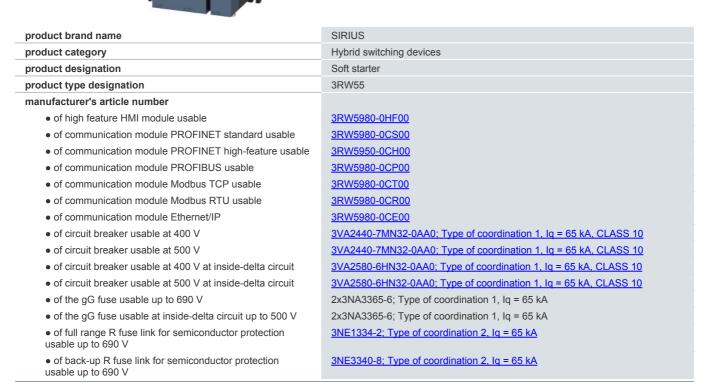
SIEMENS

Data sheet 3RW5546-2HA16



SIRIUS soft starter 200-690 V 370 A, 110-250 V AC spring-type terminals





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	690 V
degree of pollution	3, acc. to IEC 60947-4-2
impulse voltage rated value	8 kV
	1 800 V
blocking voltage of the thyristor maximum	1.15
service factor	
surge voltage resistance rated value	8 kV
maximum permissible voltage for protective separation	000 // 1
between main and auxiliary circuit	690 V; does not apply for thermistor connection
shock resistance	15 g / 11 ms, from 6 g / 11 ms with potential contact lifting
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)	02/15/2018
SVHC substance name	Lead - 7439-92-1 Lead monoxide (lead oxide) - 1317-36-8 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
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
• motor overload protection	overload protection)
 evaluation of thermistor motor protection 	Yes; Type A PTC or Klixon / Thermoclick
inside-delta circuit	Yes; Only up to 600 V operating voltage
• auto-RESET	Yes
manual RESET	Yes
• remote reset	Yes
communication function	Yes
operating measured value display	Yes
event list	Yes
	Yes
error logbook via poftware parameterizable	
via software parameterizable	Yes
 via software configurable 	Yes
• screw terminal	No
screw terminalspring-loaded terminal	No Yes
spring-loaded terminalPROFlenergy	Yes; in connection with the PROFINET Standard and PROFINET High-Feature communication modules
spring-loaded terminalPROFlenergyfirmware update	Yes Yes; in connection with the PROFINET Standard and PROFINET High-Feature communication modules Yes
spring-loaded terminalPROFlenergy	Yes; in connection with the PROFINET Standard and PROFINET High-Feature communication modules

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	370 A
at 40 °C rated value minimum	74 A
at 40 °C rated value at 50 °C rated value	328 A
at 60 °C rated value	300 A
operational current at inside-delta circuit	641 A
• at 40 °C rated value	641 A
• at 50 °C rated value	568 A
• at 60 °C rated value	519 A
operating voltage	
rated value	200 690 V
at inside-delta circuit rated value	200 600 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 	110 kW
 at 230 V at inside-delta circuit at 40 °C rated value 	200 kW
 at 400 V at 40 °C rated value 	200 kW
 at 400 V at inside-delta circuit at 40 °C rated value 	355 kW
 at 500 V at 40 °C rated value 	250 kW
• at 500 V at inside-delta circuit at 40 °C rated value	450 kW
• at 690 V at 40 °C rated value	355 kW
	50 Hz
Operating frequency 1 rated value	
Operating frequency 1 rated value Operating frequency 2 rated value	60 Hz
Operating frequency 1 rated value Operating frequency 2 rated value relative negative tolerance of the operating frequency	60 Hz -10 %
Operating frequency 2 rated value	
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency	-10 % 10 %
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%]	-10 %
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC	-10 % 10 % 10 %; Relative to set le
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup	-10 % 10 % 10 %; Relative to set le
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup	-10 % 10 % 10 %; Relative to set le 111 W 98 W
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup • at 60 °C after startup	-10 % 10 % 10 %; Relative to set le
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup • at 60 °C after startup power loss [W] at AC at current limitation 350 %	-10 % 10 %; Relative to set le 111 W 98 W 90 W
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup • at 60 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup	-10 % 10 %; Relative to set le 111 W 98 W 90 W
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup • at 60 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 60 °C during startup	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W 4 145 W
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 60 °C during startup type of the motor protection	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup • at 60 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 60 °C during startup type of the motor protection Control circuit/ Control	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W 4 145 W Electronic, tripping in the event of thermal overload of the motor
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup • at 60 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 60 °C during startup type of the motor protection Control circuit/ Control type of voltage of the control supply voltage	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W 4 145 W
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup • at 60 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 60 °C during startup type of the motor protection Control circuit/ Control type of voltage of the control supply voltage control supply voltage at AC	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W 4 145 W Electronic, tripping in the event of thermal overload of the motor
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 60 °C during startup type of the motor protection Control circuit/ Control type of voltage of the control supply voltage control supply voltage at AC • at 50 Hz	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W 4 145 W Electronic, tripping in the event of thermal overload of the motor
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 50 °C during startup type of the motor protection Control circuit/ Control type of voltage of the control supply voltage control supply voltage at AC • at 50 Hz • at 60 Hz	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W 4 145 W Electronic, tripping in the event of thermal overload of the motor
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 60 °C during startup type of the motor protection Control circuit/ Control type of voltage of the control supply voltage control supply voltage at AC • at 50 Hz	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W 4 145 W Electronic, tripping in the event of thermal overload of the motor
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 50 °C during startup type of the motor protection Control circuit/ Control type of voltage of the control supply voltage control supply voltage at AC • at 50 Hz • at 60 Hz relative negative tolerance of the control supply voltage at	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W 4 145 W Electronic, tripping in the event of thermal overload of the motor AC 110 250 V 110 250 V
Operating frequency 2 rated value relative negative tolerance of the operating frequency relative positive tolerance of the operating frequency minimum load [%] power loss [W] for rated value of the current at AC • at 40 °C after startup • at 50 °C after startup power loss [W] at AC at current limitation 350 % • at 40 °C during startup • at 50 °C during startup • at 50 °C during startup type of the motor protection Control circuit/ Control type of voltage of the control supply voltage control supply voltage at AC • at 50 Hz • at 60 Hz relative negative tolerance of the control supply voltage at AC at 50 Hz relative positive tolerance of the control supply voltage at	-10 % 10 %; Relative to set le 111 W 98 W 90 W 5 563 W 4 694 W 4 145 W Electronic, tripping in the event of thermal overload of the motor AC 110 250 V 110 250 V -15 %

AO -4 CO II-	
AC at 60 Hz	40.0/
relative positive tolerance of the control supply voltage at AC at 60 Hz	10 %
control supply voltage frequency	50 60 Hz
relative negative tolerance of the control supply voltage	-10 %
relative positive tolerance of the control supply voltage	10 %
frequency	10 /0
control supply current in standby mode rated value	100 mA
holding current in bypass operation rated value	150 mA
inrush current by closing the bypass contacts maximum	0.87 A
inrush current peak at application of control supply voltage maximum	43 A
duration of inrush current peak at application of control supply voltage	1.6 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
parameterizable	4
• number of digital outputs	4
number of digital outputs parameterizable	3
number of digital outputs not parameterizable	1
digital output version	3 normally-open contacts (NO) / 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
Installation/ mounting/ dimensions	
mounting position	Vertical (can be rotated +/- 90° and tilted forward or backward +/- 22.5°)
fastening method	screw fixing
height	393 mm
width	210 mm
depth	203 mm
required spacing with side-by-side mounting	200 11111
• forwards	10 mm
backwards	0 mm
upwards	100 mm
downwards	75 mm
at the side	5 mm
weight without packaging	10.9 kg
Connections/ Terminals	10.0 kg
type of electrical connection	huchar connection
for main current circuit for control circuit	busbar connection
for control circuit width of connection bar maximum	spring-loaded terminals
	45 mm
with conductor cross section = 0.5 mm² maximum	50 m
with conductor cross-section = 0.5 mm² maximum with conductor cross section = 1.5 mm² maximum	50 m
with conductor cross-section = 1.5 mm² maximum with conductor cross section = 2.5 mm² maximum	150 m
with conductor cross-section = 2.5 mm² maximum tune of connectable conductor cross sections	250 m
type of connectable conductor cross-sections	2v /50 240 mm²)
for DIN cable lug for main contacts stranded for DIN cable lug for main contacts finally stranded	2x (50 240 mm²)
for DIN cable lug for main contacts finely stranded tune of connectable conductor cross sections	2x (70 240 mm²)
type of connectable conductor cross-sections	0, (0.05 4.5 mm²)
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 wire length	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 	14 24 N·m
 for auxiliary and control contacts with screw-type 	0.8 1.2 N·m
terminals	
tightening torque [lbf·in]	
 for main contacts with screw-type terminals 	124 210 lbf·in
 for auxiliary and control contacts with screw-type 	7 10.3 lbf·in
terminals	
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	
Siemens Eco Profile (SEP)	Siemens EcoTech
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	100
manufacturer's article number	
• of the fuse	T 01 1/1 4000 A 1 401 A
 usable for Standard Faults up to 575/600 V according to UL 	Type: Class J / L, max. 1200 A; Iq = 18 kA
 — usable for High Faults up to 575/600 V according to UL 	Type: Class J / L, max. 1200 A; Iq = 100 kA
 usable for Standard Faults at inside-delta circuit up to 575/600 V according to UL 	Type: Class J / L, max. 1200 A; Iq = 18 kA
 usable for High Faults at inside-delta circuit up to 575/600 V according to UL 	Type: Class J / L, max. 1200 A; Iq = 100 kA
operating power [hp] for 3-phase motors	
 at 200/208 V at 50 °C rated value 	100 hp
 at 220/230 V at 50 °C rated value 	125 hp
 at 460/480 V at 50 °C rated value 	250 hp
• at 575/600 V at 50 °C rated value	300 hp
• at 200/208 V at inside-delta circuit at 50 °C rated value	200 hp
 at 220/230 V at inside-delta circuit at 50 °C rated value 	200 hp
• at 460/480 V at inside-delta circuit at 50 °C rated value	450 hp
• at 575/600 V at inside-delta circuit at 50 °C rated value	600 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
ATEX	inger said, for vertical contact from the front with cover
Safety Integrity Level (SIL) according to IEC 61508 relating to ATEX	SIL1
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	0

ATEX	
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







Confirmation





EMV

For use in hazardous locations

Test Certificates

Marine / Shipping



<u>KC</u>





other



Type Test Certificates/Test Report



Marine / Shipping

Environment







Confirmation







Environment

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)

 $\underline{https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3RW5546-2HA16}$

Cax online generator

http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3RW5546-2HA16

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

https://support.industry.siemens.com/cs/ww/en/ps/3RW5546-2HA16

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

http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3RW5546-2HA16&lang=en

Characteristic: Tripping characteristics, I2t, Let-through current

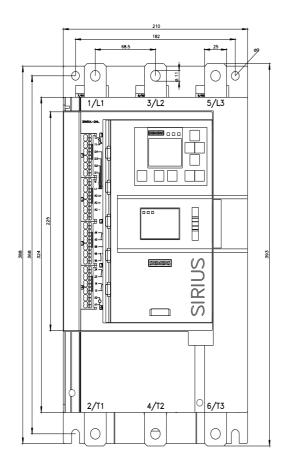
https://support.industry.siemens.com/cs/ww/en/ps/3RW5546-2HA16/char

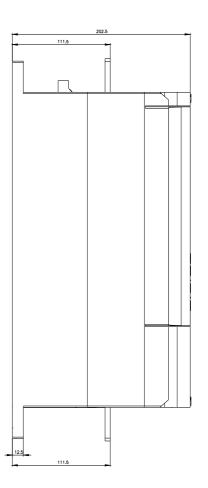
Characteristic: Installation altitude

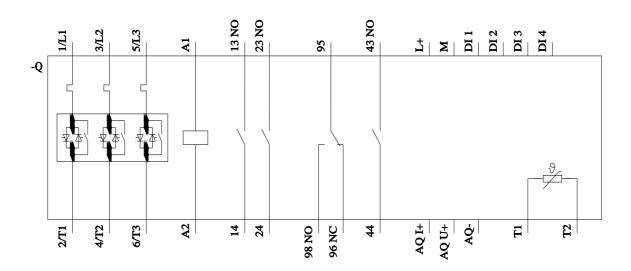
 $\underline{\text{http://www.automation.siemens.com/bilddb/index.aspx?view=Search\&mlfb=3RW5546-2HA16\&objecttype=14\&gridview=view1}$

Simulation Tool for Soft Starters (STS)

https://support.industry.siemens.com/cs/ww/en/view/101494917







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