



Semiconductor contactors

R100.xx and R300.xx range

Solid-state relays

R111, R12x and R31x range

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Semiconductor contactors R100.xx and R300.xx

Solid-state relays R111, R12x and R31x

Benefits and advantages , Approvals and marks



2CDC 305 027 F0004



2CDC 305 028 F0004

Semiconductor contactors R100.xx and R300.xx range

- Compact design with integrated heat sink
- LED for status indication
- Protection against electric shock integrated
- Mounting on 35 mm DIN rail or screw mounting on plate
- Switching element: Thyristor
- Peak inverse voltage 1200 V_{pp}

R100.xx

- 1-pole
- Zero voltage or instantaneous switching
- Rated operational current I_g: 20 A, 30 A, 45 A

R300.xx

- 3-pole
- Zero voltage switching
- Rated operational current I_g: 20 A, 25 A
- With varistor circuit

Solid-state relays R111, R12x and R31x range

- Standard design, mounting on existing cooling surface possible, heat sink available as accessory
- Zero voltage switching, radio interference suppressed
- Screw mounting or mounting on DIN rail with a rapid-fastening plate (optional accessory)
- Peak inverse voltage 650 V_{pp}, 1200 V_{pp} or 1600 V_{pp}

R111

- 1-pole
- Rated operational current I_g: 25 A, 50 A, 90 A
- Protection against electric shock by an additional terminal cover (optional accessory)
- PCB mounting possible
- Switching element: Thyristor
- Cost-saving

R12x

- 1-pole
- Rated operational current I_g: 25 A, 50 A, 75 A, 100 A
- LED for status indication
- With varistor circuit
- Protection against electric shock integrated
- Switching element: Thyristor

R31x

- 3-pole
- Rated operational current I_g: 25 A, 55 A, 75 A
- LED for status indication
- With varistor circuit
- Protection against electric shock integrated
- Switching element: Thyristor or alternistor

- existing
- pending

Approvals

		R100.xx	R300.xx		R111	R12x	R31x
	UL 508	■	■		■	■	■
	UL 508, CAN/CSA C22.2 No.14	■	■		■	■	■
	CAN/CSA C22.2 No.14				■	■	■

Marks

	CE	■	■		■	■	■
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Semiconductor contactors R100.xx and R300.xx

Solid-state relays R111, R12x and R31x

Benefits and advantages

Advantages in comparison to electromechanic switching devices

With high switching frequencies, conventional electromechanic switching devices soon reach their lifetime limits. Either they fail due to mechanical wear or it's, due to their mechanical inertia, even impossible to use them with high switching frequencies. In order to avoid unintentional downtimes, it's necessary to keep short maintenance intervals and to exchange the electromechanic devices for reasons of precaution.

Solid-state relays and semiconductor contactors switch resistive and inductive loads electronically and thus contactless.

This results in many advantages:

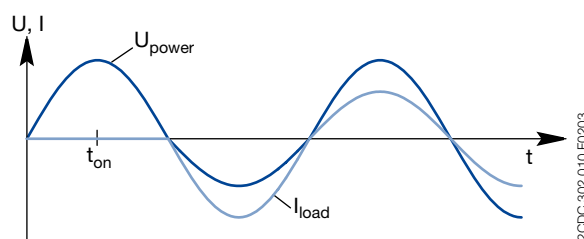
- wear-free switching even with high switching frequency
- long lifetime
- longer maintenance intervals are possible
- noiseless switching
- suited for high switching frequencies
- low degree of interference emission
- insensitivity towards environmental influences such as dust, aggressive gases or silicone
- compact design
 - space-saving installation inside the control panel

Switching functions

Zero voltage switching

When applying the control voltage, the power output (load circuit) of the solid-state relay is activated at the first zero crossing of the line voltage. The response time is less than half a periode, i.e. typically below 10 ms at 50 Hz.

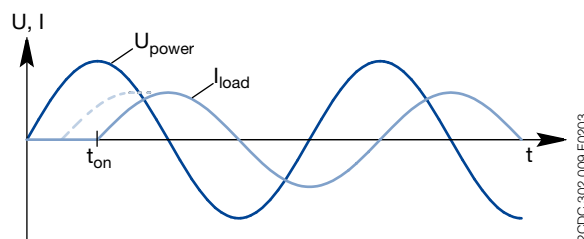
Due to high surge current- and blocking voltage capabilities, these solid-state relays are very well suited for applications with inductive and capacitive loads.



Instantaneous switching

The output (load circuit) of the solid-state relay is activated immediately after applying control voltage. Consequently the relay can switch anywhere along the sinusoidal AC voltage curve. The typical response time is less than 1 ms.

The instantaneously switching relay is particularly suitable in applications where a fast response time or phase-fired control is desired.



Fields of application

The solid-state relays and semiconductor contactors have no typical field of application. These devices are so versatile that they might be used almost universally. In the following a small selection of possible fields of application:

- Plastics industry
 - Switching of heating elements in
 - injection plastics molding machines
 - Extruder
 - Blow molding machines
 - ...
- Electronic industry
 - Soldering line
 - Drying stoves
 - Labor stoves
 - ...
- Food industry
 - Valves in filling facilities
 - Vending machines
 - ...
- Packaging industry
 - Conveying equipment
 - ...
- Building technology
 - Heating control systems
 - Light control
 - Fountain displays
 - ...

Semiconductor contactors

R100.xx and R300.xx range

Order data



2CDC 301 006 F0003

R100.20, R100.30



2CDC 301 008 F0003

R100.45



2CDC 301 005 F0004

R300.20



2CDC 301 005 F0005

R300.25

R100.xx range

Type	Rated control supply voltage U_s	Rated operational current I_e	Order code	Pack.-unit piece	Price 1 piece	Weight 1 piece kg / lb
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1-pole, zero voltage switching, operational voltage range: 42-660 V AC

R100.20	4-32 V DC	20 A	1SAR 111 020 R8607	1		0.25/0.55
R100.30-ZS		30 A	1SAR 111 030 R8607	1		0.25/0.55
R100.45		45 A	1SAR 111 045 R8607	1		0.36/0.79
R100.45-SG ¹⁾		45 A	1SAR 111 045 R9607	1		0.36/0.79

1-pole, instantaneous switching, operational voltage range: 42-660 V AC

R100.30-IO	4-32 V DC	30 A	1SAR 113 030 R8607	1		0.25/0.55
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R300.xx range

Type	Rated control supply voltage U_s	Rated operational current I_e	Order code	Pack.-unit piece	Price 1 piece	Weight 1 piece kg / lb
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3-pole, zero voltage switching, operational voltage range: 40-660 V AC

R300.20	5-32 V DC	20 A	1SAR 131 020 R8207	1		0.38/0.84
R300.25		25 A	1SAR 131 030 R8207	1		0.68/1.50

¹⁾ with integrated overtemperature protection with signalling output

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Solid-state relays
R111, R12x and R31x range
Order data



2CDC 301 002 F0003

R111



2CDC 301 004 F0003

R120, R121, R122, R126



2CDC 301 031 F0004

R311, R315

R111 range

Type	Rated control supply voltage U_s	Rated operational current I_e	Order code	Pack.-unit piece	Price 1 piece	Weight 1 piece kg / lb
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1-pole, zero voltage switching, operational voltage range: 24-280 V AC

R111/25	3-32 V DC	25 A	1SAR 111 025 R0102	1		0.11/0.24
R111/45		50 A	1SAR 111 050 R0102	1		0.11/0.24

1-pole, zero voltage switching, operational voltage range: 42-530 V AC

R111/20	3-32 V DC	25 A	1SAR 111 025 R0106	1		0.11/0.24
R111/40		50 A	1SAR 111 050 R0106	1		0.11/0.24
R111/90		90 A	1SAR 111 090 R0106	1		0.11/0.24

R12x range

Type	Rated control supply voltage U_s	Rated operational current I_e	Order code	Pack.-unit piece	Price 1 piece	Weight 1 piece kg / lb
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1-pole, zero voltage switching, operational voltage range: 24-265 V AC

R120/25	3-32 V DC	25 A	1SAR 111 025 R4609	1		0.06/0.13
R120/50		50 A	1SAR 111 050 R4609	1		0.06/0.13

1-pole, zero voltage switching, operational voltage range: 42-530 V AC

R121/25	4-32 V DC	25 A	1SAR 111 025 R4606	1		0.06/0.13
R121/50		50 A	1SAR 111 050 R4606	1		0.06/0.13
R121/75		75 A	1SAR 111 075 R4606	1		0.10/0.22
R121/100		100 A	1SAR 111 100 R4606	1		0.10/0.22

1-pole, zero voltage switching, operational voltage range: 42-660 V AC

R122/50	4-32 V DC	50 A	1SAR 111 050 R4607	1		0.06/0.13
R122/75		75 A	1SAR 111 075 R4607	1		0.10/0.22
R122/100		100 A	1SAR 111 100 R4607	1		0.10/0.22

1-pole, zero voltage switching, operational voltage range: 42-530 V AC

R126/25	20-280 V AC / 24-48 V DC	25 A	1SAR 111 025 R4707	1		0.06/0.13
R126/50		50 A	1SAR 111 050 R4707	1		0.06/0.13
R126/75		75 A	1SAR 111 075 R4707	1		0.10/0.22
R126/100		100 A	1SAR 111 100 R4707	1		0.10/0.22

R31x range

Type	Rated control supply voltage U_s	Rated operational current I_e	Order code	Pack.-unit piece	Price 1 piece	Weight 1 piece kg / lb
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3-pole, zero voltage switching, operational voltage range: 42-660 V AC

R311/25	4-32 V DC	25 A	1SAR 131 025 R4814	1		0.38/0.84
R311/55		55 A	1SAR 131 055 R4814	1		0.38/0.84
R311/75		75 A	1SAR 131 075 R4814	1		0.38/0.84
R315/25	24-275 V AC / 24-50 V DC	25 A	1SAR 131 025 R4914	1		0.38/0.84
R315/55		55 A	1SAR 131 055 R4914	1		0.38/0.84
R315/75		75 A	1SAR 131 075 R4914	1		0.38/0.84

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Solid-state relays

R111, R12x and R31x range

Order data

2CDC 301 011 F0003



KK-2,6

2CDC 301 013 F0003



KK-R111-1,5

2CDC 301 014 F0003



KK-R111-0,7

Accessories for 1- and 3-pole solid-state relays

Type	Description		Order code	Pack.- unit piece	Price 1 piece	Weight 1 piece kg / lb
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Heat sinks

KK-2,6	for R1xx:	2.6 K/W ¹⁾	GHR1 109 401 P0001	1		0.12/0.26
KK-1,8	screw mounting on	1.8 K/W ¹⁾	GHR1 109 401 P0002	1		0.20/0.44
KK-0,7	mounting plate	0.7 K/W ¹⁾	GHR1 109 404 P0001	1		0.65/1.43
KK-R111-2,1	for R1xx:	2.1 K/W ¹⁾	GHR1 109 402 P0001	1		0.29/0.64
KK-R111-1,5	DIN rail mounting	1.5 K/W ¹⁾	GHR1 109 405 P0001	1		0.42/0.93
KK-R111-0,7		0.7 K/W ¹⁾	GHR1 109 406 P0001	1		1.02/2.25
KK-R111-0,5		0.5 K/W ¹⁾	GHR1 109 407 P0001	1		1.30/2.87
KK-R311-0,8	for R31x:	0.8 K/W ¹⁾	GHR3 109 401 P0001	1		1.00/2.20
	DIN rail mounting					

Terminal cover

SSR-COV.1	for R111		GHR1 106 605 P0001	1		0.05/0.11
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Rapid-fastening plate

SBF1	for R1xx		GHR1 101 105 R0001	1		0.045/0.99
SBF2	for R31x		GHR3 101 105 R0001	1		0.05/0.11

EMC filter

EMV-100	for R1xx		GHR1 100 000 R0001	1		0.10/0.22
EMV-300	for R31x		GHR3 100 000 R0001	1		0.10/0.22

Heat transfer foil

TP-01	for R1xx		GHR1 109 500 P0001	1		0.001/0.002
TP-03	for R31x		GHR3 109 500 P0001	1		0.005/0.01

¹⁾ For R1xx: Use heat transfer paste or heat transfer foil TP-01 and screws M4x12 with fan type lock washer (DIN 6798-AZ M4) when mounting single-pole solid-state relays. These are not included in delivery.
For R31x: Use heat transfer paste or heat transfer foil TP-03 and screws M5x12 with fan type lock washer (DIN 6798-AZ M5) when mounting 3-pole solid-state relays. These are not included in delivery.

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Semiconductor contactors

R100.xx range

Technical data

Data at $T_a = 25\text{ °C}$, U_{MAX} and rated values, if nothing else indicated

Type		R100.20	R100.30-IO	R100.30-ZS	R100.45	R100.45-SG
Output circuit		L1~, T1~				
Switching element		Thyristor				
Rated operational voltage U _e		600 V AC				
Operational voltage range		42-660 V AC				
Peak inverse voltage U _{pp}		1200 V _{pp}				
Rated operational current I _e for utilization category	AC51	20 A AC _{rms}	30 A AC _{rms}		45 A AC _{rms}	
	AC53a	5 A AC _{rms}	15 A AC _{rms}		20 A AC _{rms}	
Frequency range		45-65 Hz				
Max. off-state leakage current		< 3 mA _{rms}				
Minimum load current		350 mA	150 mA			
Rated peak withstand current I _{tms} (t = 10 ms)		300 A	580 A		1150 A	
Max. impulse overload capacity (t = 1 s)		< 35 A AC	< 125 A AC			
Max. load integral ∫ i²dt (t = 10 ms)		450 A²s	1680 A²s		6600 A²s	
Voltage drop in on-state		1.6 V _{rms}				
Critical current gradient di/dt		≥ 50 A/μs			≥ 100 A/μs	
Critical voltage gradient du/dt		500 V/μs				
Power factor (cos ϕ)	at U _e	≥ 0.5				
Maximum barrier-layer temperature		125 °C				
Protective circuit						
Input circuit - control circuit		A1+, A2-				
Rated control supply voltage U _s		4-32 V DC				
Make voltage		3.8 V DC	4.25 V DC	3.8 V DC		
Break voltage		1.2 V DC	1 V DC	1.2 V DC		
Maximum input current		12 mA	15 mA	12 mA		
Maximum switching times (at 50 Hz)	make	1 period (20 ms)	1 ms	1 period (20 ms)		
	break	1 period (20 ms)				
General data						
Ambient temperature range	operation	-30...+70 °C				
	storage	-40...+100 °C				
Electrical connection - input circuit						
Wire size		1 x 0.5 mm² / 2 x 2.5 mm² (1 x 20 AWG / 2 x 14 AWG)				
Tightening torque		2 Nm			0.6 Nm	
Electrical connection - output circuit						
Wire size		1 x 0.5 mm² / 2 x 2.5 mm² (1 x 20 AWG / 2 x 14 AWG)			1 x 4 mm² / 1 x 25 mm² (1 x 12 AWG / 1 x 3 AWG)	
	maximum with ring-/ fork-type cable lug	1 x 4 mm² (1 x 12 AWG)			-	
Tightening torque		2 Nm			2.5 Nm	
Insulation data						
Rated impulse withstand voltage U _{imp}		4000 V				
Test voltage between all isolated circuits (type test)		4000 V				

Semiconductor contactors

R300.xx range

Technical data

Data at $T_a = 25\text{ °C}$, U_{MAX} and rated values, if nothing else indicated

Type	R300.20		R300.25	
Output circuit	L1-T1, L2-T2, L3-T3			
Switching element	Thyristor			
Rated operational voltage U _e	600 V AC			
Operational voltage range	40-660 V AC			
Peak inverse voltage U _{pp}	1200 V _{pp}			
Rated operational current I _e for utilization category	AC51	3 x 20 A _{rms}	3 x 25 A _{rms}	
	AC53a	3 x 15 A _{rms}	3 x 15 A _{rms}	
Frequency range	45-65 Hz			
Max. off-state leakage current	< 3 mA _{rms}			
Minimum load current	150 mA			
Rated peak withstand current I _{tms} (t = 10 ms)	580 A			
Max. impulse overload capacity (t = 1 s)	< 125 A AC			
Max. load integral ∫ i²dt (t = 10 ms)	1680 A²s			
Voltage drop in on-state	1.6 V _{rms}			
Critical current gradient di/dt	≥ 50 A/μs			
Critical voltage gradient du/dt	500 V/μs			
Power factor (cos ϕ) at U _e	≥ 0.5			
Maximum barrier-layer temperature	125 °C			
Protective circuit	Varistor			
Input circuit - control circuit	A1+, A2-			
Rated control supply voltage U _s	5-32 V DC			
Make voltage	4.7 V DC			
Break voltage	1.2 V DC			
Maximum input current	24 mA			
Maximum switching times (at 50 Hz)	make	< 1 period (10 ms)		
	break	< 1 period (10 ms)		
General data				
Ambient temperature range	operation	-30...+70 °C		
	storage	-40...+80 °C		
Electrical connection - input / output circuit				
Wire size	fine-strand with wire end ferule	0.5-2.5 mm² (20-14 AWG)		
	rigid	0.5-4 mm² (20-12 AWG)		
Tightening torque	0.6 Nm			
Insulation data				
Rated impulse withstand voltage U _{imp}	4000 V			
Test voltage between all isolated circuits (type test)	4000 V			

Solid-state relays

R111 range

Technical data

Data at $T_a = 25\text{ °C}$, U_{MAX} and rated values, if nothing else indicated

Type		R111/25	R111/45	R111/20	R111/40	R111/90
Output circuit		1, 2				
Switching element		Thyristor				
Rated operational voltage U_e		230 V AC		480 V AC		
Operational voltage range		24-280 V AC		42-530 V AC		
Peak inverse voltage U_{pp}		650 V _{pp}		1200 V _{pp}		
Rated operational current I_e	AC51	25 A _{rms}	50 A _{rms}	25 A _{rms}	50 A _{rms}	90 A _{rms}
for utilization category	AC53a	5 A _{rms}	15 A _{rms}	5 A _{rms}	15 A _{rms}	20 A _{rms}
Frequency range		45-65 Hz				
Max. off-state leakage current		3 mA				
Minimum load current		20 mA _{rms}				
Rated peak withstand current I_{tms} (t = 10 ms)		250 A	600 A	250 A	600 A	1000 A
Max. impulse overload capacity (t = 1 s)		≤ 55 A	≤ 125 A	≤ 55 A	≤ 125 A	≤ 150 A
Max. load integral $\int i^2 dt$ (t = 10 ms)		450 A ² s	1680 A ² s	450 A ² s	1680 A ² s	6600 A ² s
Voltage drop in on-state		1.6 V				
Critical current gradient di/dt		50 A/μs				100 A/μs
Critical voltage gradient du/dt		500 V/μs				
Max. thermal resistance	barrier / base	1.25 K/W	0.65 K/W	1.25 K/W	0.65 K/W	0.3 K/W
	barrier / ambient	12 K/W				
Power factor (cos φ)	at U_e	> 0.5				
Maximum barrier-layer temperature		125 °C				
Protective circuit		RC element (snubber)				
Input circuit - control circuit		+A1, -A2				
Rated control supply voltage U_s		3-32 V DC				
Make voltage		3 V DC				
Break voltage		1 V DC				
Input resistance		1.5 kΩ				
Maximum input current		22 mA				
Maximum switching times	make	≤ 1/2 period (10 ms)				
(at 50 Hz)	break	≤ 1/2 period (10 ms)				
General data						
Ambient temperature	operation	-20...+100 °C				
range	storage	-40...+100 °C				
Electrical connection - input circuit						
Wire size		2 x 0.5 mm ² / 2 x 2.5 mm ² (2 x 20 AWG / 2 x 14 AWG)				
Maximum ring-/ fork-type cable lug diameter		7.5 mm (0.30 in)				
Tightening torque		0.5 Nm				
Electrical connection - output circuit						
Wire size		2 x 1 mm ² / 2 x 6 mm ² (2 x 18 AWG / 2 x 10 AWG)				
Maximum ring-/ fork-type cable lug diameter		12 mm (0.47 in)				
Tightening torque		2.4 Nm				
Insulation data						
Rated impulse withstand voltage U_{imp}		4000 V				
Test voltage between all isolated circuits (type test)		4000 V				

Solid-state relays

R12x range

Technical data

Data at $T_a = 25\text{ °C}$, U_{MAX} and rated values, if nothing else indicated

Type		R120/25	R120/50	R121/25 R126/25	R121/50 R126/50	R121/75 R126/75	R121/100 R126/100	R122/50	R122/75	R122/100
Output circuit		L1-T1								
Switching element		Thyristor								
Rated operational voltage U _e		230 V AC		480 V AC				600 V AC		
Operational voltage range		24-265 V AC		42-530 V AC				42-660 V AC		
Peak inverse voltage U _{pp}		650 V _{pp}		1200 V _{pp}				1600 V _{pp}		
Rated operational current I _e for utilization category	AC51	25 A _{rms}	50 A _{rms}	25 A _{rms}	50 A _{rms}	75 A _{rms}	100 A _{rms}	50 A _{rms}	75 A _{rms}	100 A _{rms}
	AC53a	5 A _{rms}	15 A _{rms}	5 A _{rms}	15 A _{rms}	20 A _{rms}	30 A _{rms}	15 A _{rms}	20 A _{rms}	30 A _{rms}
Frequency range		45-65 Hz								
Max. off-state leakage current		3 mA _{rms}								
Minimum load current		150 mA _{rms}								
Rated peak withstand current I _{tms} (t = 10 ms)		300 A	580 A	300 A	580 A	1150 A	1900 A	580 A	1150 A	1900 A
Max. impulse overload capacity (t = 1 s)		< 55 A _{rms}	< 125 A _{rms}	< 55 A _{rms}	< 125 A _{rms}	< 150 A _{rms}	< 200 A _{rms}	< 125 A _{rms}	< 150 A _{rms}	< 200 A _{rms}
Max. load integral ∫ i²dt (t = 10 ms)		450 A²s	1680 A²s	450 A²s	1680 A²s	6600 A²s	18000 A²s	1680 A²s	6600 A²s	18000 A²s
Voltage drop in on-state		1.6 V								
Critical current gradient di/dt		50 A/μs								
Critical voltage gradient du/dt		500 V/μs								
Max. thermal resistance	barrier / base	0.8 K/W	0.5 K/W	0.8 K/W	0.5 K/W	0.35 K/W	0.3 K/W	0.5 K/W	0.35 K/W	0.3 K/W
	barrier / ambient	20 K/W					15 K/W	20 K/W		15 K/W
Power factor (cos φ)	at U _e	> 0.5								
Maximum barrier-layer temperature		125 °C								
Protective circuit		Varistor								

Type		R120	R121	R122	R126
Input circuit - control circuit		A1+, A2-			
Rated control supply voltage U _s		3-32 V DC	4-32 V DC		20-280 V AC / 24-48 V DC
Make voltage		2.5 V DC	3.5 V DC		18 V AC/DC
Break voltage		1.2 V DC			6 V AC/DC
Input resistance		1.5 kΩ			44 kΩ
Maximum input current		≤ 12 mA	< 12 mA		< 20 mA
Maximum switching times (at 50 Hz)	make	≤ 1/2 period (10 ms)			≤ 12 ms
	break	≤ 1/2 period (10 ms)			≤ 40 ms
General data					
Ambient temperature range	operation	-20...+70 °C			
	storage	-40...+100 °C			
Electrical connection - input circuit					
Wire size		2 x 0.5 mm ² / 2 x 2.5 mm ² (2 x 20 AWG / 2 x 14 AWG)			
Maximum ring-/ fork-type cable lug diameter		7.5 mm (0.30 in)			
Tightening torque		0.5 Nm			
Electrical connection - output circuit					
Wire size		2 x 1 mm ² / 2 x 6 mm ² (2 x 18 AWG / 2 x 10 AWG)			
Maximum ring-/ fork-type cable lug diameter		12 mm (0.47 in)			
Tightening torque		2.4 Nm			
Insulation data					
Rated impulse withstand voltage U _{imp}		4000 V			
Test voltage between all isolated circuits (type test)		4000 V			

Solid-state relays

R31x range

Technical data

Data at $T_a = 25^\circ\text{C}$, U_{MAX} and rated values, if nothing else indicated

Type		R311/25	R311/55	R311/75	R315/25	R315/55	R315/75
Output circuit		L1-T1, L2-T2, L3-T3					
Switching element		Alternistor	Thyristor		Alternistor	Thyristor	
Rated operational voltage U _e		600 V AC					
Operational voltage range		42-660 V AC					
Peak inverse voltage U _{pp}		1200 V _{pp}					
Rated operational current I _e	AC51	3 x 25 A _{rms}	3 x 55 A _{rms}	3 x 75 A _{rms}	3 x 25 A _{rms}	3 x 55 A _{rms}	3 x 75 A _{rms}
for utilization category	AC53a	3 x 5 A _{rms}	3 x 15 A _{rms}	3 x 20 A _{rms}	3 x 5 A _{rms}	3 x 15 A _{rms}	3 x 20 A _{rms}
Frequency range		45-65 Hz					
Max. off-state leakage current		< 3 mA					
Minimum load current		150 mA _{rms}					
Rated peak withstand current I _{tms} (t = 10 ms)		300 As	580 As	1150 As	300 As	580 As	1150 As
Max. impulse overload capacity (t = 1 s)		< 37 A _{rms}	< 125 A _{rms}	< 150 A _{rms}	< 37 A _{rms}	< 125 A _{rms}	< 150 A _{rms}
Max. load integral ∫ i²dt (t = 10 ms)		450 A²s	1680 A²s	6600 A²s	450 A²s	1680 A²s	6600 A²s
Voltage drop in on-state		≤ 1.6 V _{rms}					
Critical current gradient di/dt (at 50 Hz)		≥ 50 A/μs					
Critical voltage gradient du/dt		≥ 500 V/μs					
Maximum barrier-layer temperature		125 °C					
Protective circuit		Varistor					
Input circuit - control circuit		A1+, A2-			A1~, A2~		
Rated control supply voltage U _s		4-32 V DC			24-275 V AC, 24-50 V DC		
Make voltage		3.8 V DC			18 V AC, 20 V DC		
Break voltage		1.2 V DC			9 V AC		
Maximum input current		≤ 23 mA			≤ 15 mA		
Maximum switching times	make	≤ 1/2 period (10 ms)			20 ms		
(at 50 Hz)	break	≤ 1/2 period (10 ms)			30 ms		
General data							
Ambient temperature	operation	-30...+80 °C					
range	storage	-40...+100 °C					
Degree of protection		IP10					
Protection class		II					
Electrical connection - input circuit							
Wire size		2 x 1 mm² / 2 x 2.5 mm² (2 x 18 AWG / 2 x 14 AWG)					
Tightening torque		≤ 0.5 Nm					
Electrical connection - output circuit							
Wire size		2 x 1 mm² / 2 x 6 mm² (2 x 18 AWG / 2 x 10 AWG)					
Tightening torque		2.5 Nm					
Isolation data							
Rated isolation voltage between solid-state relay / enclosure		≥ 400 V AC					
Rated impulse withstand voltage U _{imp}		4000 V					
Test voltage between all isolated circuits (type test)		4000 V					
Overvoltage category		III					

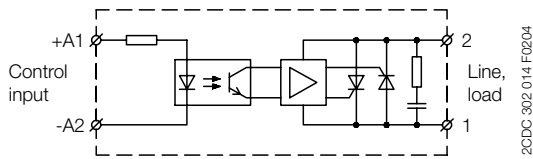
Semiconductor contactors R100.xx and R300.xx

Solid-state relays R111, R12x and R31x

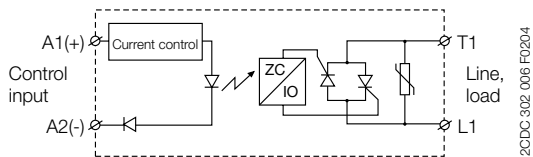
Circuit diagrams, Technical diagrams

Circuit diagrams

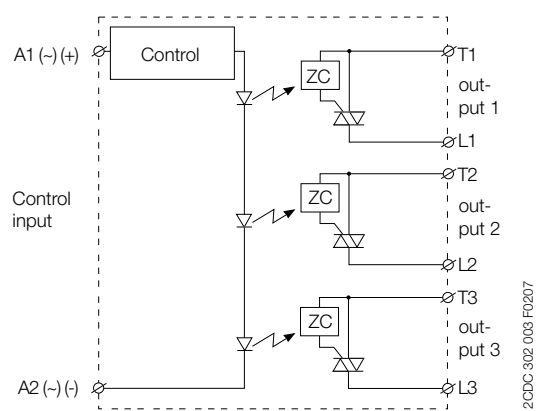
R111



R12x

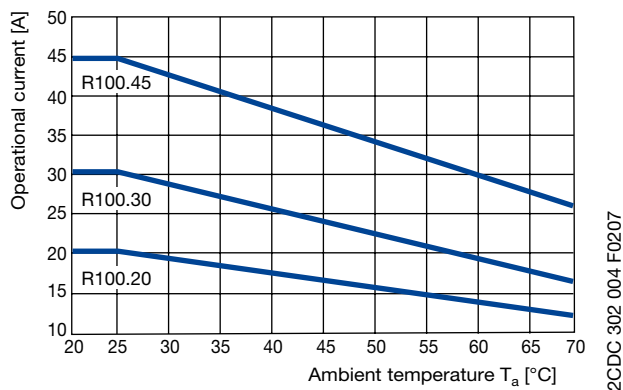


R31x



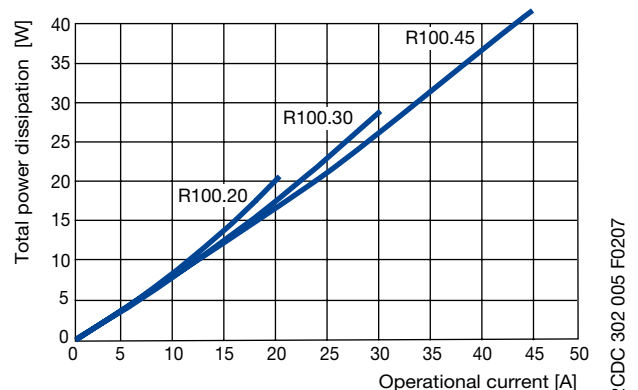
Technical diagrams

Operational current at ambient temperature

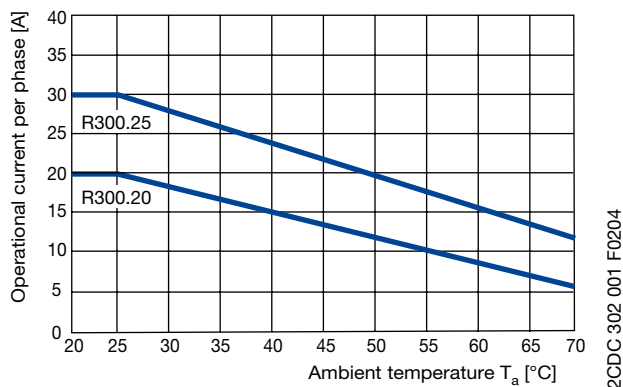


R100.20 / R100.30 / R100.45

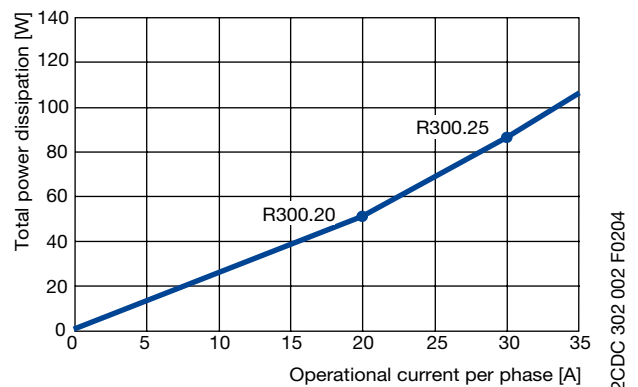
Dissipation at operational current



R100.20 / R100.30 / R100.45



R300.xx



R300.xx

Solid-state relays

R111, R12x and R31x range

Heat sink dimensioning

Procedure for choosing a solid-state relay

Choosing the suitable solid-state relay is easy to do, if the following 4 questions are answered.

- 1. How much is the maximum operational current?
- 2. Which control circuit voltage is used?
- 3. Which operational voltage is required?
- 4. Is the device operated continuously or in duty cycles?

Knowing these data you can easily choose a suitable relay by means of the technical data specified in this catalog.

Procedure for choosing a suitable heat sink

After having selected the relay, a heat sink suitable for the specific application has to be chosen. For this, the following two questions are of importance.

- 1. How much is the maximum operational current?
- 2. How much is the ambient temperature during operation?

If you know the ambient temperature during operation, you can determine the thermal resistance between the bottom of the solid-state relay and the environment using a matrix as it is shown below. The respective matrixes for the other relays are shown on the following pages. Knowing the thermal resistance and the technical data of the heat sink, you can then choose a suitable heat sink.

R120/50, R121/50, R122/50, R126/50												
Thermal resistance [K/W]												
Operational current I _o [A]	50	1.03	0.86	0.7	0.53	0.37	0.2	61	Power dissipation P _v [W]	50	1.03	
	45	1.27	1.09	0.9	0.71	0.52	0.33	53		45	1.27	
	40	1.54	1.32	1.1	0.89	0.67	0.45	46		40	1.54	
	35	1.85	1.59	1.34	1.08	0.82	0.57	39		35	1.85	
	30	2.26	1.95	1.65	1.34	1.03	0.72	33		30	2.26	
	25	2.85	2.47	2.08	1.70	1.32	0.94	26		25	2.85	
	20	3.73	3.24	2.75	2.26	1.77	1.27	20		20	3.73	
	15	5.22	4.54	3.86	3.19	2.51	1.83	15		15	5.22	
	10	8.21	7.16	6.11	5.05	4	2.95	10		10	8.21	
	5	17.2	15	12.9	10.7	8.51	6.33	5		5	17.2	
Ambient temperature T _a [°C]												
20 30 40 50 60 70												

The selection of the heat sink directly affects the warming of the relay.

Relay temperature T = ambient temperature + (dissipation * thermal resistance)

The calculated value for the relay temperature should not exceed 100 °C. Otherwise, danger of fire as well as danger of damage to the device exist.

Example

Choosing the solid-state relay:

- 1. The maximum operational current is 30 A
- 2. A control circuit voltage of 230 V AC is used
- 3. The operational voltage is 400 V AC
- 4. The relay shall be used at continuous operation

→ Possible relays:

R 126/50 - R 126/75 - R 126/100

Chosen relay:

R 126/50

Choosing the heat sink:

- 1. The maximum operational current is 30 A
- 2. The ambient temperature during operation is 40 °C

The thermal resistance can be determined using the operational current-ambient temperature matrix.

The Y axis of the diagram shows the operational current, the X axis shows the ambient temperature in °C. The thermal resistance can be read at the cross-point of the operational current with the ambient temperature. In our example the thermal resistance is 1.65 K/W (kelvin/watt).

Consequently, the required heat sink must have a value of at least 1.65 K/W. Here it has to be observed that the quality of the heat sink increases with a reduction of the temperature/power ratio which means that a heat sink with a ratio of 0.5 K/W provides better heat dissipation than a heat sink with a ratio of 1.5 K/W.

The power dissipation can be read from the right column of the matrix. In our example it is 33 W.

Knowing the thermal resistance, you can now choose a suitable heat sink using the technical data.

Example 1: Heat sink KK-R111-2,1

T = 40 °C + (33 W x 2.1 K/W) = 40 °C + 69.3 °C = 109.3 °C **Too hot!**

Example 2: Heat sink KK-R111-1,5

T = 40 °C + (33 W x 1.5 K/W) = 40 °C + 49.5 °C = 89.5 °C **OK!**

Example 3: Heat sink KK-R111-0,5

T = 40 °C + (33 W x 0.5 K/W) = 40 °C + 16.5 °C = 56.5 °C **OK!**

Due to reasons of space and costs, example 2 is the most commonly used case.

The calculated values apply for continuous duty; during cycling the heating is lower depending on the duty cycle.

Solid-state relays

R111, R12x and R31x

Operational current-temperature matrixes

Operational currents related to the ambient temperature, heat sink dimensioning

R111 range

R111/20, R111/25

		Thermal resistance [K/W]							
Operational current I_o [A]	25	2	1.7	1.4	1	0.71	0.4	32	
	22.5	2.5	2.1	1.8	1.4	1	0.66	27	
	20	3.1	2.7	2.3	1.9	1.4	1	23	
	17.5	4	3.5	3	2.5	2	1.4	20	
	15	4.9	4.3	3.7	3.1	2.5	1.9	16	
	12.5	6.2	5.4	4.6	3.9	3.1	2.3	13	
	10	8.1	7.1	6.1	5.1	4	3	10	
	7.5	11.3	9.9	8.5	7.1	5.6	4.2	7	
5		-	15.6	13.3	11.1	8.9	6.7	5	
	2.5	-	-	-	-	18.7	14	2	
		20	30	40	50	60	70		
		Ambient temperature T_a [°C]							

R12x range

R120/25, R121/25, R126/25

		Thermal resistance [K/W]							
Operational current I_o [A]	25	2.7	2.34	1.98	1.61	1.25	0.89	28	
	22.5	3.1	2.69	2.28	1.86	1.45	1.04	24	
	20	3.61	3.13	2.65	2.18	1.7	1.23	21	
	17.5	4.26	3.7	3.14	2.59	2.03	1.47	18	
	15	5.14	4.47	3.8	3.14	2.47	1.8	15	
	12.5	6.38	5.56	4.73	3.91	3.09	2.27	12	
	10	8.25	7.19	6.14	5.08	4.02	2.97	9	
	7.5	11.4	9.94	8.49	7.04	5.59	4.14	7	
5		17.7	15.4	13.2	11	8.74	6.51	4	
	2.5	-	-	-	-	18.2	13.6	2	
		20	30	40	50	60	70		
		Ambient temperature T_a [°C]							

R31x range

R311/25, R315/25

		Thermal resistance [K/W]							
Operational current I_o [A]	25	0.44	0.34	0.23	0.12	0.01	-	92	
	22.5	0.62	0.49	0.37	0.24	0.12	-	80	
	20	0.84	0.69	0.54	0.4	0.25	0.1	68	
	17.5	1.12	0.95	0.78	0.6	0.43	0.25	58	
	15	1.51	1.3	1.09	0.88	0.67	0.46	47	
	12.5	2.06	1.8	1.54	1.27	1.01	0.75	38	
	10	2.75	2.4	2.06	1.72	1.37	1.03	29	
	7.5	3.83	3.35	2.87	2.39	1.91	1.43	21	
5		6.01	5.26	4.51	3.76	3.01	2.25	13	
	2.5	12.62	11.04	9.46	7.89	6.31	4.73	6	
		20	30	40	50	60	70	80	
		Ambient temperature T_a [°C]							

R111/40, R111/45

		Thermal resistance [K/W]							
Operational current I_o [A]	50	0.92	0.76	0.6	0.45	0.29	-	63	
	45	1.2	0.99	0.8	0.62	0.44	0.26	55	
	40	1.5	1.3	1.1	0.85	0.63	0.42	47	
	35	1.9	1.6	1.4	1.1	0.89	0.63	40	
	30	2.4	2.1	1.8	1.5	1.2	0.91	33	
	25	3	2.7	2.3	1.9	1.5	1.1	26	
	20	3.9	3.5	3	2.5	2	1.5	20	
	15	5.5	4.8	4.1	3.4	2.7	2.1	15	
10		8.6	7.5	6.4	5.4	4.3	3.2	9	
	5	17.9	15.6	13.4	11.2	8.9	6.7	4	
		20	30	40	50	60	70		
		Ambient temperature T_a [°C]							

R120/50, R121/50, R122/50, R126/50

		Thermal resistance [K/W]							
Operational current I_o [A]	50	1.03	0.86	0.7	0.53	0.37	0.2	61	
	45	1.27	1.09	0.9	0.71	0.52	0.33	53	
	40	1.54	1.32	1.1	0.89	0.67	0.45	46	
	35	1.85	1.59	1.34	1.08	0.82	0.57	39	
	30	2.26	1.95	1.65	1.34	1.03	0.72	33	
	25	2.85	2.47	2.08	1.70	1.32	0.94	26	
	20	3.73	3.24	2.75	2.26	1.77	1.27	20	
	15	5.22	4.54	3.86	3.19	2.51	1.83	15	
10		8.21	7.16	6.11	5.05	4	2.95	10	
	5	17.2	15	12.9	10.7	8.51	6.33	5	
		20	30	40	50	60	70		
		Ambient temperature T_a [°C]							

R311/55, R315/55

		Thermal resistance [K/W]							
Operational current I_o [A]	55	0.29	0.23	0.17	0.11	0.05	-	164	
	50	0.36	0.29	0.22	0.16	0.09	0.02	148	
	45	0.44	0.36	0.29	0.21	0.14	0.06	133	
	40	0.54	0.46	0.37	0.29	0.2	0.12	118	
	35	0.67	0.58	0.48	0.38	0.28	0.19	103	
	30	0.85	0.74	0.62	0.51	0.39	0.28	87	
	25	1.1	0.96	0.82	0.68	0.55	0.41	73	
	20	1.38	1.21	1.04	0.87	0.69	0.52	58	
15		1.85	1.62	1.39	1.16	0.93	0.7	43	
	10	2.8	2.45	2.1	1.75	1.4	1.05	29	
5		5.62	4.92	4.21	3.51	2.81	2.11	14	
	2.5	11.26	9.85	8.45	7.04	5.63	4.22	7	
		20	30	40	50	60	70	80	
		Ambient temperature T_a [°C]							

R111/90

		Thermal resistance [K/W]							
Operational current I_o [A]	90	0.63	0.53	0.42	0.32	-	-	97	
	80	0.81	0.69	0.57	0.45	0.33	-	84	
	70	1	0.89	0.75	0.61	0.47	0.33	71	
	60	1.3	1.2	1	0.83	0.66	0.49	59	
	50	1.7	1.5	1.3	1.1	0.85	0.64	47	
	40	2.2	1.9	1.7	1.4	1.1	0.83	36	
	30	3.1	2.7	2.3	1.9	1.5	1.2	26	
	20	4.8	4.2	3.6	3	2.4	1.8	17	
10		10	8.8	7.5	6.3	5	3.8	8	
		20	30	40	50	60	70		
		Ambient temperature T_a [°C]							

R121/75, R122/75, R126/75

		Thermal resistance [K/W]							
Operational current I_o [A]	75	0.91	0.78	0.65	0.52	0.39	0.26	77	
	67.5	1.1	0.96	0.81	0.66	0.51	0.36	68	
	60	1.34	1.17	1	0.83	0.66	0.49	59	
	52.5	1.6	1.4	1.2	1	0.8	0.6	50	
	45	1.93	1.68	1.44	1.2	0.96	0.72	42	
	37.5	2.38	2.08	1.78	1.49	1.19	0.89	34	
	30	3.06	2.68	2.3	1.91	1.53	1.15	26	
	22.5	4.21	3.68	3.16	2.63	2.1	1.58	19	
15		6.51	5.7	4.88	4.07	3.26	2.44	12	
	7.5	13.5	11.77	10.09	8.41	6.73	5.04	6	
		20	30	40	50	60	70		
		Ambient temperature T_a [°C]							

R311/75, R315/75

		Thermal resistance [K/W]							
Operational current I_o [A]	75	0.27	0.22	0.17	0.12	0.07	0.02	201	
	70	0.32	0.27	0.21	0.16	0.1	0.05	184	
	65	0.38	0.32	0.26	0.2	0.14	0.08	167	
	60	0.44	0.38	0.31	0.25	0.18	0.11	151	
	55	0.52	0.45	0.38	0.3	0.23	0.16	136	
	50	0.62	0.54	0.45	0.37	0.29	0.21	121	
	45	0.74	0.64	0.55	0.46	0.36	0.27	106	
	40	0.87	0.76	0.65	0.54	0.43	0.32	92	
35		1.01	0.89	0.76	0.63	0.51	0.38	79	
	30	1.21	1.06	0.91	0.76	0.6	0.45	66	
25		1.49	1.3	1.11	0.93	0.74	0.56	54	
	20	1.9	1.67	1.43	1.19	0.95	0.71	42	
15		2.6	2.28	1.95	1.3	1.3	0.98	31	
	10	4.01	3.51	3.01	2.51	2.01	1.5	20	
5		8.24	7.21	6.18	5.15	4.12	3.09	10	
		20	30	40	50	60	70	80	
		Ambient temperature T_a [°C]							

R121/100, R122/100, R126/100

		Thermal resistance [K/W]							
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Semiconductor contactors R100.xx and R300.xx

Solid-state relays R111, R12x and R31x

Fusing table



When testing (e.g. isolation measuring) or commissioning plants, in which solid-state relays or semiconductor contactors are used, do not use a test voltage that is higher than the rated operational voltage. This may damage or destroy the solid-state relay or semiconductor contactor.

If short-circuit protection of a solid-state relay or semiconductor contactor is required, we recommend selecting protective elements from the following fusing tables.

Selection table for circuit breakers

Relay type	Order code	Miniature Circuit Breaker Z-characteristic	Miniature Circuit Breaker B-characteristic	Wire size	Minimum length of a copper cable
R100.20	1SAR 111 020 R8607	S 201-Z2	n/a	1.0 mm ² (18 AWG)	15.0 m (49.21 ft.)
				1.5 mm ² (16 AWG)	22.5 m (73.82 ft.)
R100.30-IO R100.30-ZS	1SAR 113 030 R8607 1SAR 111 030 R8607	S 201-Z10	S 201-B4	1.0 mm ² (18 AWG)	7.6 m (24.93 ft.)
				1.5 mm ² (16 AWG)	11.4 m (37.40 ft.)
				2.5 mm ² (14 AWG)	19.0 m (62.34 ft.)
R100.45 R100.45-SG	1SAR 111 045 R8607 1SAR 111 045 R9607	S 201-Z20	S 201-B10	1.5 mm ² (16 AWG)	4.2 m (13.78 ft.)
				2.5 mm ² (14 AWG)	7.0 m (22.97 ft.)
				4.0 mm ² (12 AWG)	11.2 m (36.75 ft.)
		S 202-Z20	S 202-B10	1.5 mm ² (16 AWG)	1.8 m (5.92 ft.)
				2.5 mm ² (14 AWG)	3.0 m (9.84 ft.)
				4.0 mm ² (12 AWG)	4.8 m (15.75 ft.)
		S 201-Z32	S 201-B16	2.5 mm ² (14 AWG)	13.0 m (42.65 ft.)
				4.0 mm ² (12 AWG)	20.8 m (68.24 ft.)
				6.0 mm ² (10 AWG)	31.2 m (102 ft.)
		S 202-Z32	S 202-B16	2.5 mm ² (14 AWG)	5.0 m (16.40 ft.)
				4.0 mm ² (12 AWG)	8.0 m (26.25 ft.)
				6.0 mm ² (10 AWG)	12.0 m (39.37 ft.)
				10.0 mm ² (8 AWG)	20.0 m (65.62 ft.)
R120/25 R121/25 R126/25	1SAR 111 025 R4609 1SAR 111 025 R4606 1SAR 111 025 R4707	S 201-Z4	S 201-B2	1.0 mm ² (18 AWG)	21.0 m (68.90 ft.)
R120/50 R121/50 R126/50 R122/50	1SAR 111 050 R4609 1SAR 111 050 R4606 1SAR 111 050 R4707 1SAR 111 050 R4607	S 201-Z10	S 201-B4	1.0 mm ² (18 AWG)	7.6 m (24.93 ft.)
				1.5 mm ² (16 AWG)	11.4 m (37.40 ft.)
				2.5 mm ² (14 AWG)	19.0 m (62.34 ft.)
R121/75 R126/75 R122/75	1SAR 111 075 R4606 1SAR 111 075 R4707 1SAR 111 075 R4607	S 201-Z20	S 201-B10	1.5 mm ² (16 AWG)	4.2 m (13.78 ft.)
				2.5 mm ² (14 AWG)	7.0 m (22.97 ft.)
				4.0 mm ² (12 AWG)	11.2 m (36.75 ft.)
		S 202-Z20	S 202-B10	1.5 mm ² (16 AWG)	1.8 m (5.91 ft.)
				2.5 mm ² (14 AWG)	3.0 m (9.84 ft.)
				4.0 mm ² (12 AWG)	4.8 m (15.75 ft.)
		S 201-Z32	S 201-B16	2.5 mm ² (14 AWG)	13.0 m (42.65 ft.)
				4.0 mm ² (12 AWG)	20.8 m (68.24 ft.)
				6.0 mm ² (10 AWG)	31.2 m (102.36 ft.)
		S 202-Z32	S 202-B16	2.5 mm ² (14 AWG)	5.0 m (16.40 ft.)
				4.0 mm ² (12 AWG)	8.0 m (26.25 ft.)
				6.0 mm ² (10 AWG)	12.0 m (39.37 ft.)
				10.0 mm ² (8 AWG)	20.0 m (65.62 ft.)
R121/100 R126/100 R122/100	1SAR 111 100 R4606 1SAR 111 100 R4707 1SAR 111 100 R4607	S 201-Z50	S 201-B25	4.0 mm ² (12 AWG)	4.8 m (15.75 ft.)
				6.0 mm ² (10 AWG)	7.2 m (23.62 ft.)
				10.0 mm ² (8 AWG)	12.0 m (39.37 ft.)
		S 201-Z63	S 201-B32	16.0 mm ² (6 AWG)	19.2 m (62.99 ft.)
				6.0 mm ² (10 AWG)	7.2 m (23.62 ft.)
				10.0 mm ² (8 AWG)	12.0 m (39.37 ft.)
				16.0 mm ² (6 AWG)	19.2 m (62.99 ft.)

Specifications are subject to change without notice.

Semiconductor contactors R100.xx and R300.xx

Solid-state relays R111, R12x and R31x

Fusing table

Selection table for fuses

Relay type Rated operational current (Max. load integral $\int i^2 dt$)	Rated operational voltage	Max. fuse	Size	Suggested accessory fuse Ferraz Shawmut order code (or equivalent) order from www.ferrazshawmut.com	Fuse holder 1-pole / 3-pole
R100.xx					
20 A ($I^2t = 450 \text{ A}^2\text{s}$)	230 V AC	20 A	10.3 x 38	660 gRB 10-20	ST 10
	600 V AC	20 A	10.3 x 38	660 gRB 10-20	ST 10
30 A ($I^2t = 1680 \text{ A}^2\text{s}$)	230 V AC	30 A	10.3 x 38	660 gRB 10-30	ST 10
	600 V AC	30 A	10.3 x 38	660 gRB 10-30	ST 10
45 A ($I^2t = 6600 \text{ A}^2\text{s}$)	230 V AC	45 A	14 x 51	6.6xx CP URGB 14x51/40	ST 14
	600 V AC	45 A	14 x 51	6.6xx CP URGB 14x51/40	ST 14
R300.xx					
20 A ($I^2t = 1680 \text{ A}^2\text{s}$)	230 V AC	20 A	10.3 x 38	660 gRB 10-20	ST 10 III
	600 V AC	20 A	10.3 x 38	660 gRB 10-20	ST 10 III
25 A ($I^2t = 1680 \text{ A}^2\text{s}$)	230 V AC	25 A	10.3 x 38	660 gRB 10-25	ST 10 III
	600 V AC	25 A	10.3 x 38	660 gRB 10-25	ST 10 III
R111					
25 A ($I^2t = 450 \text{ A}^2\text{s}$)	230 V AC	25 A	10.3 x 38	660 gRB 10-25	ST 10
	400 V AC	25 A	10.3 x 38	661 gRB 10-25	ST 10
	480 V AC	25 A	10.3 x 38	662 gRB 10-25	ST 10
50 A ($I^2t = 1680 \text{ A}^2\text{s}$)	230 V AC	63 A	14 x 51	6.6xx CP URG 22 x 58/50	ST 14
	400 V AC	63 A	14 x 51	6.6xx CP URG 22 x 58/50	ST 14
	480 V AC	63 A	22 x 58	6.6xx CP URG 22 x 58/50	ST 22
90 A ($I^2t = 6600 \text{ A}^2\text{s}$)	230 V AC	80 A	22 x 58	6.6xx CP URG 22 x 58/80	ST 22
	400 V AC	80 A	22 x 58	6.6xx CP URG 22 x 58/80	ST 22
	480 V AC	80 A	22 x 58	6.6xx CP URG 22 x 58/80	ST 22
	600 V AC	80 A	22 x 58	6.6xx CP URG 22 x 58/80	ST 22
R12x					
25 A ($I^2t = 450 \text{ A}^2\text{s}$)	230 V AC	25 A	10.3 x 38	660 gRB 10-25	ST 10
	400 V AC	25 A	10.3 x 38	661 gRB 10-25	ST 10
	480 V AC	25 A	10.3 x 38	662 gRB 10-25	ST 10
	600 V AC	20 A	10.3 x 38	663 gRB 10-25	ST 10
50 A ($I^2t = 1680 \text{ A}^2\text{s}$)	230 V AC	50 A	14 x 51	6.6xx CP URGB 14x51/50	ST 22
	400 V AC	50 A	14 x 51	6.6xx CP URGB 14x51/50	ST 22
	480 V AC	50 A	22 x 58	6.6xx CP URG 14x51/50	ST 22
	600 V AC	50 A	22 x 58	6.6xx CP URG 14x51/50	ST 22
75 A ($I^2t = 6600 \text{ A}^2\text{s}$)	230 V AC	63 A	22 x 58	6.6xx CP URD 22 x 58/63	ST 22
	400 V AC	63 A	22 x 58	6.6xx CP URD 22 x 58/63	ST 22
	480 V AC	63 A	22 x 58	6.6xx CP URD 22 x 58/63	ST 22
	600 V AC	63 A	22 x 58	6.6xx CP URD 22 x 58/63	ST 22
100 A ($I^2t = 18000 \text{ A}^2\text{s}$)	230 V AC	100 A	22 x 58	6.6xx CP URD 22 x 58/100	ST 22
	400 V AC	100 A	22 x 58	6.6xx CP URD 22 x 58/100	ST 22
	480 V AC	100 A	22 x 58	6.6xx CP URD 22 x 58/100	ST 22
	600 V AC	100 A	22 x 58	6.6xx CP URD 22 x 58/100	ST 22
R31x					
25 A ($I^2t = 450 \text{ A}^2\text{s}$)	400 V AC	25 A	10.3 x 38	660 gRB 10-25	ST 10 III
	600 V AC	20 A	10.3 x 38	660 gRB 10-20	ST 10 III
55 A ($I^2t = 1680 \text{ A}^2\text{s}$)	400 V AC	50 A	14 x 51	6.6xx CP URGB 14 x 51/50	ST 14 III
	600 V AC	50 A	22 x 58	6.6xx CP URG 22 x 58/50	ST 22 III
75 A ($I^2t = 6600 \text{ A}^2\text{s}$)	400 V AC	63 A	22 x 58	6.6xx CP URD 22 x 58/63	ST 22 III
	480 V AC	63 A	22 x 58	6.6xx CP URD 22 x 58/63	ST 22 III

Specifications are subject to change without notice.

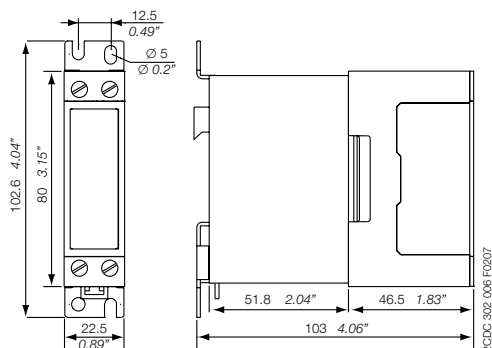
Semiconductor contactors R100.xx and R300.xx Solid-state relays R111, R12x and R31x

Dimensional drawings

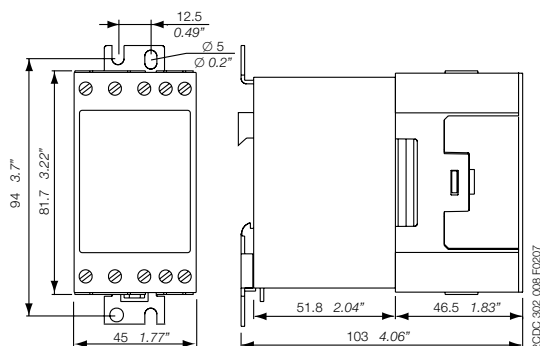
Dimensional drawings

Dimensions in mm

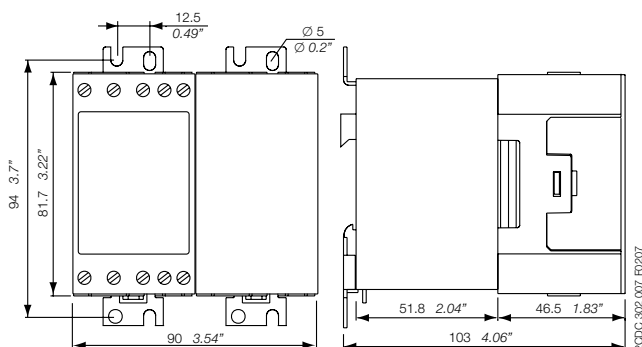
Semiconductor contactors



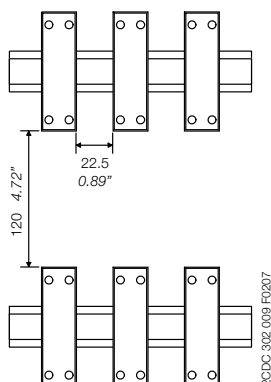
R100.20, R100.30



**R100.45, R100.45-SG
R300.20**

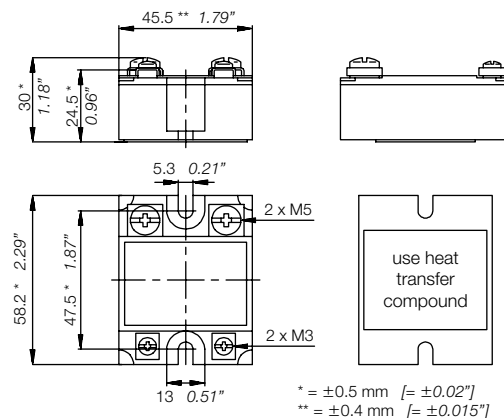


R300.25

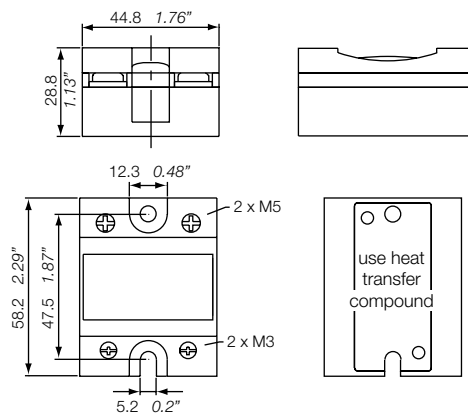


DIN rail mounting for R100.xx

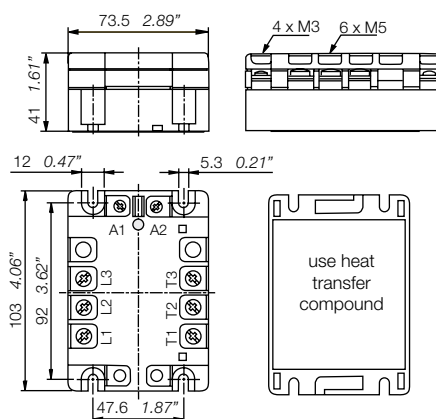
Solid-state relays



R111



R120, R121, R122, R126



R311, R315

Solid-state relays

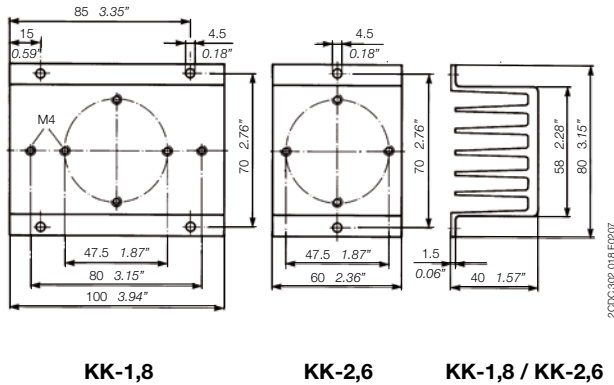
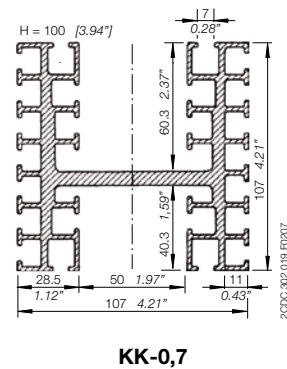
Accessories - Heat sinks KK

Dimensional drawings

Dimensional drawings

Dimensions in mm

Heat sinks for screw mounting on a mounting plate for solid-state relays R111



Heat sinks for DIN rail mounting

Type	W	H	D
KK-R111-2,1	51 [2.01"]	65 [2.56"]	65 [2.56"]
KK-R111-0,7	72 [2.83"]	75 [2.95"]	136 [5.35"]
KK-R111-1,5	45 [1.77"]	65 [2.56"]	97 [3.82"]
KK-R111-0,5	120 [4.72"]	100 [3.94"]	136 [5.35"]
KK-R311-0,8	114 [4.89"]	75 [2.95"]	130 [5.12"]

