K7L 222	SS S8BA 67, 88 S8EX 70 S8FS-C 66 S8JX-G 7- S8JX-P 7- S8M 88 S8T-DCBU-01 76
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5C8 51 E5CSV 50 EJ1N-HFU-ETN 65	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K3MA-L 117 K7L 222 K8AK-AS 189	SS S8BA 67, 88 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 88 S8T-DCBU-01 76 S8T-DCBU-02 76
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5GB 51 E5CSV 50 EJ1N-HFU-ETN 65 ES1B 64	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-S 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K3MA-L 117 K7L 222 K8AK-AS 189 K8AK-AW 192	S8BA 67, 88 S8EX 70 S8FS-C 66 S8JX-G 75 S8JX-P 75 S8JX-P 75 S8M 88 S8T-DCBU-01 77 S8T-DCBU-02 76 S8TS 77
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5C8 51 E5CSV 50 E1IN-HFU-ETN 65 ES1B 64 ES1C 65	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K3MA-L 117 K7L 222 K8AK-AS 189 K8AK-AW 192 K8AK-LS 218	S8BA 67, 88 S8EX 70 S8FS-C 66 S8JX-G 75 S8JX-P 75 S8JX-P 75 S8M 88 S8T-DCBU-01 77 S8T-DCBU-02 76 S8TS 77 S8VK-C 77
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5GB 51 E5CSV 50 EJ1N-HFU-ETN 65 ES1B 64	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K3MA-L 117 K7L 222 K8AK-AS 189 K8AK-AW 192 K8AK-LS 218 K8AK-PA 208	S S8BA 67,88 S8EX 70 S8FS-C 66 S8JX-G 76 S8JX-P 77 S8M 88 S8T-DCBU-01 76 S8T-DCBU-02 76 S8T-DCBU-02 77 S8T-S8VK-C 77 S8VK-C 77
ES_C-T 57 ES_N-H 45 E5_N-HT 45 E5_R 59 ES_R-T 59 E52-E 63 E5C2 48 E5CB 51 ESCSV 50 EJ1N-HFU-ETN 65 ES1B 64 ES1C 65	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K3MA-L 117 K7L 222 K8AK-AS 189 K8AK-AW 192 K8AK-B 218 K8AK-B 208 K8AK-PA 208 K8AK-PH 201	S S8BA 67,84 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 88 S8T-DCBU-01 70 S8T-DCBU-02 76 S8TS 77 S8VK-C 77 S8VK-G 77 S8VK-G 77 S8VK-G 77 S8VK-R 8
ES_C-T 57 ES_N-H 45 E5_N-HT 45 E5_R 59 ES_R-T 59 E52-E 63 E5C2 48 E5CB 51 ESCSV 50 EJ1N-HFU-ETN 65 ES1B 64 ES1C 65	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K3MA-L 117 K7L 222 K8AK-AS 189 K8AK-AW 192 K8AK-LS 218 K8AK-PA 208	S S8BA 67,88 S8EX 70 S8FS-C 66 S8JX-G 76 S8JX-P 77 S8M 88 S8T-DCBU-01 76 S8T-DCBU-02 76 S8T-DCBU-02 77 S8T-S8VK-C 77 S8VK-C 77
ES_C-T 57 ES_N-H 45 E5_N-HT 45 E5_R 59 ES_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50 EJ1N-HFU-ETN 65 E51B 64 ES1C 65 G G2RS 138	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-V 118 K3HB-L 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AW 192 K8AK-AW 192 K8AK-PA 208 K8AK-PH 201 K8AK-PM 204	S S8BA 67,81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 88 S8T-DCBU-01 77 S8T-DCBU-02 77 S8TS 77 S8VK-C 77 S8VK-G 77 S8VK-G 77 S8VK-R 88 S8VK-S 77
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50 EJ1N-HFU-ETN 65 ES1B 64 ES1C 65 G G 31 G2RS 138 G2RV 136	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AW 192 K8AK-B 218 K8AK-PA 208 K8AK-PH 201 K8AK-PM 204 K8AK-PT 223	S S8BA 67,84 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 88 S8T-DCBU-01 70 S8T-DCBU-02 76 S8TS 77 S8VK-C 77 S8VK-G 77 S8VK-G 77 S8VK-G 77 S8VK-R 8
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5C8 51 E5CSV 50 EJ1N-HFU-ETN 65 E51B 64 E51C 65 G G G2RS 138 G2RV 136 G3NA 157	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3HB-X 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AS 189 K8AK-AW 192 K8AK-B 208 K8AK-P 208 K8AK-PH 201 K8AK-PM 204 K8AK-PT 223 K8AK-PW 214	S S8BA 67,81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 88 S8T-DCBU-01 77 S8T-DCBU-02 77 S8TS 77 S8VK-C 77 S8VK-G 77 S8VK-G 77 S8VK-R 88 S8VK-S 77
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5C8 51 E5CSV 50 EJ1N-HFU-ETN 65 ES1B 64 ES1C 65 GG 65 Gana 157 G3NA 157 G3PA 159	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3HB-X 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AS 189 K8AK-AW 192 K8AK-B 208 K8AK-PA 208 K8AK-PH 201 K8AK-PM 204 K8AK-PT 223 K8AK-PW 214 K8AK-TH 44, 179	S S8BA 67, 81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 81 S8T-DCBU-01 77 S8T-DCBU-02 77 S8T-S8VK-C 77 S8VK-G 77 S8
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5GB 51 E5CSV 50 EJ1N-HFU-ETN 65 ES1B 64 ES1C 65 G 65 G 138 G2RS 138 G2RV 136 G3NA 157 G3PA 159 G3PE 160	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-W 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AS 189 K8AK-AS 192 K8AK-B 208 K8AK-PA 208 K8AK-PH 201 K8AK-PM 204 K8AK-PM 204 K8AK-PW 214 K8AK-TH 44,179 K8AK-TS 223	S S8BA 67,81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 88 S8T-DCBU-01 77 S8T-DCBU-02 77 S8TS 77 S8VK-C 77 S8VK-G 77 S8VK-G 77 S8VK-R 88 S8VK-S 77
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5C8 51 E5CSV 50 EJ1N-HFU-ETN 65 ES1B 64 ES1C 65 GG 65 Gana 157 G3NA 157 G3PA 159	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3HB-X 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AS 189 K8AK-AW 192 K8AK-B 208 K8AK-PA 208 K8AK-PH 201 K8AK-PM 204 K8AK-PT 223 K8AK-PW 214 K8AK-TH 44, 179	S S8BA 67, 81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 81 S8T-DCBU-01 77 S8T-DCBU-02 77 S8T-S8VK-C 77 S8VK-G 77 S8
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50 E1N-HFU-ETN 65 ES1B 64 ES1C 65 GG 65 G2RS 138 G2RV 136 G3NA 157 G3PA 159 G3PE 160 G3PF 151	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-W 117 K3HB-X 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-S 189 K8AK-B 192 K8AK-B 208 K8AK-PA 208 K8AK-PH 201 K8AK-PM 204 K8AK-PW 214 K8AK-PW 214 K8AK-TH 44,179 K8AK-TS 223 K8AK-VS 195	\$\frac{\\$S8BA}{\$\$S8EX}\$
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50 E1N-HFU-ETN 65 ES1B 64 ES1C 65 G G2RS 138 G2RV 136 G3NA 157 G3PA 159 G3PE 160 G3PF 151 G3PH 150	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-S 192 K8AK-AW 192 K8AK-B 208 K8AK-PA 208 K8AK-PH 201 K8AK-PM 204 K8AK-PW 214 K8AK-PH 44, 179 K8AK-TS 223 K8AK-TS 223 K8AK-VS 195 K8AK-VW 198	S S8BA
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5CS 48 E5CB 51 E5CSV 50 E11N-HFU-ETN 65 E51B 64 ES1C 65 G G2RS 138 G2RV 136 G3NA 157 G3PA 159 G3PE 160 G3PF 151 G3PH 150 G3PJ 161	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-I 117 K7L 222 K8AK-AS 189 K8AK-AW 192 K8AK-B 218 K8AK-PA 208 K8AK-PH 201 K8AK-PH 204 K8AK-PH 204 K8AK-PH 214 K8AK-TH 44,179 K8AK-TH 44,179 K8AK-TS 223 K8AK-TS 223 K8AK-YS 195 K8AK-VW 198 K8DS-PA 209	\$\frac{\\$S8BA}{\$\$S8EX}\$
ES_C-T 57 ES_N-H 45 E5_N-HT 45 E5_R 59 ES_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50 EJ1N-HFU-ETN 65 E51B 64 ES1C 65 G 65 G 63 G2RS 138 G2RV 136 G3NA 157 G3PA 159 G3PE 160 G3PH 151 G3PJ 161 G3PW 151	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-V 118 K3HB-V 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AW 192 K8AK-AW 192 K8AK-PA 208 K8AK-PA 208 K8AK-PH 201 K8AK-PM 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 214 K8AK-PH 214 K8AK-FT 223 K8AK-TH 44,179 K8AK-TS 223 K8AK-YS 195 K8AK-VW 198 K8DS-PA 209 K8DS-PH 202	S S8BA
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50 EJ1N-HFU-ETN 65 E51B 64 E51C 65 G G2RS 138 G2RV 136 G3NA 157 G3PA 159 G3PF 151 G3PH 150 G3PJ 161 G3PW 151 G3PU 161 G3PW 151 G3PW 151 G3PU 161 G3PW 151 G3PU 161 G3PW 151 G3R-I 156	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-I 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AS 189 K8AK-B 208 K8AK-P 208 K8AK-P 201 K8AK-PH 201 K8AK-PH 201 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 201 K8AK-PH 202 K8AK-Y 195 K8AK-VW 198 K8DS-PA 209 K8DS-PH 202 K8DS-PM 205	S S8BA 67,81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 80 S8T-DCBU-01 77 S8T-DCBU-02 77 S8YK-C 77 S8VK-G 77 S8VK-G 77 S8VK-R 88 S8VK-S 77 S8VK-T 77 X X XWSP 244 XWSP 244 XWSS 25
ES_C-T 57 ES_N-H 45 ES_N-HT 45 ES_R 59 ES_R-T 59 ES2-E 63 E5C2 48 E5CB 51 ESCSV 50 EJ1N-HFU-ETN 65 ES1B 64 ES1C 65 G 65 G 65 G 136 G3NA 157 G3PA 159 G3PE 160 G3PF 151 G3PH 150 G3PJ 161 G3PW 151 G3R-I 156 G3R-O 156	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3HA-F 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AS 189 K8AK-B 208 K8AK-B 208 K8AK-P 208 K8AK-PH 201 K8AK-PH 201 K8AK-PH 201 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 201 K8AK-W 214 K8AK-TS 223 K8AK-VS 195 K8AK-VW 198 K8DS-PA 209 K8DS-PH 202 K8DS-PM 205 K8DS-PU 213	S S8BA
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50 EJ1N-HFU-ETN 65 E51B 64 E51C 65 G G2RS 138 G2RV 136 G3NA 157 G3PA 159 G3PF 151 G3PH 150 G3PJ 161 G3PW 151 G3PU 161 G3PW 151 G3PW 151 G3PU 161 G3PW 151 G3PU 161 G3PW 151 G3R-I 156	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-I 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AS 189 K8AK-B 208 K8AK-P 208 K8AK-P 201 K8AK-PH 201 K8AK-PH 201 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 201 K8AK-PH 202 K8AK-Y 195 K8AK-VW 198 K8DS-PA 209 K8DS-PH 202 K8DS-PM 205	S S8BA 67,81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 80 S8T-DCBU-01 77 S8T-DCBU-02 77 S8YK-C 77 S8VK-G 77 S8VK-G 77 S8VK-R 88 S8VK-S 77 S8VK-T 77 X X XWSP 244 XWSP 244 XWSS 25
ES_C-T 57 ES_N-H 45 ES_N-HT 45 ES_R 59 ES_R-T 59 ES2-E 63 E5C2 48 E5C8 51 ESCSV 50 EJ1N-HFU-ETN 65 ES1B 64 ES1C 65 GG 65 GG 30 G2RS 138 G2RV 136 G3NA 157 G3PA 159 G3PE 160 G3PF 151 G3PJ 161 G3PJ 161 G3PU 151 G3R-I 156 G3R-O 156 G3RV 155	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3HB-X 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AS 189 K8AK-AB 208 K8AK-LS 218 K8AK-PA 208 K8AK-PH 201 K8AK-PH 204 K8AK-PM 204 K8AK-PH 205 K8AK-PH 209 K8AK-PH 209 K8AK-PH 209 K8AK-PH 209 K8AK-PH 209 K8AK-PH	S S8BA 67, 81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 81 S8T-DCBU-01 77 S8T-DCBU-02 77 S8T-S8VK-C 77 S8VK-G 77 S8VK-G 77 S8VK-S 88 S8VK-T 77 X X X XW5P 244 XW5S 25
E5_C-T 57 E5_N-H 45 E5_N-HT 45 E5_R 59 E5_R-T 59 E52-E 63 E5C2 48 E5CB 51 E5CSV 50 E1N-HFU-ETN 65 ES1B 64 ES1C 65 G G2RS 138 G2RV 136 G3NA 157 G3PA 159 G3PE 160 G3PF 151 G3PU 161 G3PW 151 G3R-I 156 G3R-O 156 G3RV 155 G3ZA 151	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-S 118 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3HB-X 117 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-AS 189 K8AK-AS 189 K8AK-AB 208 K8AK-LS 218 K8AK-PA 208 K8AK-PH 201 K8AK-PH 204 K8AK-PH 205 K8AK-PH 209 K8AK-PH 209 K8AK-PH 209 K8AK-PH 209 K8AK-PH 209 K8AK-PH	S S8BA 67,81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 80 S8T-DCBU-01 77 S8T-DCBU-02 77 S8YK-C 77 S8VK-G 77 S8VK-G 77 S8VK-R 88 S8VK-S 77 S8VK-T 77 X X XWSP 244 XWSP 244 XWSS 25
ES_C-T 57 ES_N-H 45 ES_N-HT 45 ES_R 59 ES_R-T 59 ES2-E 63 ESC2 48 ESCB 51 ESCSV 50 E1N-HFU-ETN 65 ES1B 64 ES1C 65 GA 65 GAP 136 G3NA 157 G3PA 159 G3PA 159 G3PF 151 G3PH 150 G3PJ 161 G3PW 151 G3R-I 156 G3R-O 156 G3RA 155 G3ZA 151 G70V 146	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K3MA-L 117 K7L 222 K8AK-AS 189 K8AK-S 192 K8AK-B 208 K8AK-PA 208 K8AK-PH 201 K8AK-PH 201 K8AK-PH 204 K8AK-PH 204 K8AK-PH 204 K8AK-PH 205 K8AK-PH 207 K8AK-PH 208 K8AK-PH 209 K8AK-PH 201	S S8BA 67, 81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 81 S8T-DCBU-01 77 S8T-DCBU-02 77 S8T-S8VK-C 77 S8VK-G 77 S8VK-G 77 S8VK-S 88 S8VK-T 77 X X X XW5P 244 XW5S 25
ES_C-T 57 ES_N-H 45 ES_N-HT 45 ES_R 59 ES_R-T 59 ES2-E 63 ESC2 48 ESCB 51 ESCSV 50 EJIN-HFU-ETN 65 ES1B 64 ES1C 65 GA 65 GB 136 G3NA 157 G3PA 159 G3PA 159 G3PF 151 G3PH 150 G3PJ 161 G3PW 151 G3R-0 156 G3RV 155 G3ZA 151 G7OV 146 G7J 144	K3HB-C 120 K3HB-H 118 K3HB-P 120 K3HB-R 120 K3HB-S 118 K3HB-V 118 K3HB-X 118 K3MA-F 117 K3MA-J 117 K7L 222 K8AK-S 189 K8AK-S 189 K8AK-B 192 K8AK-B 208 K8AK-PA 208 K8AK-PH 201 K8AK-PH 201 K8AK-PH 204 K8AK-PW 214 K8AK-T 223 K8AK-Y 195 K8AK-V 198 K8DS-PA 209 K8DS-PH 205 K8DS-PU 211 K8DS-PZ 210 K8DT-AS 190 K8DT-AW 193 K8DT-LS 220	S S8BA 67, 81 S8EX 70 S8FS-C 66 S8JX-G 77 S8JX-P 77 S8M 81 S8T-DCBU-01 77 S8T-DCBU-02 77 S8T-S8VK-C 77 S8VK-G 77 S8VK-G 77 S8VK-S 88 S8VK-T 77 X X X XW5P 244 XW5S 25
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