SIEMENS

Data sheet 3RT2023-1AN20



power contactor, AC-3e/AC-3, 9 A, 4 kW / 400 V, 3-pole, 220 V AC, 50/60 Hz, auxiliary contacts: 1 NO + 1 NC, screw terminal, size: S0

product brand name	SIRIUS
product designation	Power contactor
product type designation	3RT2
General technical data	
size of contactor	S0
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 	0.6 W
 at AC in hot operating state per pole 	0.2 W
 without load current share typical 	2 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	7,5g / 5 ms, 4,7g / 10 ms
shock resistance with sine pulse	
• at AC	11,8g / 5 ms, 7,4g / 10 ms
mechanical service life (operating cycles)	
 of contactor typical 	10 000 000
 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	0.407 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	74.2 kg
global warming potential [CO2 eq] during manufacturing	1.9 kg
global warming potential [CO2 eq] during operation	72.4 kg
global warming potential [CO2 eq] after end of life	-0.117 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 	40 A
— up to 690 V at ambient temperature 40 °C rated value	40 A
— up to 690 V at ambient temperature 60 $^{\circ}\text{C}$ rated value	35 A
• at AC-3	
— at 400 V rated value	9 A
— at 500 V rated value	9 A
— at 690 V rated value	9 A
• at AC-3e	
— at 400 V rated value	9 A
— at 500 V rated value	9 A
— at 690 V rated value	9 A
at AC-4 at 400 V rated valueat AC-5a up to 690 V rated value	8.5 A 35.2 A
at AC-5a up to 400 V rated value at AC-5b up to 400 V rated value	7.4 A
• at AC-6a	1.7.1
— up to 230 V for current peak value n=20 rated value	11.4 A
— up to 400 V for current peak value n=20 rated value	11.4 A
— up to 500 V for current peak value n=20 rated value	9.1 A
up to 690 V for current peak value n=20 rated value	9 A
• at AC-6a	
— up to 230 V for current peak value n=30 rated value	7.6 A
— up to 400 V for current peak value n=30 rated value	7.6 A
 up to 500 V for current peak value n=30 rated value 	6.1 A
— up to 690 V for current peak value n=30 rated value	6.1 A
minimum cross-section in main circuit at maximum AC-1 rated value	10 mm²
operational current for approx. 200000 operating cycles at AC-4	
at 400 V rated value	4.1 A
• at 690 V rated value	3.3 A
operational current	
at 1 current path at DC-1 — at 24 V rated value	35 A
— at 60 V rated value	20 A
— at 110 V rated value	4.5 A
— at 220 V rated value	1A
— at 440 V rated value	0.4 A
— at 600 V rated value	0.25 A
• with 2 current paths in series at DC-1	
— at 24 V rated value	35 A
— at 60 V rated value	35 A
— at 110 V rated value	35 A
— at 220 V rated value	5 A
— at 440 V rated value	1 A
— at 600 V rated value	0.8 A

with 3 current paths in series at DC-1	
— at 24 V rated value	35 A
— at 60 V rated value	35 A
— at 110 V rated value	35 A
— at 220 V rated value	35 A
— at 440 V rated value	2.9 A
— at 600 V rated value	1.4 A
• at 1 current path at DC-3 at DC-5	1.7 //
— at 24 V rated value	20 A
— at 60 V rated value	5 A
— at 220 V rated value	1A
— at 440 V rated value	0.09 A
— at 600 V rated value	0.06 A
with 2 current paths in series at DC-3 at DC-5	5.50 A
— at 24 V rated value	35 A
— at 60 V rated value	35 A
— at 110 V rated value	15 A
— at 220 V rated value	3 A
— at 440 V rated value	0.27 A
— at 600 V rated value	0.16 A
with 3 current paths in series at DC-3 at DC-5	
— at 24 V rated value	35 A
— at 60 V rated value	35 A
— at 110 V rated value	35 A
— at 220 V rated value	10 A
— at 440 V rated value	0.6 A
— at 600 V rated value	0.6 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	7.5 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	7.5 kW
operating power for approx. 200000 operating cycles at AC-	
at 400 V rated value	2 kW
at 690 V rated value	2.5 kW
operating apparent power at AC-6a	
up to 230 V for current peak value n=20 rated value	4.5 kVA
• up to 400 V for current peak value n=20 rated value	7.8 kVA
• up to 500 V for current peak value n=20 rated value	7.8 kVA
up to 690 V for current peak value n=20 rated value	10.7 kVA
operating apparent power at AC-6a	
up to 230 V for current peak value n=30 rated value	3 kVA
 up to 400 V for current peak value n=30 rated value 	5.2 kVA
up to 500 V for current peak value n=30 rated value	5.2 kVA
• up to 690 V for current peak value n=30 rated value	7.2 kVA
short-time withstand current in cold operating state up to	
40 °C	470 At Lieu minimum cross scation and to AC 4 acts desired
limited to 1 s switching at zero current maximum limited to 5 a switching at zero current maximum	170 A; Use minimum cross-section acc. to AC-1 rated value
limited to 5 s switching at zero current maximum	170 A; Use minimum cross-section acc. to AC-1 rated value
limited to 10 s switching at zero current maximum	140 A; Use minimum cross-section acc. to AC-1 rated value
limited to 60 s switching at zero current maximum	104 A; Use minimum cross-section acc. to AC-1 rated value
Iimited to 60 s switching at zero current maximum no-load switching frequency	88 A; Use minimum cross-section acc. to AC-1 rated value
at AC	5 000 1/h
- 41.10	0 000 1111

operating frequency at AC-1 maximum 1 000 1 fh at AC-2 maximum 1 000 1 fh at AC-3 maximum 1 000 1 fh at AC-3 maximum 1 000 1 fh at AC-3 maximum 300 1 fh Control Supply voltage of the centrol supply voltage C control Supply voltage at AC 220 V at 50 1/z rated volue 220 V operating range factor control supply voltage rated value of an 30 Hz 4 50 Hz at 50 1/z rated volue 20 V operating range factor control supply voltage rated value of an 30 Hz 6 S VA at 50 Hz 6 S VA at 50 Hz 6 S VA at 50 Hz 0 7 VA at 50 Hz 0 72 at 50 Hz 0 72 at 50 Hz 0 72 at 50 Hz 0 75 VA at		
** at AC-2 maximum 1000 1/h ** at AC-3 maximum 1000 1/h ** at AC-5 maximum 1000 1/h ** at AC-4 maximum 2000 1/h ** at SO 1/k rated value 200		
** at AC-3 remainma** 1000 l/h ** at AC-3 remainma** 1000 l/h ** at AC-3 remainma** 1000 l/h ** at AC-4 remainma** 300 l/h	at AC-1 maximum	1 000 1/h
at AC-3e maximum 1000 l/h Control Surpul Voltage of the control supply voltage AC control supply voltage at AC - at 50 Hz rated value 200 V at 50 Hz rated value 200 V operating range factor control supply voltage rated value of rangenet coll at AC value 0.8 ± 1.1 at 50 Hz 0.8 ± 1.1 spearent plack-up power of magnet coll at AC value 67 VA at 50 Hz 67 VA inductive power factor with closing power of the coll 4 ± 50 Hz at 50 Hz 0.72 at 50 Hz 6.5 VA inductive power factor with tholding power of the coll 7.9 VA at 50 Hz 6.5 VA inductive power factor with tholding power of the coll 4.1 50 Hz at 50 Hz 6.5 VA inductive power factor with tholding power of the coll 7.9 VA at 50 Hz 6.5 VA inductive power factor with tholding power of the coll 8.4 Mg at 50 Hz 6.5 VA inductive power factor with tholding power of the coll 1.0 Mg at 20 Hz 6.5 VA inductive power	• at AC-2 maximum	1 000 1/h
	• at AC-3 maximum	1 000 1/h
Speed voltage of the control supply voltage AC	• at AC-3e maximum	1 000 1/h
type of voltage of the control supply voltage at AC C at 50 Hz rated value 220 V at 60 Hz rated value 220 V cat 50 Hz 0.8 1.1 at 50 Hz 0.72 at 50 Hz 0.72 at 50 Hz 0.74 apparent boiding power of magnet coil at AC 0.74 at 50 Hz 0.79 AX at 50 Hz 0.79 AX at 50 Hz 0.5 VA at 50 Hz 0.5 VA at 40 Hz 0.25 at 40 Hz 0.25 at 40 Hz 0.8 40 ms at 4 C 4 16 ms arcing time 0 10 ms cottract value v	at AC-4 maximum	300 1/h
entrol supply voltage at AC at 50 Hz rated value 220 V 220	Control circuit/ Control	
* at 50 Hz rated value * at 60 Hz rated value operating range factor control supply voltage rated value of magnet coil at AC * at 50 Hz * at 60	type of voltage of the control supply voltage	AC
* al 60 Hz rated value 220 V	control supply voltage at AC	
Spending range factor control supply voltage rated value of magnet coil at AC • alt 50 Hz	at 50 Hz rated value	220 V
magnet coli at AC	at 60 Hz rated value	220 V
* at 50 Hz		
+ at 80 Hz		0.9 1.1
### STAND CONTRACT OF THE WORLD FOR THE WORL		
• at 50 Hz		0.85 1.1
• at 60 Hz		60.1/4
1		
• at 50 Hz aparent holding power of magnet coil at AC est 50 Hz 5150 Hz 5150 Hz 6150		OF VIC
* at 60 Hz		0.72
a 150 Hz	*****	
• at 50 Hz • at 60 Hz • at AC opening delay • at AC opening time • at AC arcing time control version of the switch operating mechanism Standard A1 - A2 Auxiliary circuit number of NC contacts for auxiliary contacts instantaneous contact contact number of NO contacts for auxiliary contacts instantaneous contact operational current at AC-12 maximum 10 A operational current at AC-14 maximum operational current at AC-15 • at 230 V rated value • at 600 V rated value • at 600 V rated value • at 48 V rated value • at 48 V rated value • at 48 V rated value • at 125 V rated value • at 600 V rated value •		0.17
• at 60 Hz 10 Hz		7 0 \/\
a ti 50 Hz 0.25 0.26		
• at 50 Hz • at 60 Hz • at 60 Hz • at AC • arching time • at Auxiliary circuit Tumber of NC contacts for auxiliary contacts instantaneous contact • contact • arching time • at 200 V acted value • at 400 V rated value		0.5 VA
closing delay 8 40 ms opening delay 4 16 ms a rcing time 10 10 ms control version of the switch operating mechanism Standard A1 - A2 Auxiliary circuit 10 ms number of NC contacts for auxiliary contacts instantaneous contact 1 number of NC contacts for auxiliary contacts instantaneous contact 1 outlead 10 A operational current at AC-12 maximum 10 A operational current at AC-14 maximum 10 A operational current at AC-15 3A o at 230 V rated value 3A o at 400 V rated value 1A operational current at DC-12 1A o at 24 V rated value 6A o at 48 V rated value 6A o at 48 V rated value 3A o at 125 V rated value 1A o at 220 V rated value 2A o at 220 V rated value 1A o at 220 V rated value 1A o at 24 V rated value 2A o at 24 V rated value 1A o at 600 V rated value 2A <		0.25
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■ at AC arcing time		io iiio
arcing time 10 10 ms control version of the switch operating mechanism Standard A1 - A2 Auxiliary circuit To contacts number of NC contacts for auxiliary contacts instantaneous contact 1 ounder of NO contacts for auxiliary contacts instantaneous contact 1 operational current at AC-12 maximum 10 A operational current at AC-15 10 A e at 230 V rated value 3 A e at 400 V rated value 2 A e at 4500 V rated value 10 A e at 48 V rated value 6 A e at 44 V rated value 6 A e at 60 V rated value 6 A e at 110 V rated value 3 A e at 125 V rated value 1 A e at 220 V rated value 1 A e at 220 V rated value 2 A e at 600 V rated value 1 A e at 48 V rated value 2 A		4 16 ms
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 ◆ at 600 V rated value Operational current at DC-13 ◆ at 24 V rated value ◆ at 48 V rated value ◆ at 60 V rated value ◆ at 110 V rated value ◆ at 125 V rated value ◆ at 220 V rated value ◆ at 600 V rated value ◆ at 200 V rated value ◆ at 200 V rated value ◆ at 600 V rated value ◆ at 600 V rated value 	operational current at AC-15 • at 230 V rated value • at 400 V rated value • at 500 V rated value • at 690 V rated value operational current at DC-12 • at 24 V rated value • at 48 V rated value • at 60 V rated value • at 110 V rated value	10 A 3 A 2 A 1 A 10 A 6 A 6 A 6 A 3 A
operational current at DC-13 • at 24 V rated value 10 A • at 48 V rated value 2 A • at 60 V rated value 2 A • at 110 V rated value 1 A • at 125 V rated value 0.9 A • at 220 V rated value 0.3 A • at 600 V rated value 0.1 A	operational current at AC-15 • at 230 V rated value • at 400 V rated value • at 500 V rated value • at 690 V rated value operational current at DC-12 • at 24 V rated value • at 48 V rated value • at 60 V rated value • at 110 V rated value • at 125 V rated value	10 A 3 A 2 A 1 A 10 A 6 A 6 A 3 A 2 A
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 at 48 V rated value at 60 V rated value at 110 V rated value at 125 V rated value at 220 V rated value at 600 V rated value at 600 V rated value at 600 V rated value 	operational current at AC-15 • at 230 V rated value • at 400 V rated value • at 500 V rated value • at 690 V rated value operational current at DC-12 • at 24 V rated value • at 48 V rated value • at 60 V rated value • at 110 V rated value • at 125 V rated value • at 220 V rated value • at 600 V rated value • at 600 V rated value	10 A 3 A 2 A 1 A 10 A 6 A 6 A 3 A 2 A 1 A
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 at 125 V rated value at 220 V rated value at 600 V rated value 0.3 A at 600 V rated value 	operational current at AC-15 • at 230 V rated value • at 400 V rated value • at 500 V rated value • at 690 V rated value operational current at DC-12 • at 24 V rated value • at 48 V rated value • at 60 V rated value • at 110 V rated value • at 125 V rated value • at 220 V rated value • at 600 V rated value • at 220 V rated value • at 24 V rated value • at 48 V rated value • at 48 V rated value operational current at DC-13 • at 24 V rated value • at 48 V rated value	10 A 3 A 2 A 1 A 10 A 6 A 6 A 3 A 2 A 1 A 10 A 2 A 1 A 0.15 A
 at 220 V rated value at 600 V rated value 0.3 A 0.1 A 	operational current at AC-15 • at 230 V rated value • at 400 V rated value • at 500 V rated value • at 690 V rated value operational current at DC-12 • at 24 V rated value • at 48 V rated value • at 60 V rated value • at 110 V rated value • at 125 V rated value • at 220 V rated value • at 600 V rated value • at 220 V rated value • at 24 V rated value • at 48 V rated value • at 48 V rated value operational current at DC-13 • at 24 V rated value • at 48 V rated value	10 A 3 A 2 A 1 A 10 A 6 A 6 A 3 A 2 A 1 A 10 A 2 A 1 A 0.15 A
at 600 V rated value 0.1 A	operational current at AC-15 • at 230 V rated value • at 400 V rated value • at 500 V rated value • at 690 V rated value operational current at DC-12 • at 24 V rated value • at 48 V rated value • at 60 V rated value • at 110 V rated value • at 125 V rated value • at 220 V rated value • at 600 V rated value • at 220 V rated value • at 600 V rated value • at 600 V rated value • at 600 V rated value • at 48 V rated value • at 48 V rated value • at 48 V rated value • at 600 V rated value	10 A 3 A 2 A 1 A 10 A 6 A 6 A 3 A 2 A 1 A 10 A 2 A 1 A 0.15 A
	operational current at AC-15 • at 230 V rated value • at 400 V rated value • at 500 V rated value • at 690 V rated value operational current at DC-12 • at 24 V rated value • at 48 V rated value • at 60 V rated value • at 110 V rated value • at 125 V rated value • at 220 V rated value • at 600 V rated value • at 48 V rated value • at 600 V rated value	10 A 3 A 2 A 1 A 10 A 6 A 6 A 3 A 2 A 1 A 0.15 A
contact reliability of auxiliary contacts 1 faulty switching per 100 million (17 V, 1 mA)	operational current at AC-15 • at 230 V rated value • at 400 V rated value • at 500 V rated value • at 690 V rated value operational current at DC-12 • at 24 V rated value • at 48 V rated value • at 60 V rated value • at 110 V rated value • at 125 V rated value • at 220 V rated value • at 600 V rated value • at 48 V rated value • at 600 V rated value • at 600 V rated value • at 600 V rated value • at 110 V rated value • at 125 V rated value • at 110 V rated value • at 110 V rated value • at 125 V rated value • at 125 V rated value	10 A 3 A 2 A 1 A 10 A 6 A 6 A 3 A 2 A 1 A 0.15 A
	operational current at AC-15 • at 230 V rated value • at 400 V rated value • at 500 V rated value • at 690 V rated value operational current at DC-12 • at 24 V rated value • at 48 V rated value • at 60 V rated value • at 110 V rated value • at 125 V rated value • at 220 V rated value • at 600 V rated value • at 125 V rated value	10 A 3 A 2 A 1 A 10 A 6 A 6 A 3 A 2 A 1 A 0.15 A 10 A 2 A 2 A 1 A 0.9 A 0.3 A 0.1 A

UL/CSA ratings	
full-load current (FLA) for 3-phase AC motor	
• at 480 V rated value	7.6 A
• at 600 V rated value	9 A
yielded mechanical performance [hp]	
for single-phase AC motor	
— at 110/120 V rated value	1 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 / P600
Short-circuit protection	
design of the miniature circuit breaker for short-circuit protection	C characteristic: 10 A; 0.4 kA
of the auxiliary circuit up to 230 V design of the fuse link	
for short-circuit protection of the main circuit	
with type of coordination 1 required	gG: 63A (690V,100kA), aM: 32A (690V,100kA), BS88: 63A (415V,80kA)
with type of assignment 2 required	gG: 25A (690V,100kA), aM: 20A (690V,100kA), BS88: 25A (415V,80kA)
for short-circuit protection of the auxiliary switch required	gG: 10 A (500 V, 1 kA)
Installation/ mounting/ dimensions	<u></u>
mounting position	+/-180° rotation possible on vertical mounting surface; can be tilted forward and
	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	85 mm
width	45 mm
depth	97 mm
required spacing	
with side-by-side mounting	40
— forwards	10 mm
— upwards	10 mm
— downwards	10 mm
— at the side	0 mm
• for grounded parts	40
— forwards	10 mm
— upwards	10 mm
— at the side	6 mm
— downwards	10 mm
• for live parts	10 mm
— forwards	10 mm
— upwards	10 mm
downwards at the side	10 mm 6 mm
— at the side Connections/ Terminals	O IIIIII
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 (1 2.5 mm²), 2x (2.5 10 mm²)
— solid or stranded	2x (1 2.5 mm²), 2x (2.5 10 mm²)
— finely stranded with core end processing	2x (1 2.5 mm²), 2x (2.5 6 mm²), 1x 10 mm²
• for AWG cables for main contacts	2x (16 12), 2x (14 8)
connectable conductor cross-section for main contacts	
• solid	1 10 mm²
• stranded	1 10 mm²

finely stranded with core end processing	1 10 mm²
connectable conductor cross-section for auxiliary contacts	
solid or stranded	0.5 2.5 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)
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)
AWG number as coded connectable conductor cross section	
for main contacts	16 8
for auxiliary contacts	20 14
Safety 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
Approvals Certificates	

General Product Approval







Confirmation



<u>KC</u>

General Product Approval

EMV

Test Certificates

Marine / Shipping





Type Test Certificates/Test Report

Special Test Certificate





Marine / Shipping









Miscellaneous

other

Confirmation

other Railway Environment



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)

Cax online generator

http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RT2023-1AN20

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

https://support.industry.siemens.com/cs/ww/en/ps/3RT2023-1AN20

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

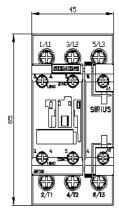
http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RT2023-1AN20&lang=en

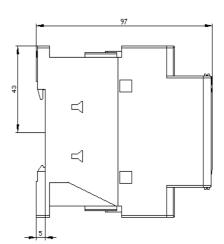
Characteristic: Tripping characteristics, I²t, Let-through current

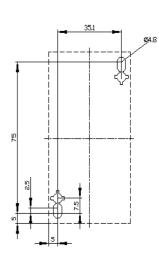
https://support.industry.siemens.com/cs/ww/en/ps/3RT2023-1AN20/char

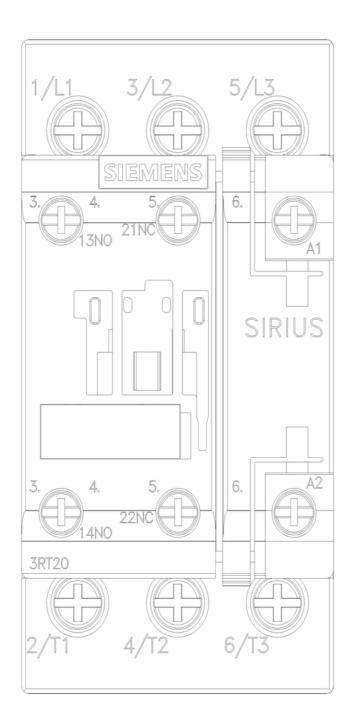
Further characteristics (e.g. electrical endurance, switching frequency)

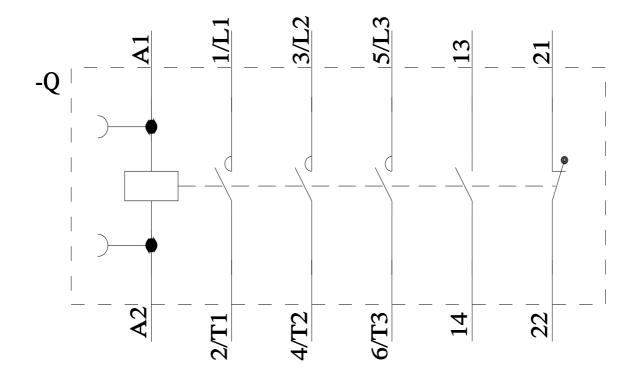
http://www.automation.siemens.com/bilddb/index.aspx?view=Search&mlfb=3RT2023-1AN20&objecttype=14&gridview=view1











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