Твердотельные реле SSR 1, SSR 2, SSR 3, однофазные, двухфазные, трехфазные

Технические характеристики

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Solid State Relays

Zero-Point Switching, heatsink integrated

Main Characteristics:

Zero switching
LED display
Various connection technologies
Plug-in control terminal
Degree of protection IP 20
Insulated mounting foot

Standards / Approvals:

DIN EN 60947-4-3
UL 508 / CSA

CE
C-Ti ck

Ordering Key:

3RF23	10	- 1	A	A	0	2
Solid state contactor with heat sink	Max. load current 10 = 10.5 A 20 = 20 A 30 = 30 A 40 = 40 A 50 = 50 A 70 = 70 A 90 = 88 A	Connection technology 1 = Screw connection 2 = Spring-loaded connection 3 = Ring cable connection M5	Switching function A = Zero-point switching	Controlled phases A = Single-phase	Control voltage 0 = 24 V DC 1 = 24 V AC/DC 2 = 110 - 230 V AC 4 = 4 - 30 V DC	Operating voltage 2 = 24 - 230 V 4 = 48 - 460 V 5 = 48 - 600 V 6 = 48 - 600 V

Not all possible versions are available ex stock!

Main Circuit:

Values for 40 °C ambient temperature!	I_{AC-51}	I_e acc. to IEC947-4-3	Ie UL/CSA	Power loss with I_{max}	Min. load current	Max. leakage current
Type	A	A	A	W	A	mA
3RF2310-.AA.	10.5	7.5	9.6	11	0.1	10
3RF2320-.AA.	20	13.2	17.6	20	0.5	10
3RF2330-**1**AA.	30	22	27	33	0.5	10
3RF2330-**3**AA.	30	22	27	33	0.5	10
3RF2340-**1**AA.	40	33	36	44	0.5	10
3RF2340-**3**AA.	40	33	36	44	0.5	10
3RF2350-**1**AA.	50	36	45	54	0.5	10
3RF2350-**3**AA.	50	36	45	54	0.5	10
3RF2370-**3**AA.	70	70	62	83	0.5	10
3RF2390-**3**AA.	88	88	83	117	0.5	10

Type		3RF23..-.AA.**2**	3RF23..-.AA.**4**	3RF23..-.AA.**5**	3RF23..-.AA.**6**
Rated operating voltage U_e	V	24 ... 230	48 ... 460	48 ... 600	48 ... 600
• Voltage range	V	20 ... 253	40 ... 506	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %			
Rated insulation voltage U_i	V	600			
Rated impulse withstand voltage U_{imp}	kV	6			
Blocking voltage	V	800	1200	1200	1600
Slew rate	V/µs	1000			

	Rated impulse withstand strength Itsm	I^2t value
Type	A	A^2s
3RF2310-.AA.2	200	200
3RF2310-.AA.4	200	200
3RF2310-.AA.6	400	800
3RF2320-.A.	600	1800
3RF2330-.A.	600	1800
3RF2340-.AA.2	1200	7200
3RF2340-.AA.4	1200	7200
3RF2340-.AA.6	1150	6600
3RF2350-.A.	1150	6600
3RF2370-.A.	1150	6600
3RF2390-.A.	1150	6600

Control Circuit A1-A2:

Type		3RF23..-.AA**0.**	3RF23..-.AA**1.**		3RF23..-.AA**2.**	3RF23..-.AA**4.**
Control voltage U_s	V	DC 24 acc. to EN 61131-2	AC/DC 24		AC 110 ... 230	DC 4 ... 30
Max. control voltage U_s	V	30	AC 26,5	DC 30	253	30
Typical operating current	mA	20	20	20	15	20
Response voltage	V	15	AC 14	DC 15	90	4
Drop-out voltage	V	5	5	5	40	1
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10 %	--	50/60 ± 10 %	--
Switching times ON delay	ms	1 + Max. one half-wave	1 + Max. one hw.	40 + Max. one hw.	40 + Max. one half-wave	1 + Max. one half-wave
OFF delay	ms	1 + Max. one add. half-wave	1 + Max. one Hw	40 + Max. one hw.	40 + Max. one add. half-wave	1 + Max. one add. half-wave

General Data:

Ambient temperature		
During operation	°C	-25 ... 60
During storage	°C	-55 ... 80
Mounting altitude	m	0 ... 1000; at > 1000 m, please contact our Technical Assistance
Impact resistance acc. to DIN IEC 68	g/ms	15/11
Vibration resistance	g	2
Degree of protection		IP20
Electromagnetic compatibility	(EMC)	
Interference emission		
o Conducted interference voltage IEC 60 947-4-3		Class A for industrial applications[1]
o Radiated, high-frequency interference voltage IEC 60 947-4-3		Class A for industrial applications
Interference resistance		
o Electrostatic discharge acc. to IEC 61 000-4-2 (corresponds to severity 3)	kV	Contact discharge 4; air discharge 8; performance criterion 2
o Induced HF fields acc. to IEC 61 000-4-6	MHz	0.15 ... 80; 140 dBµV; performance criterion 1
o Burst acc. to IEC 61 000-4-4	kV	2/5.0 kHz; performance criterion 1
o Surge acc. to IEC 61 000-4-5	kV	Phase-to-ground 2; phase-to-phase 1; performance criterion 2
Dielectric Strength 50/60 Hz (Input, Output / Base)	V rms	4000

[1] **Attention!**
This product was constructed as a EMC Class A device. The use of this product in residential applications could lead to radio interferences. In such an application, additional filtering may be required.

Type **Connection, main contacts**		3RF23..-**1.** **Screw connection**	3RF23..-**2.** **Spring-loaded connection**	3RF23..-**3.** **Ring cable connection**
Conductor cross-section				
o Solid	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2x (0.5 ... 2.5)	
o Finely stranded with end sleeve	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2x (0.5 ... 1.5)	
o Finely stranded w/o end sleeve	mm^2		2x (0.5 ... 2.5)	
o Solid or stranded	AWG	2 x (14 ... 10)	2 x (18 ... 14)	
Stripping length	mm	10	10	
Terminal screw		M 4	-	M 5
o Tightening torque D 5...6 mm / PZ 2	Nm lb.in	2 ... 2.5 18 ... 22	- -	2 ... 2.5 18 ... 22
Cable lug DIN		-	-	DIN 46234 5-2.5 ... 5-25[2]
JIS		-	-	JIS C 2805 R 2-5 ... 14-5
Connection, control contacts				
Conductor cross-section with or without end sleeve	mm^2 mm^2 AWG	1 x (0.5 ... 2.5) 2 x (0.5 ... 1.0) 20 ... 12	0.5 ... 2.5 20 ... 12	1 x (0.5 ... 2.5) 2 x (0.5 ... 1.0) 20 ... 12
Stripping length	mm	7	10	7
Terminal screw		M 3	-	M 3
o Tightening torque D 3.5 / PZ 1	Nm lb.in	0.5 ... 0.6 4.5 ... 5.3	- -	0.5 ... 0.6 4.5 ... 5.3

Fused Design with Semiconductor Protection

Type	Full-range fuse LV HBC design gR/SITOR	Semiconductor protection fuse LV HBC design aR / 3NE80	Semiconductor protection fuse, cylindrical design		
			10 x 38 mm aR / SITOR	14 x 51 mm aR / SITOR	22 x 58 mm aR / SITOR
3RF2310-.AA.	3NE1813-0	3NE8015-1	3NC1010	3NC1410	3NC2220
3RF2320-.AA.	3NE1814-0	3NE8015-1	3NC1020	3NC1420	3NC2220
3RF2330-.AA.	3NE1803-0	3NE8003-1	3NC1032	3NC1432	3NC2232
3RF2340-.AA.	3NE1802-0	3NE8017-1	-	3NC1440	3NC2240
3RF2350-.AA.	3NE1817-0	3NE8018-1	-	3NC1450	3NC2250
3RF2370-.AA.2	3NE1820-0	3NE8020-1	-	-	3NC2280
3RF2370-.AA.4	3NE1020-2	3NE8020-1	-	-	3NC2280
3RF2370-.AA.5	3NE1020-2	3NE8020-1	-	-	3NC2280
3RF2370-.AA.6	3NE1020-2	3NE8020-1	-	-	3NC2280
3RF2390-.AA.2	3NE1021-2	3NE8021-1	-	-	3NC2200
3RF2390-.AA.4	3NE1021-2	3NE8021-1	-	-	3NC2280 *
3RF2390-.AA.5	3NE1020-2 *	3NE8021-1	-	-	3NC2280 *
3RF2390-.AA.6	3NE1020-2 *	3NE8021-1	-	-	3NC2280 *

* The fuses have a lower rated current than the solid state contactors.

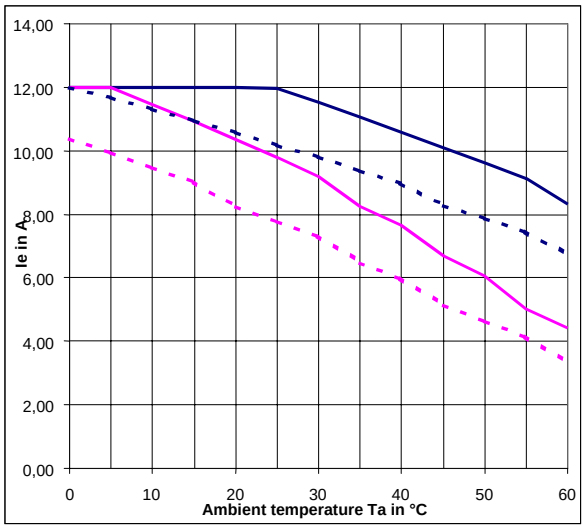
Accessories

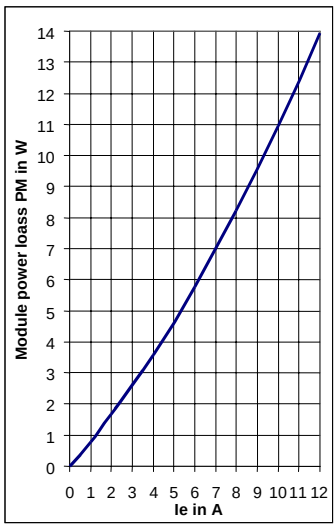
Function module	Order No.	Applicable for	Versions
Converter	3RF2900-0EA18	3RF23..-.AA**0.** 3RF23..-.AA**4**.	Us = 24 V DC
Load monitoring Basic	3RF2920-0FA08	3RF23..-**1**AA**0.** 3RF23..-**1**AA**4.**	Screw connection, Us = 24 V DC
Load monitoring Extended [3]	3RF29..-0GA..	3RF23..-**1.**	Screw connection
		3RF23..-**3.**	Ring cable connection
Terminal cover[4]	3RF2900-3PA88	3RF23..-**1.**	Screw connection
		3RF23..-**3.**	Ring cable connection

[2] Maximum breadth of the Cable lug 12 mm!
[3] For the exact allocation of the function modules, please refer to the LV 1 Catalog.
[4] The terminal covers can be easily adjusted for screw connection applications.

Characteristic Curves

3RF2310-.

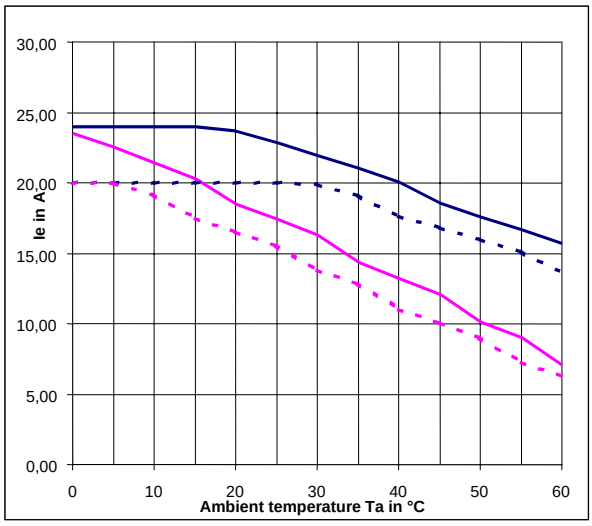


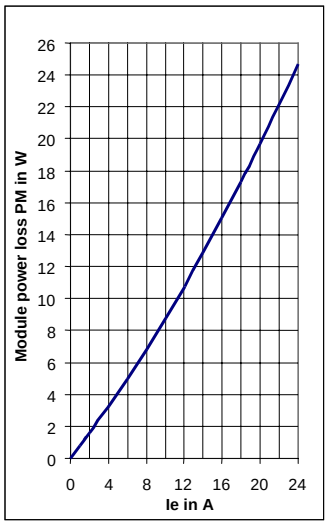


Upper curves:
I_{max} thermal limit current
Lower curves:
Rated current Ie
acc. to
DIN EN 60947-4-3

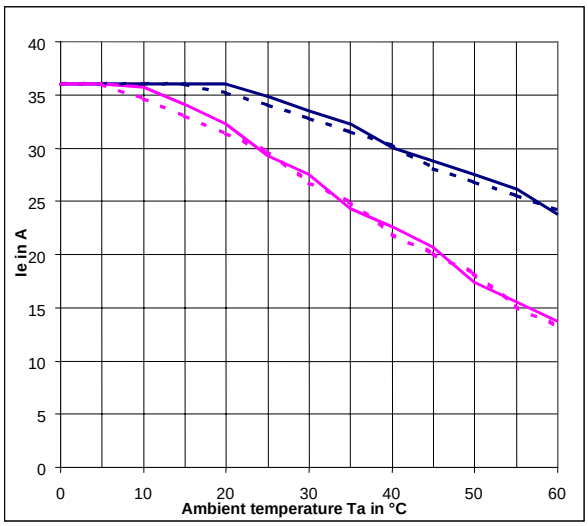
Continuous lines:
Stand-alone mounting
Dashed lines:
Side-by-side mounting

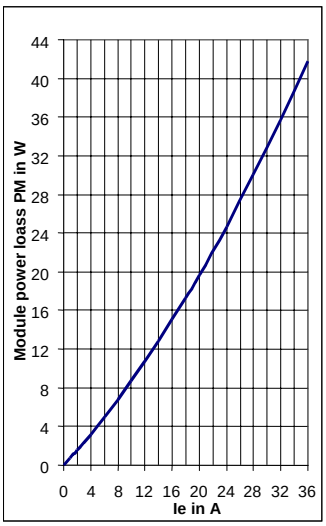
3RF2320-.



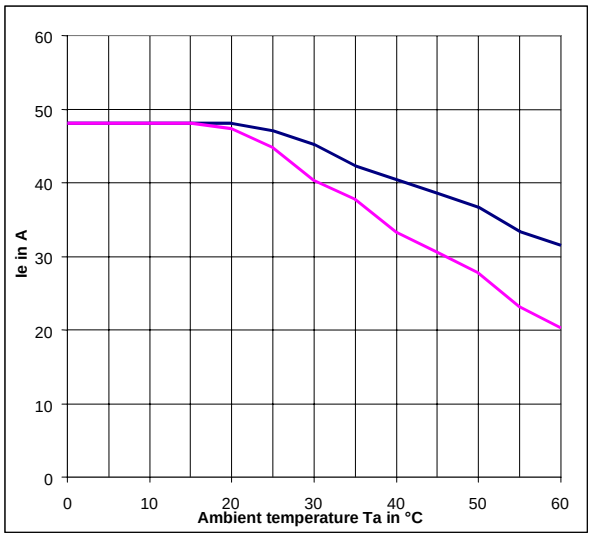


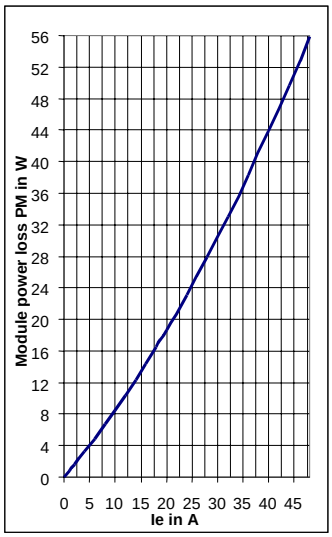
3RF2330-.





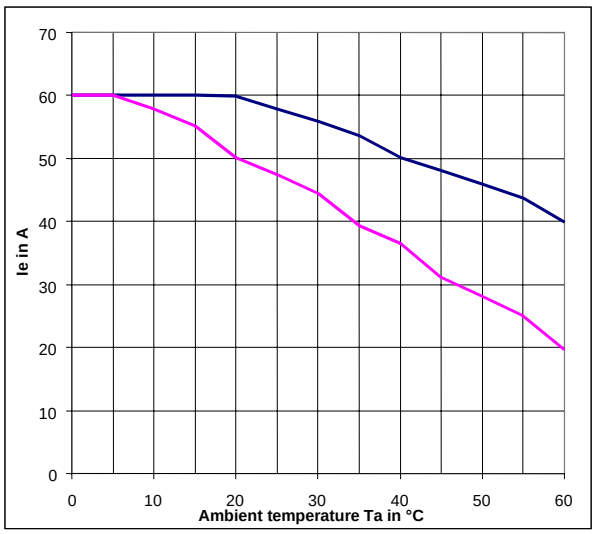
3RF2340-.[5]

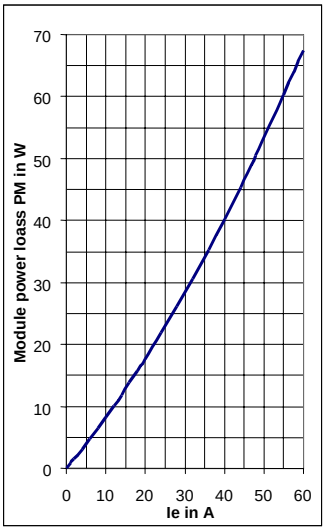




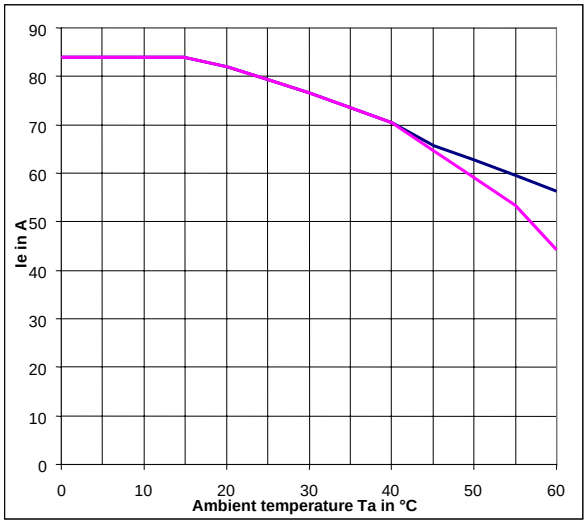
Upper curves:
I_{max} thermal limit current
Lower curves:
Rated current Ie
acc. to
DIN EN 60947-4-3

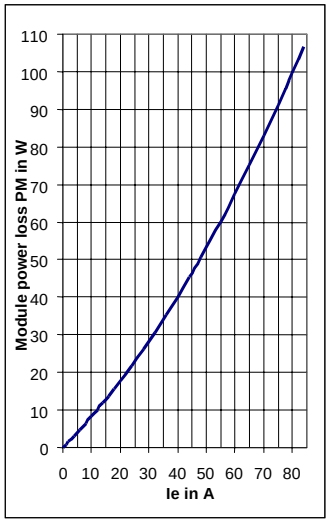
3RF2350-.





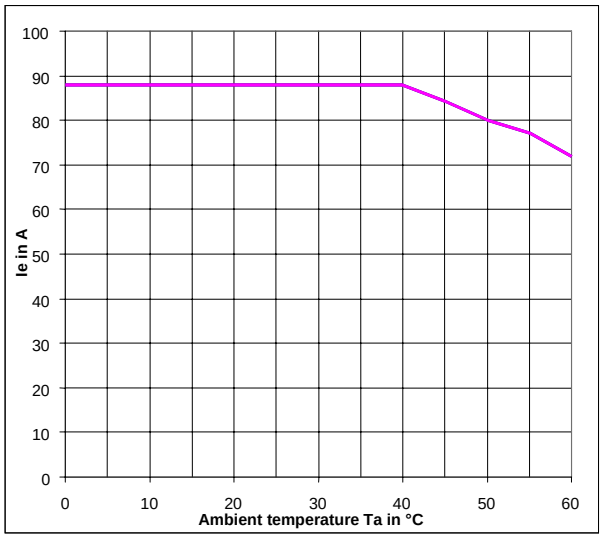
3RF2370-.[5]

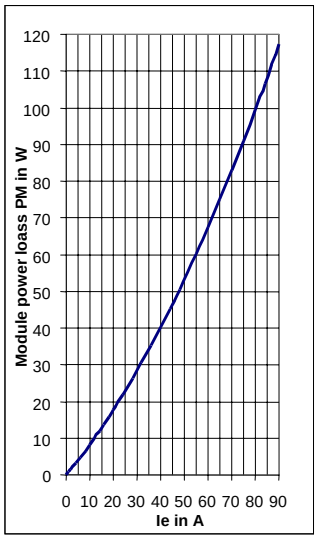




[5] Identical current / temperature curves for stand-alone and side-by-side mounting

3RF2390-.[5]

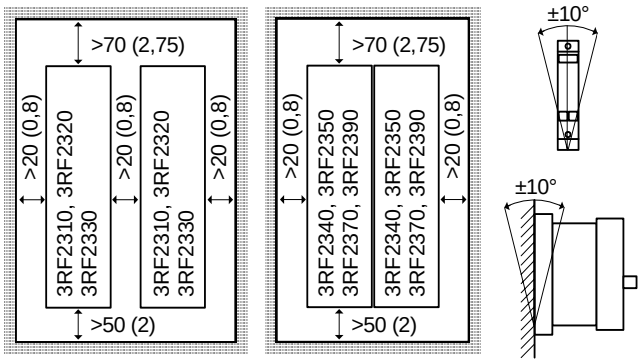




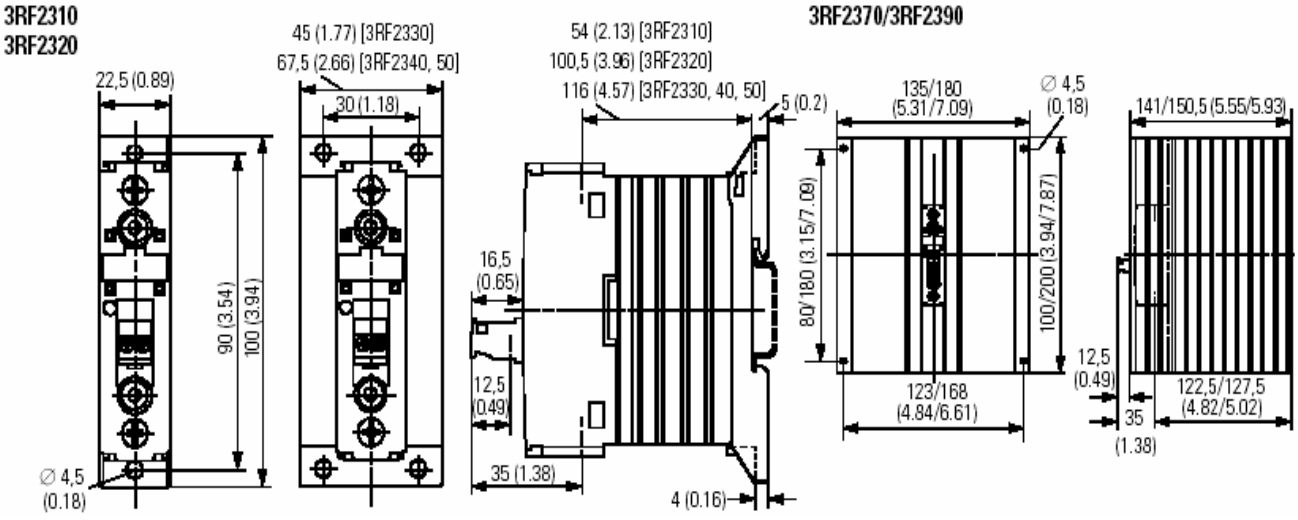
Curve:
I_{max} thermal limit current
and
rated current Ie
acc. to DIN EN 60947-4-3

For:
Stand-alone mounting
and
side-by-side mounting

Mounting Instructions [6]:



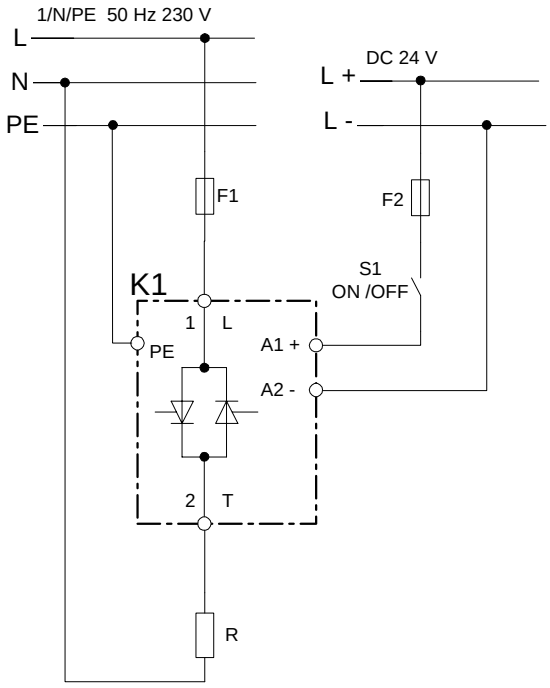
Dimension Drawings :



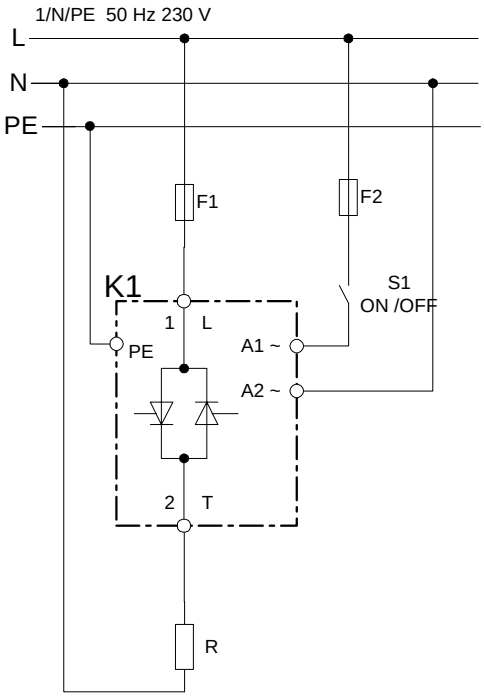
[6] Dimensions in mm, (in);
Stand-alone mounting, Characteristic curves show derating for side-by-side mounting

Device / Example Circuit Diagram:

3RF23**..**-**.**AA**0.**
Us = 24 V DC



3RF23**..**-**.**AA**2.**
Us = 110 ... 230 V AC



F1 Main circuit fuse
(semiconductor protection recommended)
F2 Control circuit fuse
K1 3RF2 solid state contactor
R Load resistance

Solid-State Relays

Zero-point switching, without heatsink

Main Characteristics:

Space-saving, width of only 22.5 mm
LED display
Various connection technologies
Plug-in control terminal
Degree of protection IP 20
Zero switching

Standards / Approvals:

DIN EN 60947-4-3
UL 508 / CSA
CE
C-Tick

Ordering Key:

3RF21	**20**	**- 1**	**A**	**A**	**0**	**2**
Solid state relay without heat sink	Max. load current 20 = 20 A 30 = 30 A 50 = 50 A 70 = 70 A 90 = 88 A	Connection technology 1 = Screw connection 2 = Spring-loaded 3 = Ring cable connection M5	Switching function A = Zero-point switching	Controlled phases A = Single-phase	Control voltage 0 = 24 V DC 2 = 110 - 230 V AC 4 = 4 - 30 V DC *	Operating voltage 2 = 24 - 230 V 4 = 48 - 460 V 5 = 48 - 600 V 6 = 48 - 600 V

Not all possible versions are available ex stock.

Main Circuit[1]:

	I_{max}		I_e IEC 947-4-3		I_e UL/CSA		Power loss	Min.load current	Max. leakage current
Type	A	With Rthha / 40 °C	A	With Rthha / 40 °C	A	With Rthha / 50 °C	With I_{max} W	A	mA
3RF2120-**.**	20	2.0 K/W	20	1.7 K/W	20	1.3 K/W	28.5	0.1	10
3RF2130-1**.**	30	1.1 K/W	30	0.79 K/W	30	0.56 K/W	44	0.5	10
3RF2150-1**.**	50	0.68 K/W	50	0.48 K/W	50	0.33 K/W	66	0.5	10
3RF2150-2**.**			20	2.60 K/W	20	2.90 K/W			
3RF2150-3**.**			50	0.48 K/W	50	0.33 K/W			
3RF2170-1**.**	70	0.40 K/W	50	0.77 K/W	50	0.60 K/W	94	0.5	10
3RF2190-1**.**	88	0.33 K/W	50	0.94 K/W	50	0.85 K/W	118	0.5	10
3RF2190-2**.**			20	2.80 K/W	20	3.50 K/W			
3RF2190-3**.**			88	0.22 K/W	83	0.19 K/W			

Type		3RF21**..**-.AA.**2**	3RF21**..**-.AA.**4**	3RF21**..**-.AA.**5**	3RF21**..**-.AA.**6**
Rated operating voltage U_e	V	24 ... 230	48 ... 460	48 ... 600	48 ... 600
• Voltage range	V	20 ... 253	40 … 506	40 … 660	40 … 660
• Rated frequency	Hz	50/60 ± 10 %			
Rated insulation voltage U_i	V	600			
Rated impulse withstand voltage U_{imp}	kV	6			
Blocking voltage	V	800	1200	1200	1600
Slew rate	V/µs	1000			

[1] The current I_{max} provides information about the performance of the solid-state relays. The actual permitted rated operating current I_e can be smaller depending on the connection method and cooling conditions. The spring-loaded terminals version can be used for a rated current of up to approx. 20 A with one conductor and up to approx. 40 A with two conductor on each terminal.

Type	Rated impulse withstand strength Itsm A	I^2t value A^2s
3RF2120-.	200	200
3RF2130-.AA.2	300	450
3RF2130-.AA.4	300	450
3RF2130-.AA.6	400	800
3RF2150-.	600	1800
3RF2170-.AA.2	1200	7200
3RF2170-.AA.4	1200	7200
3RF2170-.AA.6	1150	6600
3RF2190-.	1150	6600

Control Circuit A1-A2:

Type		3RF21..-.AA**0.**	3RF21..-.AA**2.**	3RF21..-.AA**4.**
Control voltage U_s	V	24 DC (EN 61131-2)	110 ... 230 AC	4 ... 30 DC
Max. control voltage U_s	V	30	253	30
Typical operating current	mA	20	15	20
Response voltage	V	15	90	4
Drop-out voltage	V	5	40	1
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10 %	--
Switching times ON delay	ms	1 + max. one half-wave	40 + max. one half-wave	1 + max. one half-wave
OFF delay	ms	1 + max. one half-wave	40 + max. one half-wave	1 + max. one half-wave

General Data:

Ambient temperature		
During operation, derating as of 40 °C	°C	-25 ... 60
During storage	°C	-55 ... 80
Mounting altitude	m	0 ... 1000; at > 1000 m, please contact our Technical Assistance
Impact resistance acc. to DIN IEC 68	g/ms	15/11
Vibration resistance	g	2
Degree of protection		IP20
Electromagnetic compatibility	(EMC)	
Interference emission		
o Conducted interference voltage IEC 60 947-4-3		Class A for industrial applications[2]
o Radiated, high-frequency interference voltage IEC 60 947-4-3		Class A for industrial applications
Interference resistance		
o Electrostatic discharge acc. to IEC 61 000-4-2 (corresponds to severity 3)	kV	Contact discharge 4; air discharge 8; performance criterion 2
o Induced HF fields acc. to IEC 61 000-4-6	MHz	0.15 ... 80; 140 dBµV; performance criterion 1
o Burst acc. to IEC 61 000-4-4	kV	2/5.0 kHz; performance criterion 1
o Surge acc. to IEC 61 000-4-5	kV	Phase-to-ground 2; phase-to-phase 1; performance criterion 2
Dielectric Strength 50/60 Hz (Input, Output / Base)	V rms	4000

[2] **Attention!**
This product was constructed as a EMC Class A device. The use of this product in residential applications could lead to radio interferences. In such an application, additional filtering may be required.

Type **Connection, main contacts**		3RF21..-**1.** **Screw connection**	3RF21..-**2.** **Spring-loaded connection**	3RF21..-**3.** **Ring cable connection**
Conductor cross-section				
o Solid	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2x (0.5 ... 2.5)	
o Finely stranded with end sleeve	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2x (0.5 ... 1.5)	
o Finely stranded w/o end sleeve	mm^2		2x (0.5 ... 2.5)	
o Solid or stranded	AWG	2 x (14 ... 10)	2 x (18 ... 14)	
Stripping length	mm	10	10	
Terminal screw		M 4	-	M 5
o Tightening torque	Nm	2 ... 2.5	-	2 ... 2.5
D 5...6 mm / PZ 2	lb.in	18 ... 22	-	18 ... 22
Cable lug DIN		-	-	DIN 46234 5-2.5 ... 5-25[3]
JIS		-	-	JIS C 2805 R 2-5 ... 14-5

Type **Connection, auxiliary/control contacts**		3RF21..-**1.** **Screw connection**	3RF21..-**2.** **Spring-loaded connection**	3RF21..-**3.** **Ring cable connection**
Conductor cross-section with or without end sleeve	mm^2	1 x (0.5 ... 2.5)	0.5 ... 2.5	1 x (0.5 ... 2.5)
	mm^2	2 x (0.5 ... 1.0)		2 x (0.5 ... 1.0)
	AWG	20 ... 12	20 ... 12	20 ... 12
Stripping length	mm	7	10	7
Terminal screw		M 3	-	M 3
o Tightening torque	Nm	0.5 ... 0.6	-	0.5 ... 0.6
D 3.5 / PZ 1	lb.in	4.5 ... 5.3	-	4.5 ... 5.3

Fused Design with Semiconductor Protection:

Type	Full-range fuse LV HBC design gR/SITOR	Semiconductor protection fuse, cylindrical design		
		10 x 38 mm aR / SITOR	14 x 51 mm aR / SITOR	22 x 58 mm aR / SITOR
3RF2120-....2	3NE1814-0	3NC1020	3NC1420	3NC2220
3RF2120-....4	3NE1813-0	3NC1016	3NC1420	3NC2220
3RF2130-....2	3NE1815-0	3NC1032	3NC1430	3NC2232
3RF2130-....4	3NE1815-0	3NC1025	3NC1430	3NC2232
3RF2130-....6	3NE1815-0	3NC1032	3NC1430	3NC2232
3RF2150-....2	3NE1817-0	-	3NC1450	3NC2250
3RF2150-....4	3NE1802-0	-	3NC1450	3NC2250
3RF2150-....6	3NE1803-0	-	3NC1450	3NC2250
3RF2170-....2	3NE1820-0	-	-	3NC2280
3RF2170-....4	3NE1818-0	-	-	3NC2280
3RF2170-....6	3NE1817-0	-	-	3NC2280
3RF2190-....2	3NE1820-0	-	-	3NC2200
3RF2190-....4	3NE1021-2	-	-	3NC2280
3RF2190-....6	3NE1020-2	-	-	3NC2280

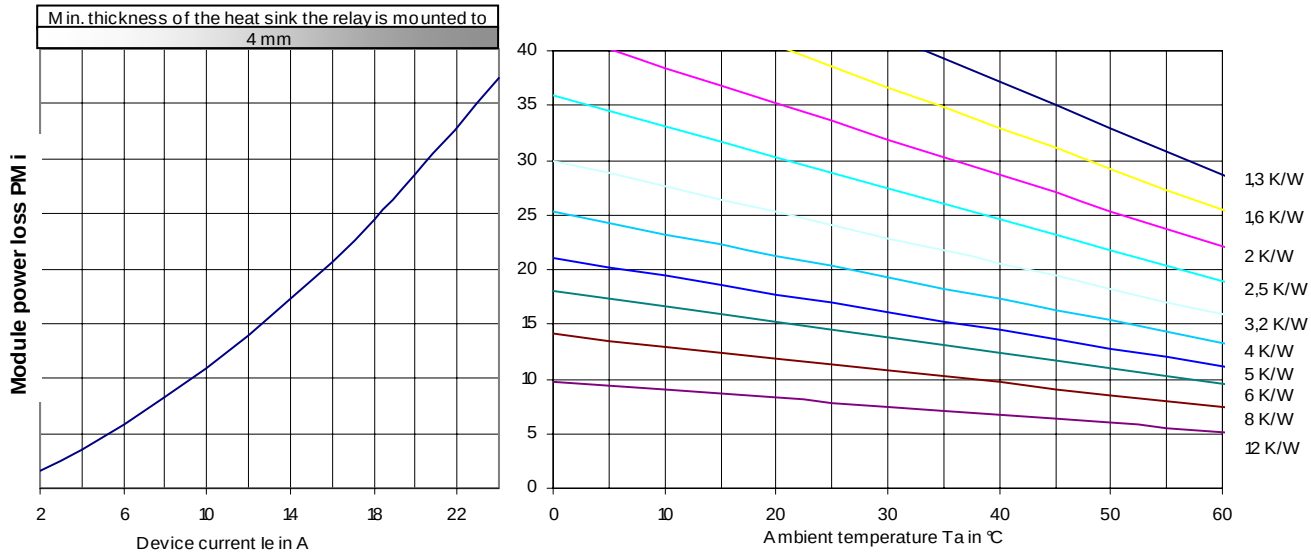
[3] Maximum breadth of the Cable lug 12 mm!

Accessories:

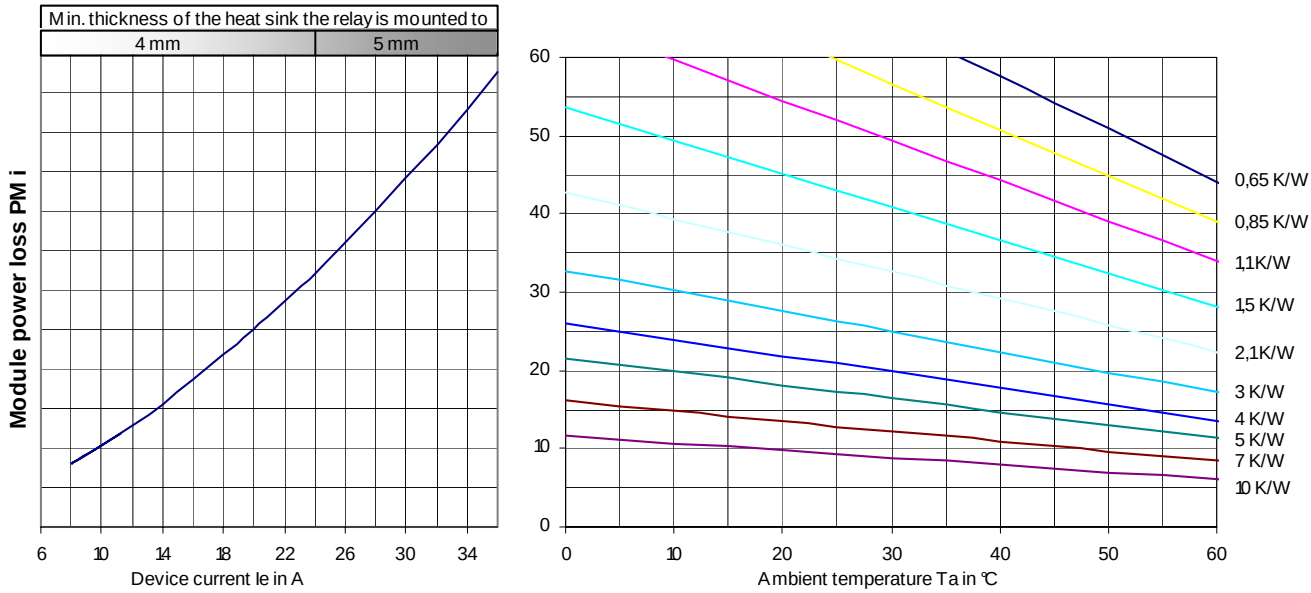
Function module	Order No.	Applicable for the following types	Versions
Converter	3RF2900-0EA18	3RF21..-.AA**0**. 3RF21..-.AA**4**.	Us = 24 V AC/DC
Load monitoring Basic	3RF2920-0FA08	3RF21..-**1**AA**0**. 3RF21..-**1**AA**4**.	Screw connection Us = 24 V DC
Load monitoring Extended [4]	3RF29..-0GA..	3RF21..-**1**.	Screw connection
		3RF21..-**3**.	Ring cable connection
Terminal cover[5]	3RF2900-3PA88	3RF21..-**1**.	Screw connection
		3RF21..-**3**.	Ring cable connection

Characteristic Curves:

3RF21**2**0-

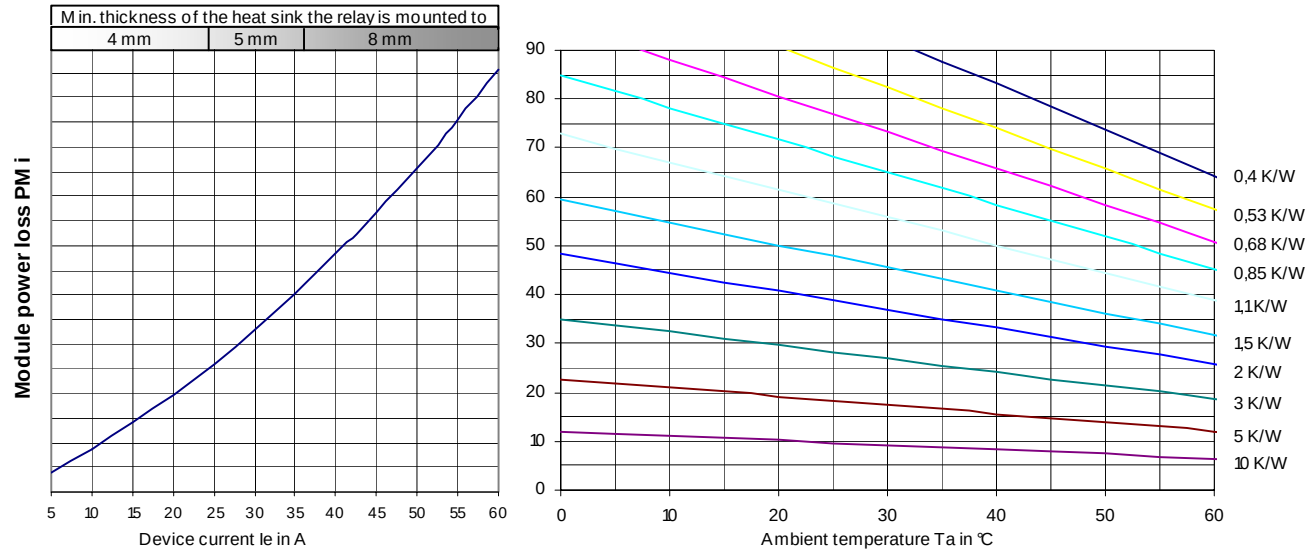


3RF21**3**0-

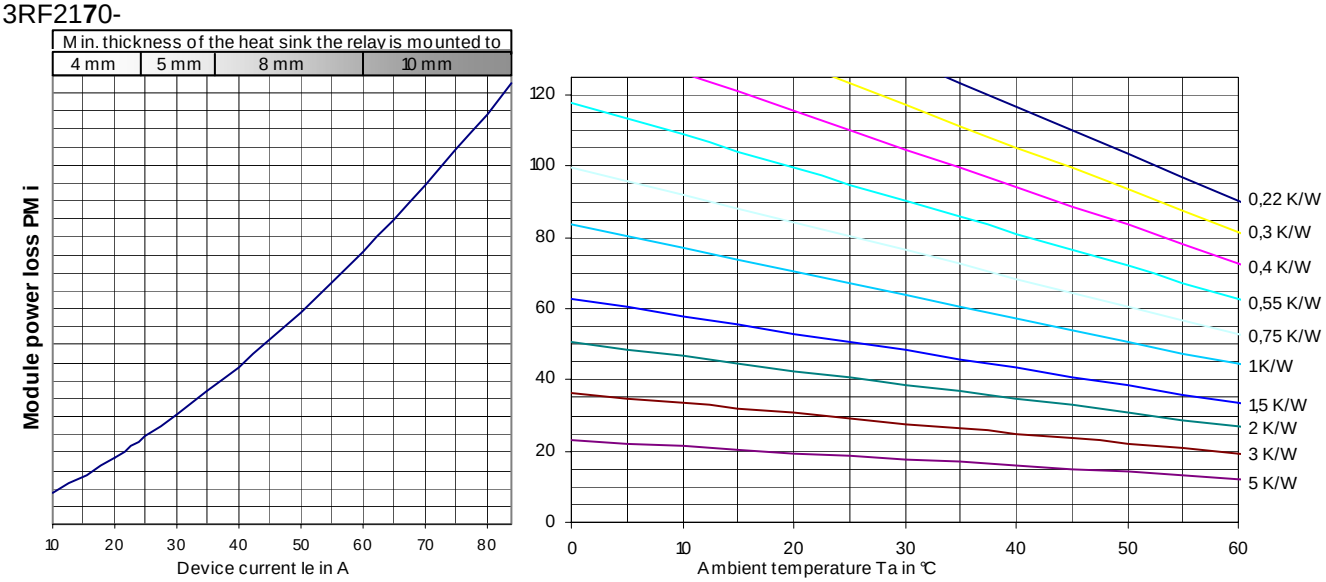


[4] For the exact allocation of the function modules, please refer to the LV 1 Catalog.
[5] The terminal cover can be easily adjusted for screw connection applications.

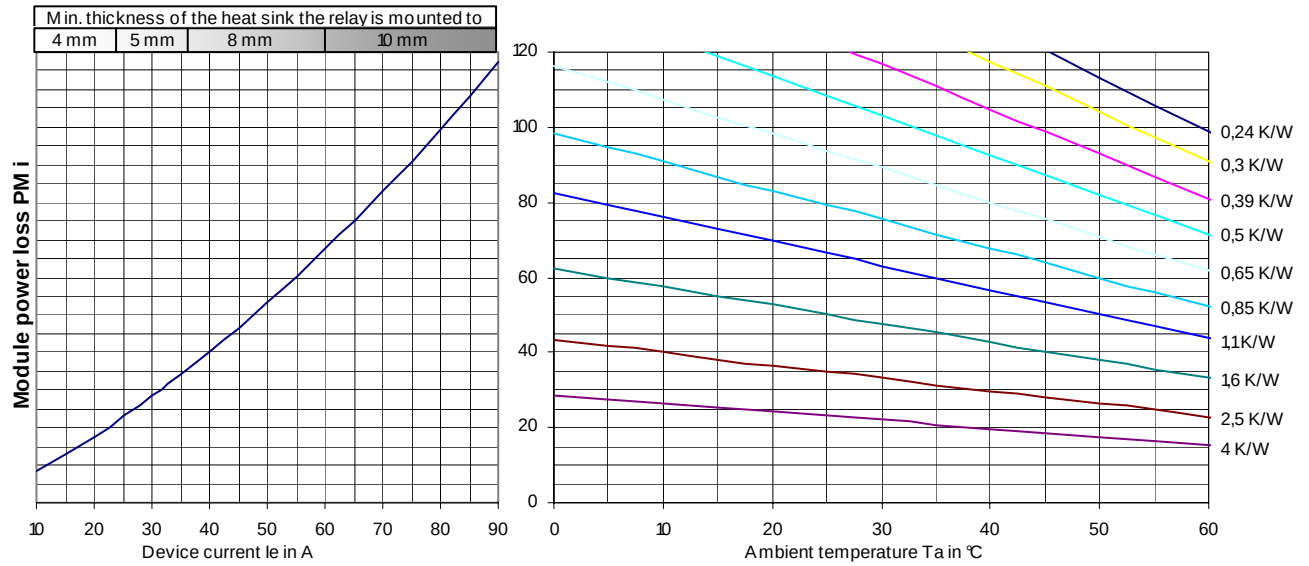
3RF21**5**0-



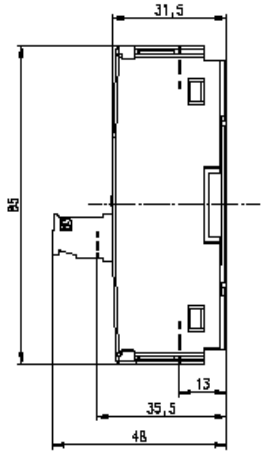
3RF21**7**0-



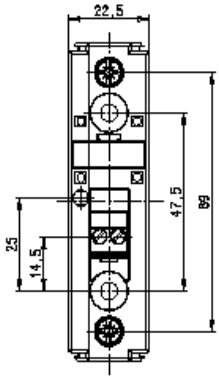
3RF21**9**0-



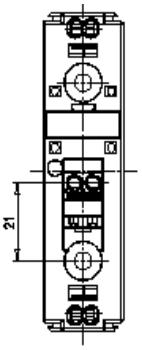
Dimension Drawings:



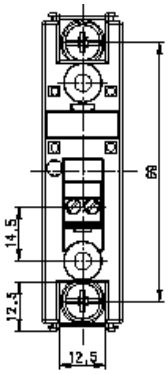
Screw connection



Spring-loaded connection
All other dimensions as with screw connection

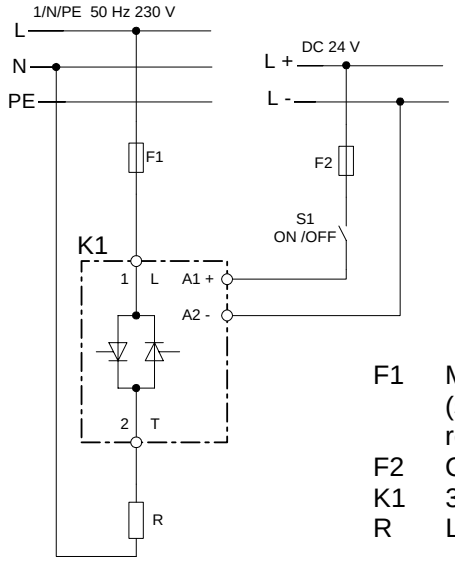


Ring cable connection
All other dimensions as with screw connection



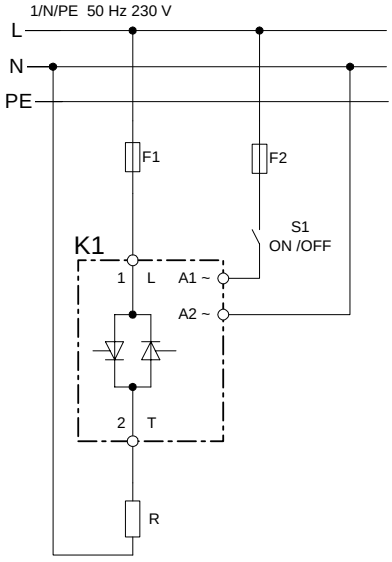
Device / Example Circuit Diagram:

3RF21**..**-.AA**0.**
Us = 24 V DC



F1 Main circuit fuse (semiconductor protection recommended)
F2 Control circuit fuse
K1 3RF2 solid state relay
R Load resistance

3RF21**..**-.AA**2.**
Us = 110 ... 230 V AC



Solid State Relays, 2-phase controlled

Zero-Point switching, heatsink intgrated

Main Characteristics:

Two-phase controlled
Zero switching
LED display
Various connection technologies
Plug-in control terminal
Degree of protection IP 20
Insulated mounting foot

Standards / Approvals:

DIN EN 60947-4-3
UL 508 / CSA[1]

CE
C-Ti ck

Ordering Key:

3RF24	10	- 1	A	B	4	5
3-phase solid state contactor with heat sink	Max. load current 10 = 10,5 A 20 = 22 A 30 = 30 A 40 = 40 A 50 = 50 A	Connection technology 1 = Screw connection 2 = Spring-loaded connection 3 = Ring cable connection M5	Switching function A = Zero-point switching	Controlled phases B = two-phase	Control voltage 4 = 4 - 30 VDC 5 = 190 - 230 VAC	Operating voltage 5 = 48 - 600 V

Not all possible versions are available ex stock!

Main Circuit:

Values for 40 °C ambient temperature!	I_{AC-51}	I_e acc. to IEC947-4-3	Ie [50°C] UL/CSA	Power loss with I_{AC-51}	Min. load current	Max. leakage current
Type	A	A	A	W	A	mA
3RF2410-.AB.	10,5	7	7	23	0,1	10
3RF2420-.AB.	22	15	15	44	0,5	
3RF2430-.AB.	30	22	22	61		
3RF2440-.AB.	40	30	30	80		
3RF2450-.AB.	50	38	38	107		

Type		3RF24..-.AB.**5**
Rated operating voltage U_e	V	48 ... 600
• Voltage range	V	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %
Rated insulation voltage U_i	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Slew rate	V/µs	1000

	Rated impulse withstand strength Itsm	I^2t value	Blocking voltage
Type A		A^2s V	
3RF2410-.AB.	200	200	1200
3RF2420-.AB.	600	1800	1200
3RF2430-.AB.	1200	7200	1200
3RF2440-.AB.	1150	6600	1600
3RF2450-.AB.	1150	6600	1600

[1] Use overvoltage protection device; max cut-off-voltage 6.000 V; min energy handling capability 100 J

Control Circuit A1-A2:

Type		3RF24..-.AB**5**.	3RF24..-.AB**4**.
Control voltage U_s	V	AC 190 ... 230	DC 4 ... 30
Max. control voltage U_s	V	253	30
Typical operating current	mA	15	30
Response voltage	V	180	4
Drop-out voltage	V	<40	<1
Rated frequency of the control supply voltage	Hz	50/60 ± 10 %	--
Switching times ON delay	ms	40 + Max. one half-wave	1 + Max. one half-wave
OFF delay	ms	40 + Max. one add. half-wave	1 + Max. one add. half-wave

General Data:

Ambient temperature		
During operation	°C	-25 ... 60
During storage	°C	-55 ... 80
Mounting altitude	m	0 ... 1000; at > 1000 m, please contact our Technical Assistance
Impact resistance acc. to DIN IEC 68	g/ms	15/11
Vibration resistance	g	2
Degree of protection		IP20
Electromagnetic compatibility (EMC)		
Interference emission		
o Conducted interference voltage IEC 60 947-4-3		Class A for industrial applications[2]
o Radiated, high-frequency interference voltage IEC 60 947-4-3		Class A for industrial applications
Interference resistance		
o Electrostatic discharge acc. to IEC 61 000-4-2 (corresponds to severity 3)	kV	Contact discharge 4; air discharge 8; performance criterion 2
o Induced HF fields acc. to IEC 61 000-4-6	MHz	0.15 ... 80; 140 dBµV; performance criterion 1
o Burst acc. to IEC 61 000-4-4	kV	2/5.0 kHz; performance criterion 1
o Surge acc. to IEC 61 000-4-5	kV	Phase-to-ground 2; phase-to-phase 1; performance criterion 2
Dielectric Strength 50/60 Hz (Input, Output / Base)	V rms	4000

[2] **Attention!**
This product was constructed as an EMC Class A device. The use of this product in residential applications could lead to radio interferences. In such an application, additional filtering may be required.

Type		3RF24..-**1**.	3RF24..-**2**.	3RF24..-**3**.
Connection, main contacts		**Screw connection**	**Spring-loaded connection**	**Ring cable connection**
Conductor cross-section				
o Solid	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2x (0.5 ... 2.5)	
o Finely stranded with end sleeve	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2x (0.5 ... 1.5)	
o Finely stranded w/o end sleeve	mm^2		2x (0.5 ... 2.5)	
o Solid or stranded	AWG	2 x (14 ... 10)	2 x (18 ... 14)	
Stripping length	mm	10	10	
Terminal screw		M 4	-	M 5
o Tightening torque	Nm	2 ... 2.5	-	2 ... 2.5
D 5...6 mm / PZ 2	lb.in	18 ... 22	-	18 ... 22
Cable lug DIN		-	-	DIN 46234 5-2.5 ... 5-25
JIS		-	-	JIS C 2805 R 2-5 … 14-5
Connection, control contacts				
Conductor cross-section with or without end sleeve	mm^2	1 x (0.5 ... 2.5)	0.5 ... 2.5	1 x (0.5 ... 2.5)
	mm^2	2 x (0.5 ... 1.0)		2 x (0.5 ... 1.0)
	AWG	20 ... 12	20 ... 12	20 ... 12
Stripping length	mm	7	10	7
Terminal screw		M 3	-	M 3
o Tightening torque	Nm	0.5 ... 0.6	-	0.5 ... 0.6
D 3.5 / PZ 1	lb.in	4.5 ... 5.3	-	4.5 ... 5.3

Fused Design with Semiconductor Protection

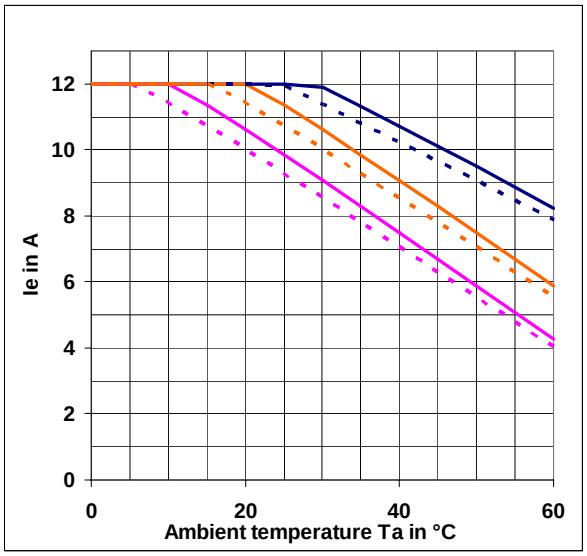
Type	Full-range fuse LV HBC design gR/SITOR	Semiconductor protection fuse LV HBC design aR / 3NE80	Semiconductor protection fuse, cylindrical design		
			10 x 38 mm aR / SITOR	14 x 51 mm aR / SITOR	22 x 58 mm aR / SITOR
3RF2410-.AB.	3NE1813-0	3NE8015-1	3NC1012	3NC1415	3NC2220
3RF2420-.AB.	3NE1814-0	3NE8015-1	3NC1025	3NC1425	3NC2225
3RF2430-.AB.	3NE1803-0	3NE8003-1	3NC1032	3NC1432	3NC2232
3RF2440-.AB.	3NE1802-0	3NE8017-1	-	3NC1450	3NC2250
3RF2450-.AB.	3NE1817-0	3NE8018-1	-	3NC1450	3NC2263

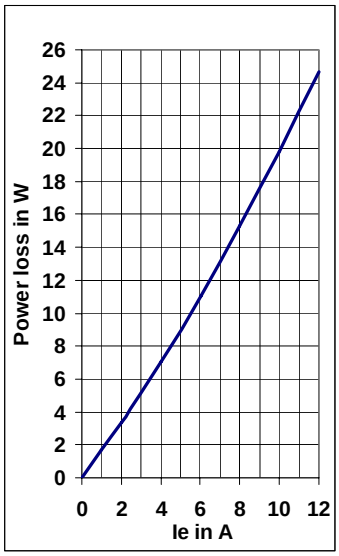
Accessories

Function module	Order No.	Applicable for	Versions
Converter	3RF2900-0EA18	3RF24..-.AB**4**.	Us = DC 24 V

Characteristic Curves

3RF2410-.

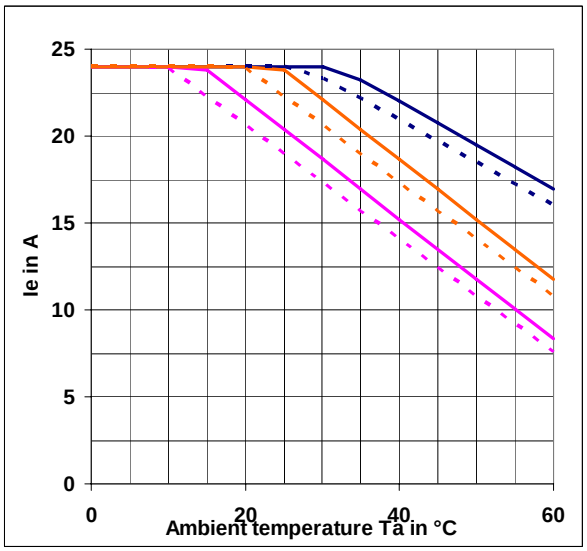


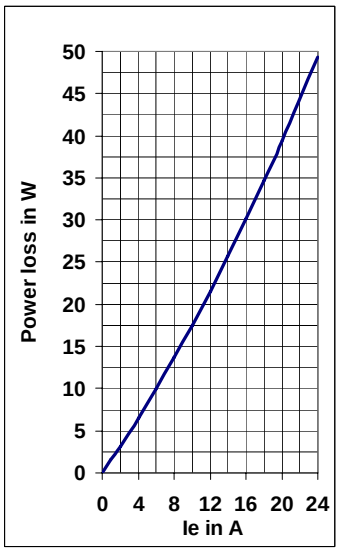


Upper curves:
I_{max} thermal limit current
Middle curves:
Rated current I_e acc. to UL
Lower curves:
Rated current I_e
acc. to
DIN EN 60947-4-3

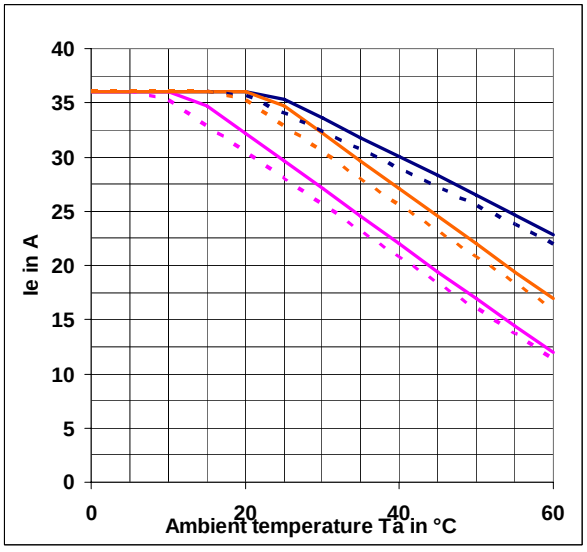
Continuous lines:
Stand-alone mounting
Dashed lines:
Side-by-side mounting

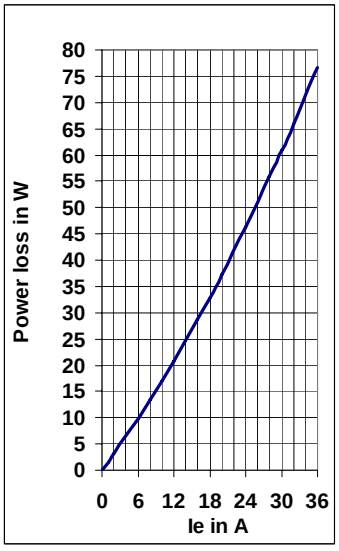
3RF2420-.



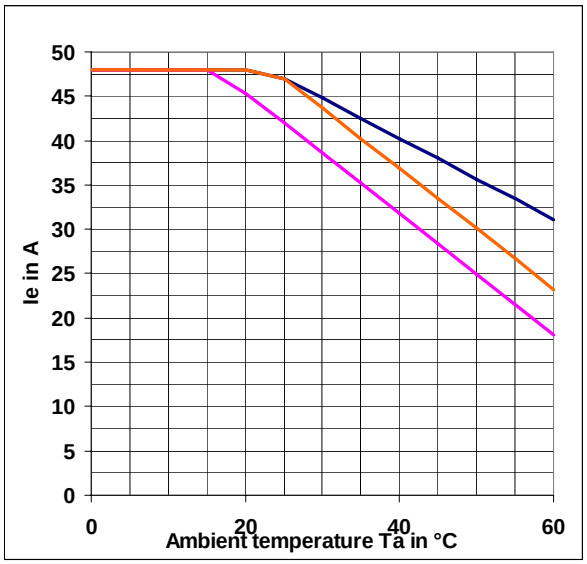


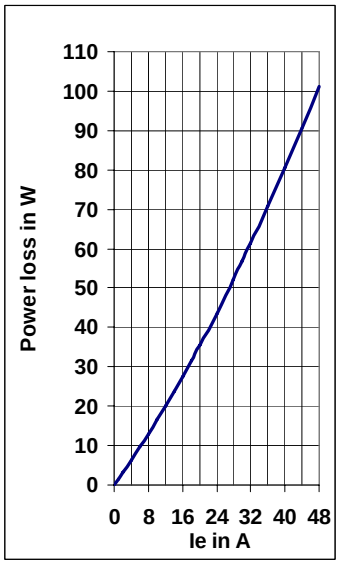
3RF2430-.





3RF2440-.[3]

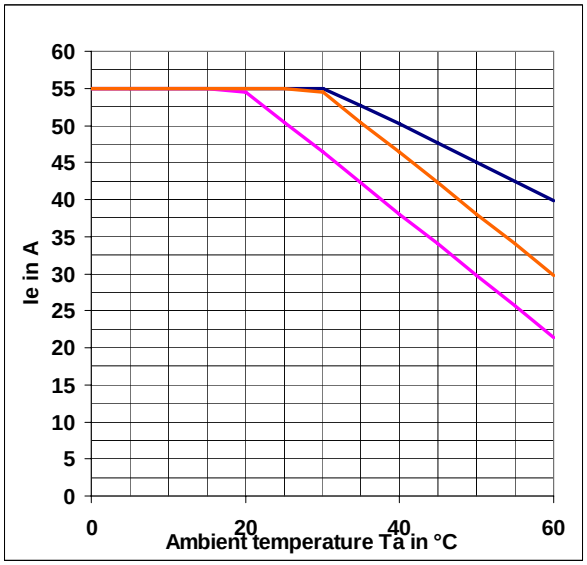


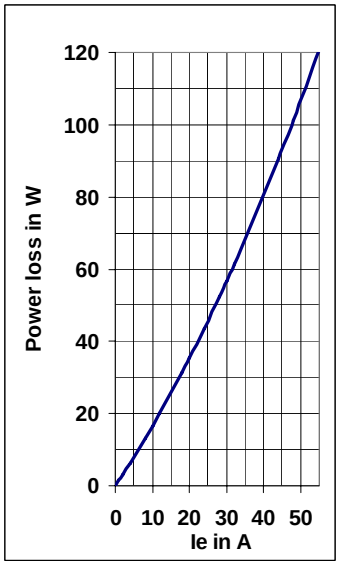


Upper curves:
I_{max} thermal limit current
Middle curves:
Rated current I_e acc. to UL
Lower curves:
Rated current I_e
acc. to
DIN EN 60947-4-3

For:
Stand-alone and side-by-side mounting

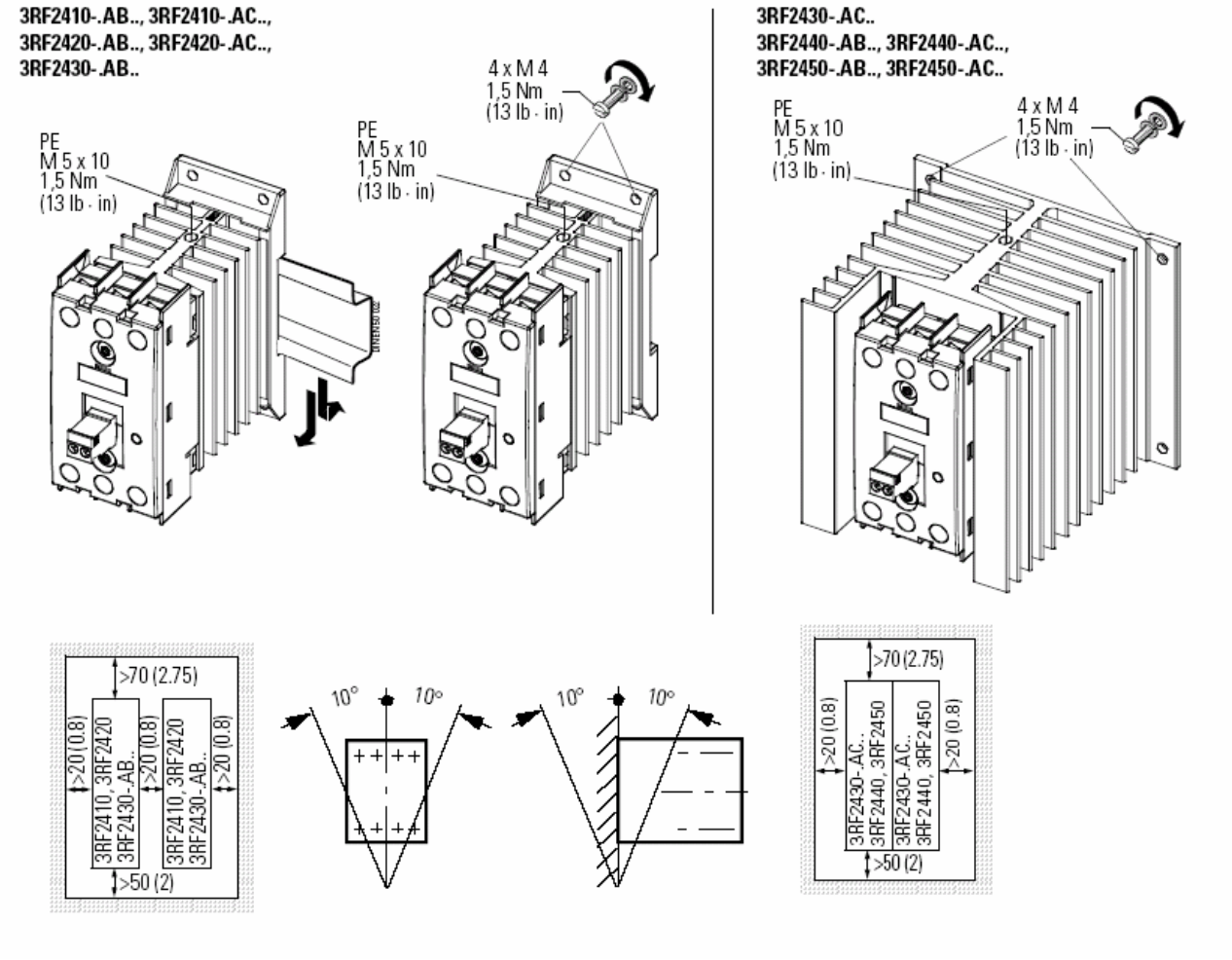
3RF2450-.[3]



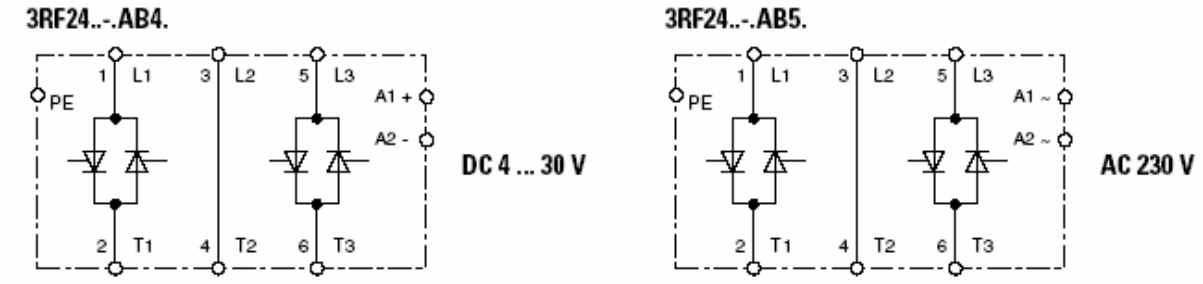


[3] Identical current/temperature curves for Stand-alone and side by side mounting.

Mounting Instructions: [4]



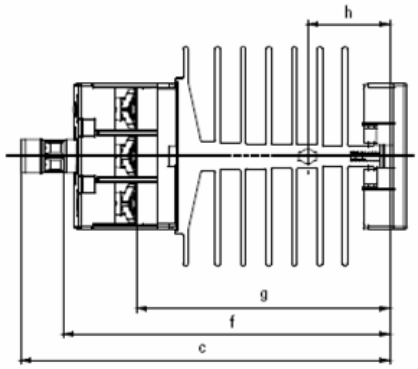
Device / Example Circuit Diagram:

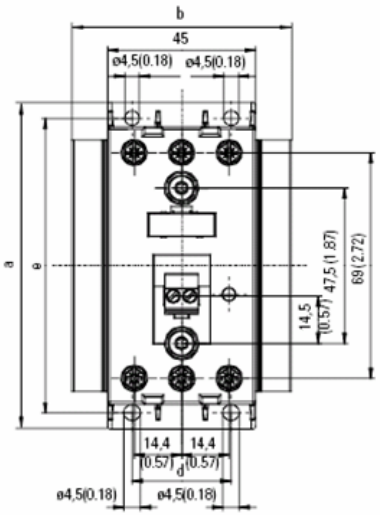


[4] Dimensions in mm, (in);
Stand-alone mounting, Characteristic Curves shows derating for Side-by-side mounting

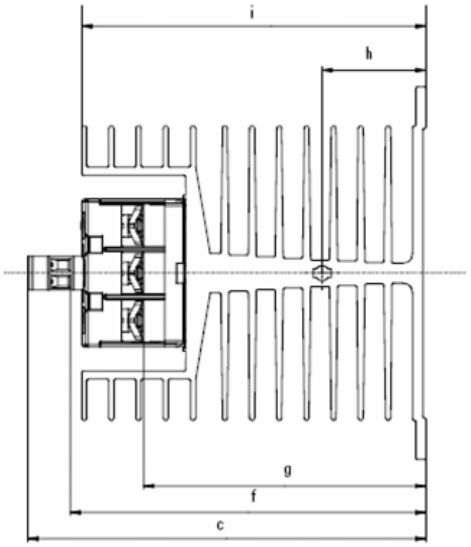
Dimension Drawings [5]:

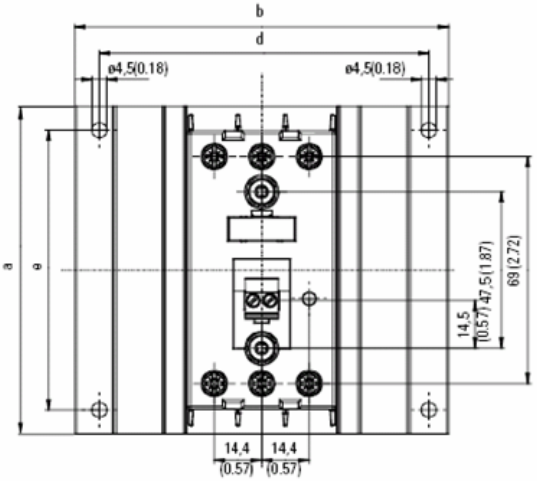
3RF2410-.AB.., 3RF2410-.AC..,
3RF2420-.AB.., 3RF2420-.AC..,
3RF2430-.AB..





3RF2430-.AC..
3RF2440-.AB.., 3RF2440-.AC..,
3RF2450-.AB.., 3RF2450-.AC..





	a	b	c	d	e	f	g	h	i
3RF2410-.AC.. 3RF2410-.AB..	100 (3.94)	45 (1.77)	104,5 (4.11)	30 (1.18)	90 (3.54)	91,5 (3.60)	69,5 (2.74)	25 (0.98)	–
3RF2420-.AB..	100 (3.94)	67 (2.64)	112,5 (4.43)	30 (1.18)	90 (3.54)	99,5 (3.92)	77 (3.03)	25 (0.98)	–
3RF2420-.AC.. 3RF2430-.AB..	100 (3.94)	89,5 (3.52)	112,5 (4.43)	30 (1.18)	90 (3.54)	99,5 (3.92)	77 (3.03)	25 (0.98)	–
3RF2430-.AC.. 3RF2440-.AB..	100 (3.94)	113,5 (4.47)	121 (4.76)	100 (3.94)	85 (3.35)	108 (4.25)	86 (3.39)	31,5 (1.24)	104,5 (4.11)
3RF2440-.AC.. 3RF2450-.AB..	100 (3.94)	157,5 (6.20)	121 (4.76)	146 (5.75)	80 (3.15)	108 (4.25)	86 (3.39)	31,5 (1.24)	104,5 (4.11)
3RF2450-.AC..	180 (7.09)	157,5 (6.20)	121 (4.76)	146 (5.75)	160 (6.30)	108 (4.25)	86 (3.39)	31,5 (1.24)	104,5 (4.11)

[5] Dimensions in mm, (in)

Solid State Relays, 2-phase controlled

Zero-point switching, without heatsink

Main Characteristics:

2-phase control
Space-saving, width of only 45 mm
LED display
Various connection technologies
Plug-in control terminal
Degree of protection IP 20

Standards / Approvals:

DIN EN 60947-4-3
UL 508 / CSA[1]
CE / C-Tick

Ordering Key:

3RF22	**30**	**- 1**	**A**	**B**	**4**	**5**
Solid state relay without heat sink	Max. load current 30 = 30 A 55 = 55 A	Connection technology 1 = Screw connection 2 = Spring-loaded 3 = Ring cable connection M5	Switching function A = Zero-point switching	Controlled phases B = 2-phase	Control voltage 4 = 4 - 30 VDC	Operating voltage 5 = 48 - 600 V

Not all possible versions are available ex stock.

Main Circuit[2]:

	I_{max}		I_e IEC 947-4-3		I_e UL/CSA		Power loss	Min.load current	Max. leakage current
Type	A	With Rthha / 40 °C	A	With Rthha / 40 °C	A	With Rthha / 50 °C	With I_{max} W	A	mA
3RF2230-.	30	0,57 K/W	30	0,57 K/W	30	0,44 K/W	81	0,5	10
3RF2230-2.			20	1,36 K/W	20	1,15 K/W			
3RF2255-.	55	0,18 K/W	55	0,18 K/W	55	0,12 K/W	151		
3RF2255-2.			20	1,83 K/W	20	1,58 K/W			

Type		3RF22..-.AB.**5**
Rated operating voltage U_e	V	48 ... 600
• Voltage range	V	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %
Rated insulation voltage U_i	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Blocking voltage	V	1200
Slew rate	V/µs	1000

	Rated impulse withstand strength Itsm	**I^2t value**
Type	A	A^2s
3RF2230-.	300	450
3RF2255-.	600	1800

Control Circuit A1-A2:

Type		3RF22..-.AB**4**.
Control voltage U_s	V	DC 4 ... 30
Max. control voltage U_s	V	30
Typical operating current	mA	30
Response voltage	V	4
Drop-out voltage	V	1
Switching times ON delay	ms	1 + max. one half-wave
OFF delay	ms	1 + max. one half-wave

[1] Use overvoltage protection device; max cut-off-voltage 6.000 V; min energy handling capability 100 J
[2] The current I_{max} provides information about the performance of the solid-state relays. The actual permitted rated operating current I_e can be smaller depending on the connection method and cooling conditions. The spring-loaded terminals version can be used for a rated current of up to approx. 20 A with one conductor and up to approx. 40 A with two conductor on each terminal.

General Data:

Ambient temperature		
During operation, derating as of 40 °C	°C	-25 ... 60
During storage	°C	-55 ... 80
Mounting altitude	m	0 ... 1000; at > 1000 m, please contact our Technical Assistance
Impact resistance acc. to DIN IEC 68	g/ms	15/11
Vibration resistance	g	2
Degree of protection		IP20
Electromagnetic compatibility		
Interference emission		
o Conducted interference voltage IEC 60 947-4-3		Class A for industrial applications[3]
o Radiated, high-frequency interference voltage IEC 60 947-4-3		Class A for industrial applications
Interference resistance		
o Electrostatic discharge acc. to IEC 61 000-4-2 (corresponds to severity 3)	kV	Contact discharge 4; air discharge 8; performance criterion 2
o Induced HF fields acc. to IEC 61 000-4-6	MHz	0.15 ... 80; 140 dBµV; performance criterion 1
o Burst acc. to IEC 61 000-4-4	kV	2/5.0 kHz; performance criterion 1
o Surge acc. to IEC 61 000-4-5	kV	Phase-to-ground 2; phase-to-phase 1; performance criterion 2
Dielectric Strength 50/60 Hz (Input, Output / Base)	V rms	4000

Type		3RF22..-**1.**	3RF22..-**2.**	3RF22..-**3.**
Connection, main contacts		**Screw connection**	**Spring-loaded connection**	**Ring cable connection**
Conductor cross-section				
o Solid	mm^2	2 x (1,5 ... 2,5), 2 x (2,5 ... 6)	2x (0,5 ... 2,5)	
o Finely stranded with end sleeve	mm^2	2 x (1,5 ... 2,5), 2 x (2,5 ... 6), 1 x 10	2x (0,5 ... 1,5)	
o Finely stranded w/o end sleeve	mm^2		2x (0,5 ... 2,5)	
o Solid or stranded	AWG	2 x (14 ... 10)	2 x (18 ... 14)	
Stripping length	mm	10	10	
Terminal screw		M 4	-	M 5
o Tightening torque D 5...6 mm / PZ 2	Nm	2 ... 2,5	-	2 ... 2,5
	lb.in	18 ... 22	-	18 ... 22
Cable lug DIN		-	-	DIN 46234 5-2,5 ... 5-25
JIS		-	-	JIS C 2805 R 2-5 ... 14-5
Connection, auxiliary/control contacts				
Conductor cross-section with or without end sleeve	mm^2	1 x (0,5 ... 2,5)	0,5 ... 2,5	1 x (0,5 ... 2,5)
	mm^2	2 x (0,5 ... 1,0)		2 x (0,5 ... 1,0)
	AWG	20 ... 12	20 ... 12	20 ... 12
Stripping length	mm	7	10	7
Terminal screw		M 3	-	M 3
o Tightening torque D 3.5 / PZ 1	Nm	0,5 ... 0,6	-	0,5 ... 0,6
	lb.in	4,5 ... 5,3	-	4,5 ... 5,3

[3] **Attention!**
This product was constructed as an EMC Class A device. The use of this product in residential applications could lead to radio interferences. In such an application, additional filtering may be required.

Fused Design with Semiconductor Protection:

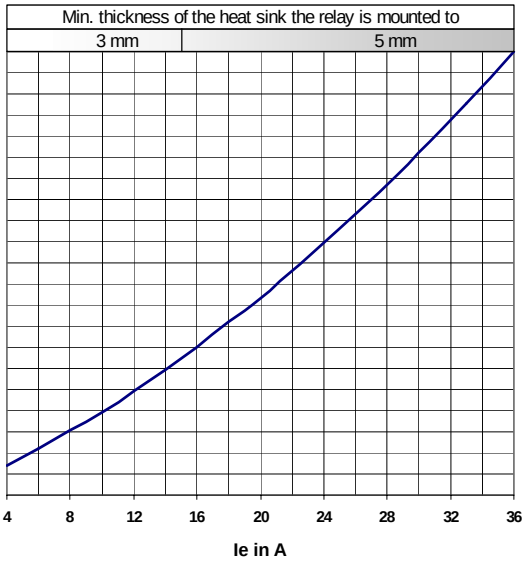
Type	Full-range fuse LV HBC design gR/SITOR	Semiconductor protection fuse, cylindrical design		
		10 x 38 mm aR / SITOR	14 x 51 mm aR / SITOR	22 x 58 mm aR / SITOR
3RF2230-**....** up to 506 V	3NE1814-0	3NC1032	3NC1430	3NC2232
3RF2230-**....** up to 660 V		3NC1025		
3RF2255-**....** up to 506 V	3NE1802-0	-	3NC1450	3NC2263
3RF2255-**....** up to 660 V	3NE1803-0	-		3NC2250

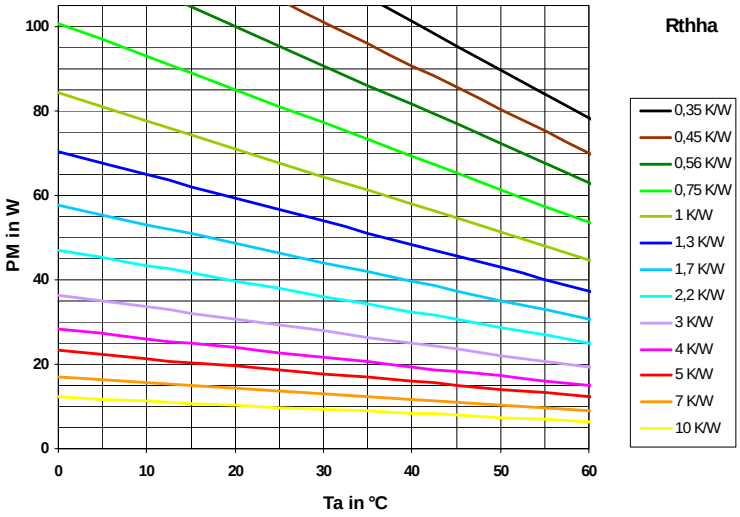
Accessories:

Function module	Order No.	Applicable for the following types	Versions
Converter	3RF2900-0EA18	3RF22**..**-.AB**4.**	Us = AC/DC 24 V

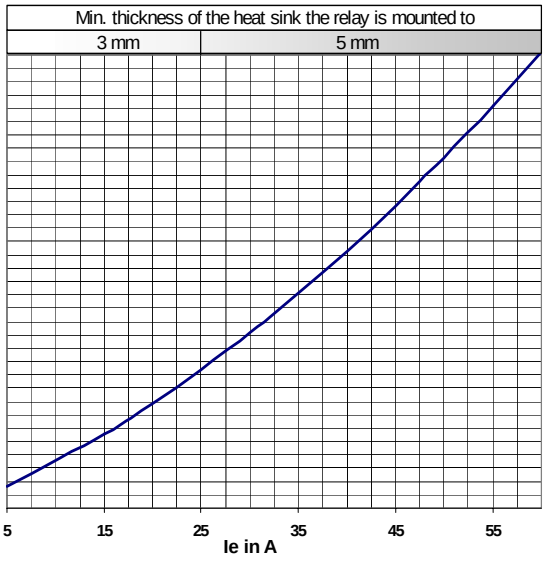
Characteristic Curves:

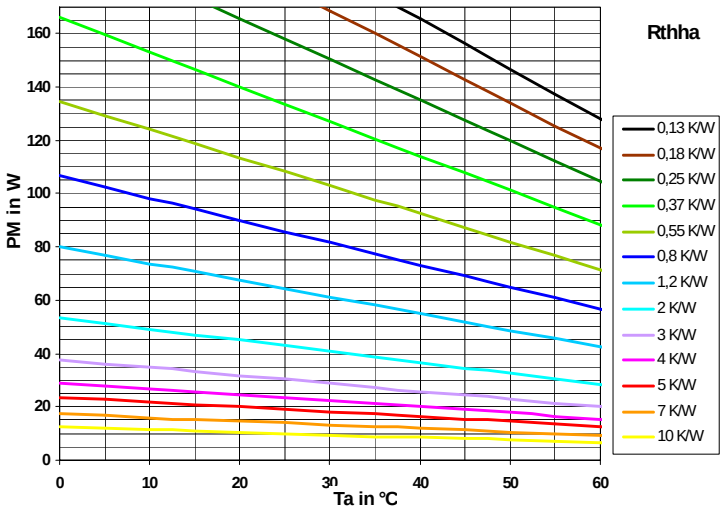
3RF22**30**-



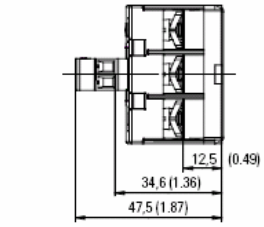


3RF22**55**-





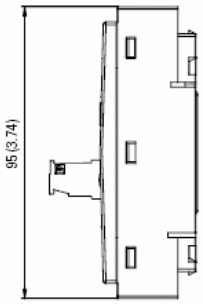
Dimension Drawings[4]:

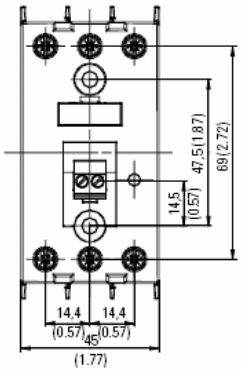


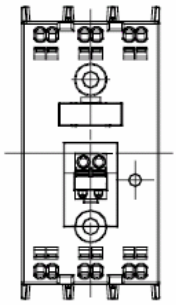
Screw connection
3RF22..-1

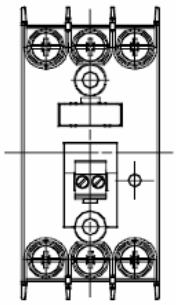
Spring-loaded connection
3RF22..-2

Ring cable connection
3RF22..-3

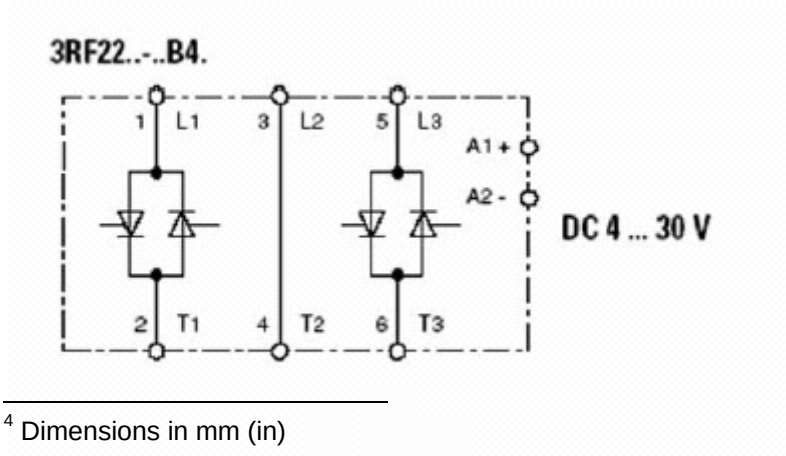








Device / Example Circuit Diagram:



[4] Dimensions in mm (in)

Solid State Relays, 3-phase

Zero-Point switching, heatsink integrated

Main Characteristics:

Zero

Three-phase controlled
switching
LED display
Various connection technologies
Plug-in control terminal
Degree of protection IP 20
Insulated mounting foot

Standards / Approvals:

DIN EN 60947-4-3
UL 508 / CSA[1]

CE
C-Tick

Ordering Key:

3RF24	10	- 1	A	C	4	5
3-phase solid state contactor with heat sink	Max. load current 10 = 10,5 A 20 = 22 A 30 = 30 A 40 = 40 A 50 = 50 A	Connection technology 1 = Screw connection 2 = Spring-loaded connection 3 = Ring cable connection M5	Switching function A = Zero-point switching	Controlled phases C = three-phase	Control voltage 4 = 4 - 30 VDC 5 = 190 - 230 VAC	Operating voltage 5 = 48 - 600 V

Not all possible versions are available ex stock!

Main Circuit:

Values for 40 °C ambient temperature!	I_{AC-51}	I_e acc. to IEC947-4-3	Ie [50°C] UL/CSA	Power loss with I_{AC-51}	Min. load current	Max. leakage current
Type	A	A	A	W	A	mA
3RF2410-.AC.	10,5	7	7	31	0,1	10
3RF2420-.AC.	22	15	15	66	0,5	
3RF2430-.AC.	30	22	22	91		
3RF2440-.AC.	40	30	30	121		
3RF2450-.AC.	50	38	38	160		

Type		3RF24..-.AC.**5**
Rated operating voltage U_e	V	48 ... 600
• Voltage range	V	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %
Rated insulation voltage U_i	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Slew rate	V/µs	1000

	Rated impulse withstand strength Itsm	I^2t value	Blocking voltage
Type A		A^2s V	
3RF2410-.AC.	300	450	1200
3RF2420-.AC.	600	1800	1200
3RF2430-.AC.	1200	7200	1200
3RF2440-.AC.	1150	6600	1600
3RF2450-.AC.	1150	6600	1600

[1] Use overvoltage protection device; max cut-off-voltage 6.000 V; min energy handling capability 100 J

Control Circuit A1-A2:

Type		3RF24..-.AC**5.**	3RF24..-.AC**4.**
Control voltage U_s	V	AC 190 ... 230	DC 4 ... 30
Max. control voltage U_s	V	253	30
Typical operating current	mA	15	30
Response voltage	V	180	4
Drop-out voltage	V	<40	<1
Rated frequency of the control supply voltage	Hz	50/60 ± 10 %	--
Switching times ON delay	ms	40 + Max. one half-wave	1 + Max. one half-wave
OFF delay	ms	40 + Max. one add. half-wave	1 + Max. one add. half-wave

General Data:

Ambient temperature		
During operation	°C	-25 ... 60
During storage	°C	-55 ... 80
Mounting altitude	m	0 ... 1000; at > 1000 m, please contact our Technical Assistance
Impact resistance acc. to DIN IEC 68	g/ms	15/11
Vibration resistance	g	2
Degree of protection		IP20
Electromagnetic compatibility (EMC)		
Interference emission		
o Conducted interference voltage IEC 60 947-4-3		Class A for industrial applications[2]
o Radiated, high-frequency interference voltage IEC 60 947-4-3		Class A for industrial applications
Interference resistance		
o Electrostatic discharge acc. to IEC 61 000-4-2 (corresponds to severity 3)	kV	Contact discharge 4; air discharge 8; performance criterion 2
o Induced HF fields acc. to IEC 61 000-4-6	MHz	0.15 ... 80; 140 dBµV; performance criterion 1
o Burst acc. to IEC 61 000-4-4	kV	2/5.0 kHz; performance criterion 1
o Surge acc. to IEC 61 000-4-5	kV	Phase-to-ground 2; phase-to-phase 1; performance criterion 2
Dielectric Strength 50/60 Hz (Input, Output / Base)	V rms	4000

[2] **Attention!**
This product was constructed as an EMC Class A device. The use of this product in residential applications could lead to radio interferences. In such an application, additional filtering may be required.

Type		3RF24..-1.	3RF24..-2.	3RF24..-3.
Connection, main contacts		**Screw connection**	**Spring-loaded connection**	**Ring cable connection**
Conductor cross-section				
o Solid	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2x (0.5 ... 2.5)	
o Finely stranded with end sleeve	mm^2	2 x (1.5 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2x (0.5 ... 1.5)	
o Finely stranded w/o end sleeve	mm^2		2x (0.5 ... 2.5)	
o Solid or stranded	AWG	2 x (14 ... 10)	2 x (18 ... 14)	
Stripping length	mm	10	10	
Terminal screw		M 4	-	M 5
o Tightening torque D 5...6 mm / PZ 2	Nm	2 ... 2.5	-	2 ... 2.5
	lb.in	18 ... 22	-	18 ... 22
Cable lug DIN		-	-	DIN 46234 5-2.5 ... 5-25
JIS		-	-	JIS C 2805 R 2-5 ... 14-5
Connection, control contacts				
Conductor cross-section with or without end sleeve	mm^2	1 x (0.5 ... 2.5)	0.5 ... 2.5	1 x (0.5 ... 2.5)
	mm^2	2 x (0.5 ... 1.0)		2 x (0.5 ... 1.0)
	AWG	20 ... 12	20 ... 12	20 ... 12
Stripping length	mm	7	10	7
Terminal screw		M 3	-	M 3
o Tightening torque D 3.5 / PZ 1	Nm	0.5 ... 0.6	-	0.5 ... 0.6
	lb.in	4.5 ... 5.3	-	4.5 ... 5.3

Fused Design with Semiconductor Protection

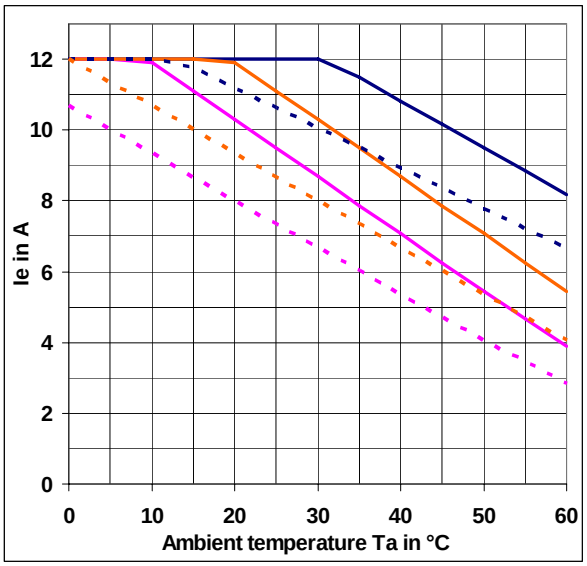
Type	Full-range fuse LV HBC design gR/SITOR	Semiconductor protection fuse LV HBC design aR / 3NE80	Semiconductor protection fuse, cylindrical design		
			10 x 38 mm aR / SITOR	14 x 51 mm aR / SITOR	22 x 58 mm aR / SITOR
3RF2410-.AC.	3NE1813-0	3NE8015-1	3NC1012	3NC1415	3NC2220
3RF2420-.AC.	3NE1814-0	3NE8015-1	3NC1025	3NC1425	3NC2225
3RF2430-.AC.	3NE1803-0	3NE8003-1	3NC1032	3NC1432	3NC2232
3RF2440-.AC.	3NE1802-0	3NE8017-1	-	3NC1450	3NC2250
3RF2450-.AC.	3NE1817-0	3NE8018-1	-	3NC1450	3NC2263

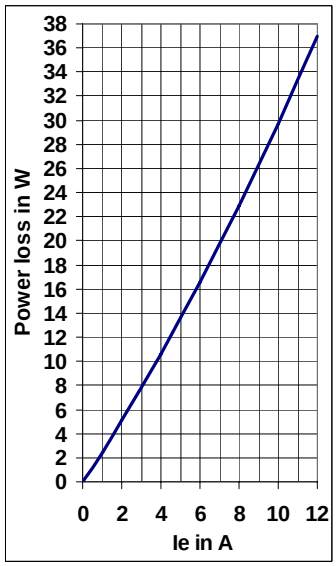
Accessories

Function module	Order No.	Applicable for	Versions
Converter	3RF2900-0EA18	3RF24..-.AC**4**.	Us = DC 24 V

Characteristic Curves

3RF2410-.

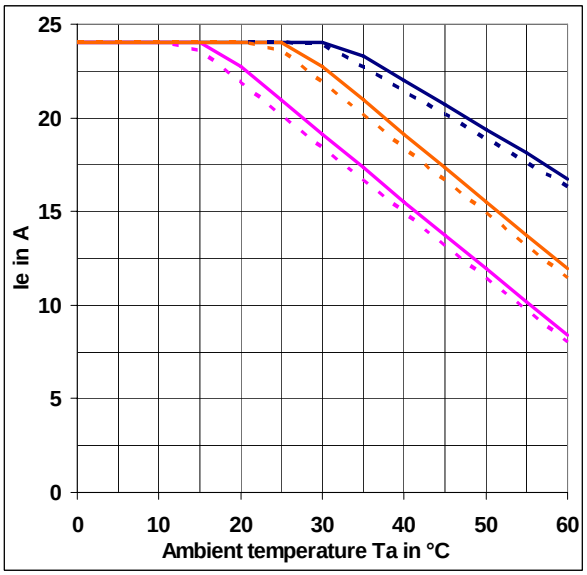


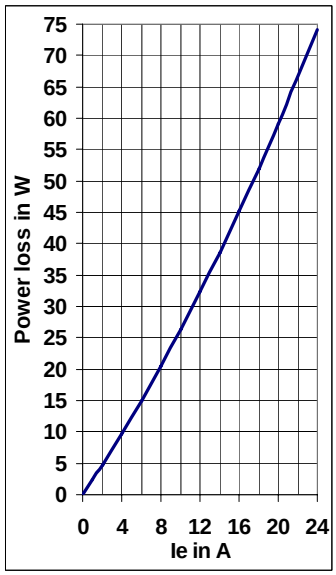


Upper curves:
I_{max} thermal limit current
Middle curves:
Rated current I_e acc. to UL
Lower curves:
Rated current Ie
acc. to
DIN EN 60947-4-3

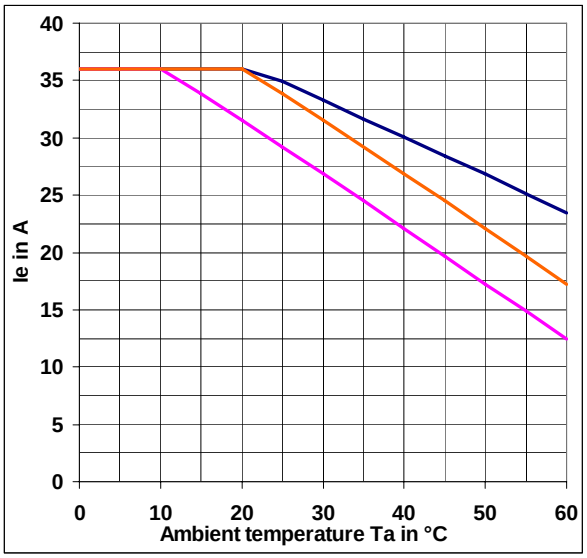
Continuous lines:
Stand-alone mounting
Dashed lines:
Side-by-side mounting

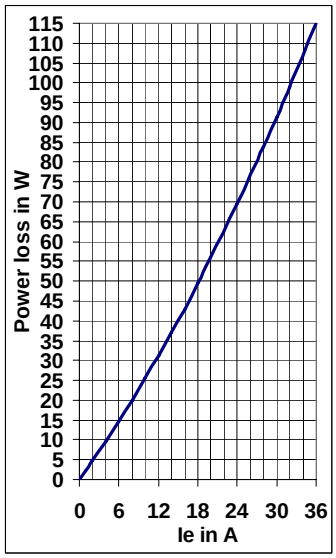
3RF2420-.





3RF2430-.[3]

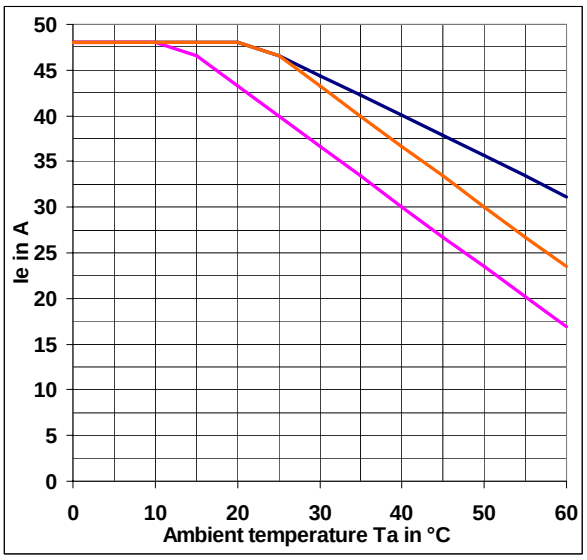


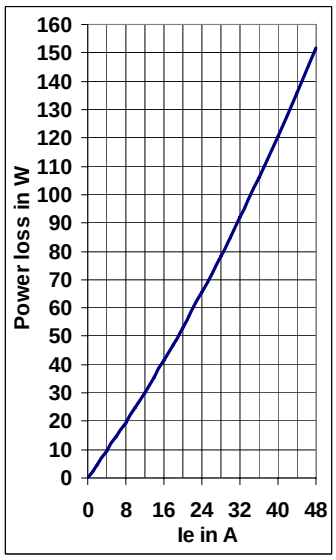


Upper curves:
I_{max} thermal limit current
Middle curves:
Rated current I_e acc. to UL
Lower curves:
Rated current Ie
acc. to
DIN EN 60947-4-3

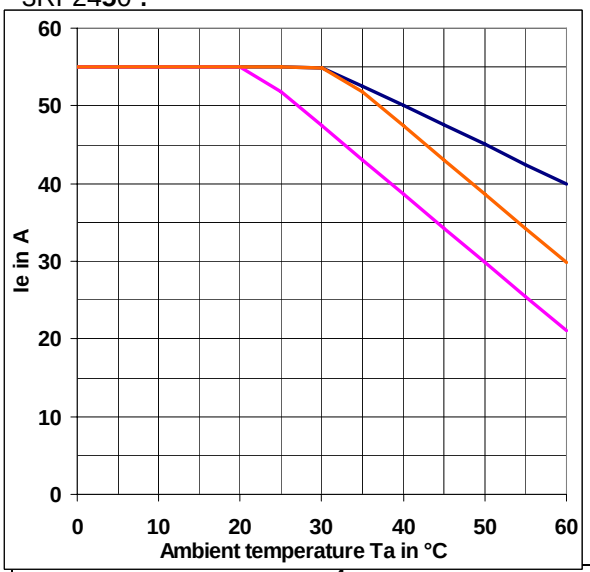
Stand-alone and side-by-side mounting

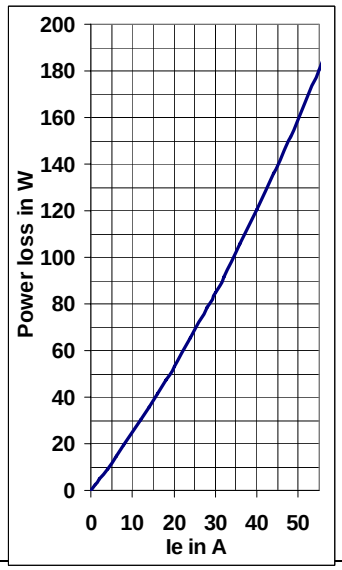
3RF2440-.[3]





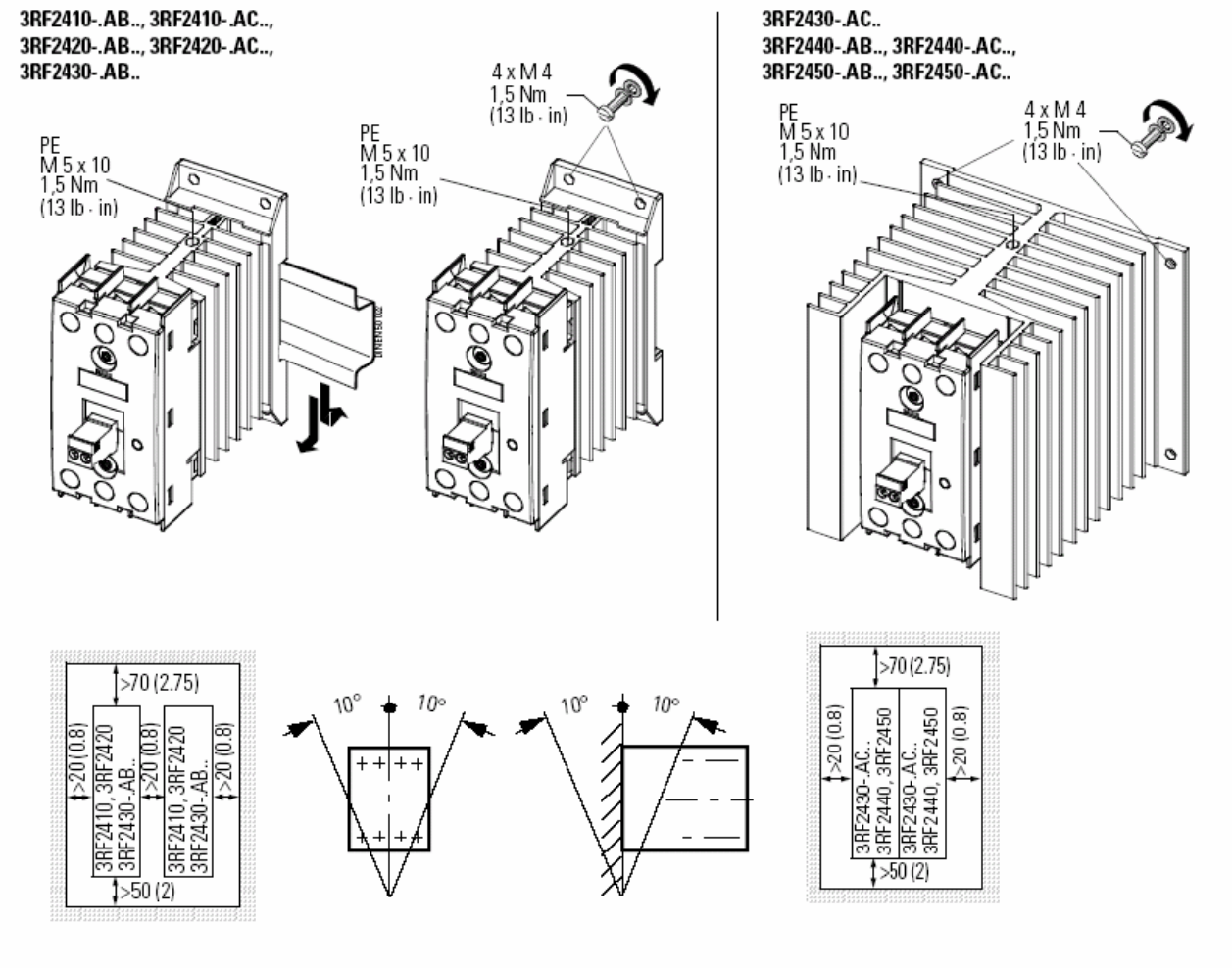
3RF2450-.[3]



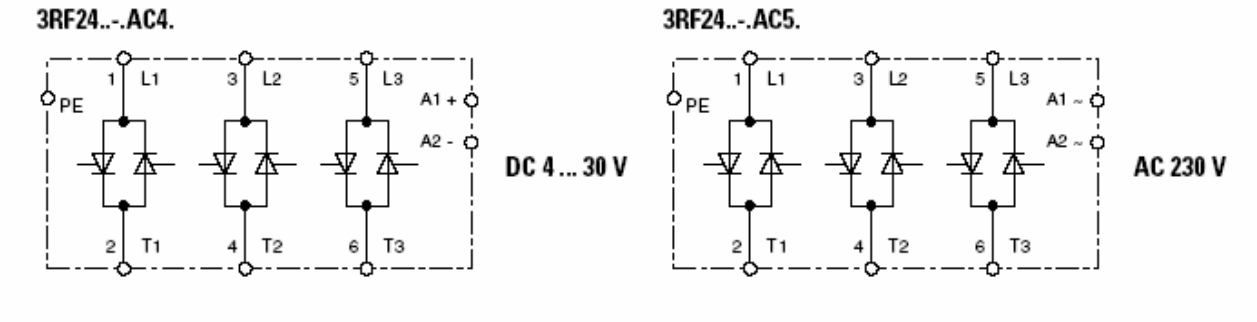


Mounting Instructions [4]:

[3] Identical current/temperature curves for Stand-alone and side by side mounting.



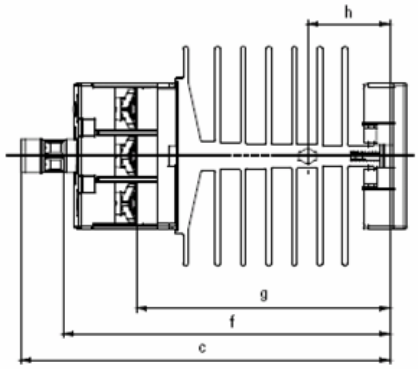
Device / Example Circuit Diagram:

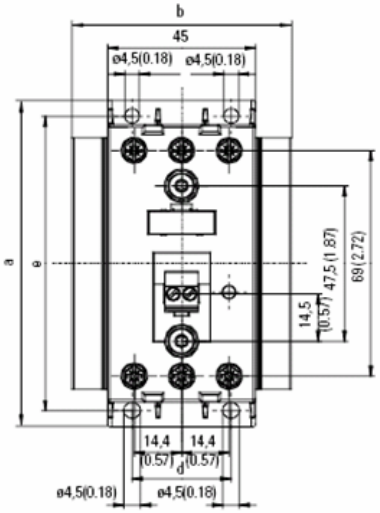


[4] Dimensions in mm, (in);
Stand alone mounting, Characteristic Curves shows derating for Side-by-side mounting

Dimension Drawings [5]:

3RF2410-.AB.., 3RF2410-.AC..,
3RF2420-.AB.., 3RF2420-.AC..,
3RF2430-.AB..





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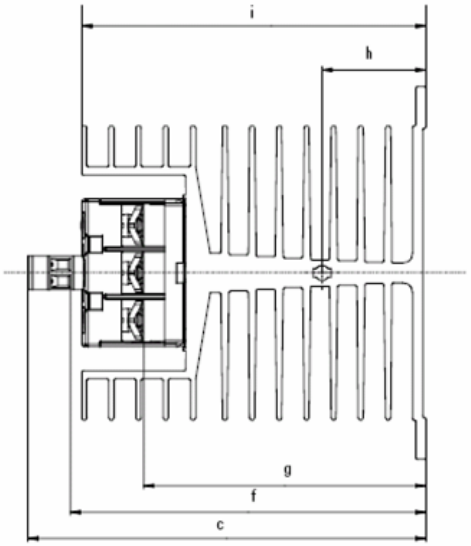
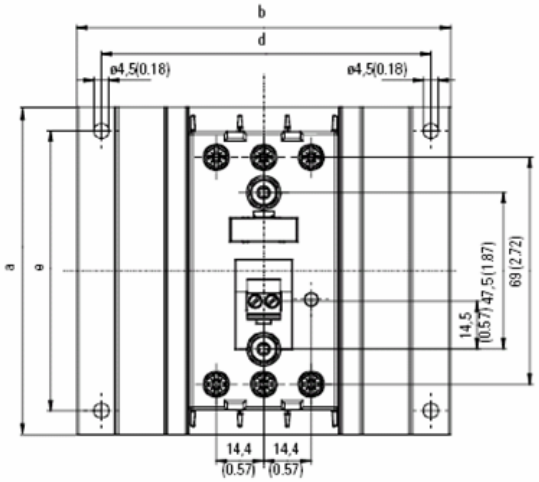
3RF2440-.AB.., 3RF2440-.AC..,
3RF2450-.AB.., 3RF2450-.AC..





	a	b	c	d	e	f	g	h	i
3RF2410-.AC.. 3RF2410-.AB..	100 (3.94)	45 (1.77)	104,5 (4.11)	30 (1.18)	90 (3.54)	91,5 (3.60)	69,5 (2.74)	25 (0.98)	–
3RF2420-.AB..	100 (3.94)	67 (2.64)	112,5 (4.43)	30 (1.18)	90 (3.54)	99,5 (3.92)	77 (3.03)	25 (0.98)	–
3RF2420-.AC.. 3RF2430-.AB..	100 (3.94)	89,5 (3.52)	112,5 (4.43)	30 (1.18)	90 (3.54)	99,5 (3.92)	77 (3.03)	25 (0.98)	–
3RF2430-.AC.. 3RF2440-.AB..	100 (3.94)	113,5 (4.47)	121 (4.76)	100 (3.94)	85 (3.35)	108 (4.25)	86 (3.39)	31,5 (1.24)	104,5 (4.11)
3RF2440-.AC.. 3RF2450-.AB..	100 (3.94)	157,5 (6.20)	121 (4.76)	146 (5.75)	80 (3.15)	108 (4.25)	86 (3.39)	31,5 (1.24)	104,5 (4.11)
3RF2450-.AC..	180 (7.09)	157,5 (6.20)	121 (4.76)	146 (5.75)	160 (6.30)	108 (4.25)	86 (3.39)	31,5 (1.24)	104,5 (4.11)

[5] Dimensions in mm, (in)

Solid State Relays, 3-phase

Zero-point switching, without heatsink

Main Characteristics:

3-phase control
Space-saving, width of only 45 mm
LED display
Various connection technologies
Plug-in control terminal
Degree of protection IP 20

Standards / Approvals:

DIN EN 60947-4-3
UL 508 / CSA[1]
CE / C-Tick

Ordering Key:

3RF22	**30**	**- 1**	**A**	**C**	**4**	**5**
Solid state relay without heat sink	Max. load current 30 = 30 A 55 = 55 A	Connection technology 1 = Screw connection 2 = Spring-loaded 3 = Ring cable connection M5	Switching function A = Zero-point switching	Controlled phases C = 3-phase	Control voltage 4 = 4 - 30 VDC	Operating voltage 5 = 48 - 600 V

Not all possible versions are available ex stock.

Main Circuit[2]:

	I_{max}		I_e IEC 947-4-3		I_e UL/CSA		Power loss	Min. load current	Max. leakage current
Type	A	With Rthha / 40 °C	A	With Rthha / 40 °C	A	With Rthha / 50 °C	With I_{max} W	A	mA
3RF2230-.	30	0,33 K/W	30	0,33 K/W	30	0,25 K/W	122	0,5	10
3RF2230-2.			20	0,86 K/W	20	0,72 K/W			
3RF2255-.	55	0,09 K/W	55	0,09 K/W	55	0,05 K/W	226		
3RF2255-2.			20	1,19 K/W	20	1,02 K/W			

Type		3RF22..-.AC.**5**
Rated operating voltage U_e	V	48 ... 600
• Voltage range	V	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %
Rated insulation voltage U_i	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Blocking voltage	V	1200
Slew rate	V/µs	1000

	Rated impulse withstand strength Itsm	**I^2t value**
Type	A	A^2s
3RF2230-.	300	450
3RF2255-.	600	1800

Control Circuit A1-A2:

Type		3RF22..-.AC**4**.
Control voltage U_s	V	DC 4 ... 30
Max. control voltage U_s	V	30
Typical operating current	mA	30
Response voltage	V	4
Drop-out voltage	V	1
Switching times ON delay	ms	1 + max. one half-wave
OFF delay	ms	1 + max. one half-wave

[1] Use overvoltage protection device; max cut-off-voltage 6.000 V; min energy handling capability 100 J
[2] The current I_{max} provides information about the performance of the solid-state relays. The actual permitted rated operating current I_e can be smaller depending on the connection method and cooling conditions. The spring-loaded terminals version can be used for a rated current of up to approx. 20 A with one conductor and up to approx. 40 A with two conductor on each terminal.

General Data:

Ambient temperature		
During operation, derating as of 40 °C	°C	-25 ... 60
During storage	°C	-55 ... 80
Mounting altitude	m	0 ... 1000; at > 1000 m, please contact our Technical Assistance
Impact resistance acc. to DIN IEC 68	g/ms	15/11
Vibration resistance	g	2
Degree of protection		IP20
Electromagnetic compatibility		
(		
Interference emission		
o Conducted interference voltage IEC 60 947-4-3		Class A for industrial applications [3]
o Radiated, high-frequency interference voltage IEC 60 947-4-3		Class A for industrial applications
Interference resistance		
o Electrostatic discharge acc. to IEC 61 000-4-2 (corresponds to severity 3)	kV	Contact discharge 4; air discharge 8; performance criterion 2
o Induced HF fields acc. to IEC 61 000-4-6	MHz	0.15 ... 80; 140 dBµV; performance criterion 1
o Burst acc. to IEC 61 000-4-4	kV	2/5.0 kHz; performance criterion 1
o Surge acc. to IEC 61 000-4-5	kV	Phase-to-ground 2; phase-to-phase 1; performance criterion 2
Dielectric Strength 50/60 Hz (Input, Output / Base)	V rms	4000

Type		3RF22..-**1.**	3RF22..-**2.**	3RF22..-**3.**
Connection, main contacts		**Screw connection**	**Spring-loaded connection**	**Ring cable connection**
Conductor cross-section				
o Solid	mm^2	2 x (1,5 ... 2,5), 2 x (2,5 ... 6)	2x (0,5 ... 2,5)	
o Finely stranded with end sleeve	mm^2	2 x (1,5 ... 2,5), 2 x (2,5 ... 6), 1 x 10	2x (0,5 ... 1,5)	
o Finely stranded w/o end sleeve	mm^2		2x (0,5 ... 2,5)	
o Solid or stranded	AWG	2 x (14 ... 10)	2 x (18 ... 14)	
Stripping length	mm	10	10	
Terminal screw		M 4	-	M 5
o Tightening torque D 5...6 mm / PZ 2	Nm	2 ... 2,5	-	2 ... 2,5
	lb.in	18 ... 22	-	18 ... 22
Cable lug DIN		-	-	DIN 46234 5-2,5 ... 5-25
JIS		-	-	JIS C 2805 R 2-5 ... 14-5
Connection, auxiliary/control contacts				
Conductor cross-section with or without end sleeve	mm^2	1 x (0,5 ... 2,5)	0,5 ... 2,5	1 x (0,5 ... 2,5)
	mm^2	2 x (0,5 ... 1,0)		2 x (0,5 ... 1,0)
	AWG	20 ... 12	20 ... 12	20 ... 12
Stripping length	mm	7	10	7
Terminal screw		M 3	-	M 3
o Tightening torque D 3.5 / PZ 1	Nm	0,5 ... 0,6	-	0,5 ... 0,6
	lb.in	4,5 ... 5,3	-	4,5 ... 5,3

[3] **Attention!**
This product was constructed as an EMC Class A device. The use of this product in residential applications could lead to radio interferences. In such an application, additional filtering may be required.

Fused Design with Semiconductor Protection:

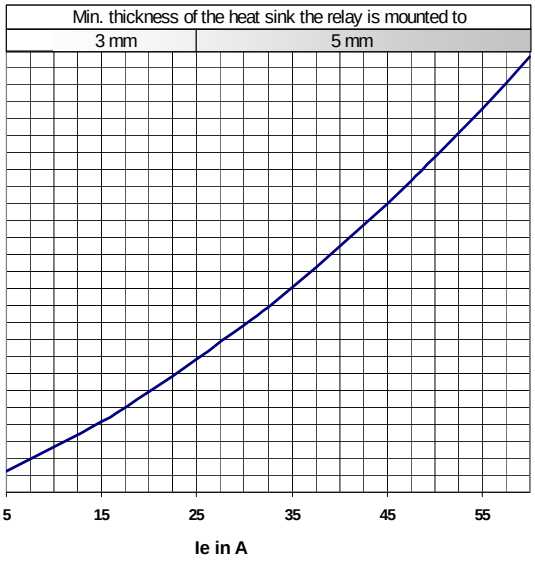
Type	Full-range fuse LV HBC design gR/SITOR	Semiconductor protection fuse, cylindrical design		
		10 x 38 mm aR / SITOR	14 x 51 mm aR / SITOR	22 x 58 mm aR / SITOR
3RF2230-**....** up to 506 V	3NE1814-0	3NC1032	3NC1430	3NC2232
3RF2230-**....** up to 660 V		3NC1025		
3RF2255-**....** up to 506 V	3NE1802-0	-	3NC1450	3NC2263
3RF2255-**....** up to 660 V	3NE1803-0	-		3NC2250

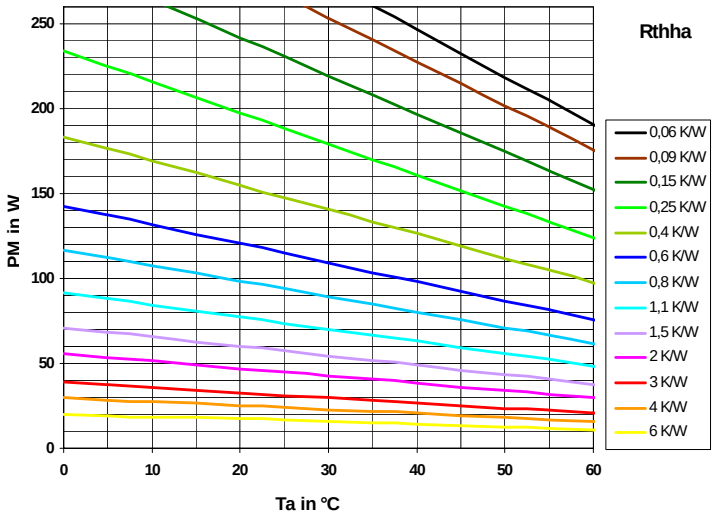
Accessories:

Function module	Order No.	Applicable for the following types	Versions
Converter	3RF2900-0EA18	3RF22**..**-**.**A C**4.**	Us = AC/DC 24 V

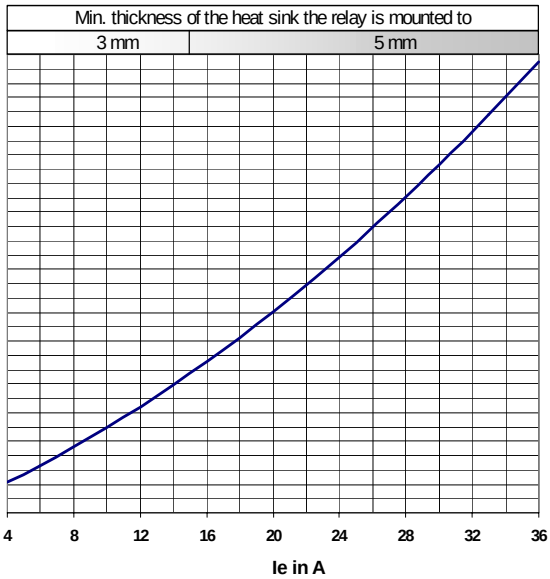
Characteristic Curves:

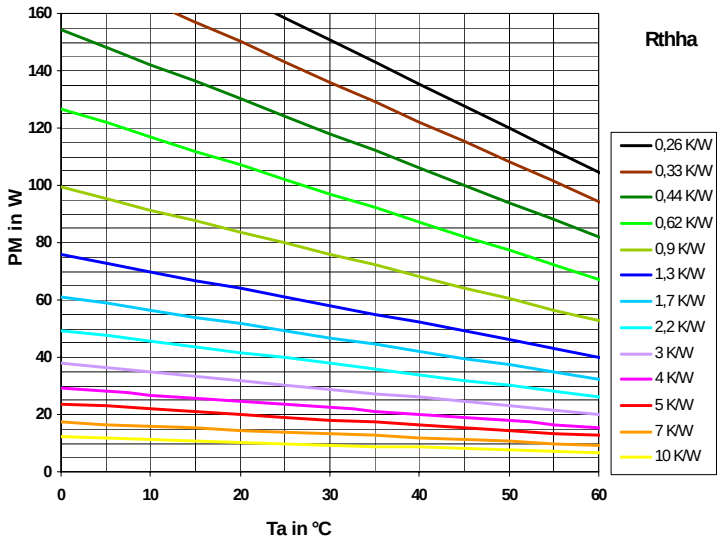
3RF22**30**-



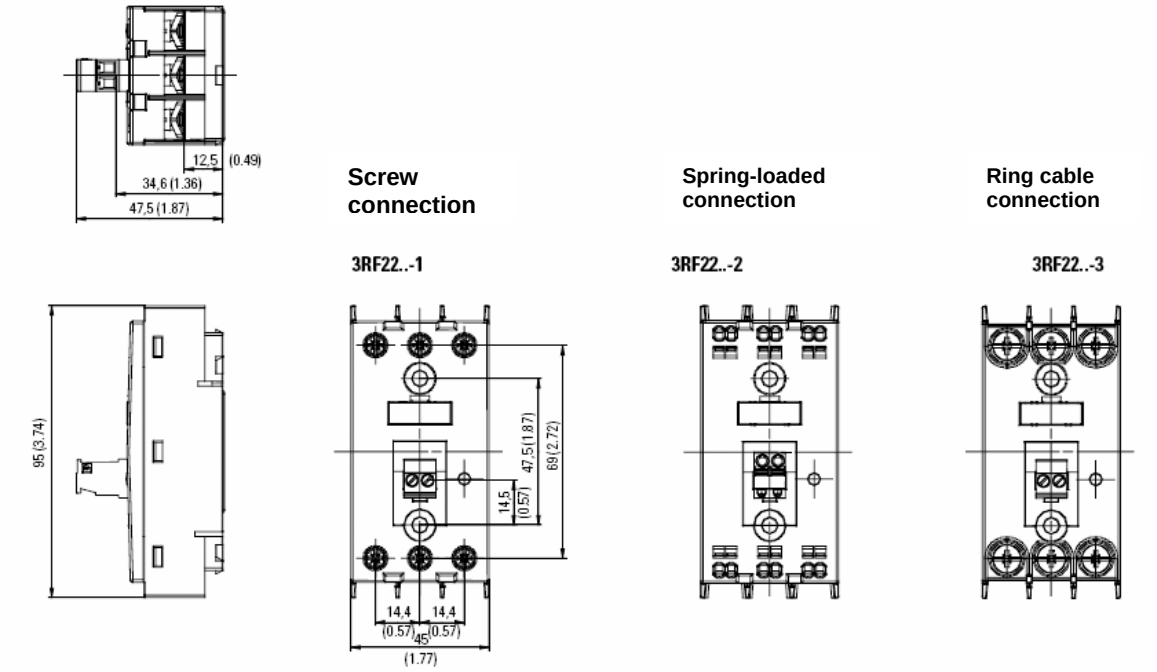


3RF22**55**-

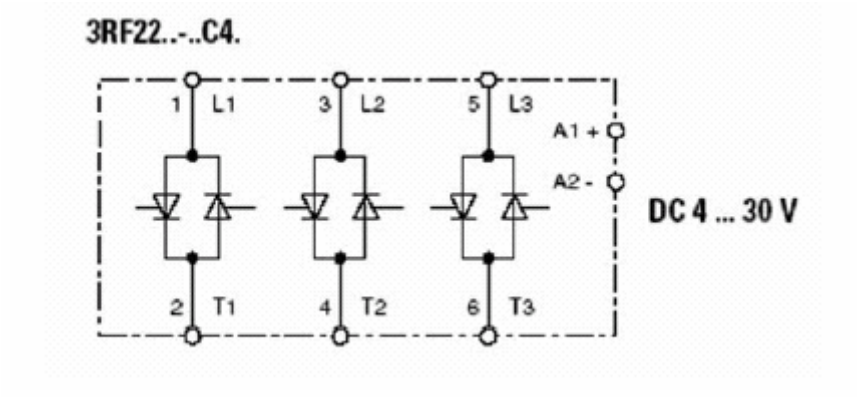




Dimension Drawings[4]:



Device / Example Circuit Diagram:



[4] Dimensions in mm (in)

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