SIEMENS

Data sheet 3RW5524-3HF04

SIRIUS soft starter 200-480 V 47 A, 24 V AC/DC spring-type terminals Fail-safe

Siemens EcoTech

product brand name	SIRIUS
product category	Hybrid switching devices
product designation	Failsafe soft starters
product type designation	3RW55
manufacturer's article number	
● of high feature HMI module usable	3RW5980-0HF00
● of communication module PROFINET standard usable	3RW5980-0CS00
● of communication module PROFINET high-feature usable	3RW5950-0CH00
● of communication module PROFIBUS usable	3RW5980-0CP00
● of communication module Modbus TCP usable	3RW5980-0CT00
● of communication module Modbus RTU usable	3RW5980-0CR00
● of communication module Ethernet/IP	3RW5980-0CE00
● of circuit breaker usable at 400 V	3RV2032-4JA10; Type of coordination 1, Iq = 65 kA, CLASS 10
● of circuit breaker usable at 500 V	3RV2032-4JA10; Type of coordination 1, Iq = 10 kA, CLASS 10
● of circuit breaker usable at 400 V at inside-delta circuit	3RV2032-4RA10; Type of coordination 1, Iq = 65 kA, CLASS 10
● of circuit breaker usable at 500 V at inside-delta circuit	3RV2032-4RA10; Type of coordination 1, Iq = 10 kA, CLASS 10
● of the gG fuse usable up to 690 V	3NA3824-6; Type of coordination 1, Iq = 65 kA
● of the gG fuse usable at inside-delta circuit up to 500 V	3NA3824-6; Type of coordination 1, Iq = 65 kA
● of full range R fuse link for semiconductor protection usable up to 690 V	3NE1021-2; Type of coordination 2, Iq = 65 kA
● of back-up R fuse link for semiconductor protection usable up to 690 V	3NE8024-1; Type of coordination 2, Iq = 65 kA
● of the redundant contactor for applications > SIL 1 according to EN 62061	3RT2038
● of the redundant contactor for applications > SIL 1 at inside-delta circuit according to EN 62061	3RT2038
● of the redundant contactor for applications > SIL 1 according to EN ISO 13849-1	3RT2046
● of the redundant contactor for applications > SIL 1 at inside-delta circuit according to EN ISO 13849-1	3RT2046
General technical data	
starting voltage [%]	20 ... 100 %
stopping voltage [%]	50 %; non-adjustable
start-up ramp time of soft starter	0 ... 360 s
ramp-down time of soft starter	0 ... 360 s
start torque [%]	10 ... 100 %
stopping torque [%]	10 ... 100 %
torque limitation [%]	20 ... 200 %
current limiting value [%] adjustable	125 ... 800 %

breakaway voltage [%] adjustable	40 ... 100 %
breakaway time adjustable	0 ... 2 s
number of parameter sets	3
accuracy class	5 (based on IEC 61557-12)
certificate of suitability	
● CE marking	Yes
● UL approval	Yes
● CSA approval	Yes
product component	
● HMI-High Feature	Yes
● is supported HMI-High Feature	Yes
product feature integrated bypass contact system	Yes
number of controlled phases	3
current unbalance limiting value [%]	10 ... 60 %
ground-fault monitoring limiting value [%]	10 ... 95 %
buffering time in the event of power failure	
● for main current circuit	100 ms
● for control circuit	100 ms
idle time adjustable	0 ... 255 s
insulation voltage rated value	480 V
degree of pollution	3, acc. to IEC 60947-4-2
impulse voltage rated value	6 kV
blocking voltage of the thyristor maximum	1 400 V
service factor	1.15
surge voltage resistance rated value	6 kV
maximum permissible voltage for protective separation	
● between main and auxiliary circuit	480 V; does not apply for thermistor connection
shock resistance	15 g / 11 ms, from 6 g / 11 ms with potential contact lifting
vibration resistance	15 mm up to 6 Hz; 2 g up to 500 Hz
recovery time after overload trip adjustable	60 ... 1 800 s
utilization category according to IEC 60947-4-2	AC 53a
reference code according to IEC 81346-2	Q
Substance Prohibitance (Date)	11/22/2019
SVHC substance name	Lead - 7439-92-1 Lead monoxide (lead oxide) - 1317-36-8 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol - 119-47-1 2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one - 71868-10-5 Dibutylbis(pentane-2,4-dionato-O,O')tin - 22673-19-4 Lead titanium trioxide - 12060-00-3
Weight	6.5 kg
product function	
● ramp-up (soft starting)	Yes
● ramp-down (soft stop)	Yes
● breakaway pulse	Yes
● adjustable current limitation	Yes
● creep speed in both directions of rotation	Yes
● pump ramp down	Yes
● DC braking	Yes
● motor heating	Yes
● min/max pointer	Yes
● trace function	Yes
● intrinsic device protection	Yes
● motor overload protection	Yes; Full motor protection (thermistor motor protection and electronic motor overload protection) / When using the motor overload protection according to ATEX, an upstream contactor is required in inside-delta circuit.
● evaluation of thermistor motor protection	Yes; Type A PTC or Klixon / Thermoclick
● inside-delta circuit	Yes
● auto-RESET	Yes
● manual RESET	Yes
● remote reset	Yes
● communication function	Yes
● operating measured value display	Yes
● event list	Yes

● error logbook	Yes
● via software parameterizable	Yes
● via software configurable	Yes
● screw terminal	No
● spring-loaded terminal	Yes
● **PROFIenergy**	Yes; in connection with the PROFINET Standard and PROFINET High-Feature communication modules
● **firmware update**	Yes
● **removable terminal for control circuit**	Yes
● voltage ramp	Yes
● torque control	Yes
● combined braking	Yes
● analog output	Yes; 4 ... 20 mA (default) / 0 ... 10 V
● programmable control inputs/outputs	Yes
● condition monitoring	Yes
● automatic parameterisation	Yes
● application wizards	Yes
● alternative run-down	Yes
● emergency operation mode	Yes
● reversing operation	Yes
● soft starting at heavy starting conditions	Yes
Power Electronics	
operational current	
● at 40 °C rated value	47 A
● at 40 °C rated value minimum	10 A
● at 50 °C rated value	41.6 A
● at 60 °C rated value	36.2 A
operational current at inside-delta circuit	
● at 40 °C rated value	81.4 A
● at 50 °C rated value	72 A
● at 60 °C rated value	62.7 A
operating voltage	
● rated value	200 ... 480 V
● at inside-delta circuit rated value	200 ... 480 V
relative negative tolerance of the operating voltage	-15 %
relative positive tolerance of the operating voltage	10 %
relative negative tolerance of the operating voltage at inside-delta circuit	-15 %
relative positive tolerance of the operating voltage at inside-delta circuit	10 %
operating power for 3-phase motors	
● at 230 V at 40 °C rated value	11 kW
● at 230 V at inside-delta circuit at 40 °C rated value	22 kW
● at 400 V at 40 °C rated value	22 kW
● at 400 V at inside-delta circuit at 40 °C rated value	45 kW
Operating frequency 1 rated value	50 Hz
Operating frequency 2 rated value	60 Hz
relative negative tolerance of the operating frequency	-10 %
relative positive tolerance of the operating frequency	10 %
minimum load [%]	10 %; Relative to set Ie
power loss [W] for rated value of the current at AC	
● at 40 °C after startup	14 W
● at 50 °C after startup	12 W
● at 60 °C after startup	11 W
power loss [W] at AC at current limitation 350 %	
● at 40 °C during startup	588 W
● at 50 °C during startup	504 W
● at 60 °C during startup	420 W
type of the motor protection	Electronic, tripping in the event of thermal overload of the motor
Control circuit/ Control	
type of voltage of the control supply voltage	AC/DC

control supply voltage at AC	
● at 50 Hz rated value	24 V
● at 60 Hz rated value	24 V
relative negative tolerance of the control supply voltage at AC at 50 Hz	-20 %
relative positive tolerance of the control supply voltage at AC at 50 Hz	20 %
relative negative tolerance of the control supply voltage at AC at 60 Hz	-20 %
relative positive tolerance of the control supply voltage at AC at 60 Hz	20 %
control supply voltage frequency	50 ... 60 Hz
relative negative tolerance of the control supply voltage frequency	-10 %
relative positive tolerance of the control supply voltage frequency	10 %
control supply voltage at DC rated value	24 V
relative negative tolerance of the control supply voltage at DC	-20 %
relative positive tolerance of the control supply voltage at DC	20 %
control supply current in standby mode rated value	440 mA
holding current in bypass operation rated value	870 mA
inrush current by closing the bypass contacts maximum	6.3 A
inrush current peak at application of control supply voltage maximum	7.5 A
duration of inrush current peak at application of control supply voltage	20 ms
design of the overvoltage protection	Varistor
design of short-circuit protection for control circuit	4 A gG fuse (Icu=1 kA), 6 A quick-acting fuse (Icu=1 kA), C1 miniature circuit breaker (Icu= 600 A), C6 miniature circuit breaker (Icu= 300 A); Is not part of scope of supply
Inputs/ Outputs	
number of digital inputs	4
● with fail-safe	1
● parameterizable	4
● **number of digital outputs**	3
● Number of digital outputs with fail-safe	1
● number of digital outputs parameterizable	2
● number of digital outputs not parameterizable	1
digital output version	2 normally-open contacts (NO) / 1 normally-closed contact (NC) / 1 changeover contact (CO)
number of analog outputs	1
switching capacity current of the relay outputs	
● at AC-15 at 250 V rated value	3 A
● at DC-13 at 24 V rated value	1 A
Response times	
OFF-delay time with safety-related request when switched off via control inputs maximum	100 ms
Installation/ mounting/ dimensions	
mounting position	Vertical (can be rotated +/- 90° and tilted forward or backward +/- 22.5°)
fastening method	screw fixing
height	306 mm
width	185 mm
depth	203 mm
required spacing with side-by-side mounting	
● forwards	10 mm
● backwards	0 mm
● upwards	100 mm
● downwards	75 mm
● at the side	5 mm
weight without packaging	5.5 kg
Connections/ Terminals	
type of electrical connection	

● for main current circuit	box terminal
● for control circuit	spring-loaded terminals
width of connection bar maximum	25 mm
wire length for thermistor connection	
● with conductor cross-section = 0.5 mm² maximum	50 m
● with conductor cross-section = 1.5 mm² maximum	150 m
● with conductor cross-section = 2.5 mm² maximum	250 m
type of connectable conductor cross-sections for main contacts for box terminal	
● using the front clamping point solid	1x (2.5 ... 16 mm²)
● using the front clamping point finely stranded with core end processing	1x (2.5 ... 50 mm²)
● using the front clamping point stranded	1x (10 ... 70 mm²)
● using the back clamping point solid	1x (2.5 ... 16 mm²)
● r box terminal using the back clamping point	1x (10 ... 2/0)
● using both clamping points solid	2x (2.5 ... 16 mm²)
● using both clamping points finely stranded with core end processing	2x (2.5 ... 35 mm²)
● using both clamping points stranded	2x (6 ... 16 mm²), 2x (10 ... 50 mm²)
● using the back clamping point finely stranded with core end processing	1x (2.5 ... 50 mm²)
● using the back clamping point stranded	1x (10 ... 70 mm²)
type of connectable conductor cross-sections	
● for control circuit solid	2x (0.25 ... 1.5 mm²)
● for control circuit finely stranded with core end processing	2x (0.25 ... 1.5 mm²)
● for AWG cables for control circuit solid	2x (24 ... 16)
● for AWG cables for control circuit finely stranded with core end processing	2x (24 ... 16)
wire length	
● between soft starter and motor maximum	800 m
● at the digital inputs at DC maximum	1 000 m
tightening torque	
● for main contacts with screw-type terminals	4.5 ... 6 N·m
● for auxiliary and control contacts with screw-type terminals	0.8 ... 1.2 N·m
tightening torque [lbf·in]	
● for main contacts with screw-type terminals	40 ... 53 lbf·in
● for auxiliary and control contacts with screw-type terminals	7 ... 10.3 lbf·in
Ambient conditions	
installation altitude at height above sea level maximum	2 000 m; Derating as of 1000 m, see catalog
ambient temperature	
● during operation	-25 ... +60 °C; Please observe derating at temperatures of 40 °C or above
● during storage and transport	-40 ... +80 °C
environmental category	
● during operation according to IEC 60721	3K6 (no ice formation, only occasional condensation), 3C3 (no salt mist), 3S2 (sand must not get into the devices), 3M6
● during storage according to IEC 60721	1K6 (only occasional condensation), 1C2 (no salt mist), 1S2 (sand must not get inside the devices), 1M4
● during transport according to IEC 60721	2K2, 2C1, 2S1, 2M2 (max. fall height 0.3 m)
Environmental footprint	
global warming potential [CO2 eq] total	399 kg
global warming potential [CO2 eq] during manufacturing	92.6 kg
global warming potential [CO2 eq] during sales	2.37 kg
global warming potential [CO2 eq] during operation	324 kg
global warming potential [CO2 eq] after end of life	-19.4 kg
Siemens Eco Profile (SEP)	Siemens EcoTech
Electromagnetic compatibility	
EMC emitted interference	acc. to IEC 60947-4-2: Class A
Communication/ Protocol	
communication module is supported	
● PROFINET standard	Yes
● PROFINET high-feature	Yes

● EtherNet/IP	Yes
● Modbus RTU	Yes
● Modbus TCP	Yes
● PROFIBUS	Yes
UL/CSA ratings	
manufacturer's article number	
● of circuit breaker usable for Standard Faults	
— at 460/480 V according to UL	Siemens type: 3RV2742, max. 70 A or 3VA51, max. 90 A; Iq = 5 kA
— 60/480 V according to UL	Siemens type: 3VA51, max. 60 A; Iq max = 65 kA
— at 460/480 V at inside-delta circuit according to UL	Siemens type: 3VA51, max. 90 A; Iq = 5 kA
— 60/480 V at inside-delta circuit according to UL	Siemens type: 3VA51, max. 60 A; Iq max = 65 kA
— at 575/600 V according to UL	Siemens type: 3RV2742, max. 70 A or 3VA51, max. 90 A; Iq = 5 kA
— 75/600 V at inside-delta circuit according to UL	Siemens type: 3VA51, max. 60 A; Iq max = 65 kA
— at 575/600 V at inside-delta circuit according to UL	Siemens type: 3VA51, max. 90 A; Iq = 5 kA
● of the fuse	
— usable for Standard Faults up to 575/600 V according to UL	Type: Class RK5 / K5, max. 175 A; Iq = 5 kA
— usable for High Faults up to 575/600 V according to UL	Type: Class J / L, max. 175 A; Iq = 100 kA
— usable for Standard Faults at inside-delta circuit up to 575/600 V according to UL	Type: Class RK5 / K5, max. 175 A; Iq = 5 kA
— usable for High Faults at inside-delta circuit up to 575/600 V according to UL	Type: Class J / L, max. 175 A; Iq = 100 kA
operating power [hp] for 3-phase motors	
● at 200/208 V at 50 °C rated value	10 hp
● at 220/230 V at 50 °C rated value	10 hp
● at 460/480 V at 50 °C rated value	30 hp
● at 200/208 V at inside-delta circuit at 50 °C rated value	20 hp
● at 220/230 V at inside-delta circuit at 50 °C rated value	25 hp
● at 460/480 V at inside-delta circuit at 50 °C rated value	50 hp
contact rating of auxiliary contacts according to UL	R300-B300
Safety related data	
product function suitable for safety function	Yes
suitability for use	
● safety-related switching on	No
● safety-related switching OFF	Yes
safe state	Open load circuit
function test interval maximum	1 a
diagnostics test interval by internal test function maximum	1 000 s
stop category according to IEC 60204-1	0
B10d value	1 000 000
average diagnostic coverage level (DCavg)	90 %
MTTFd	39 a
IEC 62061	
Safety Integrity Level (SIL) according to IEC 62061	SIL 1
PFHD with high demand rate according to IEC 62061	1E-6 1/h
ISO 13849	
performance level (PL) according to ISO 13849-1	PL c
category according to ISO 13849-1	2
IEC 61508	
Safety Integrity Level (SIL)	
● according to IEC 61508	SIL 1
safety device type according to IEC 61508-2	Type B
PFHD with high demand rate according to IEC 61508	1E-6 1/h
PFDavg with low demand rate according to IEC 61508	0.09
Safe failure fraction (SFF)	60 %
hardware fault tolerance according to IEC 61508	0
T1 value of service life according to IEC 61508	20 a
Electrical Safety	
protection class IP on the front according to IEC 60529	IP00; IP20 with cover
touch protection on the front according to IEC 60529	finger-safe, for vertical contact from the front with cover
ATEX	

Safety Integrity Level (SIL) according to IEC 61508 relating to ATEX	SIL 1
PFHD with high demand rate according to IEC 61508 relating to ATEX	5E-7 1/h
PFDavg with low demand rate according to IEC 61508 relating to ATEX	0.008
hardware fault tolerance according to IEC 61508 relating to ATEX	0
T1 value for proof test interval or service life according to IEC 61508 relating to ATEX	3 a
certificate of suitability	
• ATEX	Yes
• IECEx	Yes
• according to ATEX directive 2014/34/EU	BVS 18 ATEX F 003 X
type of protection according to ATEX directive 2014/34/EU	II (2)G [Ex eb Gb] [Ex db Gb] [Ex pxb Gb], II (2)D [Ex tb Db] [Ex pxb Db], I (M2) [Ex db Mb]

Approvals Certificates

General Product Approval					EMV
CCC	UKCA	CE EG-Konf.	UL	EAC	RCM

EMV	For use in hazardous locations		Functional Saftey	Test Certificates	Maritime application
KC	IECEx	ATEX	Type Examination Certificate	Type Test Certificates/Test Report	ABS

Maritime application			other		Environment
BUREAU VERITAS	Lloyd's Register LRS	PRS	产品合格 QC PASS	Confirmation	EPD

Environment

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Environmental Confirmations

Further information

Information on the packaging
https://support.industry.siemens.com/cs/ww/en/view/109813875
Information for data generation and storage
https://support.industry.siemens.com/cs/ww/en/view/109995012
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=3RW5524-3HF04
Cax online generator
https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RW5524-3HF04
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)
https://support.industry.siemens.com/cs/ww/en/ps/3RW5524-3HF04
Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)
https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RW5524-3HF04&lang=en
Characteristic: Tripping characteristics, I²t, Let-through current
https://support.industry.siemens.com/cs/ww/en/ps/3RW5524-3HF04/char
Characteristic: Installation altitude
https://www.automation.siemens.com/bilddb/index.aspx?view=Search&mlfb=3RW5524-3HF04&objecttype=14&gridview=view1
Simulation Tool for Soft Starters (STS)
https://support.industry.siemens.com/cs/ww/en/view/101494917