



SIGMA® Terminal components

Interface relays

Optocouplers

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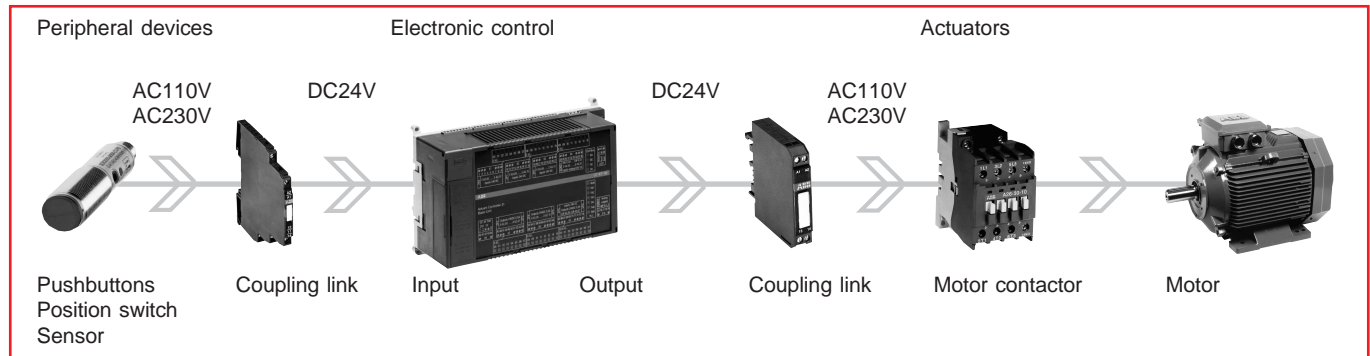
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Description

Coupling relays are electro-mechanical and electronic input and output components for the electrical isolation, level adjustment, interference rejection or signal amplification between the control and process units.



Series R 1000

- Casing width: 6.2 mm
- electromechanical: 1 n/o, 1 c/o
- electronic: R1084 Transistor, 100 mA
R1062 TRIAC, 0.5 A
R1064 Transistor, 1 A
R1048 MOS-FET, 2 A,
R1050 MOS-FET, 5 A
short-circuit-proof

Series R 2000

- Enclosure width: 12.5 mm
- Manual/automatic switch
- Base load for great cable lengths
- Connection in series w/ series R1000
- R2041-AM manual/auto
- R2050 MOS-FET, 10 A

Series R1500/R1600

- Enclosure width: 11.25 mm
- Electromechanical:
1 n/o, 1 n/c, 2 n/o, 2 n/c, 1 c/o, 2 c/o
- Electronic: R1584/R1585
Transistor, 100 mA
R1552, R1662 TRIAC
R1664 Transistor, 3 A
R1647/R1648 MOS-FET
short-circuit-proof

Series RT, PT, MT

- Plug-in
- Plug-in modules for LED, freewheel, varistor
- Electromechanical: 1,2,3,4 c/o
RT: Width 15.5 mm
PT: Width 27.0 mm
MT: Width 38.0 mm

Certifications and approvals

Conformity mark	Approvals								Quality Mark	Naval Classification Associations					
Acronym	SEV Switzerl.	DEMKO Denm.	NEMKO Norw.	SEMKO Sweden	Inspect Finland	CSA Canada	UL USA	ÖVE Austria	BV France	GL Germany	LRS GB	DNV Norw.	PRS Poland	RINa Italy	Reg. USSR
Validity		●	●	●	●	■	■		□	□	□	□	□	□	□

Legend

- No general requirement for approval save for special cases.
- Standard type authorized. The nameplates bear the conformity mark if the obligation to mark subsists.
- Requested

Remark: 1 c/o = SPDT; 2 c/o = DPDT

Interface relays

SIGMA® Terminal components

Series R 1000, width 6.2 mm, R 2000, width 12.5 mm, compact

Ordering details

Series R 1000, narrow design

- Overall width only: 6.2 mm
- Same required space as a standard terminal block
- Electrical insulation via relay or optocoupler
- Streamlined wiring by means of potential bridges
- LED status display
- State-of-the-art production engineering, modern design

Series R10xx; narrow enclosure, 6.2 mm in width

Type	Contact Type	Control voltage	On-load voltage	Load curr. max.	Order code	Price 1 piece
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Relay

R 1041	1c/o	24V AC/DC	230V AC/DC	6A	1SAR 212 100 R0251	
R 1041	1c/o	60V AC/DC	230V AC/DC	6A	1SAR 212 100 R0311	
R 1041	1c/o	115V AC/DC	230V AC/DC	6A	1SAR 212 100 R0411	
R 1041	1c/o	230V AC/DC	230V AC/DC	6A	1SAR 212 100 R0511	

Relay with hard gold-plated contacts for the connection of small voltages and currents, e.g. analog signals

R 1041-G	1c/o htv	24V AC/DC	230V AC/DC	6A	1SAR 212 200 R0211	
R 1041-G	1c/o htv	60V AC/DC	230V AC/DC	6A	1SAR 212 200 R0311	
R 1041-G	1c/o htv	115V AC/DC	230V AC/DC	6A	1SAR 212 200 R0411	
R 1041-G	1c/o htv	230V AC/DC	230V AC/DC	6A	1SAR 212 200 R0511	

Optocoupler with solid-state outputs

R 1062	TRIAC	24V DC	24-250V AC	10mA-0.5A	1SAR 271 300 R0111	
R 1048	MOS-FET ¹⁾	24V DC	≤ 40V DC	3A	1SAR 261 300 R0111	
R 1084	TRANSISTOR	24V DC	2-30V DC	0.1A	1SAR 251 300 R0111	
R 1085	TRANSISTOR	115-230V AC/DC	2-30V DC	0.1A	1SAR 251 300 R0611	
R 1050	MOS-FET ¹⁾	24V DC	10-30V DC	5A	1SAR 281 300 R0111	

Series R 20xx, compact design

- Overall width 12.5 mm
- Electrical isolation via relay or optocoupler
- LED status display

Series R20xx; compact enclosure, 12.5 mm width

Type	Contact Type	Control voltage	On-load voltage	Load curr. max.	Order code	Price 1 Piece
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Relay with manual/automatic switch

R 2041-AM	1c/o manual/auto	24V AC/DC	230V AC/DC	6A	1SAR 222 100 R0231	
R 1041-AMG	1c/o man./auto htv	24V AC/DC	230V AC/DC	6A	1SAR 222 200 R0231	

Relay with base load to compensate great connection lengths

R 2041-L	1c/o + base load	230V AC/DC	230V AC/DC	6A	1SAR 242 100 R0531	
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Relay

R 2042	2c/o	24V AC/DC	230V AC/DC	6A	1SAR 213 100 R0231	
R 2042	2c/o	230V AC/DC	230V AC/DC	6A	1SAR 213 100 R0531	

Optocoupler with solid-state output

R 2050	MOS-FET ¹⁾	24V AC/DC	5-60V DC	10A	1SAR 281 300 R0131	
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¹⁾ Short-circuit proof

Remark: 1 c/o = SPDT; 2 c/o = DPDT



R 10xx

1SAR 212 100 R0211



R 2041-AM/AMG

1SAR 222 100 R0231



R 20xx

1SAR 213 100 R0231

SIGMA® Terminal Components Series R 1500/R 1600, Standard 11.5 mm

Ordering details



R 15xx

1SAR 211 100 R0351



R 16xx

1SAR 261 300 R0151

Series R 15xx/16xx, standard design

- Overall width only: 11.5 mm
- Electrical isolation via relay or optocoupler
- LED status display

Type	Contact Type	Control voltage	On-load voltage	Load curr. max.	Order code	Price 1 piece
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Relay

R 1561	1n/o	24VAC/DC	230VAC/DC	6A	1SAR 211 100 R0251	
R 1561	1n/o	60VAC/DC	230VAC/DC	6A	1SAR 211 100 R0351	
R 1561	1n/o	115VAC/DC	230VAC/DC	6A	1SAR 211 100 R0451	
R 1561	1n/o	230VAC/DC	230VAC/DC	6A	1SAR 211 100 R0551	
R 1541	1c/o	24VAC/DC	230VAC/DC	6A	1SAR 212 100 R0251	
R 1541	1c/o	230VAC/DC	230VAC/DC	6A	1SAR 212 100 R0551	
R 1542	2c/o	24VAC/DC	230VAC/DC	6A	1SAR 213 100 R0251	
R 1542	2c/o	230VAC/DC	230VAC/DC	6A	1SAR 213 100 R0551	

Relay with RC circuit via make/break contact, e.g. for contactor coil control

R 1561	1n/o+RC	24VAC/DC	230VAC/DC	6A	1SAR 231 100 R0251	
R 1561	1n/c+RC	24VAC/DC	230VAC/DC	6A	1SAR 234 100 R0251	

Relay with solid state output

R 1648	MOS-FET ¹⁾	24VDC	≤ 40VDC	5A	1SAR 261 300 R0151	
R 1552	TRIAC	230VAC/DC	250VAC	1A	1SAR 271 300 R0551	
R 1662	TRIAC	24VDC	250VAC	2A	1SAR 271 300 R0151	
R 1584	TRANSISTOR	24VDC	2-60VDC	1.5A	1SAR 251 300 R0151	
R 1585	TRANSISTOR	230VAC/DC	2-60VDC	1A	1SAR 251 300 R0551	

¹⁾ Short-circuit proof

Accessories for SIGMA® coupling relays and optocouplers

Type	Description	Order code	Price 1 piece
P- 1024	Potential jumper bars for narrow design casing, s. R10xx	1SAR 200 024 R0003	
AK-1024	Wire chain for the connection of different series	1SAR 200 024 R0004	
EH-1000	End clamp, terminating element on top-hat rail	1SAR 200 000 R0005	

Remark: 1 c/o = SPDT; 2 c/o = DPDT

Overvoltage limitation

Electronic coupling w/o the use of mechanical relays or contacts greatly increases the service life of the coupling circuit.

P-1024



1SAR 200 024 R0003

AK-1024



1SAR 200 024 R0004

EH-1000

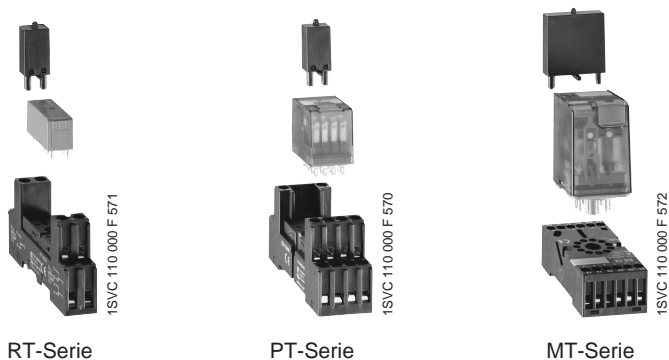


1SAR 200 000 R0005

* When switching lamp loads with electromechanical coupling relays the contact life time can be substantially reduced if the permissible make currents are exceeded.

Pluggable industrial relays Series RT, PT, MT

Ordering details



RT-Serie

PT-Serie

MT-Serie

Mini industrial relays, PT series, pluggable

2 changeover contacts

Type	Power supply voltage	Order code	Pack. unit piece	Price 1 pc.
PT L70 524	24VAC	E2 405 611 00	10	
PT L70 024	24VDC	E2 405 611 10	10	
PT L70 615	115VAC	E2 405 611 20	10	
PT L70 730	230VAC	E2 405 611 30	10	

3 changeover contacts

PT K70 524	24VAC	E2 405 612 00	10	
PT K70 024	24VDC	E2 405 612 10	10	
PT K70 615	115VAC	E2 405 612 20	10	
PT K70 730	230VAC	E2 405 612 30	10	

4 changeover contacts

PT D70 524	24VAC	E2 405 613 00	10	
PT D70 024	24VDC	E2 405 613 10	10	
PT D70 615	115VAC	E2 405 613 20	10	
PT D70 730	230VAC	E2 405 613 30	10	

accessories

Type	Socket	Order code	Pack. Unit piece	Price 1 pc.
ES 15/4N	for relay 2 c/o and 4 c/o	E2 405 651 30	10	
ES 15/3N	for relay 3 c/o	E2 405 651 20	10	
ES 15/2N	for relay 2 c/o	E2 405 651 10	10	
TR 1	marker	E4 405 658 10	10	
MS 35	retaining clip	E4 405 659 10	10	

Remark: 1 c/o = SPDT; 2 c/o = DPDT

Accessories, plug-in modules for RT, PT and MT relays sockets

Plug-in modules adaptable to sockets for plug-in PCB relays (RT series) and mini-relays (PT series)

Type	Order code	Pack. unit piece	Price 1 piece
22	Free-wheeling diode 1N4007, 6...230 V DC, A 1+, A2-	E2 405 651 00	20
42	Module with diode and red LED, 6...24 V DC, A1+, A2-	E2 405 652 00	20
42 V	Module with diode and green LED, 6...24 V DC, A1+, A2-	E2 405 652 10	20
52 B	RC element 6...24 V AC	E2 405 653 00	20
52 C	RC element 110...240 V AC	E2 405 653 10	20
62	Module with red LED, 6...24 V AC/DC, no reverse polarity protection	E2 405 654 00	20
62 V	Module with green LED, 6...24 V AC/DC, no reverse polarity protection	E2 405 654 10	20
92	Module with red LED, 110...230 V AC/DC, no reverse polarity protection	E2 405 654 01	20
92 V	Module with green LED, 110...230 V AC/DC, no reverse polarity protection	E2 405 654 11	20
62 C	Module with varistor and red LED, 6...24 V AC/DC, no reverse polarity protection	E2 405 655 00	20
62 CV	Module with varistor and green LED, 6...24 V AC/DC, no reverse polarity protection	E2 405 655 10	20
92 C	Module with varistor and red LED, 110...230 V AC/DC, no reverse polarity protection	E2 405 655 01	20
92 CV	Module with varistor and green LED, 110...230 V AC/DC, no reverse polarity protection	E2 405 655 11	20
72	Varistor module without LED, 24 V AC	E2 405 656 00	20
72 A	Varistor module without LED, 115 V AC	E2 405 656 10	20
82	Varistor module without LED, 230 V AC	E2 405 656 20	20

Plug-in modules adaptable to sockets for plug-in universal industrial relays (MT series)

Type	Order code	Pack. unit piece	Price 1 piece
11	Free-wheeling diode 1N4007, 6...230 V DC, A 1+, A2-	E2 405 661 00	20
41	Module with diode and red LED, 6...24 V DC, A1+, A2-	E2 405 662 00	20
41 V	Module with diode and green LED, 6...24 V DC, A1+, A2-	E2 405 662 10	20
51 B	RC element 6...24 V AC	E2 405 663 00	20
51 C	RC element 110...240 V AC	E2 405 663 10	20
61	Module with red LED, 6...24 V AC/DC, no reverse polarity protection	E2 405 664 00	20
61 V	Module with green LED, 6...24 V AC/DC, no reverse polarity protection	E2 405 664 10	20
91	Module with red LED, 110...230 V AC/DC, no reverse polarity protection	E2 405 664 01	20
91 V	Module with green LED, 110...230 V AC/DC, no reverse polarity protection	E2 405 664 11	20
61 C	Module with varistor and red LED, 6...24 V AC/DC, no reverse polarity protection	E2 405 665 00	20
61 CV	Module with varistor and green LED, 6...24 V AC/DC, no reverse polarity protection	E2 405 665 10	20
91 C	Module with varistor and red LED, 110...230 V AC/DC, no reverse polarity protection	E2 405 665 01	20
91 CV	Module with varistor and green LED, 110...230 V AC/DC, no reverse polarity protection	E2 405 665 11	20
71	Varistor module without LED, 24 V AC	E2 405 666 00	20
71 A	Varistor module without LED, 115 V AC	E2 405 666 10	20
81	Varistor module without LED, 230 V AC	E2 405 666 20	20

Industrial relays, RT series, pluggable

1 changeover contact accessories

Type	Power supply voltage	Order code	Pack. unit piece	Price 1 pc.
RT 314 524	24VAC	E2 405 600 00	20	
RT 314 024	24VDC	E2 405 600 10	20	
RT 314 615	115VAC	E2 405 600 20	20	
RT 314 730	230VAC	E2 405 600 30	20	

2 changeover contacts accessories

RT 424 524	24VAC	E2 405 601 00	20	
RT 424 024	24VDC	E2 405 601 10	20	
RT 424 615	115VAC	E2 405 601 20	20	
RT 424 730	230VAC	E2 405 601 30	20	

accessories

Type	power supply voltage	Order code	Pack. unit piece	Price 1 pc.
ES 50/3	log. version	E2 405 650 00	10	
ES 50	stand. Version	E2 405 650 10	10	
MS 16	retaining clip	E4 405 659 00	10	
TR	marker	E4 405 658 00	10	

Universal industrial relays, MT Series, pluggable

3 changeover contacts accessories

Type	Power supply voltage	Order code	Pack. unit piece	Price 1 pc.
MT K26 024	24VAC	E2 405 622 00	10	
MT K21 024	24VDC	E2 405 622 10	10	
MT K26 115	115VAC	E2 405 622 20	10	
MT K26 230	230VAC	E2 405 622 30	10	

accessories

ES 9	8-pin socket	E2 405 670 00	10	
ES 12	11-pin socket	E2 405 660 00	10	
MH 1	metal retain. clip	E2 405 669 00	10	

2 changeover contacts accessories

MT J26 024	24VAC	E2 405 621 00	10	
MT J21 024	24VDC	E2 405 621 10	10	
MT J26 115	115VAC	E2 405 621 20	10	
MT J26 230	230VAC	E2 405 621 30	10	

Type R 1041/R 1041-G

Technical data

Ord. code: 1SAR 212	100 R 0211	100 R 0311	100 R 0411	100 R 0511	200 R 211	200 R 311	200 R 0411	200 R 0511
Output	1c/o	1c/o	1c/o	1c/o	1c/o htv	1c/o htv	1c/o htv	1c/o htv

Control side

Rated control voltage V_N	24VAC/DC	60 V AC/DC	115VAC/DC	230VAC/DC	24VAC/DC	60VAC/DC	115VAC/DC	230VAC/DC
Rated voltage range V_s	16.8-30V AC/DC	42-75V AC/DC	80-140V AC/DC	184-250V AC/DC	16.8-30V AC/DC	42-75V AC/DC	80-140V AC/DC	184-250V AC/DC
Rated current (at V_N)	22mA	8mA	3.5mA	3.5mA	22mA	8mA	3.5mA	3.5mA
Make voltage	> 16.8V	> 42V	> 80V	> 184V	> 16.8V	> 42V	> 80V	> 184V
Break voltage	< 2.4V	< 6V	< 11V	< 23V	< 2.4V	< 6V	< 11V	< 23V
Status display	yellow LED				yellow LED			
Protective circuitry	Reverse polarity protection / bridge rectifier				polarity protection / bridge rectifier			
Rated insulation voltage (EN50178)	50V	80V	160V	250V	50V	80V	160V	250V
	Pollution degree 2 Overvoltage category I				Pollution degree 2 Overvoltage category I			

Load side

Switching voltage	min. 15V AC/DC max. 250V AC/DC				min. 1V AC/DC max. 250V AC/DC																											
Switching current I _L	min. 50mA AC/DC max. 6A AC/DC, see Derating				min. 1mA AC/DC max. 6A AC/DC, see Derating																											
Performance limit hard gold plating	-				24V/10mA																											
AC/DC switching capacity	max. 1500VA / see load capacity curve				max. 1500 VA / see load capacity curve																											
Making peak current < 4ms	16A				16A																											
Protective circuitry	none				none																											
Switching frequency at 50% ED	> 360/h				> 360/h																											
Switching capacity as per EN 60947-5-1	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>AC-15</th> <th>DC-13</th> </tr> </thead> <tbody> <tr> <td>24 V</td> <td>2 A</td> <td>1 A</td> </tr> <tr> <td>115 V</td> <td>2 A</td> <td>0.2 A</td> </tr> <tr> <td>230 V</td> <td>2 A</td> <td>0.1 A</td> </tr> </tbody> </table>					AC-15	DC-13	24 V	2 A	1 A	115 V	2 A	0.2 A	230 V	2 A	0.1 A	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>AC-15</th> <th>DC-13</th> </tr> </thead> <tbody> <tr> <td>24 V</td> <td>2 A</td> <td>1 A</td> </tr> <tr> <td>115 V</td> <td>2 A</td> <td>0.2 A</td> </tr> <tr> <td>230 V</td> <td>2 A</td> <td>0.1 A</td> </tr> </tbody> </table>					AC-15	DC-13	24 V	2 A	1 A	115 V	2 A	0.2 A	230 V	2 A	0.1 A
	AC-15	DC-13																														
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	AC-15	DC-13																														
24 V	2 A	1 A																														
115 V	2 A	0.2 A																														
230 V	2 A	0.1 A																														
Mechanical time life	> 20 x 10 ⁶ switching operations				> 20 x 10 ⁶ switching operations																											
Make time	approx. 5ms	approx. 5ms	approx. 8ms	approx. 8ms	approx. 5ms	approx. 5ms	approx. 8ms	approx. 8ms																								
Break time	approx. 10ms	approx. 12ms	approx. 16ms	approx. 16ms	approx. 10ms	approx. 12ms	approx. 16ms	approx. 16ms																								
Buffer time	approx. 5ms	approx. 2ms	approx. 6ms	approx. 5ms	approx. 5ms	approx. 2ms	approx. 6ms	approx. 5ms																								
Contacts	Changeover contacts				Changeover contacts																											
Contact material	AgSnO ₂				AgSnO ₂ gold plated																											
Rated insulation voltage (EN50178)	250V Pollution degree 2 Overvoltage category I				250V Pollution degree 2 Overvoltage category I																											

Remark: 1 c/o = SPDT; 2 c/o = DPDT

General technical data, dimensional drawings, see page 160.
Diagram - position of the connection points, see page 161.
Load capacity curve/derating, see page 162.

Interface relays

Type R 10xx

Technical data

Order code:	1SAR 251 300 R 0111	1SAR 251 300 R 0611	1SAR 271 300 R 0111	1SAR 261 300 R 0111	1SAR 281 300 R 0111
Output	TRANSISTOR	TRANSISTOR	TRIACMOS-FET ¹⁾	MOS-FET ¹⁾	MOS-FET ¹⁾

Control side

Rated control voltage V_N	24VDC	230VAC/DC	24VDC	24VDC	24VDC
Rated voltage range V_s	10-30VDC	110-230VAC/DC	16.8-30VDC	16.8-30 V DC	16.8-30VDC
Rated current (at V_N)	7mA	3-6mA	9mA	mA	7mA
Rated power	-	max. 1.4W	-	-	-
Make voltage	> 10V	> 80V	> 16,8V	> 16,8V	> 12V
Break voltage	< 6V	< 20V	< 10V	< V	< 9V
Permissible residual current	-	-	-	-	1.5mA
Status display	yellow LED				
Shoer-circuit, overtemp., OPEN LOAD error display	-	-	-	-	Red LED
Protective circuitry	Rev. pol. protection	none	Rev. pol. protection/ Suppressor diode	Rev. pol. protection	Rev. pol. protection/ Suppressor diode
Rated insulation voltage (prEN50178)	50V	250V	50V Pollution degree 2 Overvoltage category I	50V	50V
Max. connecting lead length at 230 V AC	-	25 m	-	-	-

Load side

Output	Make contact (solid-state)				
Switching volt., min./max.	< 30VDC (2-30VDC)	< 30VDC (2-30VDC)	24 bis 250VAC	≤ 40VDC	< 30VDC (10-30VDC)
Switching curr., min./max.	max. 0.1A	max. 0.1A	10-500 mA	max. 3A	min. 0.5A max. 5A (see Derating)
Make current or short term capacity	0.2 A/3s	0.2 A/3s	0.8 A/3sA/3s	-	-
Switching capacity	max. 3W	max. 3W	max. 100W	max. 120W	max. 150W
Protective circuitry	Suppressor diode	Suppressor diode	-	Suppressor diode	Suppressor diode
Overload protection	-	-	-	-	thermal
Short-circuit-proof	-	-	-	-	yes
Leakage current	-	-	-	µA	with blocked output <100 µA
Voltage drop with output switched on	-	-	-	< v	<0.5V
Switching frequency at 50% ED	200 Hz (Resistive load)	25 Hz (Resistive load)	20 Hz (Resistive load)	Hz (Resistive load)	200 Hz (Resistive load)
Make time	4ms	-	120 µs	ms	220 µs
Break time	0.6ms	-	max. 10ms at 50 Hz	ms	200 µs
Make delay	-	10-6ms	-	-	-
Break delay	-	8-12ms	-	-	-
Rated insulation voltage (prEN50178)	50V	50V	250V Pollution degree 2 Overvoltage category I	-	80V 50V

Interface relays

1) Short-circuit proof
 General technical data, dimensional drawings, see page 160.
 Diagram - position of the connection points, see page 161.
 Load capacity curve/derating, see page 162.

Type R 20xx

Technical data

	R 2041-AM	R 2041-AMG	R 2041-L	R 2042	R 2050
Order code:	1SAR 222 100 R 0231	1SAR 222 200 R 0231	1SAR 242 100 R 0531	1SAR 213 100 R 0231 R0531	1SAR 281 300 R 0131
Output	1c/o Manual/Auto	1c/o Manual/Auto hv	1c/o + base load	2c/o	MOS-FET ¹⁾

Control side

Rated control voltage V_N	24VAC/DC	24VAC/DC	230VAC/DC	24V 230V AC/DC	24V DC
Rated voltage range V_s	16.8-30VAC/DC	16.8-30VAC/DC	184-250VAC/DC	16,8-30V 184-250V AC/DC	10-30VDC
Rated current (at V_N)	12mA	12mA	18mA	22mA 5mA	22mA
Make voltage	> 16.8V	> 16.8V	> 184V	> 16,8V > 184V	> 16V
Break voltage	< 2.4V	< 2.4V	< 23V	< 2.4V < 23V	< 7V
Max. permissible connection length at 0.75 mm ²	-	-	350 m	-	-
Permissible residual current	-	-	-	-	7mA
Status display	yellow LED				Yellow LED Green LED load current > 3A
Protective circuitry	Reverse polarity protection/bridge rectifier				Rev. pol. protection/ suppressor diode
Rated insulation voltage (prEN50178)	50V	50V	250V Pollution degree 2 Overvoltage category I	50V 250V	50V

Load-side

Switching voltage	min. 15VAC/DC max. 250VAC/DC	min. 1VAC/DC max. 250VAC/DC	min. 15VAC/DC max. 250VAC/DC	min. 15VAC/DC max. 250VAC/DC	min./max. 10-30VDC																
Switching current I_L	min. 50AAC/DC max. 6AAC/DC see Derating	min. 1mAAC/DC max. 6AAC/DC see Derating	min. 50mA AC/AC max. 6AAC/DC see Derating	min. 50mAAC/DC max. 6AAC/DC see Derating	min. 0,5A max. 10A see Derating																
AC/DC switching capacity	max. 2000VA	max. 2000 VA see load capacity curve	max. 2000 VA see load capacity curve	max. 2000VA	max. 300W																
Leakage current at blocked output	-	-	-	-	< 20 μ A																
Voltage drop with output switched on	-	-	-	-	< 90mV																
Performance limit hard gold-plating	-	24 V/10mA	-	-	-																
Make peak current <4ms	30A	30A	30A	30A	-																
Protective circuitry	none	none	none	none	Suppressor diode																
Overload protection	-	-	-	-	thermal																
Short-circuit-proof	-	-	-	-	yes																
Switching freq. at 50% ED	< 360/h	< 360/h	< 360/h	< 360/h	50 Hz (Resistive load)																
Switching capacity as per EN 60947-5-1	<table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th colspan="2"></th> <th>AC-15</th> <th>DC-13</th> </tr> </thead> <tbody> <tr> <td style="padding-right: 5px;">24 V</td> <td style="border-left: 1px solid black; padding-left: 5px;">3 A</td> <td style="border-left: 1px solid black; padding-left: 5px;">1 A</td> <td></td> </tr> <tr> <td style="padding-right: 5px;">115 V</td> <td style="border-left: 1px solid black; padding-left: 5px;">3 A</td> <td style="border-left: 1px solid black; padding-left: 5px;">0,2 A</td> <td></td> </tr> <tr> <td style="padding-right: 5px;">230 V</td> <td style="border-left: 1px solid black; padding-left: 5px;">3 A</td> <td style="border-left: 1px solid black; padding-left: 5px;">0,1 A</td> <td></td> </tr> </tbody> </table>						AC-15	DC-13	24 V	3 A	1 A		115 V	3 A	0,2 A		230 V	3 A	0,1 A		-
		AC-15	DC-13																		
24 V	3 A	1 A																			
115 V	3 A	0,2 A																			
230 V	3 A	0,1 A																			
Mechanical life time	> 20x10 ⁶ switching operations				-																
Make time	approx. 8 ms	approx. 8ms	approx. 8 ms	approx. 6 ms	0,1ms																
Break time	approx. 12ms	approx. 12ms	approx. 10ms	approx.12 ms	7ms																
Bounce time	approx. 5 ms	approx. 5ms	approx. 5ms	approx. 2 ms	-																
Output	c/o contacts	c/o contacts	c/o contacts	c/o cont. 2 c/o cont.	n/o contact																
Contact material	AgSnO ₂	AgNi0, 15 hard gold-plated	AgSnO ₂	AgSnO ₂	-																
Rated insulation voltage (prEN50178)	250V	250V	250V Pollution degree 2 Overvoltage category I	250V	50V																

Remark: 1 c/o = SPDT; 2 c/o = DPDT

1) Short-circuit proof

General technical data, dimensional drawings, see page 160.

Diagram - position of the connection points, see page 161.

Load capacity curve/derating, see page 162.

Type R 15xx

Technical data

	R 1561			R 1561	R 1 561	R 1541		R 1542	
Order code	R 0251	1SAR 211 100 R 0451 R 0551		1SAR 231 100 R 0251	1SAR 234 100 R 0251	1SAR 212 100 R 0251	1SAR 212 100 R 0551	1SAR 213 100 R 0251	1SAR 213 100 R 0551
Output	1 n/o	1 n/o	1 n/o	1 n/o + RC	1 n/c+RC	1 c/o	1 c/o	2 c/o	2 c/o

Control side

Rated control voltage V_N	24V AC/DC	115V AC/DC	230V AC/DC	24V AC/DC	24V AC/DC	24V AC/DC	230V AC/DC	24V AC/DC	230V AC/DC
Rated voltage range V_s	16.8-30V AC/DC	80-140V AC/DC	184-250V AC/DC	16.8-30V AC/DC	16.8-30V AC/DC	16.8-30V AC/DC	184-250V AC/DC	16.8-30V AC/DC	184-250V AC/DC
Rated curr. (at V_N)	34mA	5mA	5mA	34mA	30mA	30mA	5mA	23mA	5mA
Make voltage	> 16.8V	> 80V	> 184V	> 16.8V	> 16.8V	> 16.8V	> 184V	> 16,8V	> 184V
Break voltage	< 2.4V	< 11V	< 23V	< 2.4V	< 2.4V	< 2.4V	< 23V	< 2.4V	< 23V
Status display	yellow LED								
Protect. circuitry	Reverse polarity protection / breidge rectifier								
Rated insulation voltage (EN50178)	50V	160V	250V	50V	50V	50V	250V	50V	250V
	Pollution degree 2 / Overvoltage category I								

Load side

Switching voltage	min. 15V AC/DC max. 250V AC/DC																				
Switch. current I_L	min. 50mA AC/DC max. 6A AC/DC, see Derating																				
AC/DC Switch. Capacity	max. 2000 VA / see load capacity curve																				
Make time	ap. 4ms	ap. 10ms	ap. 12ms	ap. 4ms	ap. 4ms	ap. 5ms	ap. 8ms	ap. 5ms	ap. 8ms												
Break time	ap. 5ms	ap. 10ms	ap. 14ms	ap. 5ms	ap. 10ms	ap. 10ms	ap. 10ms	ap. 15ms	ap. 10ms												
Bounce time	ap. 2ms	ap. 2ms	ap. 2ms	ap. 2ms	ap. 2ms	ap. 2ms	ap. 2ms	ap. 2ms	ap. 2ms												
Switch type	Make cont. n/o	Make cont. n/o	Make cont. n/o	Make cont. n/o	Break cont. m/c	Chang. cont. c/o	Chang. cont. c/o	2 Chang. cont. c/o	2 Chang. cont. c/o												
Contact material	AgSnO ₂																				
Make peak current < 4ms	30 A																				
Protective circuit.	none	none	none	RC comp. 0.047μF/100Ω	RC comp. 0.047μF/100Ω	none	none	none	none												
Switching freq. at 50% ED	> 360/h																				
Switching capacity as per EN 60947-5-1	<table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>AC-15</th> <th>DC-13</th> </tr> </thead> <tbody> <tr> <td>24 V</td> <td>3 A</td> <td>1 A</td> </tr> <tr> <td>115 V</td> <td>3 A</td> <td>0.2 A</td> </tr> <tr> <td>230 V</td> <td>3 A</td> <td>0.1 A</td> </tr> </tbody> </table>										AC-15	DC-13	24 V	3 A	1 A	115 V	3 A	0.2 A	230 V	3 A	0.1 A
	AC-15	DC-13																			
24 V	3 A	1 A																			
115 V	3 A	0.2 A																			
230 V	3 A	0.1 A																			
Mechanical time life	> 20 x 10 ⁶ switching operations																				
Rated insulation voltage (EN50178)	50V	160V	250V	50V	50V	50V	250V	50V	250V												
	Pollution degree 2																				

Remark: 1 c/o = SPDT; 2 c/o = DPDT

General technical data, dimensional drawings, see page 160.

Diagram - position of the connection points, see page 161.

Load capacity curve/derating, see page 162.

Type R 15xx / 16xx

Technical data

	R 1584	R 1585	R 1552	R 1662	R 1648
Order code:	1SAR 251300 R 0151	1SAR 251300 R 0551	1SAR 271300 R 0551	1SAR 271300 R 151	1SAR 261300 R 151
Schaltelement	TRANSISTOR	TRANSISTOR	TRIAC	TRIAC	MOS-FET ¹⁾

Control side

Rated control voltage U_N	24VDC	230VAC/DC	230VAC/DC	24VDC	24VDC
Rated voltage range U_s	16.8-30VDC	184-250VAC/DC	184-250VAC/DC	16.8-30VDC	16.8-30VDC
Rated current (at U_N)	13mA	6mA	3mA	10mA	14mA
Make voltage	>16.8V	>184V	>184V	>16.8V	>16V
Break voltage	< 5V	< 23V	< 100V	< 8V	< 10V
Status display	yellow LED				
Protective circuitry	Rev. pol. prot./ Suppressor diode	Rev. pol. prot./ Suppressor diode	Rev. pol. prot./ Suppressor diode	Rev. pol. prot./ Suppressor diode	Rev. pol. prot./ Suppressor diode
Rated insulation voltage (prEN50178)	50V	50V	250V Pollution degree 2 Overvoltage category I	50V	50V

Load side

Output	Make contact (solid-state)				
Switching voltage, min./max.	< 60VDC (2-60VDC)	< 60VDC (2-60VDC)	24 to 250VAC	24 to 250VAC	< 40VDC
Switching current min./max.	max. 1.5A	max. 1A	max. 1A	max. 2A	max. 5A
Make current or short-term capacity	5 A/1s	5 A/1s	6 A/3s	6A/3s	10 A/3s
Switching capacity	max. 60W	max. 60W	max. 250W	max. 500W	max. 200W
Protective circuitry	Suppressor diode	Suppressor diode	-	-	Varistor
Leak current	700 μ A	700 μ A	-	-	20 μ A
Voltage drop with output switched on	< 1.1V	< 1.1V	-	-	< 0.25V
Switching frequency at 50% ED	1 kHz (Resistive load)	40 Hz (Resistive load)	30 Hz (Resistive load)	1 kHz (Resistive load)	200 Hz (Resistive load)
Make time	100 μ s	14ms	max. 22ms	min. 2.5ms max. 12.5ms at 50Hz	700 μ s
Break time, AC/DC	300 μ s	6ms 50 Hz	max. 11ms at max. 13ms at 50Hz	min. 3ms	2.7ms
Rated insulation voltage (prEN50178)	80V	80V	250V Pollution degree 2 Overvoltage category I	250V	80V

Interface relays

General technical data, dimensional drawings, see page 160.
Diagram - position of the connection points, see page 161.
Load capacity curve/derating, see page 162.

Type R 15xx / 16xx

General data Dimensional drawings

General data

Wire size	Threaded terminals, single-wire, 4 mm ² (10 AWG) stranded 2.5 mm ² (14 AWG)
Clearance and creepage distances between control and load side	> 5.5 mm
Safe isolation between the control and load side	Yes does not apply for: R 1542, R 1648
Rated insulation voltage (EN50178)	320V Pollution degree 2 Overvoltage category III Impulse withstand voltage 6kV
Degree of protection	IP20
Enclosure material	Luranyl KR 2452-3
Ambient temperature	-25° C to +70° C (+85° C for 10 min, applies to: R 1041/ -G, R 1561, R 1541, R 1542)
Storage temperature	-25° C to +80° C
Load capacity curve	For resistive loads (relay coupler), see page 162.

Relay interface

The relays of the SIGMA series are suitable to be used as the interface between a control and regulation unit (e.g. PLC) and the machine/system periphery. The SIGMA modules provide for the level and performance adjustment. The ABB relay program comprises components for the various voltage and performance levels.

Relay interface with manual/automatic switch

The R20xx compact design SIGMA relays are available also with manual/automatic changeover switch (M-A-O). With the aid of this device, installation is much easier and it provides for manual operating in the case of the failure of the automation device. To prevent the accidental activation of the switch, the standard slide switches can be operated only with a screwdriver. Two examples of application are provided below.

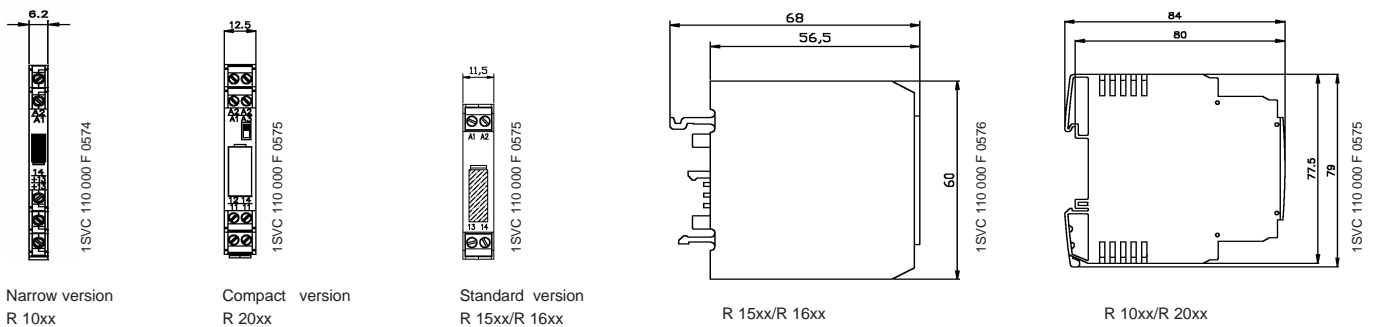
Optocoupler interface with solid-state output

ABB offers optocoupler modules for the most varied industrial applications. These devices used as interfacing components come in a wide range of voltage and performance classes. The optocoupler element always requires a stable DC voltage for safe triggering. This is assured by a rectifier with a downstream smoothing capacitor. The control DC voltage then switches the optocoupler in a safe and reliable way.

Dimensional drawings

Interface relays

Dimensions in mm



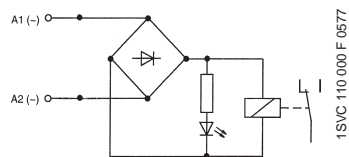
Narrow version
R 10xx

Compact version
R 20xx

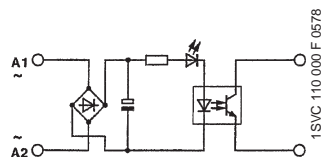
Standard version
R 15xx/R 16xx

R 15xx/R 16xx

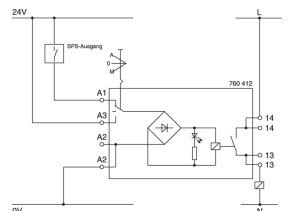
R 10xx/R 20xx



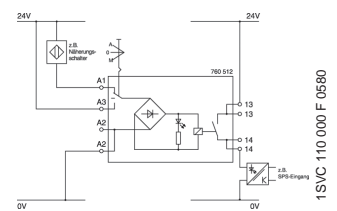
Relay interface
(typ. internal circuit diagram)



Optocoupler interface
(typ. internal circuit diagram)



Relay interface with manual/automatic switch as input relay
(process, here proximity switch -> PLC)



Relay interface with manual/automatic switch as output relay
(PLC -> process)

General information on interface relays

Engineering information

Load capacity curves / derating

General information on interface relays

Field of applications

AC and DC activation

DIN VDE 0110 part 1, DIN VDE 0435, DIN VDE 0660 and DIN EN 50 005

Each coupling component has a marker. According to the technical data of the electronic systems, the devices have a low power consumption.

Functions

Overvoltage limitation

The circuitry of the inductive loads provides a longer service life of the relay coupler thanks to an overvoltage protector. In the case of optocouplers the switching component is composed of a semiconductor. These are not subject to wearing. Welding is not possible.

Assembly

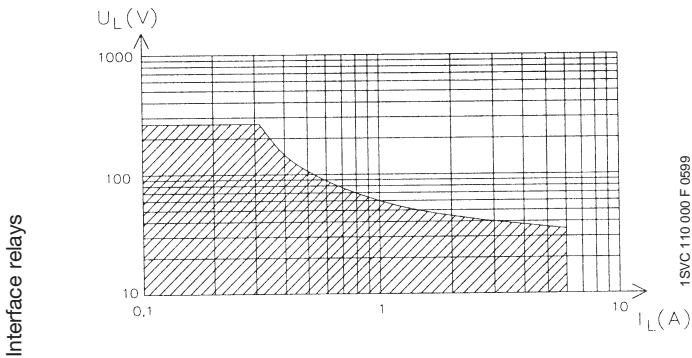
Installation

Snap-on fastening is possible on the horizontal and vertical DIN rail. For vertical DIN rail and close-packed installation, permissible ambient temperature of $T_u = 40^\circ\text{C}$. Usage position at choice.

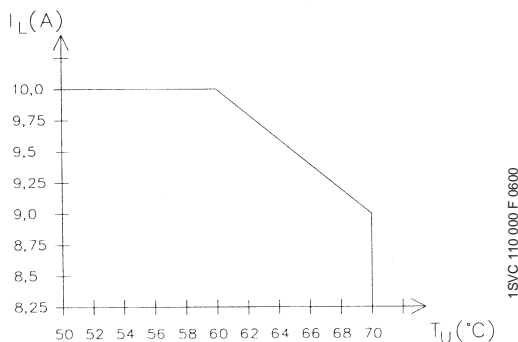
Engineering information

- The inductive loads must be provided with a suitable suppressor component.
- Relay couplers with hard gold-plated contacts: after the one-time use of the component above the performance limit of the hard gold-plating the component can no longer be used in the switching range below the performance limit.
- When switching lamp loads the contact service life can be substantially reduced if the permissible make currents are exceeded.

Load capacity curve for relay interfaces



Derating R 2050



Derating R 1050

