# **SIEMENS**

Data sheet 3RT2046-1AR60

power contactor, AC-3 95 A, 45 kW / 400 V 1 NO + 1 NC, 400 V AC, 50 Hz 400-440 V/60 Hz 3-pole, 3 NO, Size S3 screw terminal



product brand name	SIRIUS
product designation	Power contactor
product type designation	3RT2

General technical data	
size of contactor	S3
product extension	
<ul> <li>function module for communication</li> </ul>	No
<ul><li>auxiliary switch</li></ul>	Yes
power loss [W] for rated value of the current	
<ul> <li>at AC in hot operating state</li> </ul>	19.8 W
<ul> <li>at AC in hot operating state per pole</li> </ul>	6.6 W
power loss [W] for rated value of the current without	25 W
load current share typical	
surge voltage resistance	
<ul> <li>of main circuit rated value</li> </ul>	8 kV
<ul> <li>of auxiliary circuit rated value</li> </ul>	6 kV
maximum permissible voltage for safe isolation	
<ul> <li>between coil and main contacts acc. to EN</li> </ul>	690 V
60947-1	

protection class IP	
• on the front	IP20
• of the terminal	IP00
shock resistance at rectangular impulse	
• at AC	6.7 g / 5 ms, 4.0 g / 10 ms
shock resistance with sine pulse	
• at AC	10.6 g / 5 ms, 6.3 g / 10 ms
mechanical service life (switching cycles)	
<ul> <li>of contactor typical</li> </ul>	10 000 000
<ul> <li>of the contactor with added electronics- compatible auxiliary switch block typical</li> </ul>	5 000 000
<ul> <li>of the contactor with added auxiliary switch block typical</li> </ul>	10 000 000
reference code acc. to DIN EN 81346-2	Q
Ambient conditions	
• installation altitude at height above sea level	2 000 m
maximum	
ambient temperature	
<ul><li>during operation</li></ul>	-25 +60 °C
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	1 000 V
operating current	
• at AC-1 at 400 V	
— at ambient temperature 40 °C rated value	130 A
• at AC-1	
<ul> <li>up to 690 V at ambient temperature 40 °C rated value</li> </ul>	130 A
<ul> <li>up to 690 V at ambient temperature 60 °C rated value</li> </ul>	110 A
— up to 1000 V at ambient temperature 40 $^{\circ}\text{C}$ rated value	70 A
<ul> <li>up to 1000 V at ambient temperature 60 °C rated value</li> </ul>	60 A
• at AC-3	
<ul><li>at AC-3</li><li>at 400 V rated value</li></ul>	95 A
	95 A 95 A
— at 400 V rated value	
<ul><li>— at 400 V rated value</li><li>— at 500 V rated value</li></ul>	95 A

• at AC-5a up to 690 V rated value	114 A
• at AC-5b up to 400 V rated value	95 A
● at AC-6a	
<ul> <li>up to 230 V for current peak value n=20 rated value</li> </ul>	84.4 A
<ul> <li>up to 400 V for current peak value n=20 rated value</li> </ul>	84.4 A
<ul> <li>up to 500 V for current peak value n=20 rated value</li> </ul>	84.4 A
<ul><li>— up to 690 V for current peak value n=20 rated value</li></ul>	58 A
• at AC-6a	
<ul> <li>up to 230 V for current peak value n=30 rated value</li> </ul>	56.3 A
<ul><li>— up to 400 V for current peak value n=30 rated value</li></ul>	56.3 A
<ul> <li>up to 500 V for current peak value n=30 rated value</li> </ul>	56.3 A
<ul> <li>up to 690 V for current peak value n=30 rated value</li> </ul>	56.3 A
minimum cross-section in main circuit	
<ul> <li>at maximum AC-1 rated value</li> </ul>	50 mm <sup>2</sup>
operating current for approx. 200000 operating cycles at AC-4	
• at 400 V rated value	42 A
• at 690 V rated value	30 A
operating current	
• at 1 current path at DC-1	
— at 24 V rated value	100 A
— at 110 V rated value	9 A
— at 220 V rated value	2 A
— at 440 V rated value	0.6 A
— at 600 V rated value	0.4 A
<ul> <li>with 2 current paths in series at DC-1</li> </ul>	
— at 24 V rated value	100 A
— at 110 V rated value	100 A
— at 220 V rated value	10 A
— at 440 V rated value	1.8 A
— at 600 V rated value	1 A
• with 3 current paths in series at DC-1	
— at 24 V rated value	100 A
— at 110 V rated value	100 A

— at 440 V rated value	4.5 A
— at 600 V rated value	2.6 A
operating current	
• at 1 current path at DC-3 at DC-5	
— at 24 V rated value	40 A
— at 110 V rated value	2.5 A
— at 220 V rated value	1 A
— at 440 V rated value	0.15 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	100 A
— at 110 V rated value	100 A
— at 220 V rated value	7 A
— at 440 V rated value	0.42 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	100 A
— at 110 V rated value	100 A
— at 220 V rated value	35 A
— at 440 V rated value	0.8 A
— at 600 V rated value	0.35 A
operating power	
• at AC-2 at 400 V rated value	45 kW
• at AC-3	
— at 230 V rated value	22 kW
— at 400 V rated value	45 kW
— at 500 V rated value	55 kW
— at 690 V rated value	75 kW
operating power for approx. 200000 operating cycles at AC-4	
• at 400 V rated value	22 kW
• at 690 V rated value	27.4 kW
operating apparent output at AC-6a	
• up to 230 V for current peak value n=20 rated value	33 kV·A
• up to 400 V for current peak value n=20 rated value	58 kV·A
• up to 500 V for current peak value n=20 rated value	73 kV·A
• up to 690 V for current peak value n=20 rated value	69 kV·A

<ul> <li>up to 230 V for current peak value n=30 rated value</li> </ul>	22.4 kV·A
<ul> <li>up to 400 V for current peak value n=30 rated value</li> </ul>	39 kV·A
up to 500 V for current peak value n=30 rated value	48.7 kV·A
• up to 690 V for current peak value n=30 rated value	67.3 kV·A
short-time withstand current in cold operating state	
up to 40 °C	
•	1 725 A; Use minimum cross-section acc. to AC-1 rated value
<ul> <li>limited to 1 s switching at zero current maximum</li> </ul>	
<ul> <li>limited to 5 s switching at zero current maximum</li> </ul>	1 297 A; Use minimum cross-section acc. to AC-1 rated value
<ul> <li>limited to 10 s switching at zero current maximum</li> </ul>	946 A; Use minimum cross-section acc. to AC-1 rated value
<ul> <li>limited to 30 s switching at zero current maximum</li> </ul>	610 A; Use minimum cross-section acc. to AC-1 rated value
<ul> <li>limited to 60 s switching at zero current maximum</li> </ul>	486 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	900 1/h
• at AC-2 maximum	350 1/h
at AC-3 maximum	850 1/h
• at AC-4 maximum	250 1/h
Control circuit/ Control	40
type of voltage of the control supply voltage	AC
control supply voltage at AC	
• at 50 Hz rated value	400 V
• at 60 Hz rated value	400 440 V
operating range factor control supply voltage rated value of magnet coil at AC	
● at 50 Hz	0.8 1.1
● at 60 Hz	0.85 1.1
apparent pick-up power of magnet coil at AC	
● at 50 Hz	348 V·A
● at 60 Hz	296 V·A
inductive power factor with closing power of the coil	
● at 50 Hz	0.62
● at 60 Hz	0.55
apparent holding power of magnet coil at AC	
• • • • • • • • • • • • • • • • • •	

● at 50 Hz	25 V·A
● at 60 Hz	18 V·A
inductive power factor with the holding power of the coil	
● at 50 Hz	0.35
● at 60 Hz	0.41
closing delay	
• at AC	13 50 ms
opening delay	
• at AC	10 21 ms
arcing time	10 20 ms
control version of the switch operating mechanism	Standard A1 - A2
Auxilian/ circuit	

Auxiliary circuit	
number of NC contacts for auxiliary contacts	
• instantaneous contact	1
number of NO contacts for auxiliary contacts	
• instantaneous contact	1
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
• at 48 V rated value	6 A
• at 60 V rated value	6 A
• at 110 V rated value	3 A
● at 125 V rated value	2 A
• at 220 V rated value	1 A
• at 600 V rated value	0.15 A
operating 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
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	96 A
• at 600 V rated value	77 A
yielded mechanical performance [hp]	
<ul> <li>for single-phase AC motor</li> </ul>	
— at 110/120 V rated value	10 hp
— at 230 V rated value	20 hp
<ul> <li>for three-phase AC motor</li> </ul>	
— at 200/208 V rated value	30 hp
— at 220/230 V rated value	30 hp
— at 460/480 V rated value	75 hp
— at 575/600 V rated value	75 hp
contact rating of auxiliary contacts according to UL	A600 / P600

Short-circuit protection	
design of the fuse link	
<ul> <li>for short-circuit protection of the main circuit</li> </ul>	
<ul> <li>with type of coordination 1 required</li> </ul>	gG: 250 A (690 V, 100 kA), aM: 160 A (690 V, 100 kA), BS88: 200 A (415 V, 80 kA)
<ul> <li>— with type of assignment 2 required</li> </ul>	gG: 160 A (690 V, 100 kA), aM: 100 A (690 V, 100 kA), BS88: 125

A (415 V, 80 kA)

• for short-circuit protection of the auxiliary switch gG: 10 A (500 V, 1 kA) required

Installation/ mounting/ dimensions	
+/-180° rotation possible on vertical mounting surface; can be tilted forward and backward by +/- 22.5° on vertical mounting surface	
screw and snap-on mounting onto 35 mm standard mounting rail according to DIN EN 60715	
Yes	
140 mm	
70 mm	
152 mm	
20 mm	
10 mm	
10 mm	
0 mm	
20 mm	
10 mm	
10 mm	

— downwards	10 mm
• for live parts	
— forwards	20 mm
— upwards	10 mm
— downwards	10 mm
— at the side	10 mm

Connections/ Terminals	
type of electrical connection	
for main current circuit	screw-type terminals
<ul> <li>for auxiliary and control current circuit</li> </ul>	screw-type terminals
<ul> <li>at contactor for auxiliary contacts</li> </ul>	Screw-type terminals
• of magnet coil	Screw-type terminals
type of connectable conductor cross-sections	
• for main contacts	
<ul> <li>finely stranded with core end processing</li> </ul>	2x (2.5 35 mm²), 1x (2.5 50 mm²)
<ul> <li>at AWG conductors for main contacts</li> </ul>	2x (10 1/0), 1x (10 2)
connectable conductor cross-section for main	
contacts	
• solid	2.5 16 mm²
• stranded	6 70 mm²
<ul> <li>finely stranded with core end processing</li> </ul>	2.5 50 mm²
connectable conductor cross-section for auxiliary	
contacts	
<ul><li>single or multi-stranded</li></ul>	0.5 2.5 mm <sup>2</sup>
<ul> <li>finely stranded with core end processing</li> </ul>	0.5 2.5 mm <sup>2</sup>
<ul> <li>type of connectable conductor cross-sections for auxiliary contacts</li> </ul>	
<ul> <li>— single or multi-stranded</li> </ul>	2x (0,5 1,5 mm²), 2x (0,75 2,5 mm²)
<ul> <li>finely stranded with core end processing</li> </ul>	2x (0.5 1.5 mm²), 2x (0.75 2.5 mm²)
• type of connectable conductor cross-sections at	2x (20 16), 2x (18 14)
AWG conductors for auxiliary contacts	
AWG number as coded connectable conductor cross	
section	
• for main contacts	10 2
• for auxiliary contacts	20 14

Safety related data	
B10 value	
<ul> <li>with high demand rate acc. to SN 31920</li> </ul>	1 000 000
proportion of dangerous failures	
<ul> <li>with low demand rate acc. to SN 31920</li> </ul>	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	
<ul> <li>mirror contact acc. to IEC 60947-4-1</li> </ul>	Yes
<ul><li>positively driven operation acc. to IEC 60947-5-</li></ul>	No
T1 value for proof test interval or service life acc. to IEC 61508	20 y
protection against electrical shock	finger-safe when touched vertically from front acc. to IEC 60529
suitability for use safety-related switching OFF	Yes

### Certificates/ approvals

# **General Product Approval**

**EMC** 











**Declaration of Conformity** 

## **Test Certificates**

Marine / Shipping



Miscellaneous

Type Test Certificates/Test Report

Special Test Certificate





Marine / Shipping

other











Confirmation

Vibration and Shock

### 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=3RT2046-1AR60

Cax online generator

http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RT2046-1AR60

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

https://support.industry.siemens.com/cs/ww/en/ps/3RT2046-1AR60

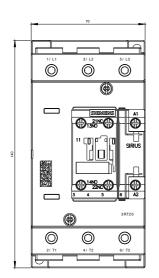
Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...) http://www.automation.siemens.com/bilddb/cax\_de.aspx?mlfb=3RT2046-1AR60&lang=en

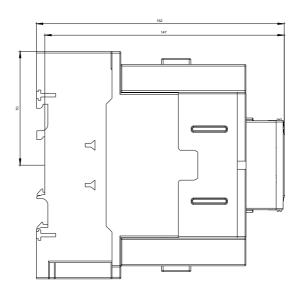
Characteristic: Tripping characteristics, I2t, Let-through current

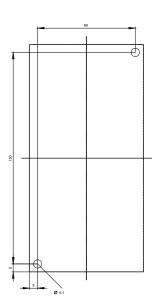
https://support.industry.siemens.com/cs/ww/en/ps/3RT2046-1AR60/char

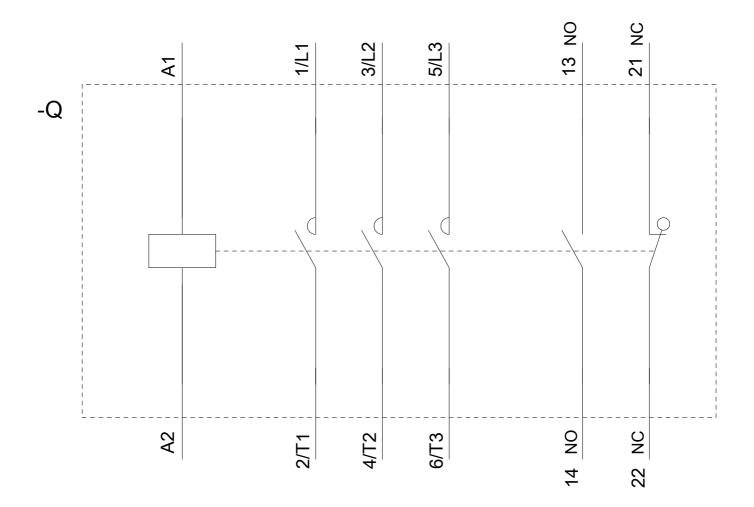
Further characteristics (e.g. electrical endurance, switching frequency)

http://www.automation.siemens.com/bilddb/index.aspx?view=Search&mlfb=3RT2046-1AR60&objecttype=14&gridview=view1









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