

SIEMENS

Data sheet

3RT2024-1AF00



power contactor, AC-3e/AC-3, 12 A, 5.5 kW / 400 V, 3-pole, 110 V AC, 50 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	0.9 W
• at AC in hot operating state per pole	0.3 W
• without load current share typical	1.9 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	0.409 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	40 A
• at AC-1	
— up to 690 V at ambient temperature 40 °C rated value	40 A
— up to 690 V at ambient temperature 60 °C rated value	35 A
• at AC-3	
— at 400 V rated value	12 A
— at 500 V rated value	12 A
— at 690 V rated value	9 A
• at AC-3e	
— at 400 V rated value	12 A
— at 500 V rated value	12 A
— at 690 V rated value	9 A
• at AC-4 at 400 V rated value	12.5 A
• at AC-5a up to 690 V rated value	35.2 A
• at AC-5b up to 400 V rated value	9.9 A
• at AC-6a	
— 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	11.3 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	7.6 A
— up to 690 V for current peak value n=30 rated value	7.6 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	5.5 A
• at 690 V rated value	5.5 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	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 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

<div><div>● with 3 current paths in series at DC-1</div><div><div>— at 24 V rated value</div><div>— at 60 V rated value</div><div>— at 110 V rated value</div><div>— at 220 V rated value</div><div>— at 440 V rated value</div><div>— at 600 V rated value</div></div></div> <div><div>● at 1 current path at DC-3 at DC-5</div><div><div>— at 24 V rated value</div><div>— at 60 V rated value</div><div>— at 220 V rated value</div><div>— at 440 V rated value</div><div>— at 600 V rated value</div></div></div> <div><div>● with 2 current paths in series at DC-3 at DC-5</div><div><div>— at 24 V rated value</div><div>— at 60 V rated value</div><div>— at 110 V rated value</div><div>— at 220 V rated value</div><div>— at 440 V rated value</div><div>— at 600 V rated value</div></div></div> <div><div>● with 3 current paths in series at DC-3 at DC-5</div><div><div>— at 24 V rated value</div><div>— at 60 V rated value</div><div>— at 110 V rated value</div><div>— at 220 V rated value</div><div>— at 440 V rated value</div><div>— at 600 V rated value</div></div></div>	<div>35 A</div> <div>35 A</div> <div>35 A</div> <div>35 A</div> <div>2.9 A</div> <div>1.4 A</div> <div>20 A</div> <div>5 A</div> <div>1 A</div> <div>0.09 A</div> <div>0.06 A</div> <div>35 A</div> <div>35 A</div> <div>15 A</div> <div>3 A</div> <div>0.27 A</div> <div>0.16 A</div> <div>35 A</div> <div>35 A</div> <div>35 A</div> <div>10 A</div> <div>0.6 A</div> <div>0.6 A</div>
<div>operating power</div> <div><div>● at AC-3</div><div><div>— at 230 V rated value</div><div>— at 400 V rated value</div><div>— at 500 V rated value</div><div>— at 690 V rated value</div></div></div> <div><div>● at AC-3e</div><div><div>— at 230 V rated value</div><div>— at 400 V rated value</div><div>— at 500 V rated value</div><div>— at 690 V rated value</div></div></div>	<div>3 kW</div> <div>5.5 kW</div> <div>5.5 kW</div> <div>7.5 kW</div> <div>3 kW</div> <div>5.5 kW</div> <div>5.5 kW</div> <div>7.5 kW</div>
<div>operating power for approx. 200000 operating cycles at AC-4</div> <div><div>● at 400 V rated value</div><div>● at 690 V rated value</div></div>	<div>2.6 kW</div> <div>4.6 kW</div>
<div>operating apparent power at AC-6a</div> <div><div>● up to 230 V for current peak value n=20 rated value</div><div>● up to 400 V for current peak value n=20 rated value</div><div>● up to 500 V for current peak value n=20 rated value</div><div>● up to 690 V for current peak value n=20 rated value</div></div>	<div>4.5 kVA</div> <div>7.8 kVA</div> <div>9.8 kVA</div> <div>10.7 kVA</div>
<div>operating apparent power at AC-6a</div> <div><div>● up to 230 V for current peak value n=30 rated value</div><div>● up to 400 V for current peak value n=30 rated value</div><div>● up to 500 V for current peak value n=30 rated value</div><div>● up to 690 V for current peak value n=30 rated value</div></div>	<div>3 kVA</div> <div>5.2 kVA</div> <div>6.5 kVA</div> <div>9 kVA</div>
<div>short-time withstand current in cold operating state up to 40 °C</div> <div><div>● limited to 1 s switching at zero current maximum</div><div>● limited to 5 s switching at zero current maximum</div><div>● limited to 10 s switching at zero current maximum</div><div>● limited to 30 s switching at zero current maximum</div><div>● limited to 60 s switching at zero current maximum</div></div>	<div>210 A; Use minimum cross-section acc. to AC-1 rated value</div> <div>210 A; Use minimum cross-section acc. to AC-1 rated value</div> <div>170 A; Use minimum cross-section acc. to AC-1 rated value</div> <div>126 A; Use minimum cross-section acc. to AC-1 rated value</div> <div>105 A; Use minimum cross-section acc. to AC-1 rated value</div>
<div>no-load switching frequency</div> <div><div>● at AC</div></div>	<div>5 000 1/h</div>

operating frequency <ul style="list-style-type: none">at AC-1 maximumat AC-2 maximumat AC-3 maximumat AC-3e maximumat AC-4 maximum	1 000 1/h 1 000 1/h 1 000 1/h 1 000 1/h 300 1/h
Control circuit/ Control	
type of voltage of the control supply voltage	AC
control supply voltage at AC <ul style="list-style-type: none">at 50 Hz rated value	110 V
operating range factor control supply voltage rated value of magnet coil at AC <ul style="list-style-type: none">at 50 Hz	0.8 ... 1.1
apparent pick-up power of magnet coil at AC <ul style="list-style-type: none">at 50 Hz	65 VA
inductive power factor with closing power of the coil <ul style="list-style-type: none">at 50 Hz	0.82
apparent holding power of magnet coil at AC <ul style="list-style-type: none">at 50 Hz	7.6 VA
inductive power factor with the holding power of the coil <ul style="list-style-type: none">at 50 Hz	0.25
closing delay <ul style="list-style-type: none">at AC	8 ... 40 ms
opening delay <ul style="list-style-type: none">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	1
number of NO contacts for auxiliary contacts instantaneous contact	1
operational current at AC-12 maximum	10 A
operational current at AC-15 <ul style="list-style-type: none">at 230 V rated valueat 400 V rated valueat 500 V rated valueat 690 V rated value	10 A 3 A 2 A 1 A
operational current at DC-12 <ul style="list-style-type: none">at 24 V rated valueat 48 V rated valueat 60 V rated valueat 110 V rated valueat 125 V rated valueat 220 V rated valueat 600 V rated value	10 A 6 A 6 A 3 A 2 A 1 A 0.15 A
operational current at DC-13 <ul style="list-style-type: none">at 24 V rated valueat 48 V rated valueat 60 V rated valueat 110 V rated valueat 125 V rated valueat 220 V rated valueat 600 V rated value	10 A 2 A 2 A 1 A 0.9 A 0.3 A 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 3-phase AC motor <ul style="list-style-type: none">at 480 V rated valueat 600 V rated value	11 A 11 A
yielded mechanical performance [hp] <ul style="list-style-type: none">for single-phase AC motor	

<div><div>— at 110/120 V rated value</div><div>— at 230 V rated value</div><div>• for 3-phase AC motor</div><div>— at 200/208 V rated value</div><div>— at 220/230 V rated value</div><div>— at 460/480 V rated value</div><div>— at 575/600 V rated value</div></div>	<div>1 hp</div> <div>2 hp</div> <div>3 hp</div> <div>3 hp</div> <div>7.5 hp</div> <div>10 hp</div>
contact rating of auxiliary contacts according to UL	A600 / P600
Short-circuit protection	
<div>design of the fuse link</div> <div><div>• for short-circuit protection of the main circuit</div><div>— with type of coordination 1 required</div><div>— with type of assignment 2 required</div><div>• for short-circuit protection of the auxiliary switch required</div></div>	<div>gG: 63A (690V,100kA), aM: 32A (690V,100kA), BS88: 63A (415V,80kA)</div> <div>gG: 25A (690V,100kA), aM: 20A (690V,100kA), BS88: 25A (415V,80kA)</div> <div>gG: 10 A (500 V, 1 kA)</div>
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
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
<div>required spacing</div> <div><div>• with side-by-side mounting</div><div>— forwards</div><div>— upwards</div><div>— downwards</div><div>— at the side</div><div>• for grounded parts</div><div>— forwards</div><div>— upwards</div><div>— at the side</div><div>— downwards</div><div>• for live parts</div><div>— forwards</div><div>— upwards</div><div>— downwards</div><div>— at the side</div></div>	<div>10 mm</div> <div>10 mm</div> <div>10 mm</div> <div>0 mm</div> <div>10 mm</div> <div>10 mm</div> <div>6 mm</div> <div>10 mm</div> <div>10 mm</div> <div>10 mm</div> <div>10 mm</div> <div>6 mm</div>
Connections/ Terminals	
<div>type of electrical connection</div> <div><div>• for main current circuit</div><div>• for auxiliary and control circuit</div><div>• at contactor for auxiliary contacts</div><div>• of magnet coil</div></div>	<div>screw-type terminals</div> <div>screw-type terminals</div> <div>Screw-type terminals</div> <div>Screw-type terminals</div>
<div>type of connectable conductor cross-sections</div> <div><div>• for main contacts</div><div>— solid</div><div>— solid or stranded</div><div>— finely stranded with core end processing</div><div>• for AWG cables for main contacts</div></div>	<div>2x (1 ... 2.5 mm²), 2x (2.5 ... 10 mm²)</div> <div>2x (1 ... 2.5 mm²), 2x (2.5 ... 10 mm²)</div> <div>2x (1 ... 2.5 mm²), 2x (2.5 ... 6 mm²), 1x 10 mm²</div> <div>2x (16 ... 12), 2x (14 ... 8)</div>
<div>connectable conductor cross-section for main contacts</div> <div><div>• solid</div><div>• stranded</div><div>• finely stranded with core end processing</div></div>	<div>1 ... 10 mm²</div> <div>1 ... 10 mm²</div> <div>1 ... 10 mm²</div>
<div>connectable conductor cross-section for auxiliary contacts</div> <div><div>• solid or stranded</div><div>• finely stranded with core end processing</div></div>	<div>0.5 ... 2.5 mm²</div> <div>0.5 ... 2.5 mm²</div>
<div>type of connectable conductor cross-sections</div> <div><div>• for auxiliary contacts</div><div>— solid or stranded</div><div>— finely stranded with core end processing</div><div>• for AWG cables for auxiliary contacts</div></div>	<div>2x (0.5 ... 1.5 mm²), 2x (0.75 ... 2.5 mm²)</div> <div>2x (0.5 ... 1.5 mm²), 2x (0.75 ... 2.5 mm²)</div> <div>2x (20 ... 16), 2x (18 ... 14)</div>

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



KC

General Product Approval	EMV	Functional Safety	Test Certificates	Marine / Shipping
		Type Examination Certificate	Special Test Certificate	Type Test Certificates/Test Report

Marine / Shipping	other
	Miscellaneous
	Confirmation

other	Railway	Environment
Confirmation	Special Test Certificate	
		Environmental Confirmations

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=3RT2024-1AF00>

Cax online generator

<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RT2024-1AF00>

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

<https://support.industry.siemens.com/cs/ww/en/ps/3RT2024-1AF00>

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

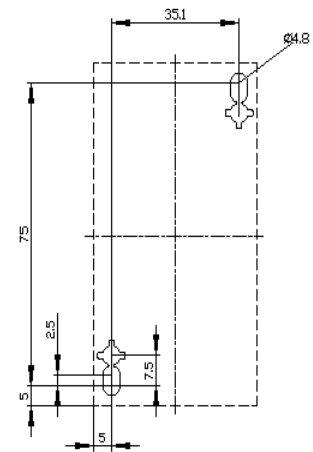
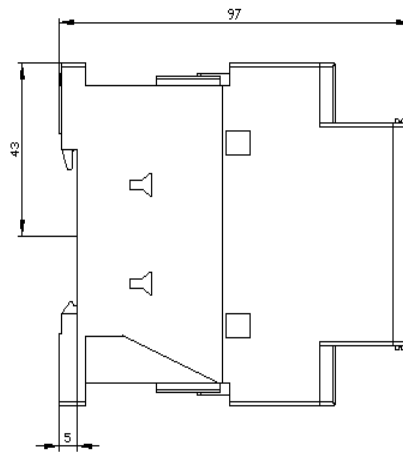
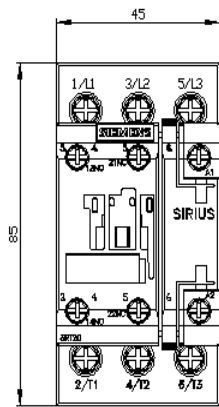
http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RT2024-1AF00&lang=en

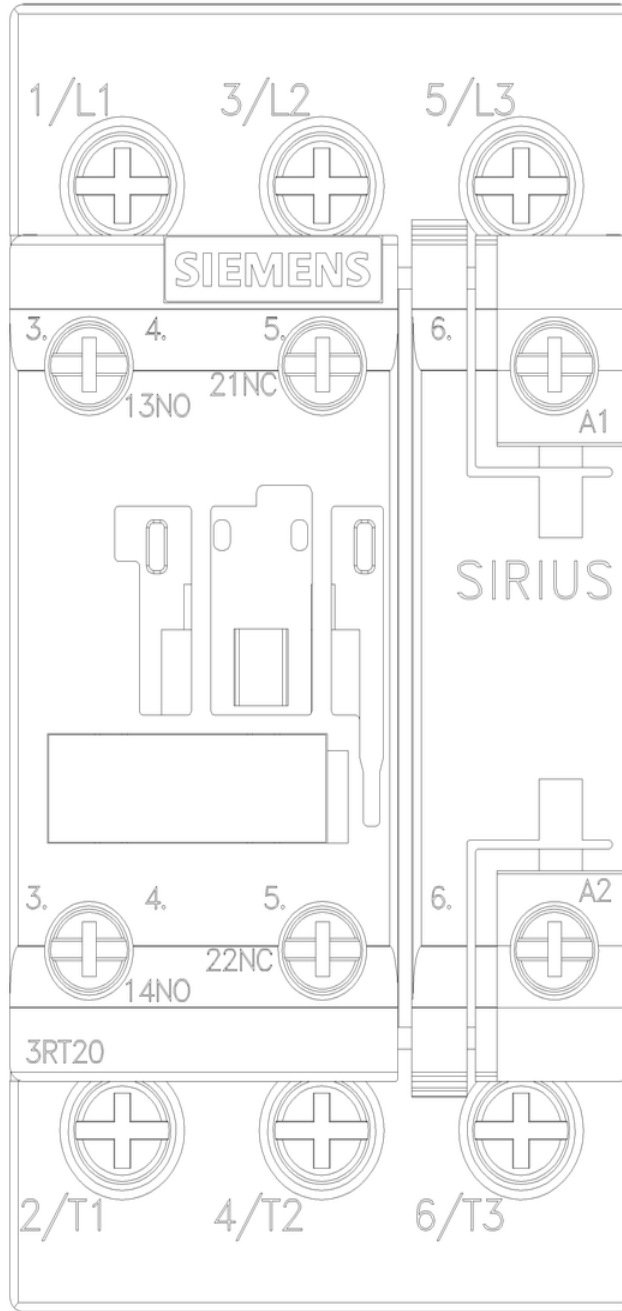
Characteristic: Tripping characteristics, I²t, Let-through current

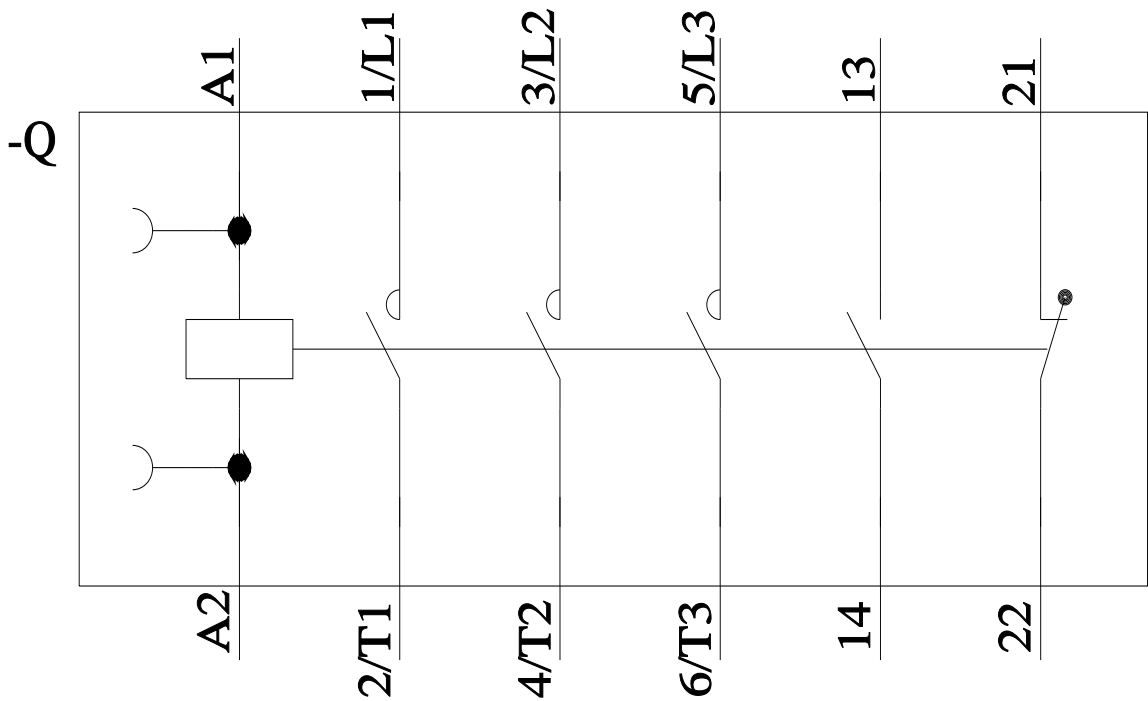
<https://support.industry.siemens.com/cs/ww/en/ps/3RT2024-1AF00/char>

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

<http://www.automation.siemens.com/bilddb/index.aspx?view=Search&mlfb=3RT2024-1AF00&objecttype=14&gridview=view1>







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