SIEMENS

Data sheet 3RT2028-1AP04

Power contactor, AC-3 38 A, 18.5 kW / 400 V 2 NO + 2 NC, 230 V AC 50 Hz, 3-pole, size S0 screw terminals Removable auxiliary switch

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
• product extension auxiliary switch	No
• power loss [W] for rated value of the current at AC in hot operating state	11.4 W
• power loss [W] for rated value of the current at AC in hot operating state per pole	3.8 W
power loss [W] for rated value of the current without load current share typical	9.8 W
Surge voltage resistance	
• of main circuit rated value	6 kV
• of auxiliary circuit rated value	6 kV
maximum permissible voltage for safe isolation	

• between coil and main contacts acc. to EN 60947-1	400 V
protection class IP	
• on the front	IP20
• of the terminal	IP20
Shock resistance at rectangular impulse	
• at AC	8,3g / 5 ms, 5,3g / 10 ms
Shock resistance with sine pulse	
• at AC	13,5g / 5 ms, 8,3g / 10 ms
Mechanical service life (switching cycles)	
• of contactor typical	10 000 000
• of the contactor with added electronics-compatible auxiliary switch block typical	5 000 000
• of the contactor with added auxiliary switch block typical	10 000 000
reference code acc. to DIN EN 81346-2	Q

Ambient conditions

• installation altitude at height above sea level maximum	2 000 m
• ambient temperature during operation	-25 ... +60 °C
• ambient temperature during storage	-55 ... +80 °C

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
• Operating current at AC-1 at 400 V	
— at ambient temperature 40 °C rated value	50 A
• Operating current at AC-1	
— up to 690 V at ambient temperature 40 °C rated value	50 A
— up to 690 V at ambient temperature 60 °C rated value	42 A
• Operating current at AC-2 at 400 V rated value	38 A
•	
— operating current at AC-3 at 400 V rated value	38 A
— Operating current at AC-3 at 500 V rated value	32 A
— Operating current at AC-3 at 690 V rated value	21 A
• Operating current at AC-4 at 400 V rated value	22 A

• Operating current at AC-5a up to 690 V rated value	44 A
• Operating current at AC-5b up to 400 V rated value	31.5 A
• Operating current at AC-6a	
— up to 230 V for current peak value n=20 rated value	30.8 A
— up to 400 V for current peak value n=20 rated value	30.8 A
— up to 500 V for current peak value n=20 rated value	30.8 A
— up to 690 V for current peak value n=20 rated value	21 A
• Operating current at AC-6a	
— up to 230 V for current peak value n=30 rated value	20.5 A
— up to 400 V for current peak value n=30 rated value	20.5 A
— up to 500 V for current peak value n=30 rated value	21.4 A
— up to 690 V for current peak value n=30 rated value	21 A
Minimum cross-section in main circuit	
• at maximum AC-1 rated value	10 mm²
Operating current for approx. 200000 operating cycles at AC-4	
• at 400 V rated value	12 A
• at 690 V rated value	12 A
Operating current	
• at 1 current path at DC-1	
— at 24 V rated value	35 A
— at 110 V rated value	4.5 A
— at 220 V rated value	1 A
— 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 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 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
Operating current	
• at 1 current path at DC-3 at DC-5	
— at 24 V rated value	20 A
— at 110 V rated value	2.5 A
— at 220 V rated value	1 A
— 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	
— at 24 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 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-2 at 400 V rated value	18.5 kW
•	
— operating power at AC-3 at 230 V rated value	11 kW
— operating power at AC-3 at 400 V rated value	18.5 kW
— operating power at AC-3 at 500 V rated value	18.5 kW
— operating power at AC-3 at 690 V rated value	18.5 kW
Operating power for approx. 200000 operating cycles at AC-4	
• at 400 V rated value	6 kW
• at 690 V rated value	10.3 kW
Operating apparent output at AC-6a	
• up to 230 V for current peak value n=20 rated value	12.2 kV·A
• up to 400 V for current peak value n=20 rated value	21.3 kV·A

• up to 500 V for current peak value n=20 rated value	26.6 kV·A
• up to 690 V for current peak value n=20 rated value	25 kV·A
Operating apparent output at AC-6a	
• up to 230 V for current peak value n=30 rated value	8.1 kV·A
• up to 400 V for current peak value n=30 rated value	14.2 kV·A
• up to 500 V for current peak value n=30 rated value	18.5 kV·A
• up to 690 V for current peak value n=30 rated value	25 kV·A
Short-time withstand current in cold operating state up to 40 °C	
• limited to 1 s switching at zero current maximum	593 A; Use minimum cross-section acc. to AC-1 rated value
• limited to 5 s switching at zero current maximum	395 A; Use minimum cross-section acc. to AC-1 rated value
• limited to 10 s switching at zero current maximum	260 A; Use minimum cross-section acc. to AC-1 rated value
• limited to 30 s switching at zero current maximum	186 A; Use minimum cross-section acc. to AC-1 rated value
• limited to 60 s switching at zero current maximum	152 A; Use minimum cross-section acc. to AC-1 rated value
No-load switching frequency	
• at AC	5 000 1/h
• Operating frequency at AC-1 maximum	1 000 1/h
• Operating frequency at AC-2 maximum	750 1/h
• operating frequency at AC-3 maximum	750 1/h
• Operating frequency at AC-4 maximum	250 1/h

Control circuit/ Control

Type of voltage of the control supply voltage	AC
• Control supply voltage at AC at 50 Hz rated value	230 V
Operating range factor control supply voltage rated value of magnet coil at AC	
• at 50 Hz	0.8 ... 1.1
Apparent pick-up power of magnet coil at AC	
• at 50 Hz	77 V·A
Inductive power factor with closing power of the coil	
• at 50 Hz	0.82
Apparent holding power of magnet coil at AC	
• at 50 Hz	9.8 V·A

Inductive power factor with the holding power of the coil	
• at 50 Hz	0.25
Closing delay	
• at AC	8 ... 40 ms
Opening delay	
• at AC	4 ... 16 ms
Arcing time	10 ... 10 ms
Control version of the switch operating mechanism	Standard A1 - A2

Auxiliary circuit

• Number of NC contacts for auxiliary contacts instantaneous contact	2
• Number of NO contacts for auxiliary contacts instantaneous contact	2
Operating current at AC-12 maximum	10 A
Operating current at AC-15	
• at 230 V rated value	6 A
• at 400 V rated value	3 A
• at 500 V rated value	2 A
• at 690 V rated value	1 A
• Operating current at DC-12 at 24 V rated value	10 A
• operating current at DC-12 at 48 V rated value	6 A
• Operating current at DC-12 at 60 V rated value	6 A
• operating current at DC-12 at 110 V rated value	3 A
• Operating current at DC-12 at 125 V rated value	2 A
• Operating current at DC-12 at 220 V rated value	1 A
• Operating current at DC-12 at 600 V rated value	0.15 A
• Operating current at DC-13 at 24 V rated value	6 A
• operating current at DC-13 at 48 V rated value	2 A
• Operating current at DC-13 at 60 V rated value	2 A
• operating current at DC-13 at 110 V rated value	1 A
• Operating current at DC-13 at 125 V rated value	0.9 A
• Operating current at DC-13 at 220 V rated value	0.3 A
• Operating current at DC-13 at 600 V rated value	0.1 A
contact reliability of auxiliary contacts	1 faulty switching per 100 million (17 V, 1 mA)

UL/CSA ratings

full-load current (FLA) for three-phase AC motor	
• at 480 V rated value	34 A
• at 600 V rated value	27 A
yielded mechanical performance [hp]	
• for single-phase AC motor	
— at 110/120 V rated value	3 hp
— at 230 V rated value	5 hp
• for three-phase AC motor	
— at 200/208 V rated value	10 hp
— at 220/230 V rated value	10 hp
— at 460/480 V rated value	25 hp
— at 575/600 V rated value	25 hp
contact rating of auxiliary contacts according to UL	A600 / Q600

Short-circuit protection

• Design of the fuse link for short-circuit protection of the main circuit with type of coordination 1 required	gG: 125A (690V,100kA), aM: 50A (690V,100kA), BS88: 125A (415V,80kA)
• Design of the fuse link for short-circuit protection of the main circuit with type of assignment 2 required	gG: 50A (690V,100kA), aM: 25A (690V, 100kA), BS88: 50A (415V, 80kA)
• design of the fuse link 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 backward by +/- 22.5° on vertical mounting surface
• **mounting type**	screw and snap-on mounting onto 35 mm standard mounting rail according to DIN EN 60715
• mounting type side-by-side mounting	Yes
height	85 mm
width	45 mm
depth	141 mm
required spacing	
• with side-by-side mounting	
— forwards	10 mm
— upwards	10 mm
— downwards	10 mm
— at the side	0 mm
• for grounded parts	
— forwards	10 mm
— 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
• type of electrical connection for auxiliary and control current circuit	screw-type terminals
• Type of electrical connection at contactor for auxiliary contacts	Screw-type terminals
• Type of electrical connection 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)
• type of connectable conductor cross-sections for main contacts single or multi-stranded	2x (1 ... 2,5 mm²), 2x (2,5 ... 10 mm²)
• type of connectable conductor cross-sections for main contacts finely stranded with core end processing	2x (1 ... 2.5 mm²), 2x (2.5 ... 6 mm²), 1x 10 mm²
• type of connectable conductor cross-sections at AWG conductors 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	
• single or multi-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 single or multi-stranded	2x (0,5 ... 1,5 mm²), 2x (0,75 ... 2,5 mm²)
• type of connectable conductor cross-sections for auxiliary contacts finely stranded with core end processing	2x (0.5 ... 1.5 mm²), 2x (0.75 ... 2.5 mm²)
• type of connectable conductor cross-sections at AWG conductors 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	
B10 value	
• with high demand rate acc. to SN 31920	1 000 000
proportion of dangerous failures	
• with low demand rate acc. to SN 31920	40 %
• with high demand rate acc. to SN 31920	73 %
failure rate [FIT]	
• with low demand rate acc. to SN 31920	100 FIT
Product function	
• Mirror contact acc. to IEC 60947-4-1	Yes
• positively driven operation acc. to IEC 60947-5-1	No
T1 value for proof test interval or service life acc. to IEC 61508	20 y
protection against electrical shock	finger-safe
Suitability for use safety-related switching OFF	Yes

Certificates/ approvals

General Product Approval					EMC
CCC	CSA	UL	KC	EAC	RCM

Functional Safety/Safety of Machinery	Declaration of Conformity		Test Certificates		Marine / Shipping
Type Examination Certificate	EG-Konf.	Miscellaneous	Type Test Certificates/Test Report	Special Test Certificate	ABS

Marine / Shipping					other
BUREAU VERITAS	LRS	RINA	RMRS	DNVGL.COM/AF	Confirmation

other
VDE

Further information

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=3RT2028-1AP04

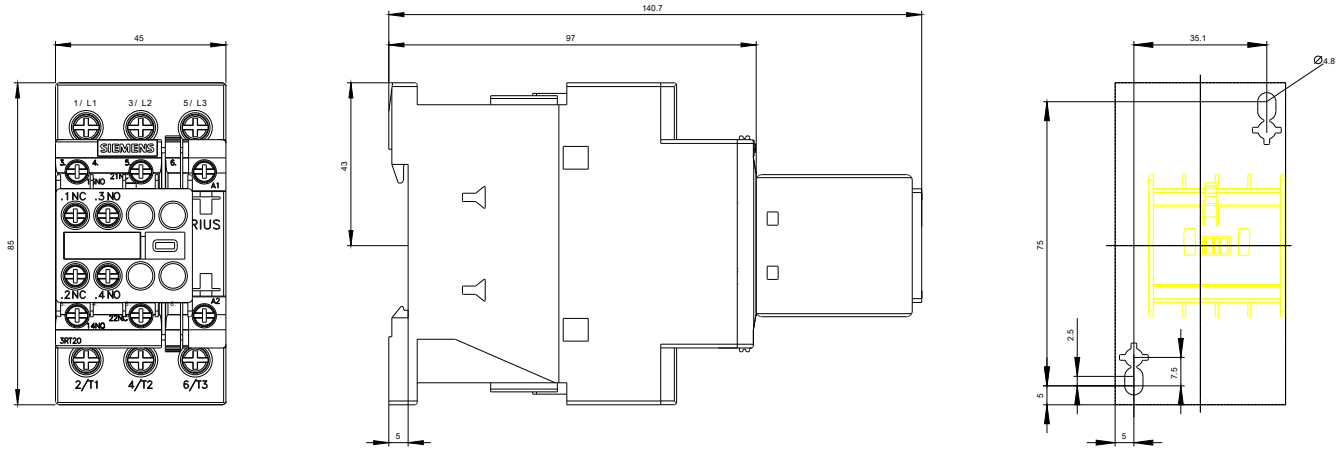
Cax online generator
http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RT2028-1AP04

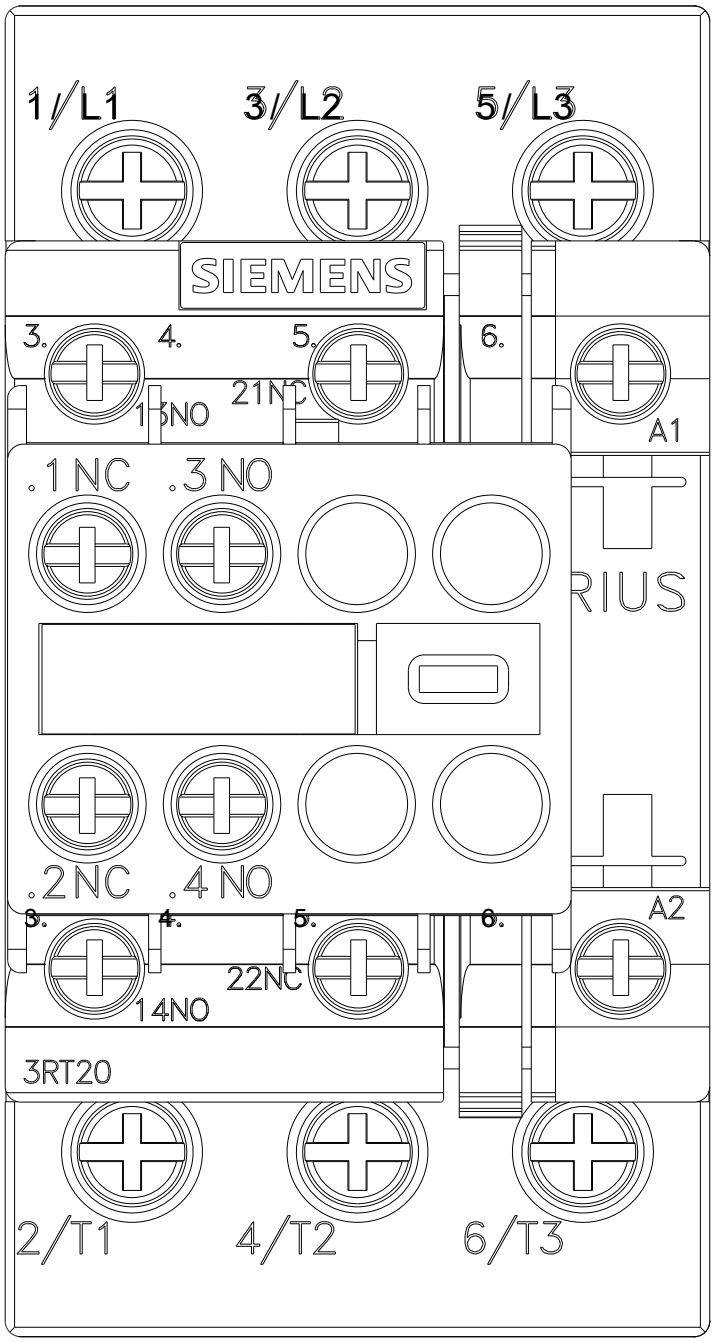
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)
https://support.industry.siemens.com/cs/ww/en/ps/3RT2028-1AP04

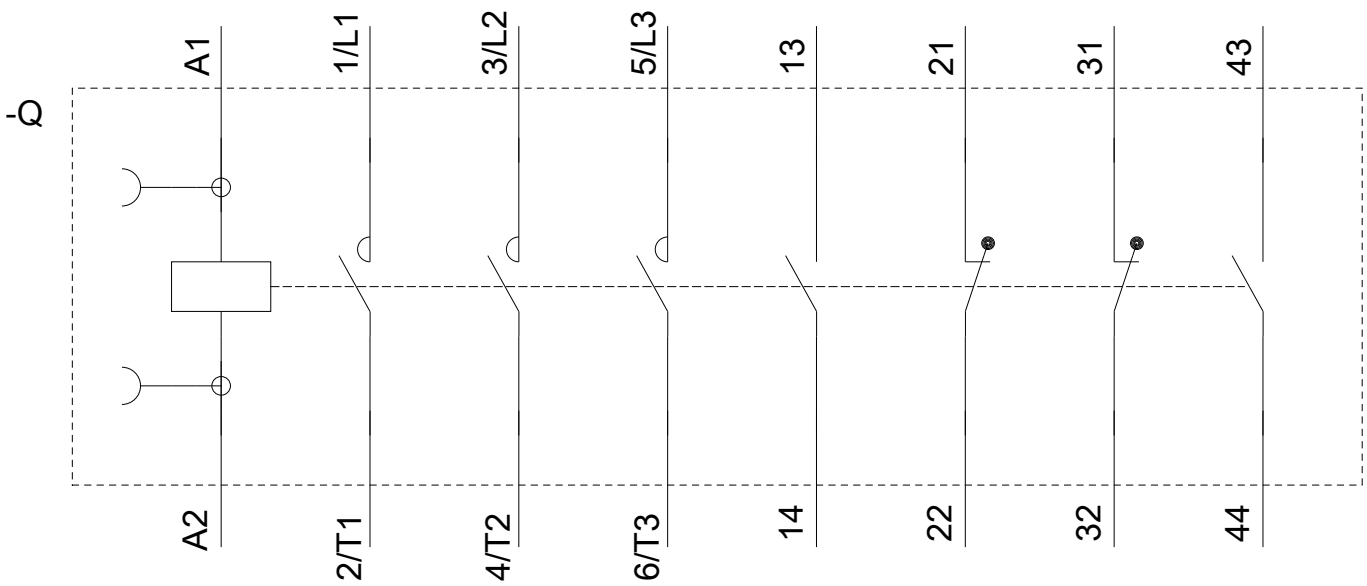
Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)
http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RT2028-1AP04&lang=en

Characteristic: Tripping characteristics, I²t, Let-through current
https://support.industry.siemens.com/cs/ww/en/ps/3RT2028-1AP04/char

Further characteristics (e.g. electrical endurance, switching frequency)
http://www.automation.siemens.com/bilddb/index.aspx?view=Search&mlfb=3RT2028-1AP04&objecttype=14&gridview=view1







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