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Data sheet 3RW5224-1TC05

Siemens EcoTech

SIRIUS soft starter 200-600 V 47 A, 24 V AC/DC Screw terminals Thermistor input

product brand name	SIRIUS
product category	Hybrid switching devices
product designation	Soft starter
product type designation	3RW52
manufacturer's article number	
● of standard HMI module usable	3RW5980-0HS00
● of high feature HMI module usable	3RW5980-0HF00
● of communication module PROFINET standard usable	3RW5980-0CS00
● 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
General technical data	
starting voltage [%]	30 ... 100 %
stopping voltage [%]	50 %; non-adjustable
start-up ramp time of soft starter	0 ... 20 s
current limiting value [%] adjustable	130 ... 700 %
certificate of suitability	
● CE marking	Yes
● UL approval	Yes
● CSA approval	Yes
product component	
● HMI-High Feature	No
● is supported HMI-Standard	Yes
● is supported HMI-High Feature	Yes
product feature integrated bypass contact system	Yes
number of controlled phases	3

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buffering time in the event of power failure	
● for main current circuit	100 ms
● for control circuit	100 ms
insulation voltage rated value	600 V
degree of pollution	3, acc. to IEC 60947-4-2
impulse voltage rated value	6 kV
blocking voltage of the thyristor maximum	1 800 V
service factor	1
surge voltage resistance rated value	6 kV
maximum permissible voltage for protective separation	
● between main and auxiliary circuit	600 V
shock resistance	15 g / 11 ms, from 12 g / 11 ms with potential contact lifting
vibration resistance	15 mm to 6 Hz; 2 g to 500 Hz
utilization category according to IEC 60947-4-2	AC 53a
reference code according to IEC 81346-2	Q
Substance Prohibitance (day/month/year)	02/15/2018
SVHC substance name	Lead CAS-No. 7439-92-1 Lead monoxide (lead oxide) CAS-No. 1317-36-8 2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one CAS-No. 71868-10-5 Melamine CAS-No. 108-78-1 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol CAS-No. 119-47-1 Dibutylbis(pentane-2,4-dionato-O,O')tin CAS-No. 22673-19-4 Perfluorobutane sulfonic acid (PFBS) and its salts CAS-No. -
Net Weight	3.628 kg
product function	
● ramp-up (soft starting)	Yes
● soft stopping	Yes
● Soft Torque	Yes
● adjustable current limitation	Yes
● pump stop	Yes
● intrinsic device protection	Yes
● motor overload protection	Yes; Full motor protection (thermistor motor protection and electronic motor overload protection)
● 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; By turning off the control supply voltage
● communication function	Yes
● operating measured value display	Yes; Only in conjunction with special accessories
● error logbook	Yes; Only in conjunction with special accessories
● via software parameterizable	No
● via software configurable	Yes
● **PROFIenergy**	Yes; in connection with the PROFINET Standard communication module
● **firmware update**	Yes
● **removable terminal for control circuit**	Yes
● torque control	No
● analog output	No
Power Electronics	
operational current	
● at 40 °C rated value	47 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 ... 600 V
● at inside-delta circuit rated value	200 ... 600 V

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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
● at 500 V at 40 °C rated value	30 kW
● at 500 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 %
adjustable motor current	
● at rotary coding switch on switch position 1	20 A
● at rotary coding switch on switch position 2	21.8 A
● at rotary coding switch on switch position 3	23.6 A
● at rotary coding switch on switch position 4	25.4 A
● at rotary coding switch on switch position 5	27.2 A
● at rotary coding switch on switch position 6	29 A
● at rotary coding switch on switch position 7	30.8 A
● at rotary coding switch on switch position 8	32.6 A
● at rotary coding switch on switch position 9	34.4 A
● at rotary coding switch on switch position 10	36.2 A
● at rotary coding switch on switch position 11	38 A
● at rotary coding switch on switch position 12	39.8 A
● at rotary coding switch on switch position 13	41.6 A
● at rotary coding switch on switch position 14	43.4 A
● at rotary coding switch on switch position 15	45.2 A
● at rotary coding switch on switch position 16	47 A
● minimum	20 A
adjustable motor current	
● for inside-delta circuit at rotary coding switch on switch position 1	34.6 A
● for inside-delta circuit at rotary coding switch on switch position 2	37.8 A
● for inside-delta circuit at rotary coding switch on switch position 3	40.9 A
● for inside-delta circuit at rotary coding switch on switch position 4	44 A
● for inside-delta circuit at rotary coding switch on switch position 5	47.1 A
● for inside-delta circuit at rotary coding switch on switch position 6	50.2 A
● for inside-delta circuit at rotary coding switch on switch position 7	53.3 A
● for inside-delta circuit at rotary coding switch on switch position 8	56.5 A
● for inside-delta circuit at rotary coding switch on switch position 9	59.6 A
● for inside-delta circuit at rotary coding switch on switch position 10	62.7 A
● for inside-delta circuit at rotary coding switch on switch position 11	65.8 A
● for inside-delta circuit at rotary coding switch on switch position 12	68.9 A
● for inside-delta circuit at rotary coding switch on switch position 13	72.1 A
● for inside-delta circuit at rotary coding switch on switch position 14	75.2 A

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● for inside-delta circuit at rotary coding switch on switch position 15	78.3 A
● for inside-delta circuit at rotary coding switch on switch position 16	81.4 A
● at inside-delta circuit minimum	34.6 A
minimum load [%]	15 %; Relative to smallest settable Ie
power loss [W] for rated value of the current at AC	
● at 40 °C after startup	26 W
● at 50 °C after startup	24 W
● at 60 °C after startup	23 W
power loss [W] at AC at current limitation 350%	
● at 40 °C during startup	606 W
● at 50 °C during startup	522 W
● at 60 °C during startup	438 W
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	160 mA
holding current in bypass operation rated value	380 mA
inrush current by closing the bypass contacts maximum	7.6 A
inrush current peak at application of control supply voltage maximum	3.3 A
duration of inrush current peak at application of control supply voltage	12.1 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	1
number of digital outputs	3
● not parameterizable	2
digital output version	2 normally-open contacts (NO) / 1 changeover contact (CO)
number of analog outputs	0
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
Installation/ mounting/ dimensions	
mounting position	+/- 10° rotation possible and can be tilted forward or backward on vertical mounting surface
fastening method	screw fixing
height	306 mm
width	185 mm

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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	5.2 kg
Connections/ Terminals	
type of electrical connection	
● for main current circuit	box terminal
● for control circuit	screw-type 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	1x (0.5 ... 4.0 mm²), 2x (0.5 ... 2.5 mm²)
● for control circuit finely stranded with core end processing	1x (0.5 ... 2.5 mm²), 2x (0.5 ... 1.5 mm²)
● for AWG cables for control circuit solid	1x (20 ... 12), 2x (20 ... 14)
wire length	
● between soft starter and motor maximum	800 m
● at the digital inputs at AC maximum	100 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	5 000 m
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)
Electromagnetic compatibility	
EMC emitted interference	acc. to IEC 60947-4-2: Class A

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Communication/ Protocol	
communication module is supported	
● PROFINET standard	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
— 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 575/600 V at 50 °C rated value	40 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
● at 575/600 V at inside-delta circuit at 50 °C rated value	60 hp
contact rating of auxiliary contacts according to UL	R300-B300
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
Approvals Certificates	
Environmental Product Declaration	
● global warming potential [CO2 eq] / during manufacturing	67.7 kg
● global warming potential [CO2 eq] / during sales	1.84 kg
● global warming potential [CO2 eq] / during operation	242 kg
● global warming potential [CO2 eq] / after end of life	-15.7 kg
● global warming potential [CO2 eq] / total	296 kg

Environment

Environmental Confirmations

General Product Approval

General Product Approval

EMV

Test Certificates

Type Test Certificates/Test Report

Maritime application

Maritime application

other

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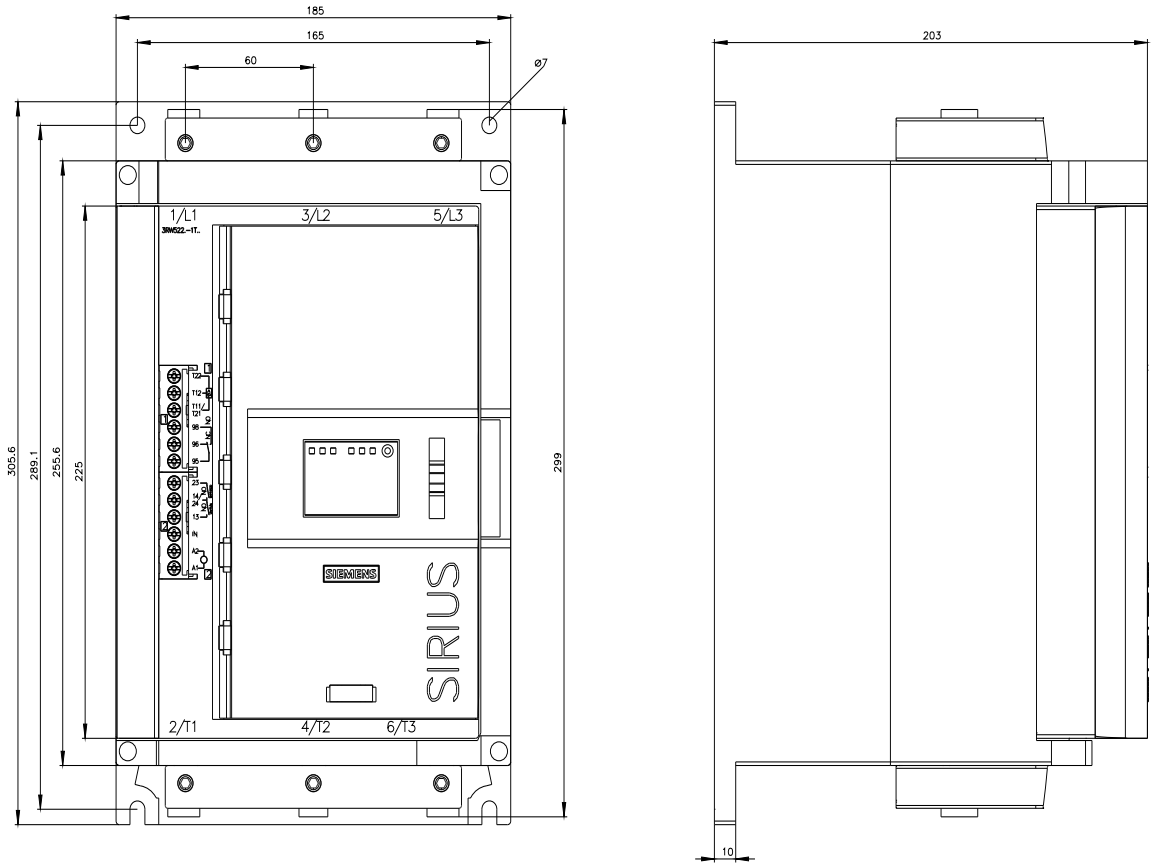
Confirmation

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=3RW5224-1TC05
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)
https://support.industry.siemens.com/cs/ww/en/ps/3RW5224-1TC05
Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)
https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RW5224-1TC05&lang=en
Cax online generator
https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RW5224-1TC05
Kennlinien
https://curves.simaris.siemens.com/curves/3RW5224-1TC05
Characteristic: Tripping characteristics, I²t, Let-through current
https://support.industry.siemens.com/cs/ww/en/ps/3RW5224-1TC05/char
Characteristic: Installation altitude
https://www.automation.siemens.com/bilddb/index.aspx?gridview=view2&objkey=G_NSB0_XX_01704&showdetail=true&view=Search
Simulation Tool for Soft Starters (STS)
https://support.industry.siemens.com/cs/ww/en/view/101494917



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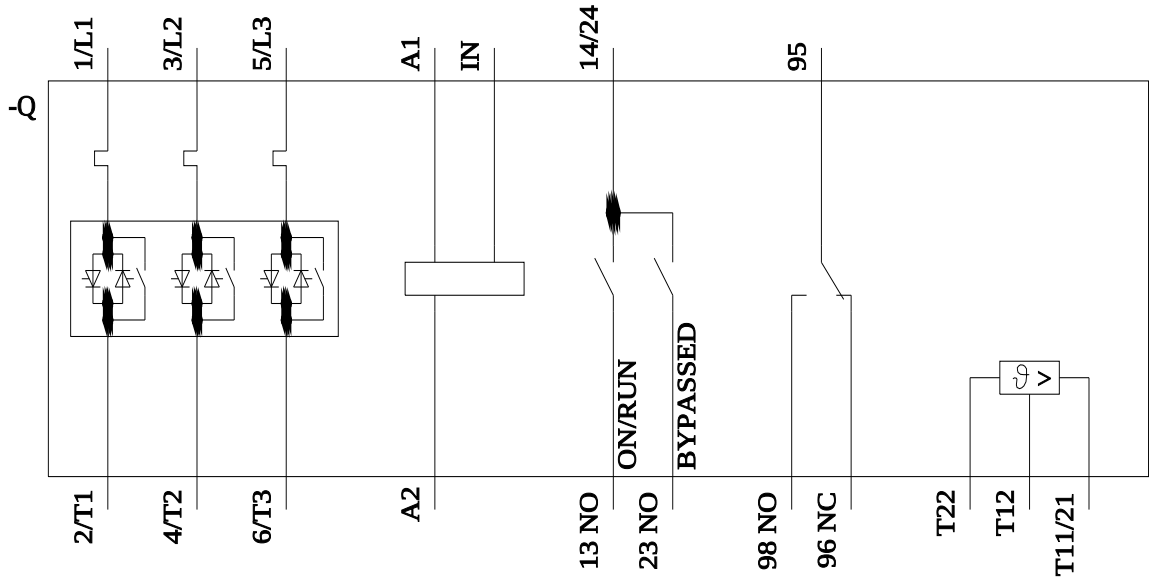

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