![Comat Releco - World of Relays logo]

1.5 **Solid State Relays**

Application	Types	Pins	Contacts	AC ratings	DC ratings	Socket
CSS Series						
AC Solid state relay, Instantaneous switching	CSS-I			3 A / 250 V		S10
AC Solid state relay synch. to zero crossing	CSS-Z			3 A / 250 V		S10
NPN Solid state relay	CSS-N				6 A / 48 V	S10
PNP Solid state relay	CSS-P				6 A / 48 V	S10
CRINT Series						
DC solid state switch	CRINT-C1x5				2 A / 24 V	
AC solid state switch	CRINT-C1x8			1 A / 240 V		

This issue replaces all previous issues. Availability, errors and specifications subject to change without notice.

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IRC series
CSS-I

4-pin, Interface solid state relay, 1-pole, plug-in faston

Type	CSS-I
	Solid state relay
	For switching resistive and inductive AC loads
	Instantaneous

Output	1 N/O contact
Operating range	**3 A, 24 ... 250 VAC, 50/60 Hz**
Minimum contact load	**35 mA**

Control circuit	
Input voltage range	5 ... 48 VDC
Input current	10 mA

Output circuit	Instantaneous
Max. output current	3 A
Min. output current	35 mA
Output voltage range	24...250 VAC
Inrush current	150 A/10 ms
Residual current	1 mA
I^2t value	210 A^2s

Specifications	
Ambient temperature operation/storage	-40 ... 70 °C /-40 ... 85 °C
Pick-up time	0.06 ms
Release time	0.06 ms
Weight	28 g

Applications

It is specially suitable to switch inductive loads up to 3A/250 VAC.

For switching loads with a high inrush or overcurrent as transformers, motors or fluorescents, the maximum output current will limit to 2 A.
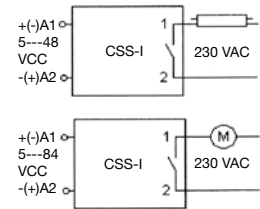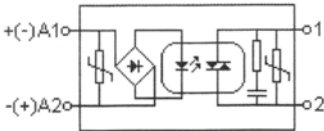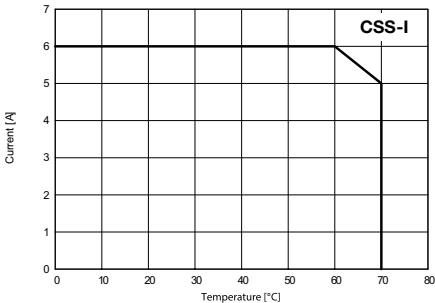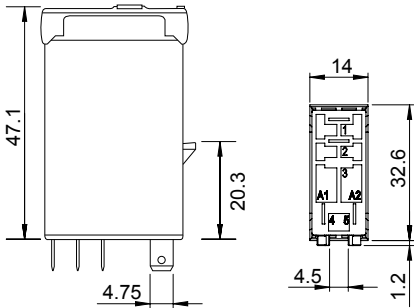

Standard types

VDC 5–48 CSS-I12X/DC5–48V

Accessories
Socket: **S10, S10-M, S10-P**

Fig. 1 CSS-I diagram

Tab. 2 AC derating curve

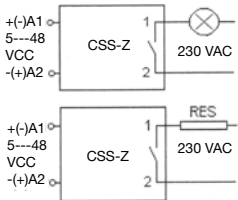**Dimensions [mm]**

Technical approvals, conformities

CE

This issue replaces all previous issues. Availability, errors and specifications subject to change without notice.

IRC series

CSS-Z

4-pin, Interface solid state relay, 1-pole, plug-in faston

Type	**CSS-Z**
	Solid state relay
	For switching resistive lamps and AC loads
	Synchronized to zero crossing

Output	**1 N/O contact**
Operating range	**3 A, 24 ... 250 VAC, 50/60 Hz**
Minimum contact load	**35 mA**

Control parameters	
Input voltage range	5 ... 48 VDC
Input current	10 mA

Output	**Synchronized zero**
Max. output current	3 A
Min. output current	35 mA
Output voltage range	24 ... 250 VAC
Inrush current	150 A/10 ms
Residual current	1 mA
I^2t value	210 A^2s

Specifications	
Ambient temperature operation/storage	-40….70 ºC /-40 ... 85 °C
Pick-up time	10 ms
Release time	10 ms
Weight	28 g

Applications

Switches ohmic AC loads up to 3 A/250 VAC in the zero-point of the tension and avoids any overcurrent peak in the connection.

Suitable for switching resistors, incandescent lamps, signalling equipment, etc. Not suitable for inductive loads
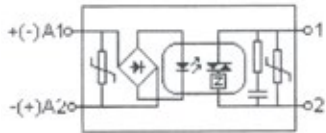

Standard types

VDC 5–48	**CSS–Z12X/DC5–48V**

Accessories
Socket:	**S10, S10-M, S10-P**

Fig. 1 CSS-Z diagram

Tab. 2 AC derating curve

Dimensions [mm]

Technical approvals, conformities

$C\epsilon$

This issue replaces all previous issues. Availability, errors and specifications subject to change without notice.

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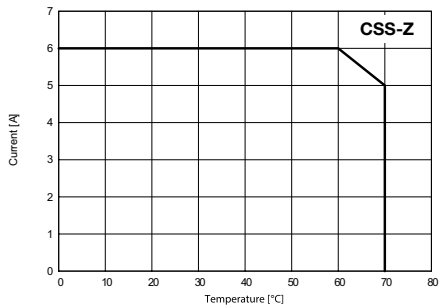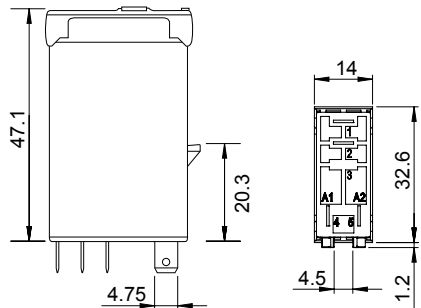
IRC series

CSS-N

4-pin, Interface solid state relay, 1-pole, plug-in faston

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Type	CSS-N
	NPN solid state relay
	Terminal commun 2 negative (S10 socket)

Output	1 N/O contact
Operating range	**6 A, 5 ... 48 VDC**
Minimum contact load	**1 mA**

Control parameters	
Input voltage range	5 ... 48 VDC
Input current	4 mA

Output	
Type	NPN
Max. output current	6 A
Output voltage range	5 ... 48 VDC
Switch-on current max.	40 A / 10 ms
Max. voltage drop	≤ 0,14 VDC
Residual current	0,1 mA

Specifications	
Ambient temperature operation/storage	-40 ... 70 °C/-40 ... 85 °C
Test voltage between input/output	4 kV rms/1 min.
Turn-on delay	0,06 ms
Release delay	**0,06** ms
Weight	28 g

Applications

For switching heating elements, electro valves, motors, PLC input/output signals, solenoids, incandescent and fluorescent lamps, etc. (up to 48 VDC).

Inductive loads must be shunted with an antiparallel diode.
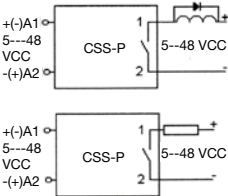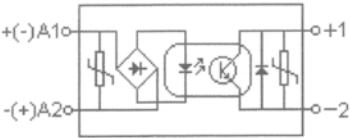
Standard types

VDC 5–48	CSS-N13X/DC5–48V

Accessories
Socket: **S10, S10-M, S10-P**

Fig. 1 CSS-N diagram

Negative common

Tab. 2 DC derating curve
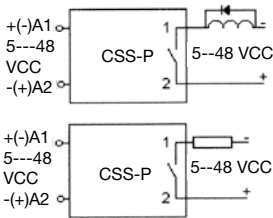
Dimensions [mm]

Technical approvals, conformities

CE

IRC series

CSS-P

4-pin, Interface solid state relay, 1-pole, plug-in faston
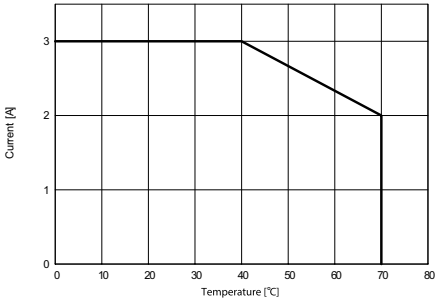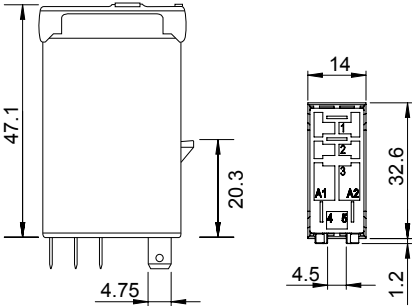
Type	CSS-P
	PNP solid state relay
	Terminal commun 2 positive (S10 socket)

Output	1 N/O contact
Operating range	**6 A, 5 ... 48 VDC**
Minimum contact load	**1 mA**

Control parameters	
Input voltage range	5 ... 48 VDC
Input current	4 mA

Output	
Type	PNP
Max. output current	6 A
Output voltage range	5 ... 48 VDC
Max. switch-on current	40 A / 10 ms
Max. voltage drop	**0,14** VDC
Residual current	0,1 mA

Specifications	
Ambient temperature operation/storage	-40…70 ºC /-40 ... 85 ºC
Turn-on delay	0,06 ms
Release delay	0,06 ms
Weight	28 g

Applications

For switching heating elements, electro valves, motors, PLC input/output signals, solenoids, incandescent and fluorescent lamps, etc. (up to 48 VDC).

Inductive loads must be shunted with an antiparallel diode.
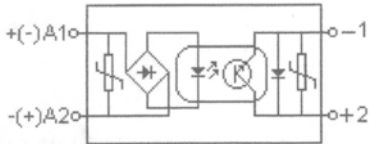

Standard types

VDC 5–48	CSS-P13X/DC5–48V

Accessories

Socket:	**S10, S10-M, S10-P**

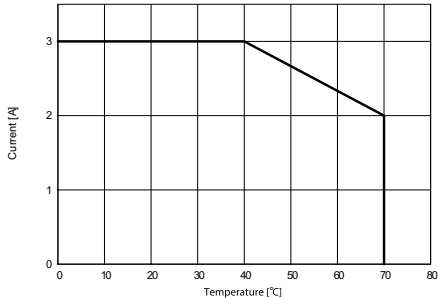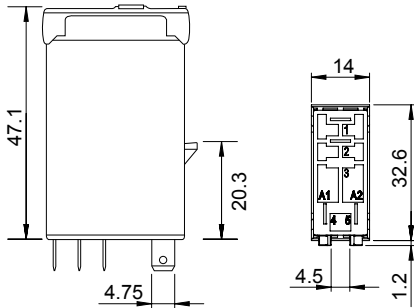

Fig. 1 CSS-P diagram

Positive common

Tab. 2 DC derating curve

Dimensions [mm]

Technical approvals, conformities

$C\epsilon$

CRINT 1x5 series

Solid state interface module with mechanical NO output contact

DIN Rail mounting according to DIN 43 880

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Types: CRINT-C115, CRINT-C125 / …V
For PLC's and process control. DC solid state switch, type NO.
For fast and high frequent switching. With screw terminals (CRINT-S11) or cage clamp terminals (CRINT-S12).

Max. contact load	2 A, 24 V DC-1

Contact

Type	1 NO (Solid state DC)
Material	MOSFET
Switching current $\vert_{TH}$	2 A 24 V DC
Recommended minimal load	20 mA / 5 V
Peak inrush current	48 A/10 ms

Coil

Operation voltage AC 50/60 Hz / DC	0.8 … 1.25 U_N
Nominal power DC/AC	160 / — mW

Insulation

Test voltage I / O	2.5 kVrms 1 minute
Pollution degree	3
Over voltage category	III
Open contact	1000 Vrms dielectric strength 1 min
Standard	EN61810-5

General Specifications

Ambient temperature: operation / storage	-30 … +70 °C / -40 … +85 °C
Typical response time @ V_n	1 ms
Typical release time @ V_n	1 ms
Cond. cross section screw terminal	2.5 mm^2
Cond. cross section spring cage	0.75 … 2.5 mm^2
Ingress protection	IP 20
Mounting position	any
Housing material	Polyamide PA6

Order information

Screw terminal: **CRINT-C115/UC…V**	**UC12V**
	UC24V
	UC48V
Cage clamp terminal: **CRINT-C125/UC…V**	**UC60V**
	UC110-125V
„ …" enter the voltage for full type designation	**UC220-240V**

Accessories

Jumper link (5 pcs):	blue:	**CRINT-BR20-BU/5**
	red:	**CRINT-BR20-RD/5**
	black:	**CRINT-BR20-BK/5**

Label plate (64 pcs):	**CRINT-LAB/64**
Spacer (5 pcs):	**CRINT-SEP/5**

Replacement relays:
CRINT-R15/DC…V

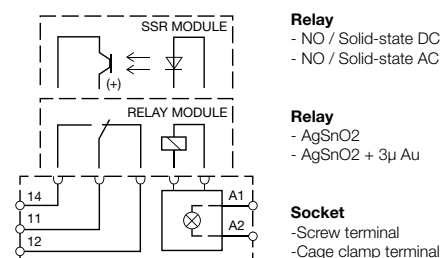| **DC12V** |
|---|
| **DC24V** |
| **DC48V** |
| **DC60V*** |

„ …" enter the voltage for full type designation

*60V Relay used for all sockets with
a nominal voltage higher or equal 60V

Connection diagram

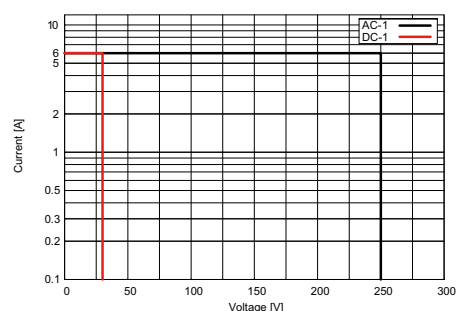**Relay**
- NO / Solid-state DC
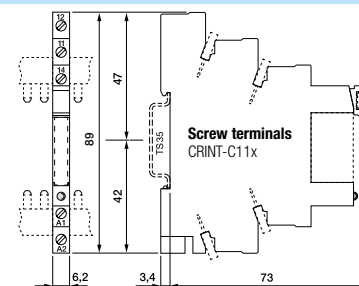- NO / Solid-state AC

Relay
- AgSnO2
- AgSnO2 + 3µ Au

Socket
- Screw terminal
- Cage clamp terminal

Fig.1 AC voltage endurance

Fig. 2 DC load limit curve

Dimensions [mm]

Screw terminals
CRINT-C11x

Technical approvals, conformities

This issue replaces all previous issues. Availability, errors and specifications subject to change without notice.

CRINT 1x8 series

Solid state interface module with mechanical NO output contact

DIN Rail mounting according to DIN 43 880

Types: CRINT-C118, CRINT-C128 / …V

For PLC's and process control.
AC output interface zero synchronous switching NO for resistive or similar load. (No transformator rec.) With screw terminals (CRINT-S11) or cage clamp terminals (CRINT-S12).

Max. contact load	1 A, 240 V AC-1

Contact	
Type	1 NO (Solid state AC)
Material	TRIAC
Switching current I_{TH}	1 A 240 V AC
Recommended minimal load	22 mA / 12 V
Peak inrush current	80 A/10 ms

Coil	
Operation voltage AC 50/60 Hz / DC	0.8 … 1.25 U_N
Nominal power DC/AC	150 / — mW

Insulation	
Test voltage I / O	2.5 kVrms 1 minute
Pollution degree	3
Over voltage category	III
Open contact	1000 Vrms dielectric strength 1 min
Standard	EN61810-5

General Specifications	
Ambient temperature: operation / storage	-30 … +70 °C / -40 … +85 °C
Typical response time @ V_n	1 ms
Typical release time @ V_n	1 ms
Cond. cross section screw terminal	2.5 mm^2
Cond. cross section spring cage	0.75 … 2.5 mm^2
Ingress protection	IP 20
Mounting position	any
Housing material	Polyamide PA6

Order information

Screw terminal: **CRINT-C118/UC…V**

UC12V
UC24V
UC48V
UC60V
UC110-125V
UC220-240V

Cage clamp terminal: **CRINT-C128/UC…V**

„ …" enter the voltage for full type designation

Accessories

Jumper link (5 pcs):	blue:	**CRINT-BR20-BU/5**
	red:	**CRINT-BR20-RD/5**
	black:	**CRINT-BR20-BK/5**

Label plate (64 pcs):	**CRINT-LAB/64**
Spacer (5 pcs):	**CRINT-SEP/5**

Replacement relays:
CRINT-R18/DC…V

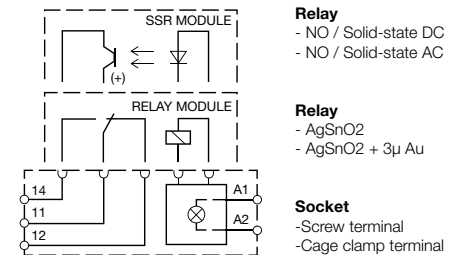| |
|---|
| **DC12V** |
| **DC24V** |
| **DC60V*** |

„ …" enter the voltage for full type designation

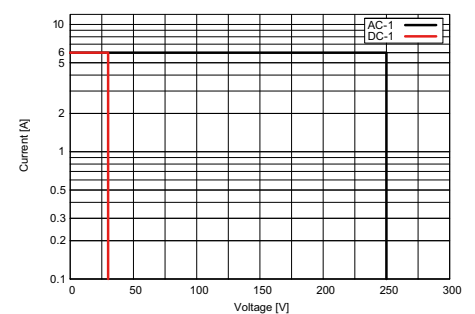*60V Relay used for all sockets with
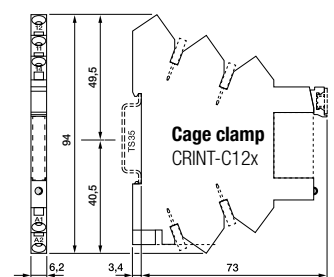a nominal voltage higher or equal 60V

Connection diagram

Relay
- NO / Solid-state DC
- NO / Solid-state AC

Relay
- AgSnO2
- AgSnO2 + 3µ Au

Socket
- Screw terminal
- Cage clamp terminal

Fig.1 AC voltage endurance

Fig. 2 DC load limit curve

Dimensions [mm]

Cage clamp
CRINT-C12x
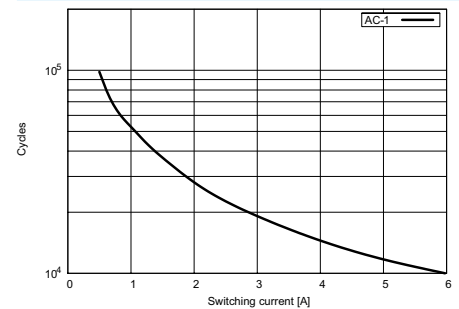
Technical approvals, conformities

IRC – Interface-Applications

In combination with I/O sockets and the plug-in jumpers, the IRC relay series permits low-cost, clearly arranged and reliable realisation of interface circuits for the input and output ends of PLC and control systems.

S10-M and S12 sockets with one and two contacts, with inputs in series and identical arrangement of the contacts.

Identical order of coil and contacts on both sockets.
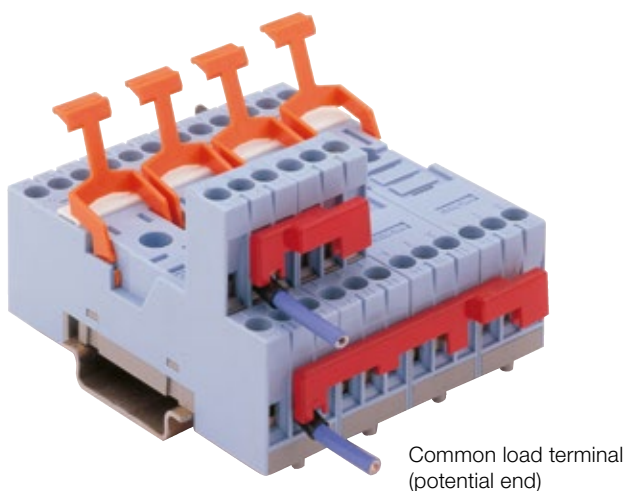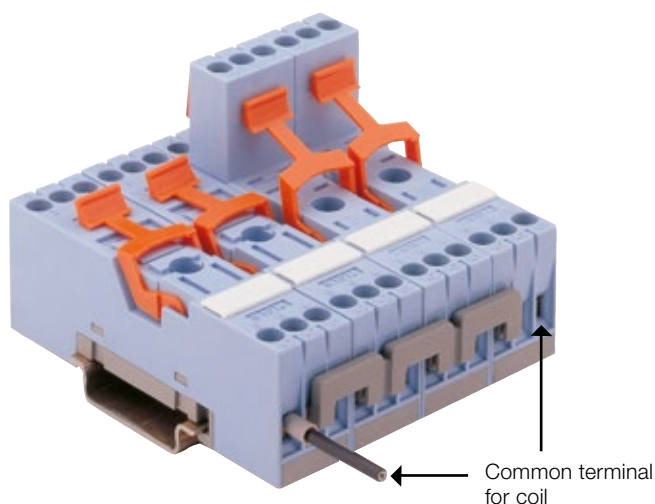
Coil terminal at level 1:
(A2, A2, A1)

Power terminals at level 1:
(12, 11, 14)

Power terminals at level 2:
(22, 21, 24)
General

All plug-in jumpers are insulated. The plug-in jumpers at the drive end (coil) can be split manually to the required length, thus enabling the creation of any required interface groups.
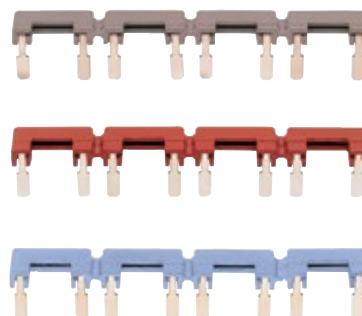
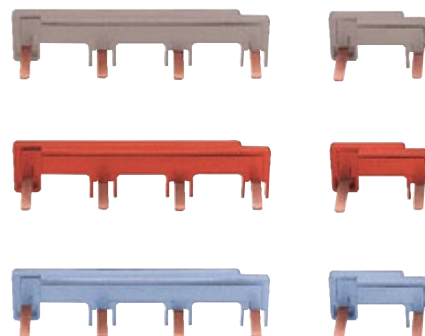The jumpers are available in the colours grey, blue and red. .

Options:
Colours used by RELECO in the relays' test buttons:
- Blue for DC circuits
- Red for AC circuits

Common terminal for coil

Common load terminal (potential end)

B20 plug-in jumpers for the control end

V40 and V10 plug-in jumpers for the power end

IRC – Interface Applications

Total interconnection, bridge bars for coil and power lines

V40, V10

Power bridge bars for sockets S10-M and S12

V40 bridges join four similar points in four aside adjacent sockets. They can join up either among themselves or to V10 units, to bridge an unlimited number of sockets S10-M and S12 in any combination.

V10 bridges are units to connect a single socket to the next one, so you bridge less or more than 4 sockets.
Made of copper with a current capacity of 40 A.

B20

Coil bridge bars for sockets S10-M and S12

B20 bridges points A2, internally connected, of every aside adjacent socket S10-M or S12.

Each element connects point 6 of the first socket to point 5 of the next one, always leaving free the point 5 of the first socket and the point 6 of the last one, to connect the common polarity cable.
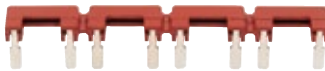
V40-G

V10-G

B20-G

V40-R

V10-R

B20-R

V40-A

V10-A

B20-A

This issue replaces all previous issues. Availability, errors and specifications subject to change without notice.

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IRC – Interface-Applications

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Jumper connection on S1O-M and S12 sockets

The S10-M and S12 sockets and the new connection jumpers B20, V10 and V40 enable easy and fast wiring of rows of relays. The jumpers can be used in a mixed configuration of S10-M and S12 sockets.

Different jumper colours allow clear identification. This results in fewer errors, lower assembly costs and easier inspection and maintenance work. Available in grey (standard), red (AC) and blue (DC), in conformity with the colour coding used by RELECO for test buttons for relay identification.

Attention needs to be paid only to the total current. At higher currents and also for safety reasons, a current supply at the start and end of a jumpered connection is recommended.

V40 plug-in jumpers for the power end

Contacts can be linked to the power ends with the aid of these jumpers. Normally, these are the changeover contacts, terminal 11 or 21. The jumpers can also be used to jumper NC or NO plug-in terminals. V40 jumpers link four identical contacts of four neighbouring sockets. They can either be linked to one another or to V10 jumpers to jumper a number of sockets in any combination.

V10 plug-in jumpers for the power end

V10 jumpers can be used to link individual sockets to one another in groups. A combination of V40 and V10 jumpers is possible, depending on the number of sockets.
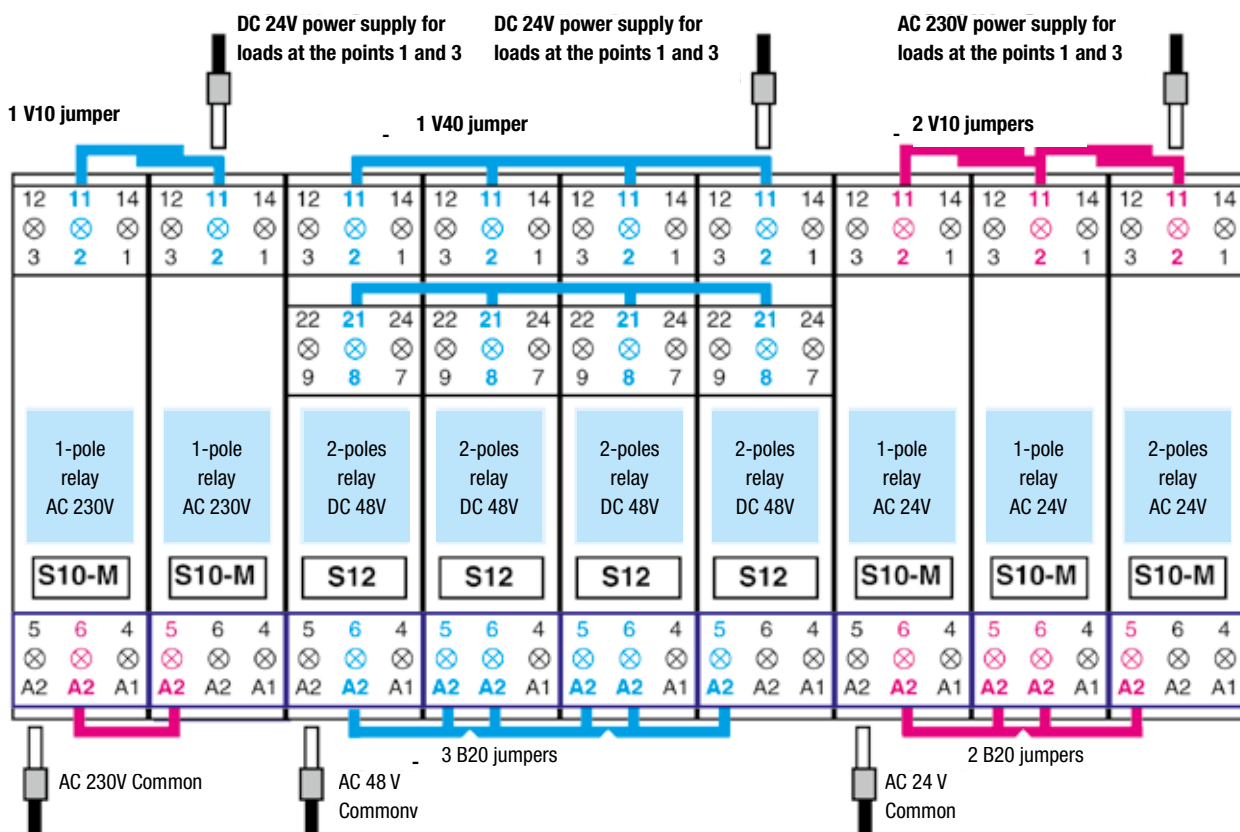
B20 plug-in jumpers for the control end

The sockets S10-M and S12 are accessible via the plug-in terminals 5 and 6 for A2 (internal connection). Each element links terminal 6 of the first socket to 5 of the next socket, and 5 of the first socket and 6 of the last socket are always left free to connect the cable. The jumper B20 consists of four coherent parts, which can be separated, however.

This issue replaces all previous issues. Availability, errors and specifications subject to change without notice.

Semiconductor relays as an interface to PLC and control systems

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Input

Application
The CSS semiconductor switches have a useful life that is practically unlimited in terms of switching cycles. They operate without bounce and permit a high switching frequency

Drive

All versions feature an electrically isolated input for 5 to 32 V DC. The inputs are characterised by a minimum delay with a simultaneously high interference immunity.
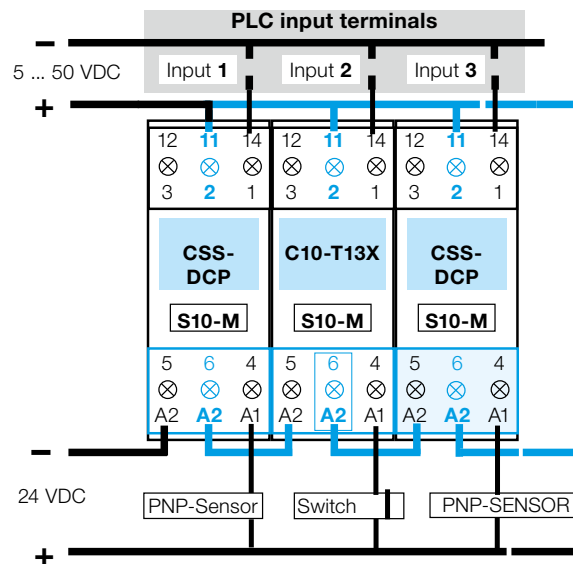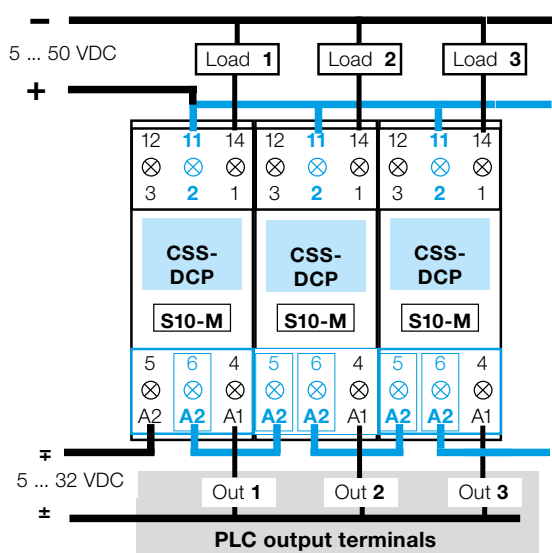
DC semiconductor switches

There are two versions with identical performance data.
The CSS-DCN version has the common negative terminal 2, and the load is connected to terminal 1. The CSS-DCP has the common positive terminal at terminal 2. The load is connected to terminal 1. This corresponds to an NPN or PNP switch.
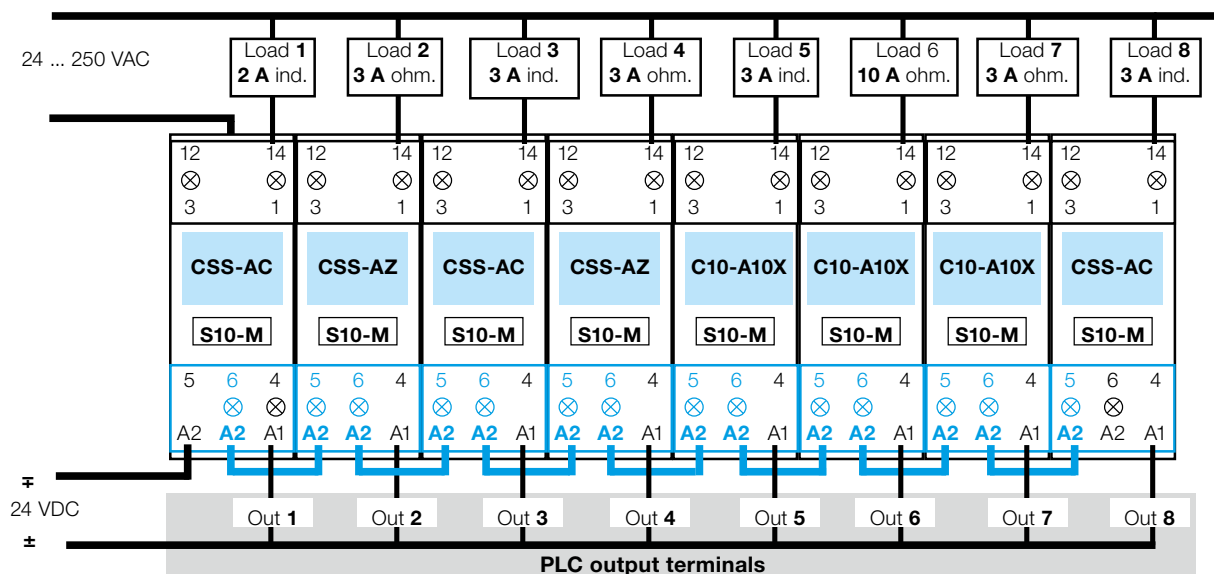
AC switches

The CSS-AZ version switches synchronously, i.e. it switches during the passage through zero. The CSS-AC version switches asynchronously, i.e. the semiconductor switch switches through, independently of the phase, at the moment of detected triggering.

DC applications with mixed components

DC applications with mixed components

AC applications with mixed components

This issue replaces all previous issues. Availability, errors and specifications subject to change without notice.

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Notes