Relays and Optocouplers

Versatile Offering for Every Application

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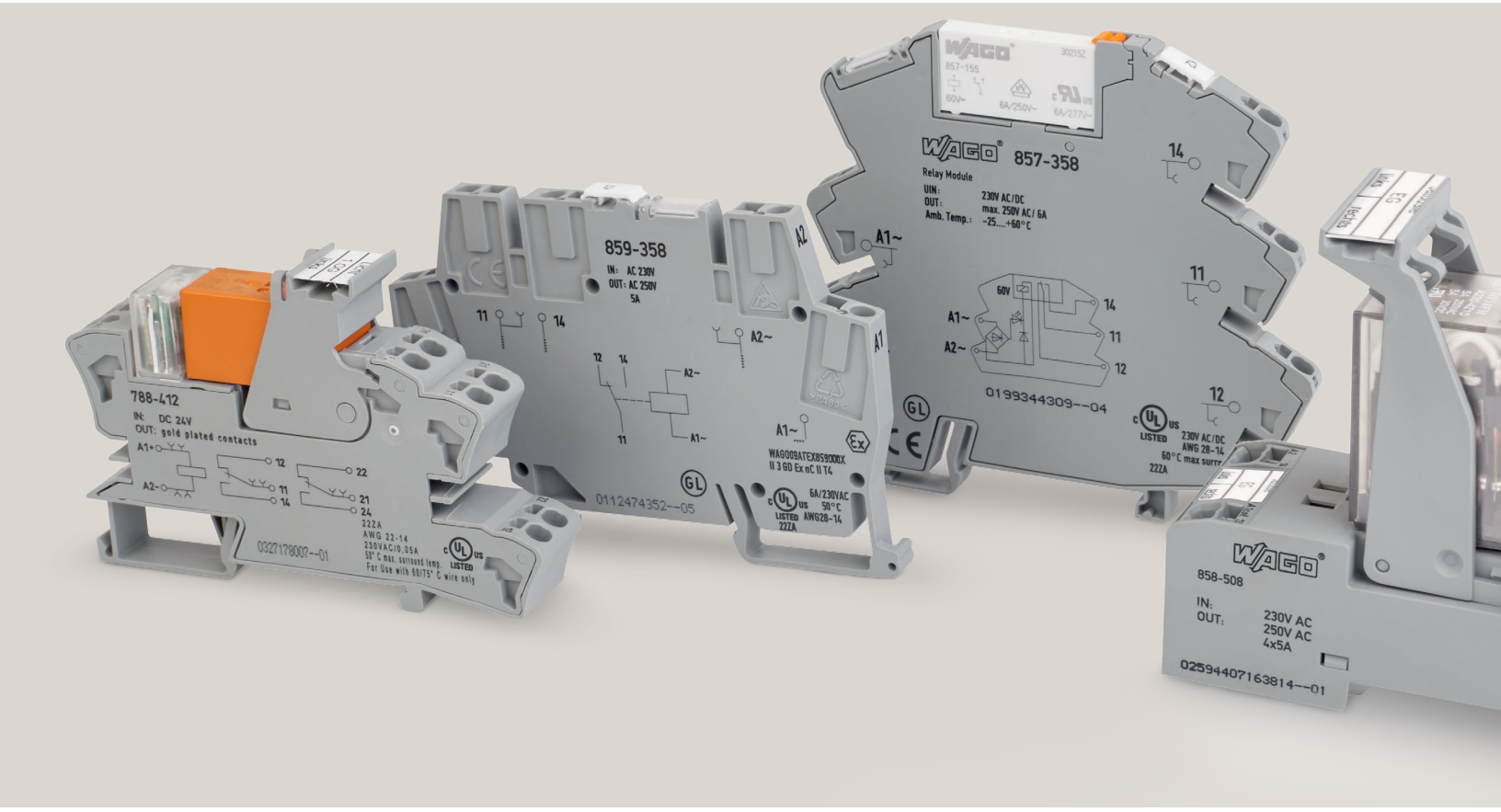


RELAYS AND OPTOCOUPLERS

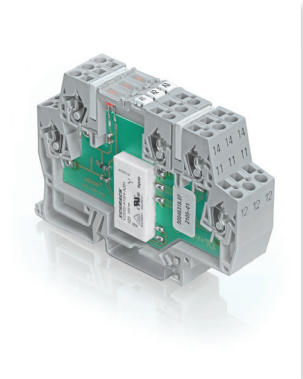
Overview

WAGO provides a broad range of relays and optocouplers to support applications where electrical signals must be transmitted, isolated, adjusted or amplified. To perform these tasks many cost-effective solutions are available in easy to install packages.

A wide product offering includes different housing options, wide voltage ranges, switchable loads from 1 mA to 16 A, pluggable relays, easy termination of conductors from 28-12 AWG and several accessories designed to optimize machine safety and uptime.

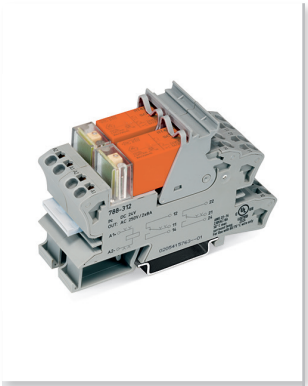
ADVANTAGES:

- Jumpering capabilities
- Reliability
- Compact design to maximize cabinet space
- Wide product offering accommodates most applications
- Easy to install



859 Series

857 Series



788 Series

WAGO RELAYS AND OPTOCOUPLERS

858 Series

2042 Series

FEATURES AND ADVANTAGES

Relays/Optocouplers

Relay or Optocoupler?		
Relay		**Optocoupler/Solid-State Relay**
• Electrically isolate input and output circuits	• Adjust different signal levels	• Amplify and/or multiply signals
Immunity to electromagnetic interference and transient voltages		Long service life – no mechanical wear on contacts
High, short-term overload on both input and output sides without losing functionality		High switching frequency due to short switch-on and switch-off times
Minimal switching loss/high switching power		Immune to shock and vibration
A single module switches both DC and AC (highly versatile)		No contact bouncing
No leakage current in the load circuit		"Noiseless" switching
Multiple contacts possible (control signal switches multiple load circuits)		Low control power
Switching state is partially visible to the naked eye		Short response times
Safe isolation between coil and contact set		No electromagnetic radiation from switching sparks or coils – no interference with adjacent modules or electronic components during switching

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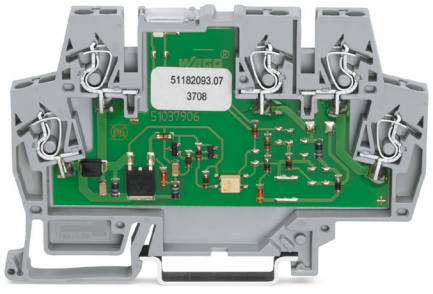
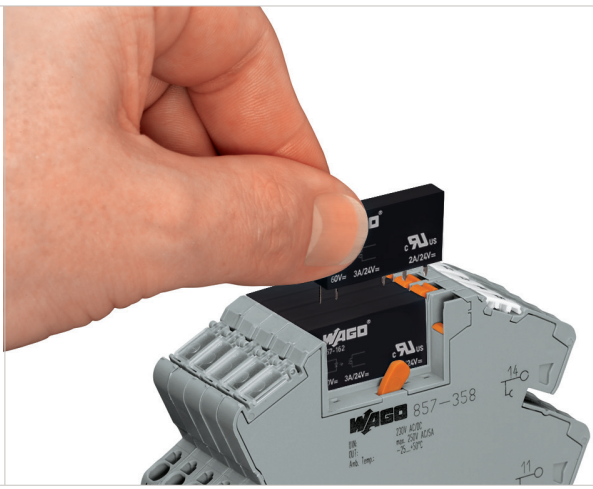
Distinguishing between Optocoupler and Solid-State Relay	
Optocoupler	**Solid-State Relay**
Mounted or soldered to the PCB - Not replaceable	Pluggable on socket - Can be replaced in case of repair
A large number of variants enhances application flexibility and range	Seamless change from electronic to electromechanical switching element





SELECTION CRITERIA FOR RELAYS

It’s in the Details

1) Coil
Coil voltage; maximum continuous voltage;
response voltage and pick-up current;
drop-off voltage and dropout current

2) Contacts
Contact arrangement; contact loading;
contact material; service life; contact resistance;
isolation requirements; limiting continuous current

In industrial applications, relays are proven to handle a variety of tasks. However, some points must be considered when selecting the right relay module . These points include the nominal voltage of the coil, as well as the number of relay break contacts, make contacts and changeover contacts. The contacts are important for the service life. The contact material has to be selected depending on whether inductive, capacitive or resistive loads will be connected.

5) Other criteria
Ambient temperature;
dielectric strength;
mounting conditions,
IP degree of protection;
approvals

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3) Switching time
Response time; drop-out time;
switching frequency; bounce time

4) Mechanical properties
Vibration resistance; shock resistance;
size and space

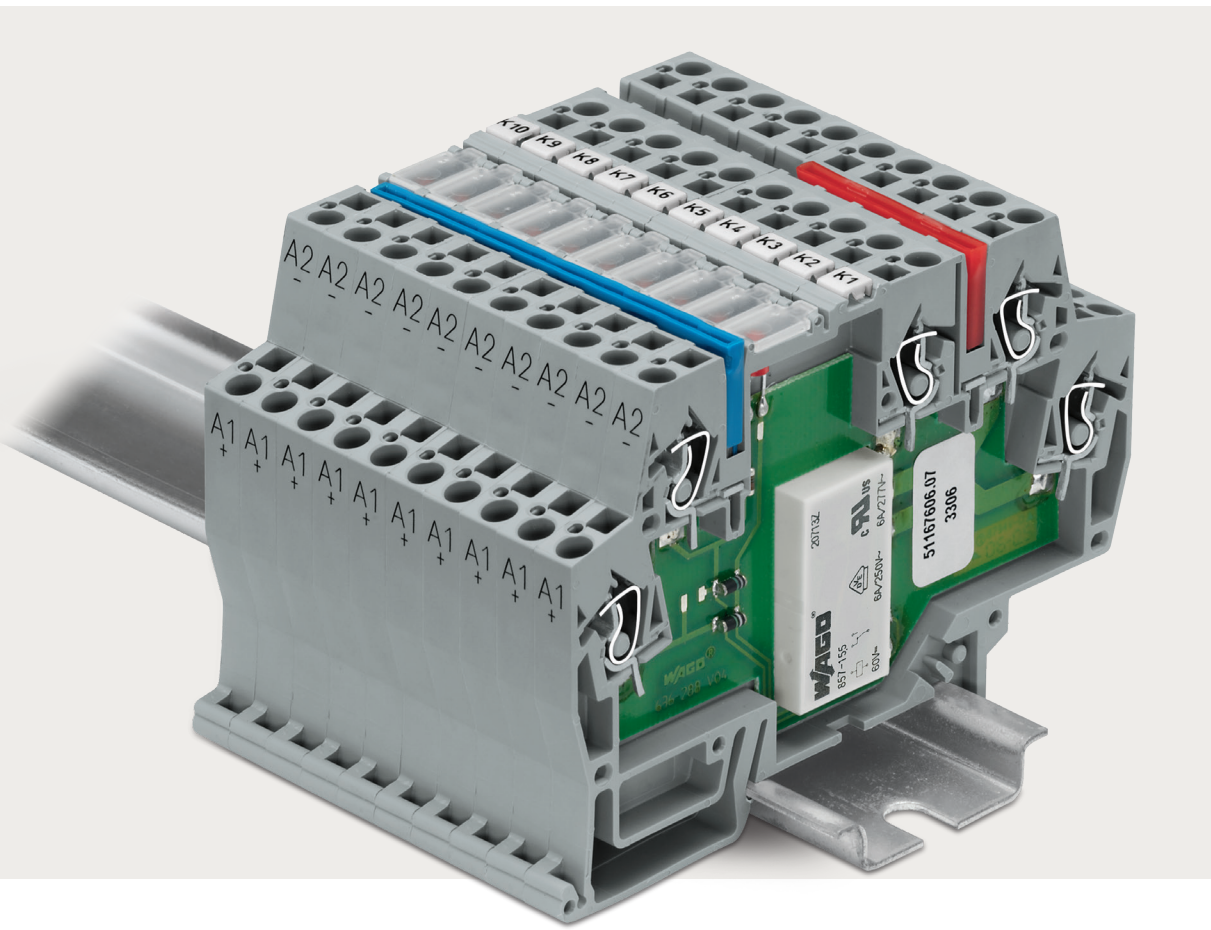
Within railway applications, there are special requirements for relays including operating voltage, ambient temperature and shock/vibration resistance: Relays from WAGO meet these requirements.

859 SERIES

6 mm Wide Terminal Blocks with Soldered PCB Relays or Optocouplers

With a large variety of relays and optocouplers, the 859 Series will suit any industrial interface application. The compact housing is ideal for space-restricted control panels. Simple commoning at the control and load-side level saves valuable wiring time and reduces errors.

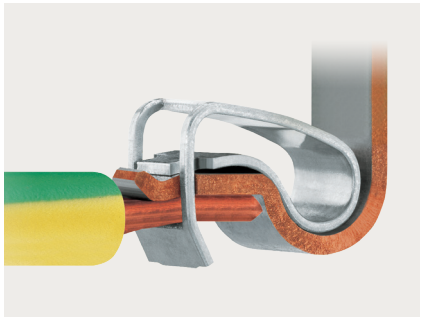
- 6 mm wide housing for DIN rail mounting
- Jumpering capabilities
- LED indication
- Integrated test port at each termination
- Marking options
- Custom solutions available - please contact factory



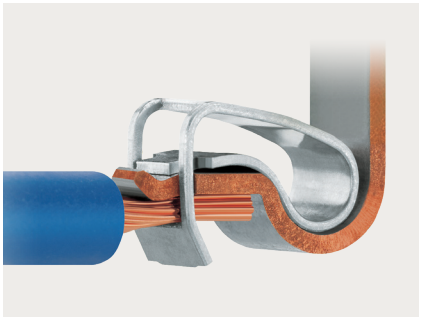
CAGE CLAMP® COMPACT

Vibration-proof - fast - maintenance-free

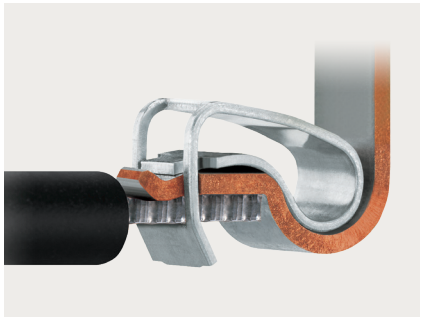
CAGE CLAMP® COMPACT handling for all types of conductors



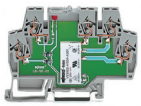
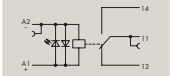
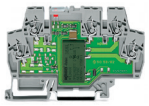
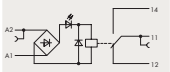
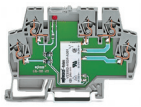
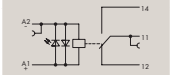
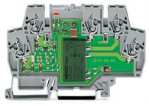
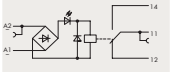
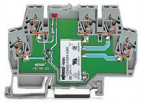
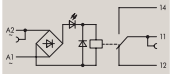
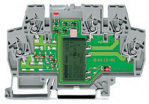
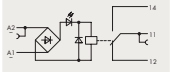
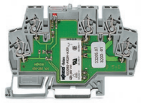
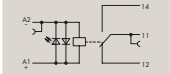
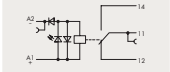
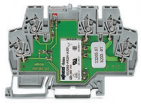
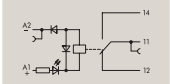
Solid



Stranded

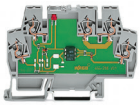
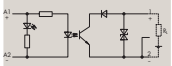
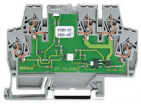
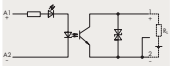
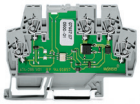
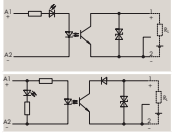
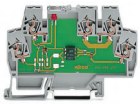
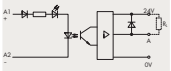
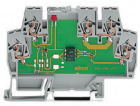
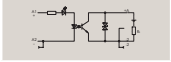
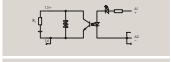
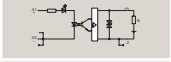
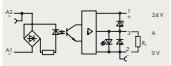
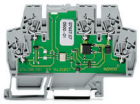
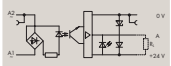
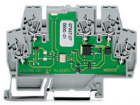
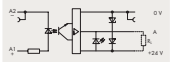
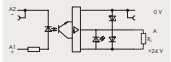
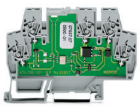
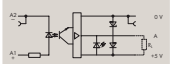
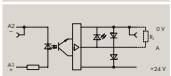
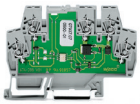
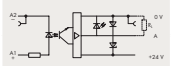
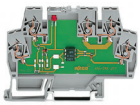
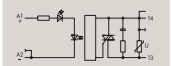


Ferruled

859 Series - 6 mm Wide Terminal Blocks with Soldered PCB Relays							
	Circuit Diagram	**Description**	**Item No.**	**Nominal Input Voltage**	**Max. Switching Voltage**	**Max. Continuous Current**	**Approvals**
		Relay with SPDT (1 C/O)	859-302 859-303 859-304 859-305 859-306 859-307 859-308	5 VDC 12 VDC 24 VDC 48 VDC 60 VDC 110 VDC 220 VDC	250 VAC	5 A	
		Relay with SPDT (1 C/O)	859-353 859-354 859-355 859-357 859-358	12 VAC/VDC 24 VAC/VDC 48 VAC/VDC 115 VAC/VDC 230 VAC/VDC	250 VAC	5 A	
		Relay with SPDT (1 C/O), with gold contacts	859-314	24 VDC	250 VAC*	5 A*	
		Relay with SPDT (1 C/O), with gold contacts, extended input voltage, and temperature range	859-392 859-386 859-317	24 VDC 36 VDC 115 VDC	250 VAC*	3 A*	
		Relay with SPDT (1 C/O), with gold contacts	859-359	230 VAC	250 VAC*	5 A*	
		Relay with SPDT (1 C/O), with gold contacts	859-360	115 VAC	250 VAC*	5 A*	
		Relay with SPDT (1 C/O)	859-367	115 VAC	250 VAC	5 A	
		Relay with SPDT (1 C/O), with specified turn-on and turn-off threshold	859-368	230 VAC	250 VAC	5 A	
		Relay with SPDT (1 C/O), with extended input voltage and temperature range	859-390	24 VDC	250 VAC	3 A	
		Relay with SPDT (1 C/O), with extended input voltage and temperature range	859-391	110 VDC	250 VAC	3 A	
		Relay with SPDT (1 C/O), with extended input voltage and temperature range	859-398 859-394 859-397 859-393 859-399	24 VDC 36 VDC 48 VDC 72 VDC 110 VDC	250 VAC	3 A	

* To avoid damage to the gold layer, the specified switching voltages and switching currents should not be exceeded.
The evaporation of the gold layer can reduce the life of the relay.

859 Series - 6 mm Wide Terminal Blocks with Soldered Optocoupler

	Circuit Diagram	Description	Item No.	Nominal Input Voltage	Max. Switching Voltage	Max. Continuous Current	Approvals
		Optocouplers with extended output voltage and temperature range for railway applications	859-793	5 VDC	3 ... 60 VDC	100 mA	
		Optocouplers with extended output voltage and temperature range for railway applications	859-791 859-794	24 VDC 24 VDC	7 ... 60 VDC 9 ... 60 VDC	100 mA 100 mA	
		Optocoupler	859-796	24 VDC	3 ... 30 VDC	100 mA	
			859-795	5 VDC	3 ... 30 VDC	100 mA	
		Optocoupler, negative switching, power optocoupler	859-720	24 VDC	10 ... 30 VDC	100 mA	
		Optocoupler, power optocoupler	859-730	24 VDC	3 ... 30 VDC	3 A	
		Optocoupler, power optocoupler	859-740	24 VDC	3 ... 30 VDC	3 A	
		Optocoupler, power optocoupler	859-744	12 ... 48 VDC	3 ... 53 VDC	4 A	
		Optocoupler PNP, increased input voltage, frequency to 100 Hz, input voltage up to 270 VAC	859-772	230 VAC	20 ... 30 VDC	500 mA	
		Optocoupler, negative switching	859-712	24 VDC	20 ... 30 VDC	500 mA	
		Optocoupler, negative switching	859-702	5 VDC	20 ... 30 VDC	500 mA	
		Optocoupler, negative switching	859-708	24 VDC	20 ... 30 VDC	500 mA	
		Optocoupler, negative switching	859-706	24 VDC	4 ... 6.25 VDC	500 mA	
		Optocoupler, positive switching	859-752	5 VDC	20 ... 30 VDC	500 mA	
		Optocoupler, positive switching	859-758	24 VDC	20 ... 30 VDC	500 mA	
		Optocoupler, positive switching	859-756	24 VDC	4 ... 6.25 VDC	500 mA	
		Optocoupler	859-902	5 VDC	24 ... 260 VAC	500 mA	

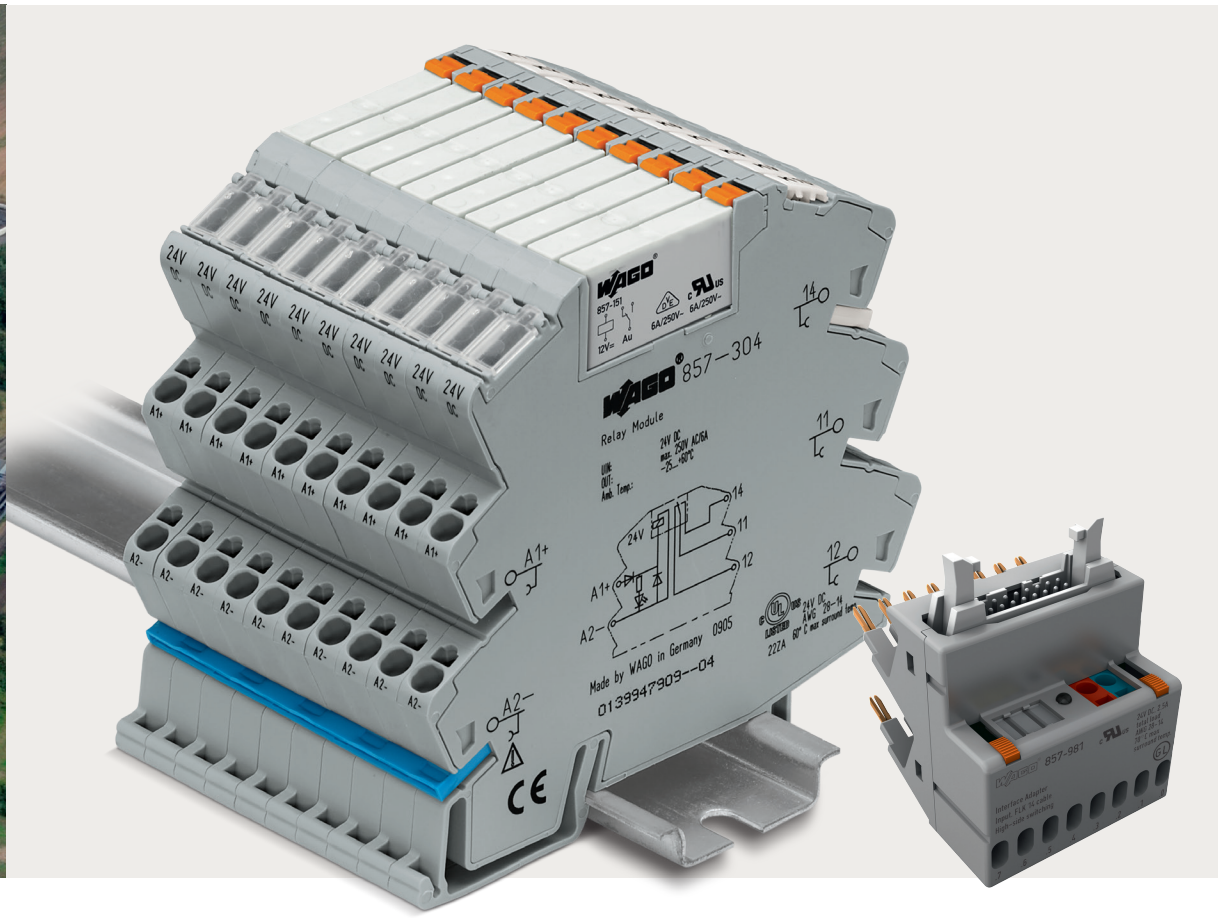
857 SERIES

6 mm Wide Terminal Block Style with Pluggable PCB Relays or Optocouplers

With a common profile and 6 mm-wide housing, 857 Series relays and optocouplers provide a powerful compact solution for switching applications. An optional interface adapter plugs into the input or output side, combining eight modules to reduce wiring time and errors.

- Pluggable relays or optocouplers
- Jumpering capabilities
- LED indication
- Wide input voltage range (5 - 230 VAC/VDC versions)
- Up to 6 A switching current
- Marking options
- Can be used with 857 Series signal conditioners

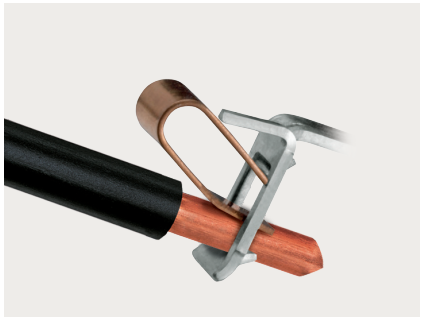
ANSI



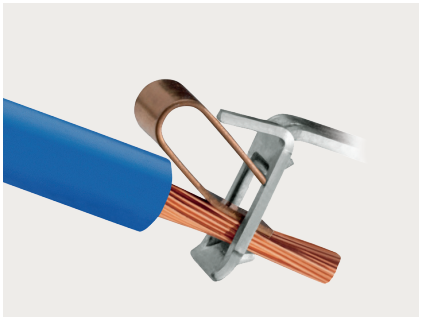
Push-in CAGE CLAMP®

Vibration-proof - fast - maintenance-free

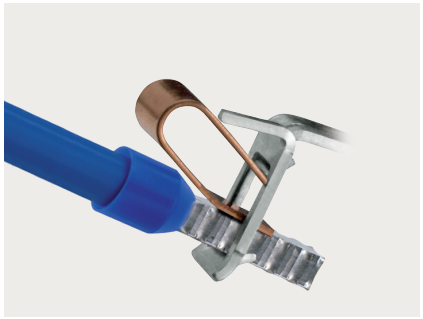
Push-in CAGE CLAMP® handling for all types of conductors



Solid

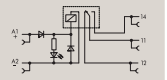
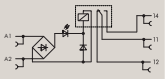
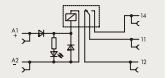
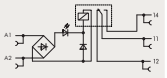
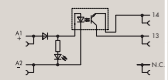
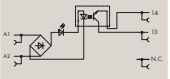
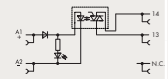
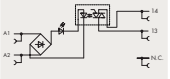
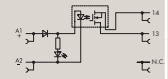
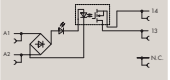


Stranded



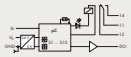
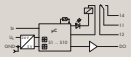
Ferruled

857 Series - 6 mm Wide Sockets with Pluggable PCB Relays or Optocouplers

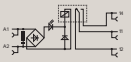
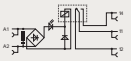
	Circuit Diagram	Description	Item No.	Nominal Input Voltage	Max. Switching Voltage	Max. Continuous Current	Approvals
		Relay with SPDT (1 C/O)	857-303 857-304 857-305 857-306	12 VDC 24 VDC 48 VDC 60 VDC	250 VAC	6 A	cULus GL CE Ex ANSI IECEx
			857-354 857-357 857-358 857-359	24 VAC/VDC 115 VAC/VDC 230 VAC/VDC 24 ... 230 VAC/VDC	250 VAC	6 A	cULus GL CE Ex ANSI IECEx
		Relay with SPDT (1 C/O), with gold contacts	857-314	24 VDC	250 VAC*	6 A**	cULus GL CE Ex ANSI IECEx
			857-364 857-367 857-368 857-369	24 VAC/VDC 115 VAC/VDC 230 VAC/VDC 24 ... 230 VAC/VDC	250 VAC*	6 A**	cULus GL CE Ex ANSI IECEx
		Optocouplers	857-704	24 VDC	0 ... 48 VDC	100 mA	cULus CE Ex IECEx
			857-707	115 VAC/VDC	0 ... 48 VDC	100 mA	cULus CE Ex IECEx
			857-708	230 VAC/VDC	0 ... 48 VDC	100 mA	cULus CE Ex IECEx
		Optocouplers	857-714	24 VDC	24 ... 240 VAC	1 A	cULus CE Ex IECEx
			857-717	115 VAC/VDC	24 ... 240 VAC	1 A	cULus CE Ex IECEx
			857-718	230 VAC/VDC	24 ... 240 VAC	1 A	cULus CE Ex IECEx
		Optocouplers	857-724	24 VDC	0 ... 24 VDC	2 A	cULus CE Ex IECEx
			857-727	115 VAC/VDC	0 ... 24 VDC	2 A	cULus CE Ex IECEx
			857-728	230 VAC/VDC	0 ... 24 VDC	2 A	cULus CE Ex IECEx

** To avoid damage to the gold layer, the specified switching voltages and switching currents should not be exceeded. The evaporation of the gold layer can reduce the life of the relay.

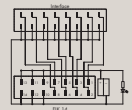
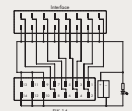
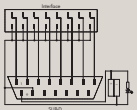
857 Series - 6 mm Wide Sockets with Pluggable PCB Timer Relays

	Circuit Diagram	Description	Item No.	Input Voltage Range	Output Voltage Range	Max. Continuous Current	Approvals
		Multifunction timer with SPDT (1 C/O), 4 functions, 4 time ranges: 0.1 s ... 30 min	857-604	16.8 ... 31.2 VDC	250 VAC	6 A	
		Solid -state relay with 1 NO contact, 4 functions, 4 time ranges: 0.1 s ... 30 min	857-624	20.4 ... 31.2 VDC	0 ... 24 VAC	2 A	
		Solid -state relay with 1 NO contact, 4 functions, 4 time ranges: 0.1 s ... 30 min	857-634	20.4 ... 31.2 VDC	24 ... 230 VAC	1 A	
		Multifunction timer with SPDT (1 C/O), 14 functions, 8 time ranges	857-640	16.8 ... 31.2 VDC	250 VAC	6 A	
		Multifunction timer with SPDT (1 C/O), 7 functions, 2 x 8 time ranges	857-642	16.8 ... 31.2 VDC	250 VAC	6 A	

857 Series - 6 mm Wide Sockets with Pluggable PCB Relays - Base Load Module for Long Cable Runs or 2-wire Sensors or Capacitive Loads

	Circuit Diagram	Description	Item No.	Input Voltage Range	Output Voltage Range	Max. Continuous Current	Approvals
		Relay with SPDT (1 C/O) with integrated base load module	857-358 /006-000	230 VAC	250 VAC	6 A	
		Relay with SPDT (1 C/O) with integrated base load module and gold-plated contacts	857-368 /006-000	230 VAC	250 VAC	6 A	

857 Series - 8 - Port Interface Adapter for System Wiring

	Circuit Diagram	Description	Item No.	Input Voltage Range	Current Carrying Capacity	Max. Continuous Current	Approvals
		8-port adapter, with 14 -pin ribbon cable connectors, input positive switching **	857-981	24 VDC	1 A	2.5 A	
		8-port adapter, with 14-pin ribbon cable connectors, output PNP ***	857-982	24 VDC	1 A	2.5 A	
		8-port adapter, with D-sub male connector, input with 15-pin ribbon cable plug connectors, plus switching **	857-986	24 VDC	1 A	2.5 A	

** Use on the coil side of the 857 - socket

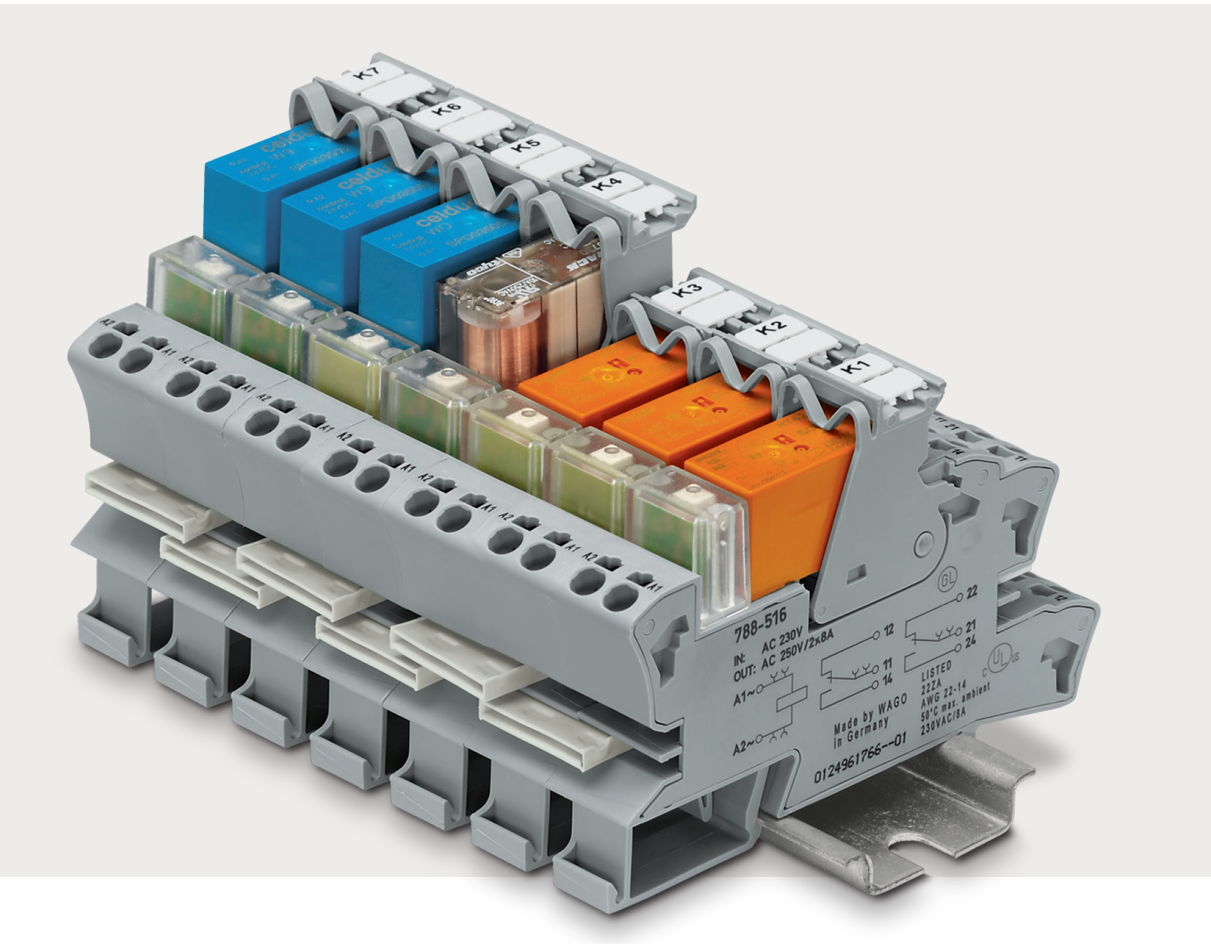
*** Use the contact page of the 857 - socket

788 SERIES

15 mm Wide Socket Style Pluggable PCB Relays or Optocouplers

788 Series pluggable PCB relay modules provide and excellent cost-effective platform for industrial and process automation applications. A robust, easy-to-use lever simplifies replacement.

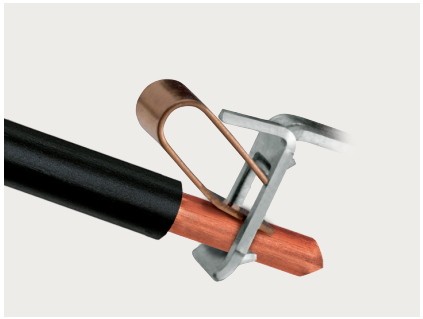
- Relays with SPDT (1 C/O) or DPDT (2 C/O)
- Up to 16 A and 250 V of switching power
- DIN rail mount
- Pluggable LED indicator
- Integrated test ports
- Marking options



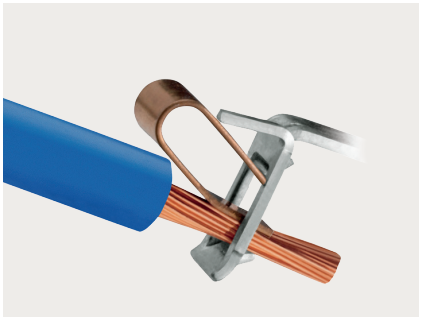
Push-in CAGE CLAMP®

Vibration-proof - fast - maintenance-free

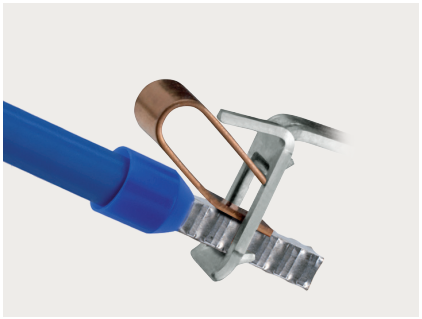
Push-in CAGE CLAMP® handling for all types of conductors



Solid

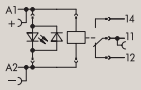
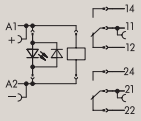
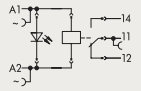
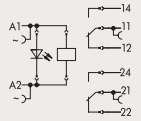
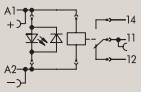
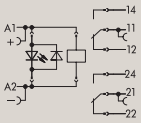
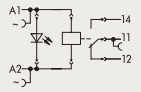
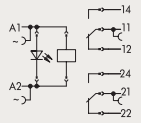


Stranded



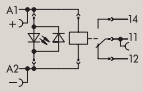
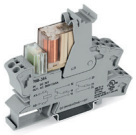
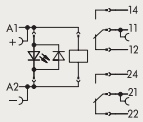
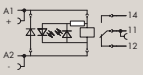
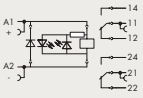
Ferruled

788 Series - 15 mm Wide Sockets with Pluggable PCB Relays

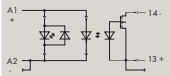
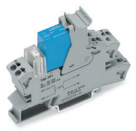
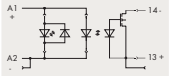
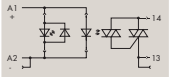
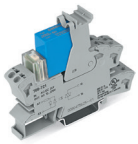
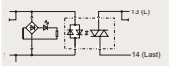
	Circuit Diagram	Description	Item No.	Nominal Input Voltage	Max. Switching Voltage	Max. Continuous Current	Approvals
		Relay with SPDT (1 C/O) and power indicator (mounting height: 15 mm)	788-303 788-304 788-305 788-306 788-307	12 VDC 24 VDC 48 VDC 60 VDC 110 VDC	250 VAC	16 A	
		Relay with DPDT (2 C/O) and power indicator (mounting height: 15 mm)	788-311 788-312 788-313 788-314 788-315	12 VDC 24 VDC 48 VDC 60 VDC 110 VDC	250 VAC	2 x 8 A	
		Relay with SPDT (1 C/O) and power indicator (mounting height: 15 mm)	788-506 788-507 788-508	24 VAC 115 VAC 230 VAC	250 VAC	16 A	
		Relay with DPDT (2 C/O) and power indicator (mounting height: 15 mm)	788-512 788-515 788-516	24 VAC 115 VAC 230 VAC	250 VAC	2 x 8 A	
		Relay with SPDT (1 C/O), with gold contacts and power indicator (mounting height: 15 mm)	788-404	24 VDC	250 VAC*	16 A*	
		Relay with DPDT (2 C/O), with gold contacts and power indicator (mounting height: 15 mm)	788-412	24 VDC	250 VAC*	2 x 8 A*	
		Relay with SPDT (1 C/O), with gold contacts and power indicator (mounting height: 15 mm)	788-607 788-608	115 VAC 230 VAC	250 VAC*	16 A*	
		Relay with DPDT (2 C/O), with gold contacts and power indicator (mounting height: 15 mm)	788-615 788-616	115 VAC 230 VAC	250 VAC*	2 x 8 A*	

** To avoid damage to the gold layer, the specified switching voltages and switching currents should not be exceeded. The evaporation of the gold layer can reduce the life of the relay.

788 Series - 15 mm Wide Sockets with Pluggable PCB Relays

	Circuit Diagram	Description	Item No.	Input Voltage Range	Output Voltage Range	Max. Continuous Current	Approvals
		Relay with SPDT (1 C/O) and power indicator (mounting height: 15 mm)	788-354	24 VDC	250 VAC	16 A	
		Safety relay SR2M DPDT (2 C/O), with force guided contacts and power indicator	788-384	24 VDC	250 VAC	6 A	
		Relay with SPDT (1 C/O), manual operation and power indicator with extended input voltage and temperature range	788-391	24 VDC	250 VAC	16 A	
		Relay with DPDT (2 C/O), manual operation and power indicator with extended input voltage and temperature range	788-390	24 VDC	250 VAC	2 x 8 A	

788 Series - 15 mm Wide Sockets with Pluggable PCB Optocouplers

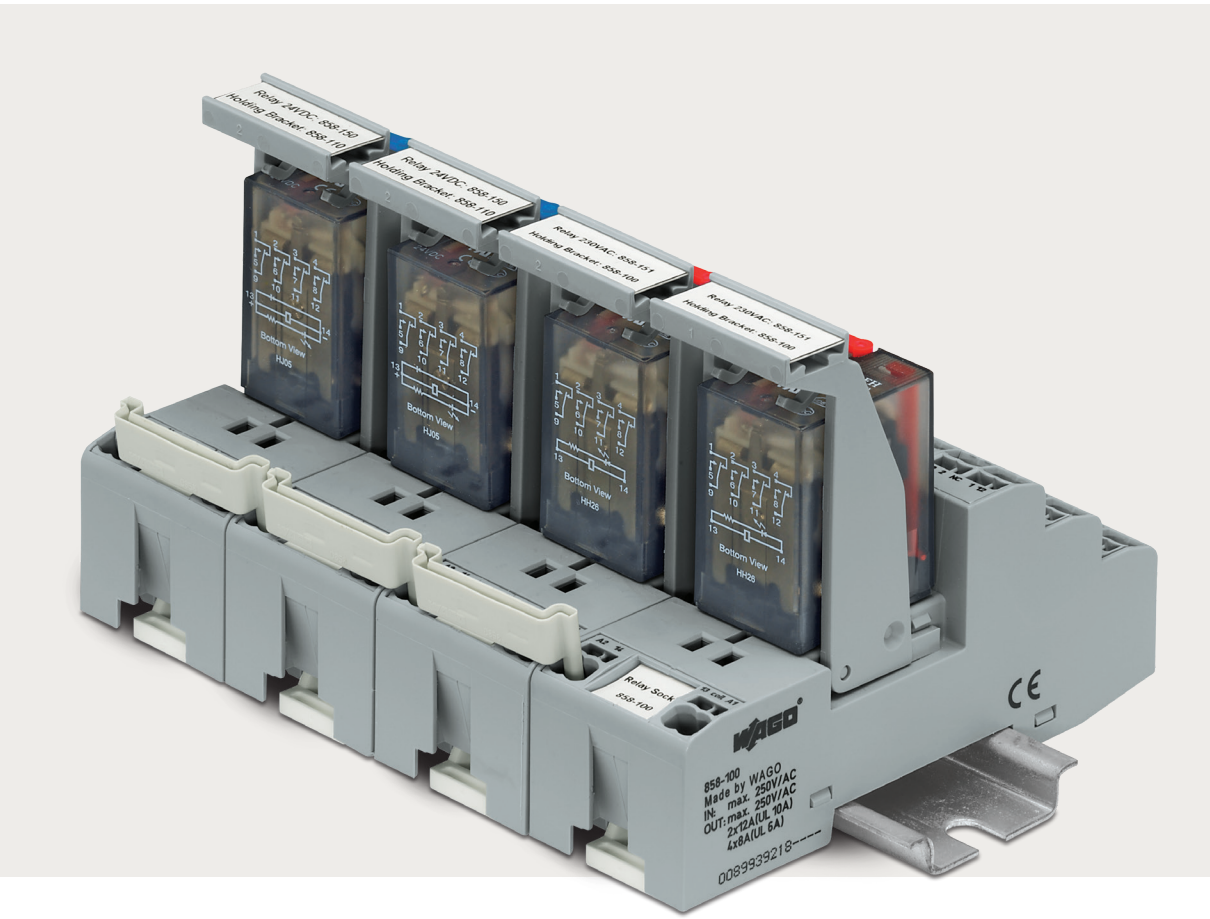
	Circuit Diagram	Description	Item No.	Input Voltage Range	Current Carrying Capacity	Max. Continuous Current	Approvals
		Optocouplers	788-700	24 VDC	0 ... 24 VDC	3.5 A	
		Optocouplers	788-701	24 VDC	0 ... 24 VDC	5 A	
		Optocouplers	788-720	24 VDC	24 ... 240 VAC	1 A	
		Optocouplers	788-721	24 VAC/VDC	12 ... 275 VAC	4 A	

858 SERIES

31 mm Wide Socket Style Pluggable “Ice Cube“ Relays

For conventional relay applications with standard pin spacing, 858 Series relay modules provide flexible DIN rail mounted solutions. The sockets carry 33.5 to 35.5 mm high relays equipped with DPDT (2 C/O) or 4PDT (4 C/O).

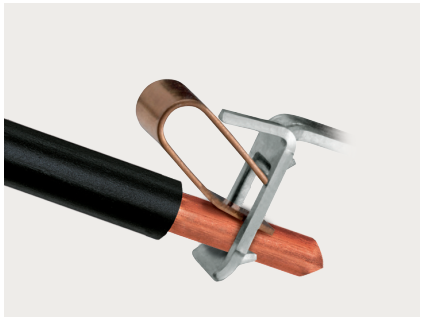
- Relays with 5 A power contacts or 50 mA gold contacts for dry switching applications
- LED indication
- Jumpering capabilities
- Marking options
- Manual switch feature on all relays



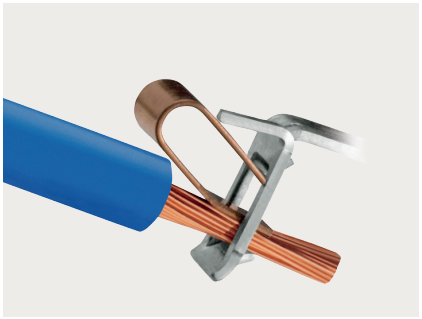
Push-in CAGE CLAMP®

Vibration-proof - fast - maintenance-free

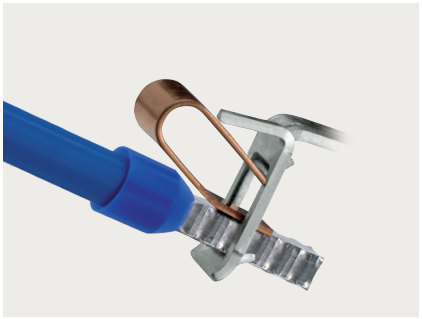
Push-in CAGE CLAMP® handling for all types of conductors



Solid

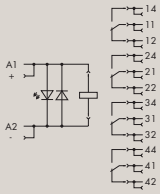
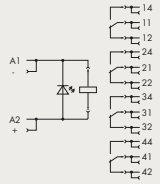
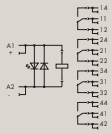
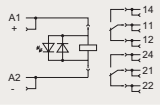
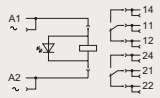


Stranded



Ferruled

858 Series - 31 mm Wide Socket with Pluggable "Ice Cube" Relays

	Circuit Diagram	Description	Item No.	Nominal Input Voltage	Max. Switching Voltage	Max. Continuous Current	Approvals
		Relay with 4PDT (4 C/O)	858-304	24 VDC	250 VAC	4 x 5 A	cULus GL CE
		Relay with 4PDT (4 C/O), with gold contacts	858-314	24 VDC	250 VAC*	4 x 5 A*	cULus GL CE
		Relay with 4PDT (4 C/O)	858-507 858-508	115 VAC 230 VAC	250 VAC	4 x 5 A	cULus GL CE
		Relay with 4PDT (4 C/O), with gold contacts	858-517 858-518	115 VAC 230 VAC	250 VAC*	4 x 5 A*	cULus GL CE
		Relay with 4PDT (4 C/O), with extended input voltage and temperature range	858-354 858-355	24 VDC	250 VAC	4 x 5 A	CE
		Relay with DPDT (2 C/O)	858-324	24 VDC	250 VAC	2 x 12 A	CE
			858-528	230 VAC			

** To avoid damage to the gold layer, the specified switching voltages and switching currents should not be exceeded. The evaporation of the gold layer can reduce the life of the relay.

Pluggable Relays - Accessories

	Description	V_N	Item No.	V_N	Item No.
	788 Series - Pluggable PCB style relays	SPDT (1 C/O)		DPDT (2 C/O)	
		12 VDC	788-150	12 VDC	788-152
		24 VDC	788-154	24 VDC	788-156
		48 VDC	788-158	48 VDC	788-160
		60 VDC	788-162	60 VDC	788-164
		110 VDC	788-166	110 VDC	788-168
		24 VAC	788-170	24 VAC	788-172
		115 VAC	788-174	115 VAC	788-176
		230 VAC	788-178	230 VAC	788-180
		12 VDC	788-155*	12 VDC	788-157*
		115 VAC	788-175*	115 VAC	788-177*
		230 VAC	788-179*	230 VAC	788-181*
	857 Series - Pluggable PCB style relays - 60 VDC replacement relays must be used with 60 VDC, 110 VDC, 220 VDC and 115 VAC/VDC, 230 VAC/VDC relay modules.	12 VDC	857-150		
		24 VDC	857-152	24 VDC	857-153*
		48 VDC	857-154		
		60 VDC	857-155	60 VDC	857-157*
	857 Series - Pluggable PCB style optocouplers	24 VDC	857-161	0 ... 24 VAC	
		24 VDC	857-164	0 ... 28 VDC	
		24 VDC	857-167	24 ... 240 VAC	
		60 VDC	857-162	35 ... 72 VDC	
		60 VDC	857-165	52 ... 72 VDC	
		60 VDC	857-168	24 ... 240 VAC	
	858 Series - Pluggable "Ice Cube" style relays	12 VDC	858-150	24 VAC	858-154
				230 VAC	858-151
		24 VDC	858-152*	230 VAC	858-153*

*With gold plated contacts

788 & 858 Series - Accessories - Jumpers

Description - For use with 788 and 858 relays		Item No.
	2-way	788-113
Push-in jumper bar, I max. 18 A (module/module)	3-way	788-114
	4-way	788-115
	6-way	788-116
	8-way	788-117
Push-in type jumper bar		858-402

Description - for use with 859 & 857 relays		Item No.
	2-way	859-402*
Push-in type jumper bars, light gray, insulated, 18 A	3-way	859-403
	4-way	859-404
	5-way	859-405
	6-way	859-406
	7-way	859-407
	8-way	859-408
	9-way	859-409
	10-way	859-410
	yellow	.../000-029
Item no. suffix for colored push-in type jumper bars	red	.../000-005
	blue	.../000-006

*Can be used for 788 load side

788, 857 & 858 Series - Accessories - Relay Sockets

Description - for use with 788, 858 and 857 relays	Item No.
 Socket without relay, for DIN 35 Relay height 15 mm, SPDT (1 C/O)	788-100
Relay height 15 mm, DPDT (2 C/O)	788-102
Relay Socket with "Ice Cube" for DIN rail	858-100
 Socket for pluggable PCB style relays or optocouplers, 24 VAC/VDC for DIN rail	857-104
Socket for pluggable PCB style relays or optocouplers, 110 VAC/VDC for DIN rail	857-107
Socket for pluggable PCB style relays or optocouplers, 230 VAC/VDC for DIN rail	857-108

2042 SERIES

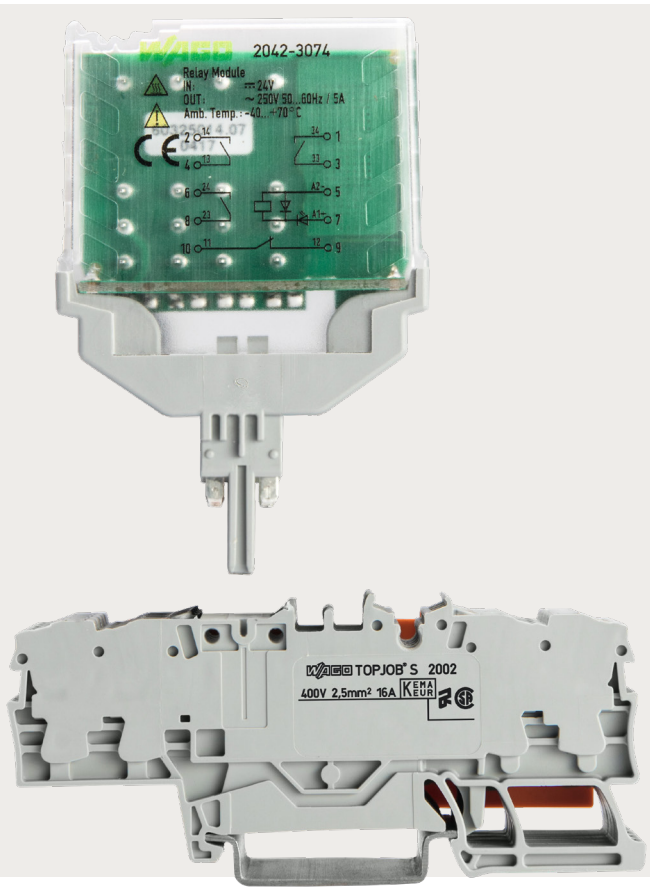
Pluggable Relay Modules for TOPJOB® S Rail-Mount Terminal Blocks

Born out of the 286 Series comes the more modern 2042 pluggable modules for TOPJOB® S terminal blocks. This pluggable module provides application flexibility for relays, optocouplers and custom electronics that can be plugged into existing terminal blocks in a control panel thus reducing wiring time and maximizing panel space.

- Wide input voltage range
- Easy replacement
- Familiar rail-mount terminal block installation
- LED indication
- Marking Options
- Custom solutions available - please contact factory
- Clear housing

CE c UL us *

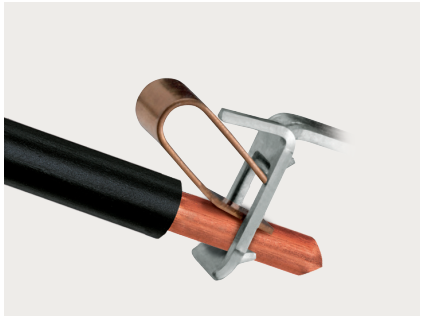
*Pending



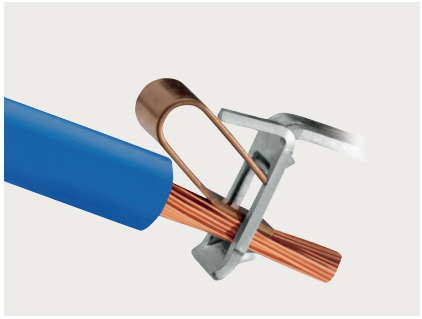
Push-in CAGE CLAMP®

Vibration-proof - fast - maintenance-free

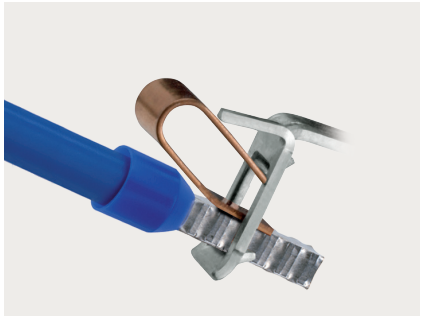
Push-in CAGE CLAMP® handling for all types of conductors



Solid



Stranded



Ferruled

Input Voltage
Wide input voltage range (16.8 ... 253 V) provides applications flexibility; even for railway applications

Ambient Temperature
Wide temperature range of -40 °C to +70 °C allows for use in extreme environments

Vibration and Shock
Tested according to EN61373 (1A, 1B) for use in railway applications

EMC Testing
Tested according to EN 50121 -3 -2 for use in non-shielded areas

Marking
Versatile and time saving marking including WAGO's continuous marking strip

2042 Series - Technical Data - Relay Modules

	Nominal Input Voltage	Input Voltage Range	Switching Voltage	Limiting Continuous Current				No. of Carrier Terminal Blocks *	Item No.	Approvals
	24 VDC	-30 ... +25%	250 VAC	6 A		1		2	2042-3004	
				8 A		2		4	2042-3014	
				5 A		4		5	2042-3024	
				10 A			1	3	2042-3034	
				8 A			2	4	2042-3044	
				6 A	1			3	2042-3054	
				8 A	1	1		4	2042-3064	
				5 A	1	3		5	2042-3074	
				5 A	2	2		5	2042-3084	
	24 ... 230 VAC/ VDC	+/- 10%		3 A		1		2	2042-3809	
				5 A		2		4	2042-3819	
				3 A		4		5	2042-3829	
				4 A			1	3	2042-3839	
				5 A			2	4	2042-3849	
				6 A	1			2	2042-3859	
				5 A	1	1		4	2042-3869	
				3 A	1	3		5	2042-3879	
				3 A	2	2		5	2042-3889	

* No. of carrier terminal blocks x 5.2 mm + module width
** cULus Pending

Model Code Key: 2042-ABCD

2042 Series = Pluggable Relay Modules for TOPJOB® S Rail-Mount Terminal Blocks

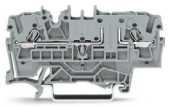
A = Product Variation
- 3 = Relay Module

B = Coil/Contact
- 0 = DC/Standard
- 8 = AC/DC/Standard

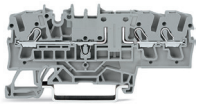
C = Contacts
- 0 = 1 NO
- 1 = 2 NO
- 2 = 4 NO
- 3 = 1 CO
- 4 = 2 CO
- 5 = 1 NC
- 6 = 1 NC/1 NO
- 7 = 1 NC/3 NO
- 8 = 2 NC/2 NO

D = Coil Voltage
- 4 = 24 V
- 9 = 24 V ... 230 V

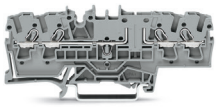
2042 Series - Appropriate TOPJOB® S Rail-Mount Terminal Block System

2-Conductor Carrier Terminal Block		Item No.
	0.25 … 2.5 (4) mm² / 22 … 12 AWG	
	Terminal block width: 5.2 mm / 0.205 inch	
	gray	2002-1661

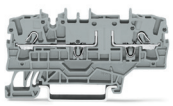
End and Intermediate Plate: 1 mm thick		Item No.
	Orange	2002-1692
	Gray	2002-1691

3-Conductor Carrier Terminal Block		Item No.
	0.25 … 2.5 (4) mm² / 22 … 12 AWG	
	Terminal block width: 5.2 mm / 0.205 inch	
	gray	2002-1761

End and Intermediate Plate: 1 mm thick		Item No.
	Orange	2002-1792
	Gray	2002-1791

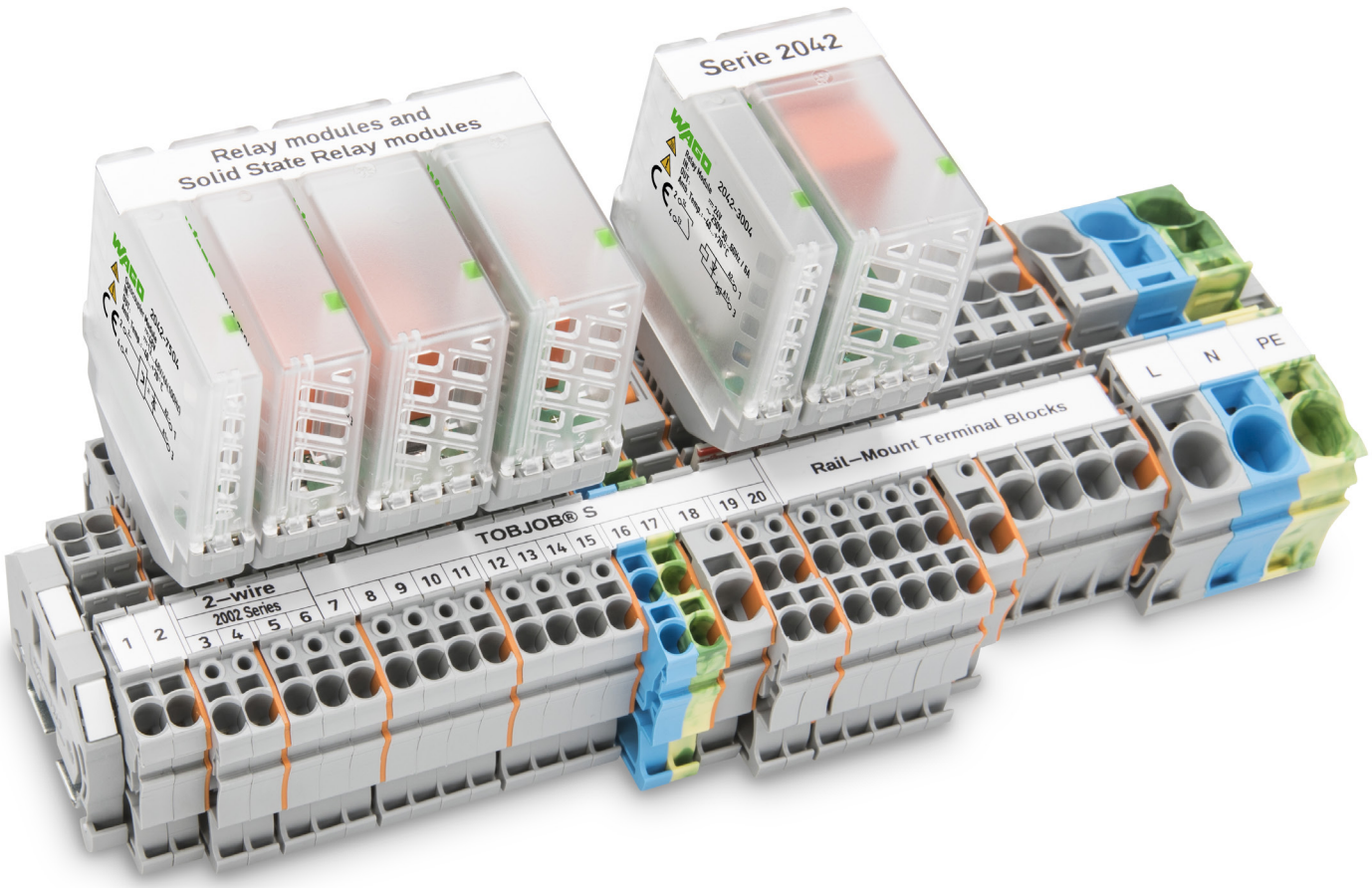
4-Conductor Carrier Terminal Block		Item No.
	0.25 … 2.5 (4) mm² / 22 … 12 AWG	
	Terminal block width: 5.2 mm / 0.205 inch	
	gray	2002-1861

End and Intermediate Plate: 1 mm thick		Item No.
	Orange	2002-1892
	Gray	2002-1891

2-Conductor Carrier Terminal Block		Item No.
	0.25 … 2.5 (4) mm² / 22 … 12 AWG	
	Terminal block width: 5.2 mm / 0.205 inch	
	gray	2002-1961

End and Intermediate Plate: 1 mm thick		Item No.
	Orange	2002-1992
	Gray	2002-1991

Additional accessories are available in the Full Line Catalog, Volume 1 or at www.wago.us



Signal monitoring: Relays with force-guided contacts make it possible to quickly detect errors such as opening failures.

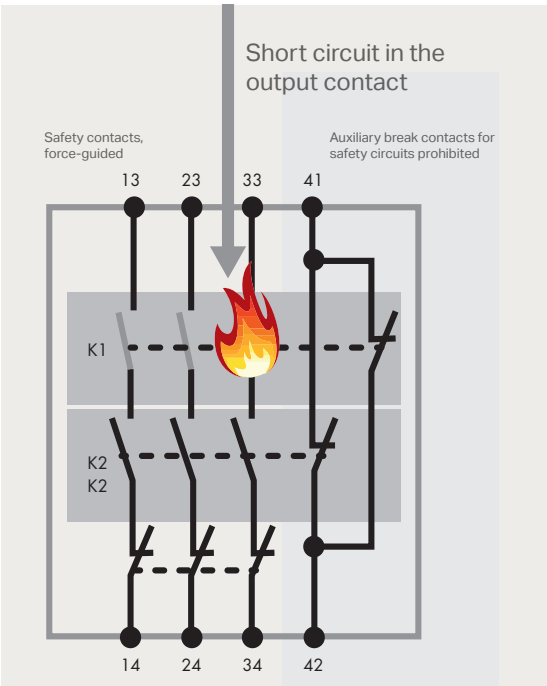
iStock.com/Richard Clark

FUNCTIONAL SAFETY

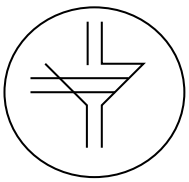
Detect Errors in Safety-Related Circuits

To meet functional safety standards relay modules must have force-guided contacts with at least one break and one make contact. In addition, they must be mechanically connected so that the contacts cannot be opened or closed at the same time, thus eliminating operating errors such as welding or sticking.

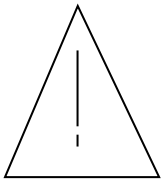
For relays with changeover contacts, EN 50205 requires that either the make or break contact must be positively driven; because of this, only relays with at least two changeover contacts can be used in safety circuits.



©th-photo/Fotolia.com



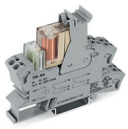
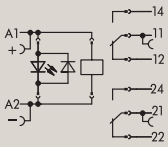
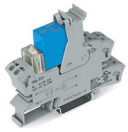
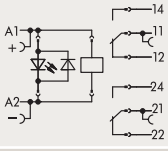
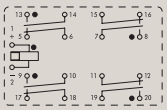
Type A



Type B

EN 50205 defines two sets of safety relays:
Type A: Relays with force-guided mechanically connected changeover contacts
Type B: Relays with force-guided mechanically connected make and break contacts

Relay Selection for Safety Relays

		Description	Item No.	Nominal Input Voltage U_N	Limiting Continuous Current	Approvals
		Safety relay module SR2M (2 changeover contacts) with force-guided contacts (type A) and status indication	788-384	24 VDC	6 A	cULus CE
		Safety relay module SR2M (2 changeover contacts) with force-guided gold contacts (type A) and status indication	788-906	24 VDC	0.3 A	UL CE
		Safety relay module with 4 break contacts and 4 make contacts, relay pre-soldered onto carrier, force-guided contacts, type B	288-414	24 VAC/DC	6 A	CE

GLOSSARY

Response
Change in the switching position of a relay from the idle state (e.g., make contacts open) to the working state (e.g., make contacts closed) caused by applying the power; this process was formerly called “tightening.”

Bistable relay
Electrical relay that remains in the achieved switching state after switching off the power.

Inrush current
The indication of the maximum inrush current specifies which peak current is allowed when switching on a contact under defined conditions (e.g., voltage, power factor, time response) without the relay then malfunctioning. The inrush current can often be much higher.

Electrical service life
Number of switching cycles until the relay fails under a specified electrical load and defined operating conditions; the standard service life values usually apply to the maximum permissible resistive load. For smaller switching loads, a much longer service life is expected. For larger switching loads, the service life is greatly reduced.

Electrical relay
Component that generates sudden predetermined changes to one or more output criteria when certain requirements in the coil circuit (input circuit) are met.

Electromechanical relay
Electrical relay in which the electrical current effects mechanical movements in the coil circuit that execute the operation in the output circuit.

Freewheeling diodes
Recovery diodes are primarily used to protect against overvoltages that arise when switching off an inductive DC load (electric motor, relay coil). Voltage peaks are limited to the value of the diode forward voltage and overruns diverted via the diode. However, this leads to a delay in the voltage drop and switching operation.

Electrical isolation
Potential-free isolation between electrical parts; with galvanic isolation, no charge carriers flow from one circuit to another, i.e., there is no electrically conductive connection between circuits. However, the circuits can still exchange electrical power or signals and specifically via magnetic fields.

Solid-state relay
Solid-state relay with a switching element that is an electronic component, e.g., transistor, thyristor or triac; solid-state resistors boast wear-free operation; compared to relays, they have a high switching frequency. Galvanic isolation is achieved by an integrated optocoupler.

Contact type
The three most important contact types (also called the contact spring set) are make contact, closed contact and changeover contact.

They are abbreviated as follows:

Germany	UK	America
Make contact 1	make A	SPST-NO (normally open)
Break contact 2	break B	SPST-NC (normally closed)
Changeover contact 21	changeover C	SPDT

Creepage distance
Shortest distance between two conductive parts measured along the surface of an insulating material.

Short-circuit-protected
Switching off the final stage of a solid-state relay to protect the output circuit in the event of a short circuit.

Load category (solid-state relay) Load classification for solid-state relays according to EN 62314

LC A – Resistive loads or low inductive loads
LC B – Inductive loads
LC C – Electrical discharge lamps
LC D – Incandescent lamps
LC E – Transformers
LC F – Capacitive loads

Leakage current
Current on the load side of an optocoupler that flows in the locked state of the output stage.

Mechanical service life
Number of switching cycles during which the relay remains functional with current-free switching contacts.

Monostable relay
Electrical relay that returns to its initial state after switching off the power.

Normally closed contact
The contact is closed when the relay is in the idle state and open when the relay is in the working state.

Optocoupler
Optocouplers are electronic components which a load current is switched via a control circuit. Unlike electromechanical relays, optocouplers have no mechanical parts prone to wear. In the control circuit, a light signal is triggered for the switching operation via an LED. Sender (LED) and receiver (e.g., phototransistor) are embedded in a light-conductive plastic and surrounded by an opaque envelope that protects against external influences.

Bounce time
Time from the first to the final closure (or opening) of a contact caused by shock processes of the contact movement; these shock processes are called “contact bouncing.”

Release time
Time between switching off the coil excitation and the first opening of the make contact or first closing of the break contact.

Switching inductive load
For inductive loads mainly present when using coils in the load circuit, the problem arises when switching off. A magnetic field forms from the current flow in the coil that suddenly collapses and generates a high induction voltage. This voltage peak must be short circuited by a diode connected in parallel. However, the time needed leads to a fall delay.

Switching capacitive load
Capacity loads occur when there is capacitor in the load circuit. This acts like a short circuit when switching on and causes a high inrush current.
If the current is no limited, it can destroy the semiconductor.

GLOSSARY

Switching resistive load
Because the amperage in the load circuit and the voltage via the semiconductor behave inversely proportional to each other for resistive loads, there is usually no problem. Maintaining the maximum amperage and voltage levels of the components is sufficient. There is a special case when switching incandescent bulbs. Due to the low cold resistance, overcurrents at 10 to 20 times the operating current can arise when switching on. The components must be designed for these potential overloads that correspond to the effect with capacitive load.

In special occasions due to low resistance (e.g., in incandescent lighting applications) over currents can arise at switch on. Thus components must be designed with this possibility in mind.

Switching cycle
The response and relapse of a relay as a result of switching on and off the power.

Make contact
The contact is closed when the relay is in the working state and open when the relay is in the idle state.

Switching current
Current (AC or DC) that can switch a relay contact on and off. Degree of protection, categories for elementary relays according to IEC 61810:

RT 0: Open relay
Relay not provided with a protective housing.

RT I: Dust-protected relay
Relay provided with a housing that protects its mechanisms from dust.

RT II: Flux-proof relay
Relay capable of being automatically soldered without allowing the migration of solder fluxes beyond the intended areas.

RT III: Wash tight (washable) relay
Relay capable of being automatically soldered and subsequently undergoing a washing process to remove flux residues without allowing the ingress of flux or washing solvents.

RT IV: Sealed relay
Relay provided with a housing that has no vents to the outside atmosphere, and has a time constant better than > $2x10^4$ s (IEC60068-2-17).

RT V: Hermetically sealed relay
Sealed relay having an enhanced level of sealing, assuring a time constant better than > $2x10^6$ s (IEC60068-2-17).

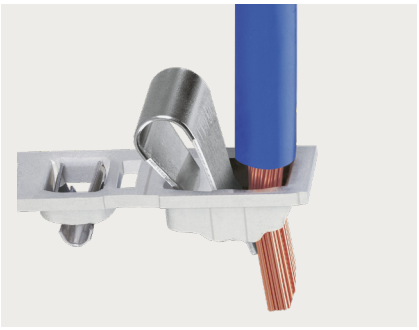
Changeover contact
Compound contact consisting of break contact and make contact with a common terminal; if one of the contact circuits is open, the other is closed.

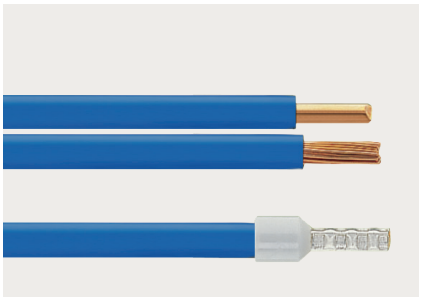
CONNECTION TECHNOLOGY

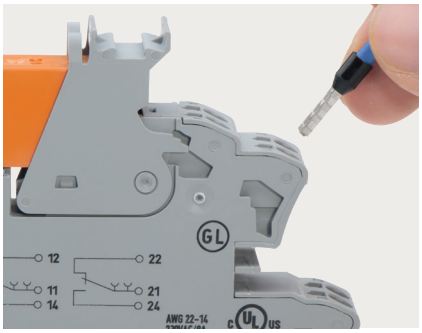
Push-In CAGE CLAMP®

Vibration-proof - fast - maintenance-free
Push-in CAGE CLAMP® handling for all types of conductors

The Push-in CAGE CLAMP® unites the advantages of the PUSH-WIRE® connection with the benefits of CAGE CLAMP®. Solid and ferruled conductors can be simply pushed in while stranded conductors are terminated with an operating tool for hands-free operation just like the original CAGE CLAMP.







This connection technology is included in the following:

788 Series 

857 Series 

858 Series 

CAGE CLAMP® COMPACT

Vibration-proof - fast - maintenance-free
CAGE CLAMP® COMPACT handling for all types of conductors

- The industry's first spring connection technology invented by WAGO in 1977.
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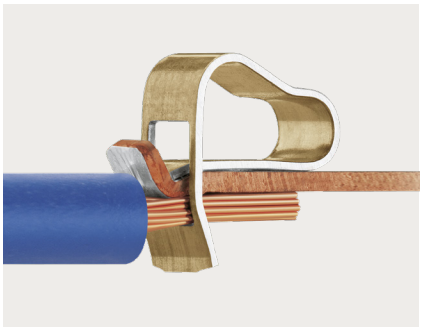
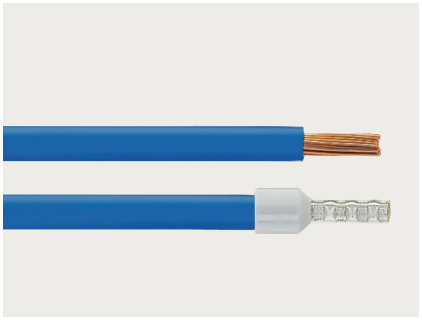
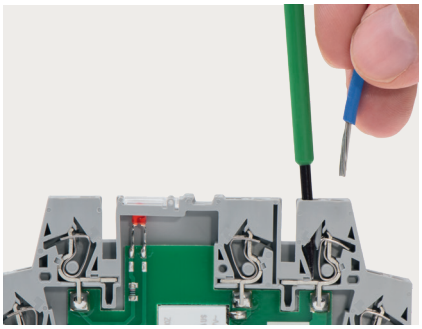
- Clamping forces automatically adjust to wire size , providing a reliable contact which is virtually independent of operator skill. The end result is a secure, vibration proof and maintenance free connection.
- Simply insert operating tool, insert stripped or ferruled conductor, then remove tool and done.







This connection technology is included in the following:

859 Series 

288 Series 

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