SIEMENS

Data sheet

3RT2016-1AP02



power contactor, AC-3e/AC-3, 9 A, 4 kW / 400 V, 3-pole, 230 V AC, 50/60 Hz, auxiliary contacts: 1 NC, screw terminal, size: S00

product brand name	SIRIUS
product designation	Power contactor
product type designation	3RT2
General technical data	
size of contactor	S00
product extension	
 function module for communication 	No
auxiliary switch	Yes
power loss [W] for rated value of the current	
 at AC in hot operating state 	0.9 W
 at AC in hot operating state per pole 	0.3 W
 without load current share typical 	1.1 W
type of calculation of power loss depending on pole	quadratic
insulation voltage	
 of main circuit with degree of pollution 3 rated value 	690 V
 of auxiliary circuit with degree of pollution 3 rated value 	690 V
surge voltage resistance	
 of main circuit rated value 	6 kV
 of auxiliary circuit rated value 	6 kV
maximum permissible voltage for protective separation between coil and main contacts according to EN 60947-1	400 V
shock resistance at rectangular impulse	
• at AC	6,7g / 5 ms, 4,2g / 10 ms
shock resistance with sine pulse	
• at AC	10,5g / 5 ms, 6,6g / 10 ms
mechanical service life (operating cycles)	
 of contactor typical 	30 000 000
 of the contactor with added electronically optimized auxiliary switch block typical 	5 000 000
 of the contactor with added auxiliary switch block typical 	10 000 000
reference code according to IEC 81346-2	Q
Substance Prohibitance (Date)	10/01/2009
Weight	0.23 kg
Ambient conditions	
installation altitude at height above sea level maximum	2 000 m
ambient temperature	
during operation	-25 +60 °C
during storage	-55 +80 °C
relative humidity minimum	10 %
relative humidity at 55 °C according to IEC 60068-2-30 maximum	95 %

Environmental footprint			
Environmental Product Declaration(EPD)	Yes		
global warming potential [CO2 eq] total	39.6 kg		
global warming potential [CO2 eq] during manufacturing	1.18 kg		
global warming potential [CO2 eq] during operation	38.5 kg		
global warming potential [CO2 eq] after end of life	-0.155 kg		
Main circuit			
number of poles for main current circuit	3		
number of NO contacts for main contacts	3		
operating voltage			
 at AC-3 rated value maximum 	690 V		
 at AC-3e rated value maximum 	690 V		
operational current			
 at AC-1 at 400 V at ambient temperature 40 °C rated value at AC-1 	22 A		
up to 690 V at ambient temperature 40 °C rated value	22 A		
— up to 690 V at ambient temperature 60 °C rated value	20 A		
• at AC-3			
— at 400 V rated value	9 A		
— at 500 V rated value	7.7 A		
— at 690 V rated value	6.7 A		
• at AC-3e			
— at 400 V rated value	9 A		
— at 500 V rated value	7.7 A		
- at 690 V rated value	6.7 A		
 at AC-4 at 400 V rated value at AC 5a up to 690 V rated value 	8.5 A 19.4 A		
 at AC-5a up to 690 V rated value at AC-5b up to 400 V rated value 	19.4 A 7.4 A		
 at AC-6a 			
 up to 230 V for current peak value n=20 rated value 	5.3 A		
— up to 400 V for current peak value n=20 rated value	5.3 A		
— up to 500 V for current peak value n=20 rated value	5.3 A		
— up to 690 V for current peak value n=20 rated value	5 A		
● at AC-6a			
— up to 230 V for current peak value n=30 rated value	3.5 A		
— up to 400 V for current peak value n=30 rated value	3.5 A		
— up to 500 V for current peak value n=30 rated value	3.6 A		
— up to 690 V for current peak value n=30 rated value	3.3 A		
minimum cross-section in main circuit at maximum AC-1 rated value	4 mm ²		
operational current for approx. 200000 operating cycles at AC-4			
 at 400 V rated value at 690 V rated value 	4.1 A 3.3 A		
operational current			
• at 1 current path at DC-1			
- at 24 V rated value	20 A		
— at 60 V rated value	20 A		
— at 110 V rated value	2.1 A		
— at 220 V rated value	0.8 A		
— at 440 V rated value	0.6 A		
— at 600 V rated value	0.6 A		
 with 2 current paths in series at DC-1 			
— at 24 V rated value	20 A		
— at 60 V rated value	20 A		
— at 110 V rated value	12 A		
— at 220 V rated value	1.6 A		
— at 440 V rated value	0.8 A		
— at 600 V rated value	0.7 A		

with 3 current paths in series at DC-1	20.4			
— at 24 V rated value	20 A			
— at 60 V rated value	20 A			
— at 110 V rated value	20 A			
— at 220 V rated value	20 A			
— at 440 V rated value	1.3 A			
— at 600 V rated value	1 A			
• at 1 current path at DC-3 at DC-5				
— at 24 V rated value	20 A			
— at 60 V rated value	0.5 A			
— at 110 V rated value	0.15 A			
• with 2 current paths in series at DC-3 at DC-5				
— at 24 V rated value	20 A			
— at 60 V rated value	5 A			
— at 110 V rated value	0.35 A			
 with 3 current paths in series at DC-3 at DC-5 				
— at 24 V rated value	20 A			
— at 60 V rated value	20 A			
— at 110 V rated value	20 A			
— at 220 V rated value	1.5 A			
— at 440 V rated value	0.2 A			
— at 600 V rated value	0.2 A			
operating power				
• at AC-3				
— at 230 V rated value	2.2 kW			
— at 400 V rated value	4 kW			
— at 500 V rated value	4 kW			
— at 690 V rated value	5.5 kW			
• at AC-3e				
— at 230 V rated value	2.2 kW			
— at 400 V rated value	4 kW			
— at 500 V rated value	4 kW			
— at 690 V rated value	5.5 kW			
operating power for approx. 200000 operating cycles at AC-				
4	0.1444			
at 400 V rated value	2 kW			
• at 690 V rated value	2.5 kW			
operating apparent power at AC-6a	0.11/4			
• up to 230 V for current peak value n=20 rated value	2 kVA			
up to 400 V for current peak value n=20 rated value	3.6 kVA			
• up to 500 V for current peak value n=20 rated value	4.6 kVA			
up to 690 V for current peak value n=20 rated value	5.9 kVA			
operating apparent power at AC-6a	4.013/4			
up to 230 V for current peak value n=30 rated value	1.3 kVA			
up to 400 V for current peak value n=30 rated value	2.4 kVA			
up to 500 V for current peak value n=30 rated value	3.1 kVA			
up to 690 V for current peak value n=30 rated value	4 kVA			
short-time withstand current in cold operating state up to 40 °C				
Imited to 1 s switching at zero current maximum	155 A; Use minimum cross-section acc. to AC-1 rated value			
Imited to 5 s switching at zero current maximum	111 A; Use minimum cross-section acc. to AC-1 rated value			
Imited to 10 s switching at zero current maximum	86 A; Use minimum cross-section acc. to AC-1 rated value			
Imited to 30 s switching at zero current maximum	66 A; Use minimum cross-section acc. to AC-1 rated value			
Imited to 60 s switching at zero current maximum	55 A; Use minimum cross-section acc. to AC-1 rated value			
no-load switching frequency				
• at AC	10 000 1/h			
operating frequency				
• at AC-1 maximum	1 000 1/h			
• at AC-2 maximum	750 1/h			
• at AC-3 maximum	750 1/h			
 at AC-3e maximum 	750 1/h			

Control supply coltage at ACtype of voltage of the control supply voltage at AC• of SD Hz rided value250 V• all SD Hz rided value250 Voperating arage factor control supply voltage rated value of magnet coll at AC0.81.1• all SD Hz0.81.1• all SD Hz0.51.1• all SD Hz0.51.1	• at AC-4 maximum	250 1/h			
type of values of the control supply values AC control supply values at AC 200 V at 50 the stand value 200 V operating range factor control supply value of magnet coll at AC 200 V at 50 the 0.8 1.1					
control supply voltage at ACNotation in the second supply voltage rate at ACeit BD Hz rate at ACBB - 1.1eit BD HZ0.8 - 1.1		AC			
sight Print of value201 Vsight Print of value V0sight Print of value V0sight Print Of Value V0sight Print Of Value V27 VAsight Print Of Value V0sight Print Of Value V27 VAsight Print Of Value V0sight Print Of Value V0					
align brain start when it was a start of the start of		230 V			
operating range factor control supply voltage rated value of magnet coll a AC0 81.1a) is 00 1/20.85.1.1a) is 00 1/20.85.1.1a) is 00 1/227 VAa) is 00 1/224.3VAis is 00 1/20.85.1.1a) is 00 1/20.85.1.1.1a) is 00 1/20.85.1.1.1a) is 00 1/20.85.1.1.1a) is 00 1/20.85.1.1.1.1a) is 00 1/20.85.1.1.1.1a) is 00 1/20.85.1.1.1.1a) is 00 1/20.85.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1					
magnet coli at AC0.81.1•••••00 HA0.81.1••••00 HA0.81.1••••00 HA27 VA••••10 HA23 VA••••10 HA23 VA••••10 HA0.8••••10 HA0.5••••10 HA0.5••••10 HA0.5••••10 HA0.5••••10 HA0.5••••10 HA0.5••••10 HA0.5••••10 HA0.9••••10 HA0.15 ms••••10 HA0.15 ms••••10 HA0.16 ms•••••10 HA0.16 ms•••••••••••••••••••••••••••••••••••					
• al 60 Hz0.85 1.1apparent pickup power of magnet cell at AC7 VA• al 60 Hz20 VA• al 60 Hz0.8 Automation (Control 100)• al 60 Hz0.7 5• al 60 Hz0.7 5• al 60 Hz0.8 Automation (Control 100)• al 60 Hz0.2 5• al 60 Hz0.5 18• al 60 Hz0.5 18• al 60 Hz0.5 18• al 60 Hz10 Automation (Hz 90)• al 60 Hz0.6 Automation (Hz 90)• al 60 H					
appeare to jok-up power of magnet cell at AC 2 V A a it 50 Hz 24 3 V A inductive power factor with closing power of the cell 0.8 a it 50 Hz 3.3 VA a it 50 Hz 0.25 closing delay 0.25 a it 60 Hz 0.25 closing delay 0.4 If S ms a it 60 Hz 0.1 S ms control varion of the switch operating mechanism Standard A1 -A2 Availary of and 1.4 control varion of the switch operating mechanism 10.A operational current at AC-15	• at 50 Hz				
a till be transmission of the coll 24 3 VA a till be transmission of the coll 44 3 VA a till be transmission of the coll 0.8 a till be transmission of the south operating mechanism 0.25 a refer gine 0.25 a refer gine 0.25 a refer gine 0.1 a refer gine 0.1 a refer gine 10		0.85 1.1			
• at 60 Hz243 VAinductive power factor with closing power of the coll0.8• at 60 Hz0.8• at 60 Hz4.2 VA• at 60 Hz3.3 VA• at 60 Hz3.3 VA• at 60 Hz0.25• at 60 Hz0.25• at 60 Hz0.9 ms• at 60 Hz0.4 ms• at 60 Hz0.4 ms• at 60 Hz0.5 ms• at 60 Hz0.5 ms• at 60 Hz0.1 Hz• at 70 Hz10 A• at 70 Hz10 A<					
inductive power factor with closing power of the coll 0.8 • at 60 Hz 0.75 apparent holding power of magnet coll at AC 4.2 VA • at 60 Hz 3.3 VA • at 60 Hz 0.25 • at 60 Hz 0.41 • at 60 Hz 0.25 • at 60 Hz 0.25 • at 60 Hz 0.25 • at 60 Hz 0.42 • at AC 1.5 ms • at AC 415 ms • at AC 10.4 • at AC 10.4 • at AC 10.4 • at					
• • • 150 Hz0.8• • • 150 Hz0.75• • • 150 Hz4.2 VA• • • 150 Hz3.3 VA• • • 150 Hz0.25• • • 150 Hz0.25• • • 150 Hz0.25• • • 160 Hz0.25• • • 160 Hz0.25• • • 160 Hz0.25• • • 160 Hz0.35 ms• • • • 160 Hz0.35 ms• • • • • 160 Hz0.35 ms• • • • • • • • • • • • • • • • • • •		24.3 VA			
• st 80 Hz0.75appent holding power of magnet coil at AC• st 80 Hz4.2 VA• st 80 Hz3.3 VAinductive power factor with the holding power of the coil0.25• st 80 Hz0.25• st 80 Hz935 msoppenting failagy415 ms• st 80 C015 ms• st 80 C115 ms					
apparent holding power of magnet coil at AC 4.2 VA • it 60 Hz 3.3 VA inductive power factor with the holding power of the coil 0.25 • it 60 Hz 0.35 ms • it 60 Hz 0					
• all 00 Hz42 VA• all 00 Hz33 VAinductive power factor with the holding power of the coll025• all 00 Hz025closing dolay025• all AC935 ms• all AC935 msopening delay415 ms• at AC1015 ms• arcing timeStandard A1 - A2Arxillary circuit1015 msoutrot varison of the switch operating mechanismStandard A1 - A2Arxillary circuit1015 msoperational current at AC-151• at 230 V rated value10 A• at 230 V rated value10 A• at 300 V rated value10 A• at 300 V rated value10 A• at 400 V rated value10 A• at 400 V rated value2A• at 400 V rated value10 A• at 400 V rated value10 A• at 400 V rated value10 A• at 400 V rated value2A• at 400 V rated value10 A• at 400 V rated value10 A• at 400 V rated value2A• at 600 V rated value3A• at 600 V rated value2A• at 600 V rated value2A• at 600 V rated value10 A• at 600 V rated value3A• at 600 V rated value3A• at 600 V rated value3A• at 600 V rated value2A• at 600 V rated value3A• at 600 V rated value3A• at 600 V rated value3A• at 600 V rated value3A </td <td></td> <td>0.75</td>		0.75			
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• at 50 Hz0.25• at 00 Hz0.55closing delay9 35 ms• at AC9 35 ms• at AC4 15 ms• at AC10 15 mscontrol version of the switch operating mechanism30 andrad A1 - A2Atkliary crout10 Aoperational current at AC-12 maximum10 Aoperational current at AC-12 maximum10 Aoperational current at AC-151• at 300 V rated value3 A• at 300 V rated value3 A• at 300 V rated value10 A• at 340 V rated value6 A• at 340 V rated value7 A• at 340 V rated value10 A• at 340 V rated value10 A• at 340 V rated value10 A• at 340 V rated value0.15 A• at 340 V rated value10 A• at 340 V rated value0.3 A• at 340 V ra					
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• at AC 4 15 ms arcing time 10 15 ms control version of the switch operating mechanism Slandard A1 - A2 Auxiliary circuit 1 number of NC contects for auxiliary contacts instantaneous contact 1 operational current at AC-12 maximum 10 A operational current at AC-15 - • at 200 V rated value 3 A • at 300 V rated value 3 A • at 500 V rated value 10 A • operational current at DC-12 - • at 400 V rated value 6 A • at 60 V rated value 6 A • at 60 V rated value 6 A • at 60 V rated value 10 A • at 60 V rated value 6 A • at 60 V rated value 10 A • at 60 V rated value 6 A • at 60 V rated value 6 A • at 60 V rated value 10 A					
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operational current at DC-13I0 A• at 24 V rated value10 A• at 48 V rated value2 A• at 60 V rated value2 A• at 110 V rated value1 A• at 125 V rated value0.9 A• at 220 V rated value0.3 A• at 600 V rated value0.1 Acontact reliability of auxiliary contacts1 faulty switching per 100 million (17 V, 1 mA)UL/CSA ratingsfull-load current (FLA) for 3-phase AC motor• at 600 V rated value7.6 A• at 600 V rated value9 A					
• at 24 V rated value10 A• at 48 V rated value2 A• at 60 V rated value2 A• at 60 V rated value1 A• at 110 V rated value0.9 A• at 220 V rated value0.3 A• at 600 V rated value0.1 A• at 600 V rated value1 faulty switching per 100 million (17 V, 1 mA)• UL/CSA ratings7.6 A• at 600 V rated value9 A		V. 10 A			
• at 48 V rated value2 A• at 60 V rated value2 A• at 10 V rated value1 A• at 125 V rated value0.9 A• at 220 V rated value0.3 A• at 600 V rated value0.1 A• at 600 V rated value1 faulty switching per 100 million (17 V, 1 mA)• UL/CSA ratingsV• at 480 V rated value7.6 A• at 600 V rated value9 A• at 600 V rated value9 A	•	10 A			
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• at 110 V rated value1 A• at 125 V rated value0.9 A• at 220 V rated value0.3 A• at 600 V rated value0.1 Acontact reliability of auxiliary contacts1 faulty switching per 100 million (17 V, 1 mA)UL/CSA ratingsfull-load current (FLA) for 3-phase AC motor• at 480 V rated value7.6 A• at 600 V rated value9 Ayielded mechanical performance [hp]• for single-phase AC motor					
• at 125 V rated value0.9 A• at 220 V rated value0.3 A• at 600 V rated value0.1 Acontact reliability of auxiliary contacts1 faulty switching per 100 million (17 V, 1 mA)UL/CSA ratingsfull-load current (FLA) for 3-phase AC motor7.6 A• at 480 V rated value9 Ayielded mechanical performance [hp]9 A					
• at 220 V rated value0.3 A• at 600 V rated value0.1 Acontact reliability of auxiliary contacts1 faulty switching per 100 million (17 V, 1 mA)UL/CSA ratingsfull-load current (FLA) for 3-phase AC motor• at 480 V rated value7.6 A• at 600 V rated value9 Ayielded mechanical performance [hp]• for single-phase AC motor					
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full-load current (FLA) for 3-phase AC motor 7.6 A • at 480 V rated value 7.6 A • at 600 V rated value 9 A yielded mechanical performance [hp] • for single-phase AC motor	contact reliability of auxiliary contacts	1 faulty switching per 100 million (17 V, 1 mA)			
full-load current (FLA) for 3-phase AC motor 7.6 A • at 480 V rated value 7.6 A • at 600 V rated value 9 A yielded mechanical performance [hp] • for single-phase AC motor	UL/CSA ratings				
• at 600 V rated value 9 A yielded mechanical performance [hp] • for single-phase AC motor					
yielded mechanical performance [hp] • for single-phase AC motor	• at 480 V rated value	7.6 A			
for single-phase AC motor	• at 600 V rated value	9 A			
	yielded mechanical performance [hp]				
- at 110/120 V rated value 0.33 hp	 for single-phase AC motor 				
	— at 110/120 V rated value	0.33 hp			

— at 230 V rated value	1 hp			
 for 3-phase AC motor 				
— at 200/208 V rated value	2 hp			
— at 220/230 V rated value	3 hp			
— at 460/480 V rated value	5 hp			
— at 575/600 V rated value	7.5 hp			
contact rating of auxiliary contacts according to UL	A600 / Q600			
Short-circuit protection				
design of the miniature circuit breaker for short-circuit protection of the auxiliary circuit up to 230 V	C characteristic: 10 A; 0.4 kA			
design of the fuse link				
 for short-circuit protection of the main circuit 				
 — with type of coordination 1 required 	gG: 35A (690V,100kA), aM: 20A (690V,100kA), BS88: 35A (415V,80kA)			
— with type of assignment 2 required	gG: 20A (690V,100kA), aM: 16A (690V, 100kA), BS88: 20A (415V, 80kA)			
 for short-circuit protection of the auxiliary switch required 	gG: 10 A (500 V, 1 kA)			
Installation/ mounting/ dimensions				
mounting position	+/-180° rotation possible on vertical mounting surface; can be tilted forward and			
inouning poolion	backward by +/- 22.5° on vertical mounting surface			
fastening method side-by-side mounting	Yes			
fastening method	screw and snap-on mounting onto 35 mm DIN rail according to DIN EN 60715			
height	58 mm			
width	45 mm			
depth	73 mm			
required spacing				
with side-by-side mounting				
— forwards	10 mm			
— upwards	10 mm			
— downwards	10 mm			
— at the side	0 mm			
	0 11111			
for grounded parts	10 mm			
— forwards				
— upwards	10 mm			
— at the side	6 mm			
— downwards	10 mm			
for live parts				
— forwards	10 mm			
— upwards	10 mm			
— downwards	10 mm			
— at the side	6 mm			
Connections/ Terminals				
type of electrical connection				
 for main current circuit 	screw-type terminals			
 for auxiliary and control circuit 	screw-type terminals			
 at contactor for auxiliary contacts 	Screw-type terminals			
• of magnet coil	Screw-type terminals			
type of connectable conductor cross-sections				
for main contacts				
— solid	2x (0.5 1.5 mm²), 2x (0.75 2.5 mm²), 2x 4 mm²			
— solid or stranded	2x (0,5 1,5 mm²), 2x (0,75 2,5 mm²), 2x 4 mm²			
 finely stranded with core end processing 	2x (0.5 1.5 mm ²), 2x (0.75 2.5 mm ²)			
for AWG cables for main contacts	2x (20 16), 2x (18 14), 2x 12			
connectable conductor cross-section for main contacts				
solid	0.5 4 mm²			
stranded	0.5 4 mm²			
 finely stranded with core end processing 	0.5 4 mm			
	0.0 2.0 mm			
connectable conductor cross-section for auxiliary contacts solid or stranded 	0.5 4 mm²			
finely stranded with core end processing	0.5 2.5 mm²			
type of connectable conductor cross-sections				
for auxiliary contacts				
— solid or stranded	2x (0.5 1.5 mm²), 2x (0.75 2.5 mm²), 2x 4 mm²			

- finely stranded with core end processing	2x (0.5 1.5 mm²), 2x (0.75 2.5 mm²)			
 for AWG cables for auxiliary contacts 	2x (20 16), 2x (18 14), 2x 12			
AWG number as coded connectable conductor cross section				
for main contacts	20 12			
 for auxiliary contacts 	20 12			
afety related data				
product function				
 mirror contact according to IEC 60947-4-1 	Yes			
 positively driven operation according to IEC 60947-5-1 	No			
suitable for safety function	Yes			
suitability for use safety-related switching OFF	Yes			
service life maximum	20 a			
test wear-related service life necessary	Yes			
proportion of dangerous failures				
 with low demand rate according to SN 31920 	40 %			
 with high demand rate according to SN 31920 	73 %			
B10 value with high demand rate according to SN 31920	1 000 000			
failure rate [FIT] with low demand rate according to SN 31920	100 FIT			
ISO 13849				
device type according to ISO 13849-1	3			
overdimensioning according to ISO 13849-2 necessary	Yes			
IEC 61508				
safety device type according to IEC 61508-2	Type A			
Electrical Safety				
protection class IP on the front according to IEC 60529	IP20			
touch protection on the front according to IEC 60529	finger-safe, for vertical contact from the front			
oprovals Certificates				
General Product Approval				
	Confirmation KC			

ccc	EG-Konf.	СА		UL	
General Product Ap- proval	EMV	Test Certificates		Marine / Shipping	
EHC	RCM	<u>Special Test Certific-</u> <u>ate</u>	Type Test Certific- ates/Test Report	ABS	BUREAU VERITAS
Marine / Shipping					other
	Lloyds Register us	PRS	RINA	RMRS R	<u>Miscellaneous</u>
other		Railway	Environment		
<u>Confirmation</u>	<u>Confirmation</u>	<u>Special Test Certific-</u> <u>ate</u>	EPD	Environmental Con- firmations	
Further information					

Information on the packaging https://support.industry.siemens.com/cs/ww/en/view/109813875 Information- and Downloadcenter (Catalogs, Brochures,...) https://www.siemens.com/ic10

Industry Mall (Online ordering system)

https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3RT2016-1AP02

Cax online generator

http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RT2016-1AP02

Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

https://support.industry.siemens.com/cs/ww/en/ps/3RT2016-1AP02

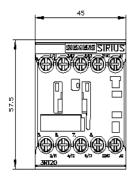
Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)

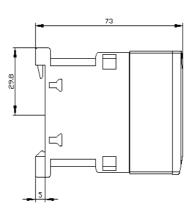
http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RT2016-1AP02&lang=en

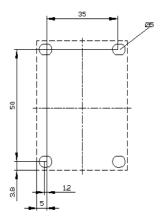
Characteristic: Tripping characteristics, I²t, Let-through current

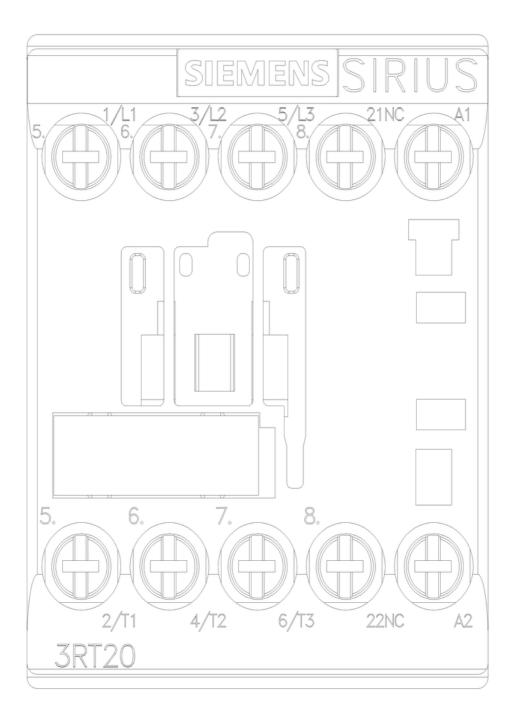
https://support.industry.siemens.com/cs/ww/en/ps/3RT2016-1AP02/char

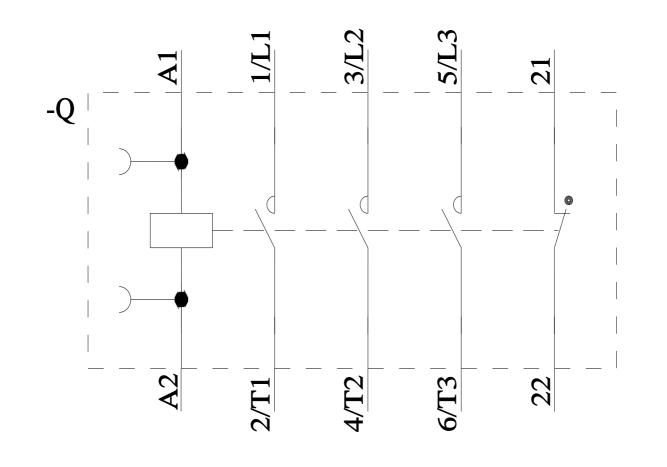
Further characteristics (e.g. electrical endurance, switching frequency) http://www.automation.siemens.com/bilddb/index.aspx?view=Search&mlfb=3RT2016-1AP02&objecttype=14&gridview=view1











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