Shihlin
Factory Automation

AC Drive Family

Superior Performance for all Industries

Head Office:
16F, No. 88, Sec. 6, ChungShan N. Rd., Taipei, Taiwan, 111
TEL:+886-2-2834-2662 FAX:+886-2-2836-6187

HsinFun Factory (Taiwan):
No.234, ChungLun, HsinFun, HsinChu, Taiwan, 304
TEL +886 3 599 5111 FAX:+886 3 5902167

SuZhou Factory(China):
88, Guangdong St., New District, Suzhou, Jiangsu, China, 215129.
TEL:+86-512-6843-2662 FAX: +86-512-68432599

Official website www.seec.com.tw **Automation Division website** www.seecfa.com automation@seec.com.tw

www.seec.com.tw

About US

Shihlin Electric Group was established in 1955 with headquarter located in Taipei, Taiwan. The company has offered a wide range of services that cover the areas of power distribution system, automobile equipment, low-voltage electrics, factory automation, and system engineering. The products of Shihlin Electric, including universal circuit breaker, molded case circuit breaker, mini circuit breaker, contactor, thermal overload relay, surge protection device, automatic transfer switch, power transformer, switch cabinet, high-voltage switch, capacitor, programmable controller, ac drives, human-machine interface, servo motors & drives, temperature controller, sensor, car alternator, starter motor, etc., are famous for their excellence in quality, which are well appreciated by the clients in the industries.

SA3 Series

Compact Design
Vector Control AC Drive

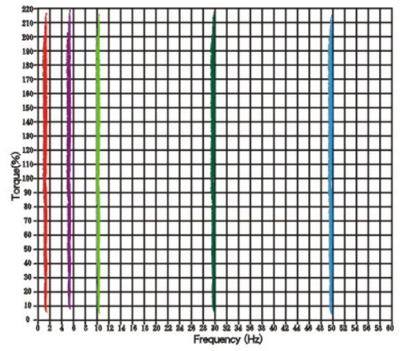
Product Range

Model		KW (HP)	0.75 (1)	1.5 (2)	2.2 (3)	3.7 (5)	5.5 (7.5)	7.5 (10)	11 (15)	15 (20)	18.5 (25)	22 (30)	30 (40)	37 (50)	45 (60)	55 (75)	75 (100)	90 (120)	110 (150)	132 (175)	160 (215)	185 (250)	220 (300)	250 (335)	280 (375)	315 (420)
SA3	SA3023	3-Phase 220V																							
	SA3043	3-Phase 440V																							

Product Features

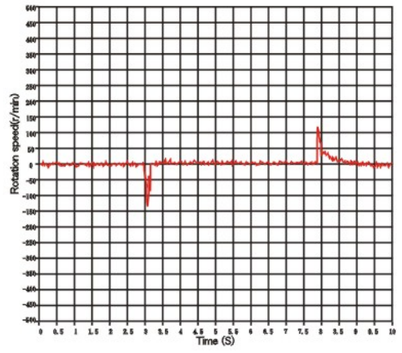
High Performance Vector Control Technology

- Vector control and Sensorless vector control (Maximum operating frequency 120 Hz).
- High starting torque: Sensorless vector control (SVC) 150% 0.3 Hz, and closed-loop vector control (FOC + PG) 180% 0 Hz.



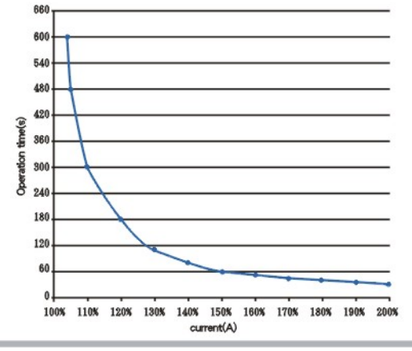
High Response Performance

- Speed accuracy: less than 1% with 0 to 100% load variation
- For applications with sudden load changes such as cranes and metal processing machinery.



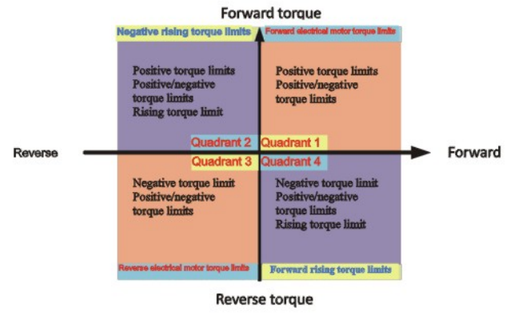
High Overload Capacity

- Greatly improved overload capacity to 150% for 60 seconds and 200% for 3 seconds, making it suitable for tooling machinery applications that requires the ability to handle sudden load changes.



4-Quadrant Torque Control and Limits

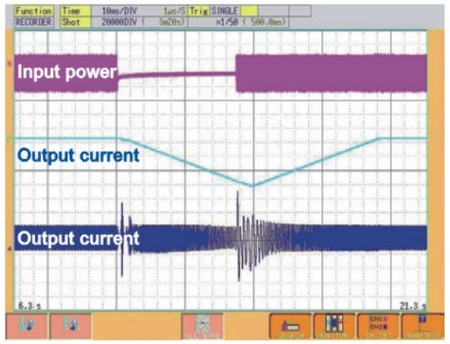
- Parameters or analog signals can be used to simply establish limits for 4 torque items.



Product Features

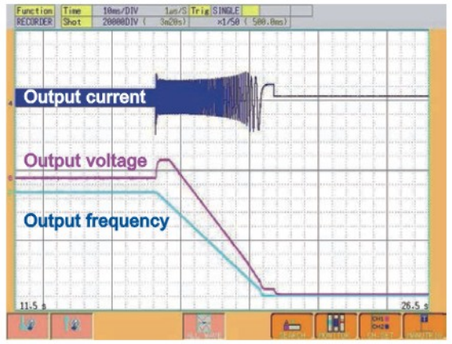
Temporary Compensation at Low Voltage

- During temporary power disruptions, output frequency can be controlled in order to maintain the DC bus voltage of the AC drive to control motor deceleration or stoppage.
- When power is restored, the AC drive will carry out re-acceleration to attain the frequency prior to power stoppage.
- May be applied to equipment that are not permitted to operate when idle.



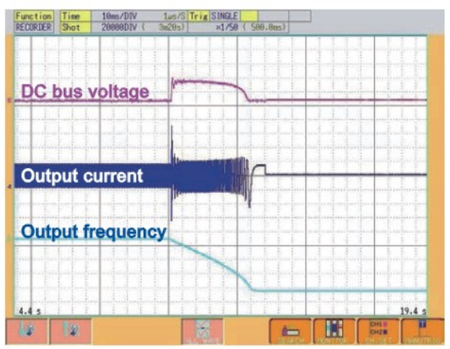
Magnetic Flux Brake

- When the motor is stopping, the magnetic flux will be transmitted to the motor coil to shorten deceleration time without relying on regenerative resistance.



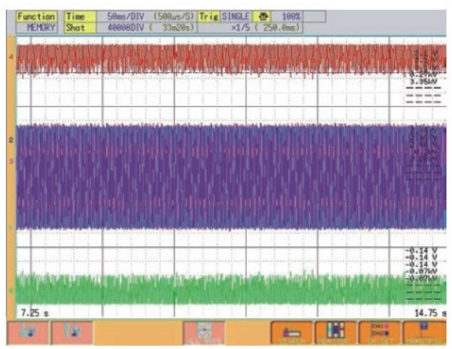
Regeneration Avoidance Functions

- By adjusting output frequency and voltage, AC drive DC bus voltage can be kept at a specified value and prevent overvoltage.



Low-noise Carrier Wave Control (Soft-PWM)

- Motor noise is controlled so that the metallic sound is transformed into a more pleasing buzz.
- Low noise operations to reduce the interference exerted upon external radio frequencies.



High Performance synchronous Motor Control Technology

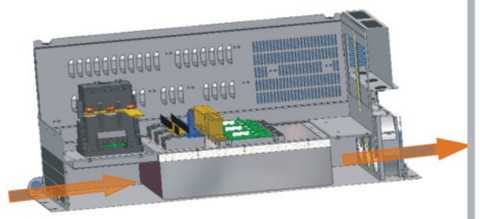
- Supports induction motor (IM) and synchronous motor (IPM and SPM) control.
- Supports open loop synchronous motor control.

LCD Operation Interface

- Supports 2 display styles.
- Able to simultaneously displaying 6 sets of operational data.
- Calendar support.
- Offers both English and Chinese language interfaces.
- Capable of storing 3 sets of parameters.
- Supports shuttle settings.

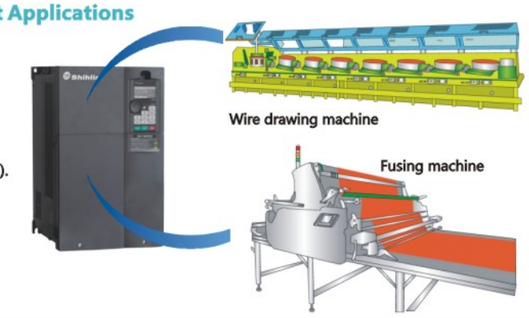
Isolated air Channel Designs

- Fan wind channels are sealed and isolated from the heat dissipation system and electrical parts. Dust will not be able to infiltrate the interior of the machine through the fans.



Supports Multiple Control Modes for Different Applications

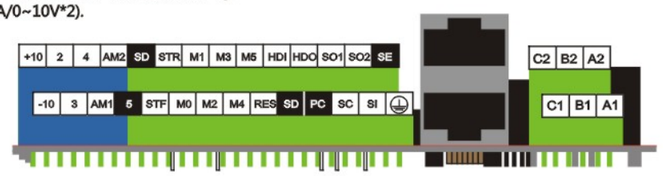
- Internal position control, torque control, speed control, and tension control functions.
- I/O switching can be used to initiate simple mixed controls over speed and torque as well as speed and location.
- Position control is capable of supporting home position return mode, zero-servo control, and single-axis position control mode (must be used with PG301C, PG301L, and PG302L).
- Supports open-loop tension control, feeding disruption inspection, and automatic spool replacement functions.



Product Features

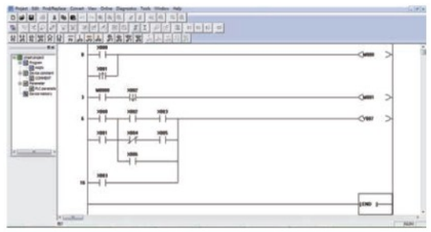
Multiple I/O Terminals

- Includes 10 sets of multi-functional combinational logic input terminals (with high-speed pulse inputs *1)
- Includes 5 sets of multi-functional combinational output terminals (including electric relay output *2, transistor output *2, and high-speed pulse output *1).
- Includes 3 sets of analog input signals (with -10~+10V*1 and 4~20mA/0~10V*2).
- Includes 2 sets of analog output signals (0~20mA/0~10V*2).
- 1 set of safety switch (S1~SC).



Built-in PLC Functions

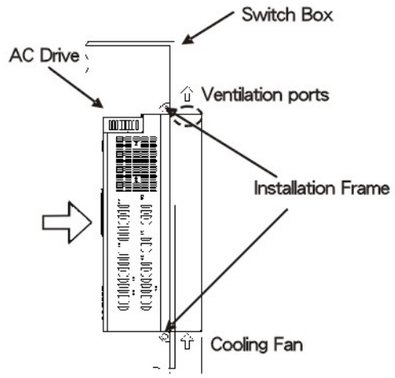
- Provides PLC programming software for easy editing program.
- Applicable for programming for small number of point sand capable of supporting multiple functions.



Item		SA3 PLC functions
Programming Language		Ladder diagram + Command
Basic commands		21
Applicable commands		14
Processing speed	Basic commands	1 μs
	Applicable commands	10 μs
Hidden program capacity		400 steps(0-399 steps)
I/O configuration	Input(X)	22 points(X0~X25, octal)
	Output(Y)	20 points (Y0~Y23, octal)
Supporting electric relay (M)	General	160 points, M0~M159
	Battery backed	80 points, M160~M239
	Special	64 points, M8000~M8063
Timer(T)	100ms	6 points, T0~T7, timer range: 0~6553.5 seconds
Counter(C)		8 points, C0~C7, counting range: 0~65535
Data register	General	32 points, D0~D31
	Battery backed	16 points, D32~D47
	Special	64 points, D8000~D8063

Through-the-wall Installation Support Provided for the Entire Series

- Improve heat dissipation, reduce heat generation within the cabinet, and improve protection for the cabinet contents.



12 Sets of Alarm Records

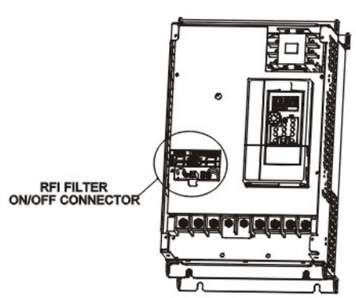
- For each alarm that occurs, the output frequency, output current, output voltage, accumulated count of temperature increase, PN voltage, total AC drive operation time, AC drive operational status, and the year, month, day, hour, minute, and second of the alarm will be recorded (only when used with PUC031C).

Improved Protection

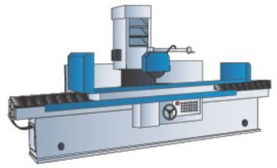
- Output phase failure protection, output short circuit protection, ground leakage protection, low voltage protection, motor overheating signal (PTC), and electrolytic capacitor life inspection.

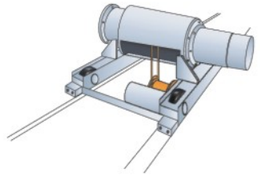
SA3 All-Series built-in RFI Filter

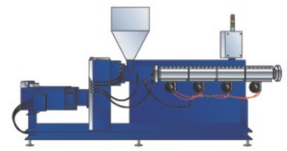
- RFI is capable of suppressing electromagnetic interference

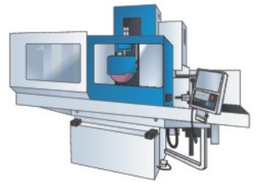


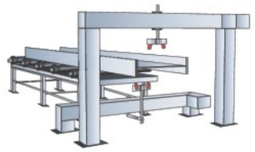
Applicable Industries

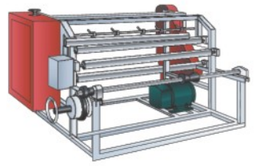

Grinding Machine


Cranes


Extrusion Machine


Grinding Machine


Plating Machine


Slitting Machine

Electrical Specifications

220 V Three-phase Series

Frame			A				B			C		D			E		F
ModelSA3-023-□□□K□-			0.75K 1.5KF	1.5K 2.2KF	2.2K 3.7KF	3.7K 5.5KF	5.5K 7.5KF	7.5K 11KF	11K 15KF	15K 18.5KF	18.5K 22KF	22K 30KF	30K 37KF	37K 45KF	45K 55KF	55K 75KF	75K 90KF
Output	HD	Rated output capacity (kVA)	2	3.2	4.2	6.7	9.5	12.5	18.3	24.7	28.6	34.3	45.7	55	65	82	110
		Rated output current (A)	5	8	11	17.5	25	33	49	65	75	90	120	145	170	215	288
		Applicable motor capacity (HP)	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100
		Applicable motor capacity (kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75
		Overload current rating	150% 60 seconds 200% 3seconds (inverse time characteristics)														
		Carrier frequency (kHz)	1~15kHz									1~9kHz					
	ND	Rated output capacity (kVA)	3.2	4.2	6.7	9.5	12.5	18.3	24.7	28.6	34.3	45.7	55	65	82	110	132
		Rated output current (A)	8	11	17.5	25	33	49	65	75	90	120	145	170	215	288	346
		Applicable motor capacity (HP)	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	120
		Applicable motor capacity (kW)	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
		Overload current rating	120% 60seconds (inverse time characteristics)														
		Carrier frequency (kHz)	1~15kHz									1~9kHz					
	Maximum output voltage		Three-phase 200-240V														
Power supply	Rated power voltage		Three-phase 200-240V 50Hz / 60Hz														
	Power voltage permissible fluctuation		Three-phase 170-264V 50Hz / 60Hz														
	Power frequency permissible fluctuation		±5%														
	Power source capacity (kVA)		2.5	4.5	6.4	10	12	17	20	28	34	41	52	65	79	100	110
Cooling method			Self cooling	Forced air cooling													
Weight (kg)			3.15	3.15	3.15	3.15	6	6	6	10.6	10.6	33	33	33	42.7	42.7	56.5

Note: The test conditions of rated output current, rated output capacity and frequency converter AC Drive power consumption are: the carrier frequency (P.72) is at the set value; the frequency converter/AC Drive output voltage is at 440V; the output frequency is at 60Hz, and the ambient temperature is 40oC.

Electrical Specifications

440 V Three-phase Series

Frame			A					B				C			D
Model SA3-043-□□□K □-			0.75K 1.5KF	1.5K 2.2KF	2.2K 3.7KF	3.7K 5.5KF	5.5K 7.5KF	7.5K 11KF	11K 15KF	15K 18.5KF	18.5K 22KF	22K 30KF	30K 37KF	37K 45KF
Output	HD	Rated output capacity (kVA)	2	3	4.6	6.9	10	14	18	25	29	34	46	56
		Rated output current (A)	3.0	4.2	6	9	12	17	24	32	38	45	60	73
		Applicable motor capacity (HP)	1	2	3	5	7.5	10	15	20	25	30	40	50
		Applicable motor capacity (kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37
		Overload current rating	150% 60 seconds 200% 3seconds (inverse time characteristics)											
		Carrier frequency (kHz)	1~15kHz											1~9kHz
	ND	Rated output capacity (kVA)	3	4.6	6.9	10	14	18	25	29	34	46	56	69
		Rated output current (A)	4.2	6	9	12	17	24	32	38	45	60	73	91
		Applicable motor capacity (HP)	2	3	5	7.5	10	15	20	25	30	40	50	60
		Applicable motor capacity (kW)	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45
		Overload current rating	120% 60seconds (inverse time characteristics)											
		Carrier frequency (kHz)	1~15kHz											1~9kHz
	Maximum output voltage		Three-phase 380-480V											
Power supply	Rated power voltage		Three-phase 380-480V 50Hz / 60Hz											
	Power voltage permissible fluctuation		Three-phase 342-528V 50Hz / 60Hz											
	Power frequency permissible fluctuation		±5%											
	Power source capacity (kVA)		2.5	4.5	6.9	10.4	11.5	16	20	27	32	41	52	65
Cooling method			Self cooling	Forced air cooling										
Weight (kg)			3.15	3.15	3.15	3.15	3.15	6	6	6	9.8	9.8	9.8	33

Frame			D			E		F	G				H	
Model SA3-043-□□□K □-			45K 55KF	55K 75KF	75K 90KF	90K 110KF	110K 132KF	132K 160KF	160K 185KF	185K 220KF	220K 250KF	250K 280KF	280K 315KF	315K 355KF
Output	HD	Rated output capacity (kVA)	69	84	114	137	168	198	236	295	367	402	438	491
		Rated output current (A)	91	110	150	180	220	260	310	340	425	480	530	620
		Applicable motor capacity (HP)	60	75	100	120	150	175	215	250	300	335	375	420
		Applicable motor capacity (kW)	45	55	75	90	110	132	160	185	220	250	280	315
		Overload current rating	150% 60 seconds 200% 3seconds (inverse time characteristics)											
		Carrier frequency (kHz)	1~9kHz										1~6kHz	
	ND	Rated output capacity (kVA)	84	114	137	168	198	236	295	367	402	438	491	544
		Rated output current (A)	110	150	180	220	260	310	340	425	480	530	620	683
		Applicable motor capacity (HP)	75	100	120	150	175	215	250	300	335	375	420	475
		Applicable motor capacity (kW)	55	75	90	110	132	160	185	220	250	280	315	355
		Overload current rating	120% 60seconds (inverse time characteristics)											
		Carrier frequency (kHz)	1~9kHz										1~6kHz	
	Maximum output voltage		Three-phase 380-480V											
Power supply	Rated power voltage		Three-phase 380-480V 50Hz / 60Hz											
	Power voltage permissible fluctuation		Three-phase 342-528V 50Hz / 60Hz											
	Power frequency permissible fluctuation		±5%											
	Power source capacity (kVA)		79	100	110	137	165	198	247	295	367	402	438	491
Cooling method				Powered fan-cooling										
Weight (kg)			33	33	33	42.7	42.7	56.5	84	84	84	84	123	123

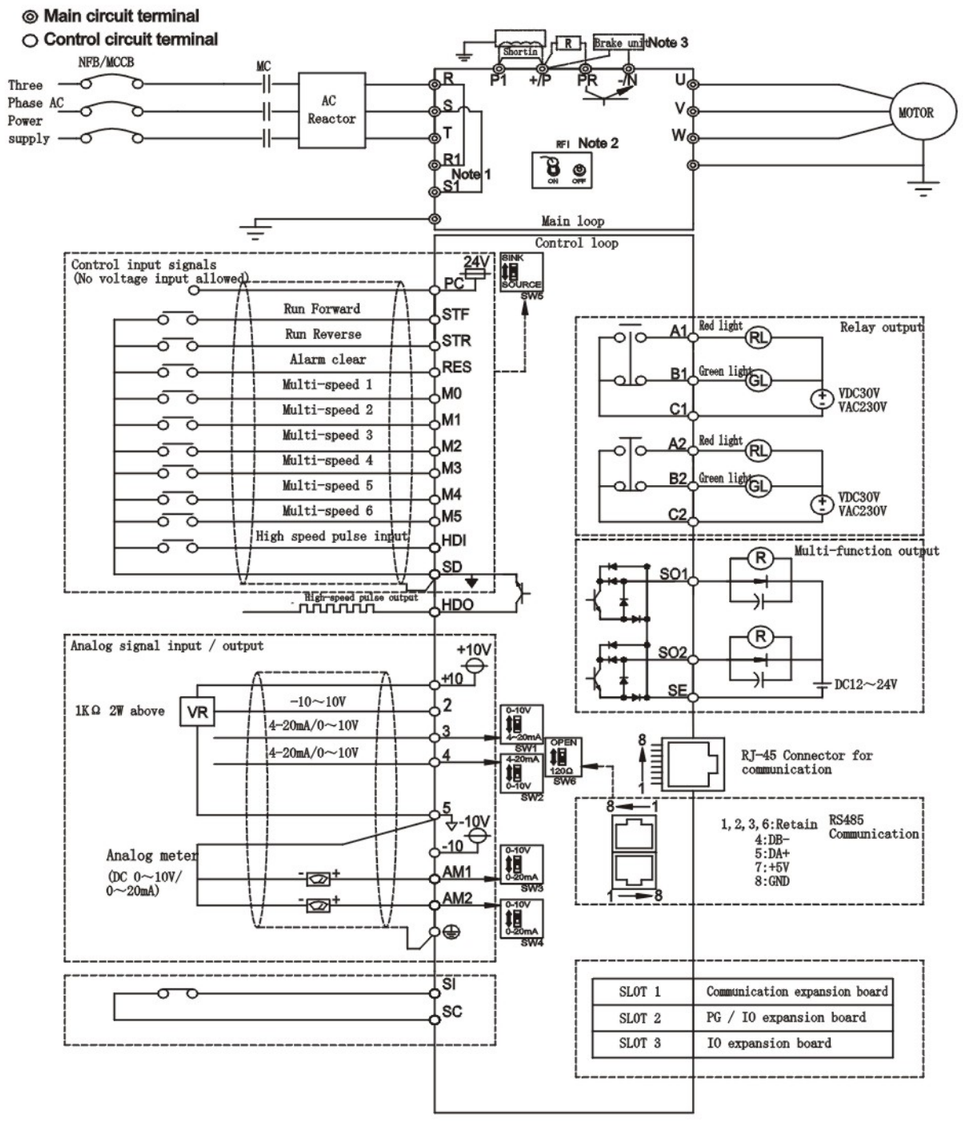
Note: The test conditions of rated output current, rated output capacity and frequency converter AC Drive power consumption are: the carrier frequency (P.72) is at the set value; the frequency converter/AC Drive output voltage is at 440V; the output frequency is at 60Hz, and the ambient temperature is 40oC.

Common Specifications

Control method		SVPWM control, V/F control, close-loop V/F control (VF+PG), general flux vector control, sensorless vector control (SVC), close-loop vector control (FOC+PG), torque control (TQC+PG).
Output frequency range		0~650.00Hz
Frequency setting resolution	Digit setting	The resolution is 0.01Hz.
	Analog setting	0.01Hz/60Hz (Terminal 2: -10~+10V/13bit) 0.015Hz/60Hz (Terminal 2: 0~±10V/12bit; Terminal 3: 0~10V, 4-20mA/12bit) 0.03Hz/60Hz (Terminals 2, 3; 0~5V/11bit) 0.06Hz/60Hz (Terminal 4: 0~10V, 4-20Ma/10bit) 0.12Hz/60Hz (Terminal 4: 0~5V/9bit)
Output frequency accuracy	Digit setting	Maximum target frequency ±0.01%.
	Analog setting	Maximum target frequency ±0.1%.
Speed control range		IM: WhenSVC, 1:200; when FOC+PG, 1:1000. PM: When SVC,1:20; when FOC+PG, 1:1000.
Start torque		150% 0.3Hz (SVC), 180% 0Hz (FOC+PG).
V/F characteristics		Constant torque curve, variable torquecurve, five-point curve, VF separation
Acceleration / deceleration curve characteristics		Linear acceleration /deceleration curve, S pattern acceleration /deceleration curve1 & 2 & 3
Driving motor		Induction motor (IM), permanent magnet motor (SPM and IPM)
Stall current protection		The stalling protection level can be set to 0~400% (06-01(P.22)). The default value is 150%.
Target frequency setting		Parameter unit setting, DC 0~5V/10V signal, DC -10~+10V signal, DC 4~20 mA signal, multiple speed stage level setting, communication setting, HDI setting.
PID control		Please refer to08-00~08-01、08-04~08-14 / P.170~P.182 in chapter 4.
Built-in simple PLC		Supports 21 basic instructions and 14 application instructions, including PC editing software;
Parameter unit	Operation monitoring	Output frequency, output current, output voltage, PN voltage, output torque, electronic thermal accumulation rate, temperature rising accumulation rate, output power, Analog value input signal, digital input and output terminal status...; alarm history 12 groups at most, the last group of alarm message is recorded.
	LED indication lamp (10)	Forward rotation indication lamp, reverse rotation indication lamp, frequency monitoring indication lamp, voltage monitoring indication lamp, current monitoring indication lamp, NET indication lamp, PU controlindication lamp, EXT indication lamp, PLC indication lamp and MON monitoring indication lamp.
Communication functions		RS-485 communication, can select Shihlin/Modbus communication protocol, communication speed38400bps or below, built-in CanOpenprotocol(SA3-CP301 expanded board can be optional), double RJ-45 connectors (the connector can also be connected to parameter unit)
Protection mechanism/ alarm function		Output short circuit protection, Over-current protection, over-voltage protection, under-voltage protection, motor over-heat protection (06-00(P.9)), IGBT module over-heat protection, communication abnormality protection, PTC temperature protection etc, electrolytic capacitor overheat, input and output phase failure, to-earth (ground) leakage currents protection, circuit error detection...
Environment	Ambient temperature	-10 ~ +50oC (non-freezing), please refer to 3.4.5 Class of protection and operation temperature for details.
	Ambient humidity	Below 90%Rh (non-condensing).
	Storage temperature	-20 ~ +65oC
	Surrounding environment	Indoors, no corrosive gases, no flammable gas, no flammable powder.
	Altitude	Altitude below 3000 meters,when altitude is above 1,000 m,derate the rated current 2% per 100 m Note 1: according to the safety of CE certification to meet specification EN61800-5-1, this series of frequency converter, using at an altitude of less than 3000 m, can be installed under the environment that could satisfy the requirement of the overvoltage level II, while using at an altitude of less than 2000 m, can be installed in conditions that could satisfy the requirement of overvoltage level III worse environment.
	Vibrations	Vibration below 5.9m/s2 (0.6G).
	Grade of protection	Frame A, B, CIP20 / NEMA TYPE 1, Frame D and above IP00 / UL OPEN TYPE(IP20 option can be selected).
	The degree of environmental pollution	2
	Class of protection	Class I
International certification		CE, C-TICK(in certificating)

Blue text indicate AC drive parameters. For details, please refer to the SA3 instruction manual.

Wiring Diagram

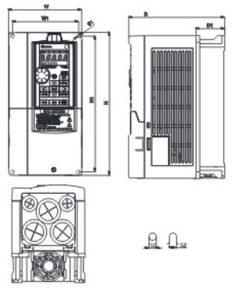


NOTE

1. Please refer to the Section 5.4.1 for the applications of external thermal overload relay.
2. Make sure that 10, -10, SD, SE, 5 and PC are not shorted each other.
3. The DC resistor between +/P and P1 is optional. Please short +/P and P1 when AC resistor is not used.
4. The brake resistor connection approach between +/P and PR is for Frame A, B and C only. For connecting the brake unit of Frame D, E, F, G and H to between +/P and -/N, please refer to the Section 3.7.1 for details.
5. When adding DC reactors, please remove the short circuit piece between P1 and +/P. Please refer to the Section 3.6.4 for the reactor type.
6. Please refer to the Section 5.3.9 for wiring of HDO.

Dimensions

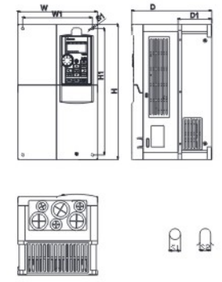
Frame A



Frame A

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
SA3-043-0.75K/1.5KF	130.0	116.0	250.0	236.0	170.0	51.3	6.2	6.2
SA3-043-1.5K/2.2KF								
SA3-043-2.2K/3.7KF								
SA3-043-3.7K/5.5KF								
SA3-043-5.5K/7.5KF								
SA3-023-0.75K/1.5KF								
SA3-023-1.5K/2.2KF								
SA3-023-2.2K/3.7KF								
SA3-023-3.7K/5.5KF								

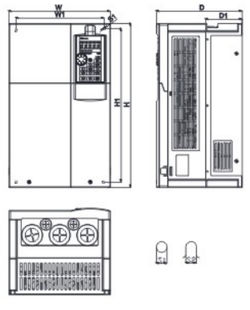
Frame B



Frame B

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
SA3-043-7.5K/11KF	190.0	173.0	320.0	303.0	190.0	80.5	8.5	8.5
SA3-043-11K/15KF								
SA3-043-15K/18.5KF								
SA3-023-5.5K/7.5KF								
SA3-023-7.5K/11KF								
SA3-023-11K/15KF								

Frame C

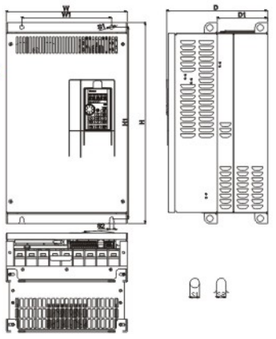


Frame C

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
SA3-043-18.5K/22KF	250.0	231.0	400.0	381.0	210.0	89.5	8.5	8.5
SA3-043-22K/30KF								
SA3-043-30K/37KF								
SA3-023-15K/18.5KF								
SA3-023-18.5K/22KF								

Dimensions

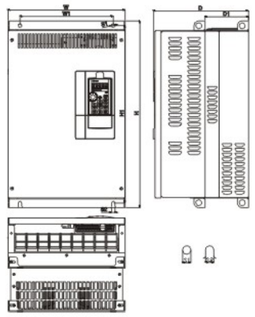
Frame D



Frame D

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
SA3-043-37K/45KF	330.0	245.0	550.0	525.0	275.0	137.5	11.0	11.0
SA3-043-45K/55KF								
SA3-043-55K/75KF								
SA3-043-75K/90KF								
SA3-023-22K/30KF								
SA3-023-30K/37KF								
SA3-023-37K/45KF								

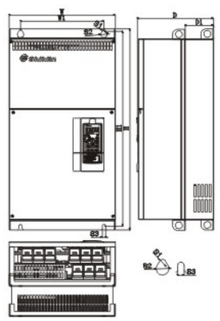
Frame E



Frame E

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
SA3-043-90K/110KF	370.0	295.0	589.0	560.0	300.0	137.5	11.0	11.0
SA3-043-110K/132KF								
SA3-023-45K/55KF								
SA3-023-55K/75KF								

Frame F

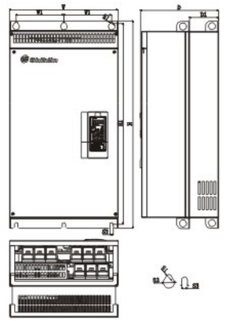


Frame F

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)	S3 (mm)
SA3-043-132K/160KF	420.0	340.0	800.0	770.0	300.0	145.5	13.0	25.0	13.0
SA3-023-75K/90KF									

Dimensions

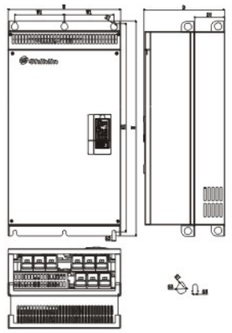
Frame G



Frame G

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)	S3 (mm)
SA3-043-160K/185KF	500.0	180.0	870.0	850.0	360.0	150.0	13.0	25.0	13.0
SA3-043-185K/220KF									
SA3-043-220K/250KF									
SA3-043-250K/280KF									

Frame H



Frame H

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)	S3 (mm)
SA3-043-280K/315KF	600.0	230.0	1000.0	980.0	400.0	181.5	13.0	25.0	13.0
SA3-043-315K/355KF									

SC3 Series

Compact AC Drive

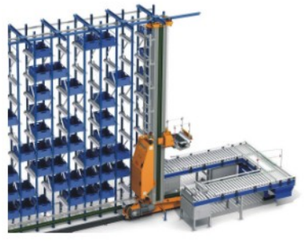
Product Range

Model		KW (HP)	0.2 (0.25)	0.4 (0.5)	0.75 (1)	1.5 (2)	2.2 (3)	3.7 (5)	5.5 (7.5)
SC3	SC3021	1-phase 220V	■	■	■	■	■		
	SC3023	3-phase 220V	■	■	■	■	■	■	
	SC3043	3-phase 440V		■	■	■	■	■	■

Main Features

* Frequency output: 0 ~ 650Hz
* Starting torque: 180%/ 3Hz
* Reasonable abosorb circuit and element match, and effectively decrease the low induction voltage by 50%.
* Built-in RFI filter
* Excellent vibration resistant ability
* Reduce 20% low-frequency noise comparing with SS2
* Easy to operate with optimized knob

Applications



Automated Storage

Sealing Machine

Band-sawing Machine

Pressure Fan

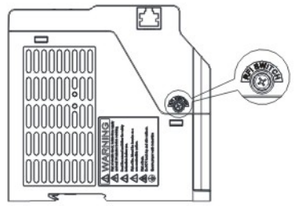
Noodle Machine

Slicer

Product Features

RFI filter has been built in all the products

· RFI filter has been built in all the products of the system, which can control electromagnetic interference effectively.

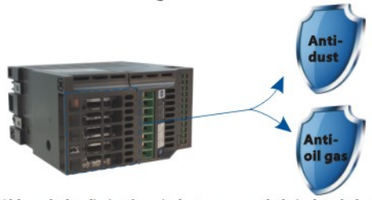


Note: For conforming to the CE specifications, please refer to the operation manual to finish the installation and distribtion.

Coating& Isolated air duct

· All of the circuit board was with insulating liquids coatings.

· Dissipation air duct was completly isolated, which force the air current only flow through the surface of the radiator, and will not blow dust and oil gas into inverter.

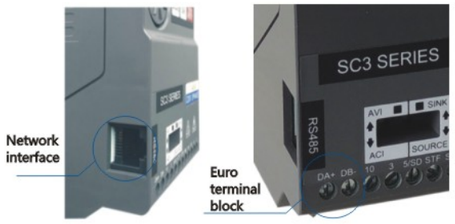


Note: Although the dissipation air duct was completly isolated, dust and oil gas would still blow into the converter with natural air current if the converter was installed in a heavy dust and oil gas environment without any protection for a long time.

Easy to install -- wiring communication

· Easy to connect the operator

· Convenient for multi-machine wiring communication



Note: Pulling operator can not be used at the same time with RS485.

The fan can be disassemble easily

· The fan is put on the top, which can effectively reduce the effect of dust and screwless wiring will not effect the daily maintenance of fan.

Update the operability of Jog dial

· Update the structure of Jog dial: The jog dial do not protrude from the surface of the product, difficult to demage and is easy to manipulate during quick turning adjusting.

parameter grouped - easier to debug

Parameter Group	Parameter NO.	Parameter Name	Setting Range	Factory
01-00	P.1	Upper limit frequency	0～120.00Hz	120.00Hz
01-01	P.2	Lower limit frequency	0～120.00Hz	0Hz
01-02	P.18	High speed upper limit frequency	120.00～650.00Hz	120.00Hz
01-03	P.3	Base frequency	50Hz System set : 0～650.00Hz	50Hz
			60Hz System set : 0～650.00Hz	60Hz
01-04	P.19	Base Voltage	0～1000.0V	99999
			99999 : Change with input voltage	

Previous Product: Parameter numbers were not in order and it was difficult to set.

SC3 system: Similar functions were put in the same group, which make it easier to set.

Electrical Specifications

220V Series single-phase

Frame		A			B	
ModelS SC3-021-□□□K-□□		0.2	0.4	0.75	1.5	2.2
Output	Rated output capacity (kVA)	0.6	1	1.5	2.5	4.2
	Rated output current (A)	1.8	2.7	4.5	8	11
	Applicable motor capacity (HP)	0.25	0.5	1	2	3
	Applicable motor capacity (kW)	0.2	0.4	0.75	1.5	2.2
	Overload current rating	150% 60seconds 200% 1second inverse time characteristics				
	Carrier frequency (kHz)	1~15kHz				
	Maximum output voltage	Three-phase 200-240V				
Power supply	Rated power voltage	Single-phase 200-240V 50Hz / 60Hz				
	Power voltage permissible fluctuation	Single-phase 170-264V 50Hz / 60Hz				
	Power frequency permissible fluctuation	±5%				
	Power source capacity (kVA)	0.75	1.5	2.5	3.5	6.4
	Cooling method	Self cooling	Forced air cooling			
	Weight (kg)	0.66	0.68	0.73	1.38	1.4

220V Series three-phase

Frame		A				B	
ModelS SC3-023-□□□K- □□		0.2	0.4	0.75	1.5	2.2	3.7
Output	Rated output capacity (kVA)	0.6	1.2	2	3.2	4.2	6.7
	Rated output current (A)	1.8	3	5	8	11	17.5
	Applicable motor capacity (HP)	0.25	0.5	1	2	3	5
	Applicable motor capacity (kW)	0.2	0.4	0.75	1.5	2.2	3.7
	Overload current rating	150% 60seconds 200% 1secondinverse time characteristics					
	Carrier frequency (kHz)	1~15kHz					
	Maximum output voltage	Three-phase 200-240V					
Power supply	Rated power voltage	Three-phase 200-240V 50Hz / 60Hz					
	Power voltage permissible fluctuation	Three-phase 170-264V 50Hz / 60Hz					
	Power frequency permissible fluctuation	±5%					
	Power source capacity (kVA)	0.75	1.5	2.5	4.5	6.4	10
	Cooling method	Self cooling	Forced air cooling				
	Weight (kg)	0.69	0.69	0.70	0.73	1.32	1.4

Electrical Specifications

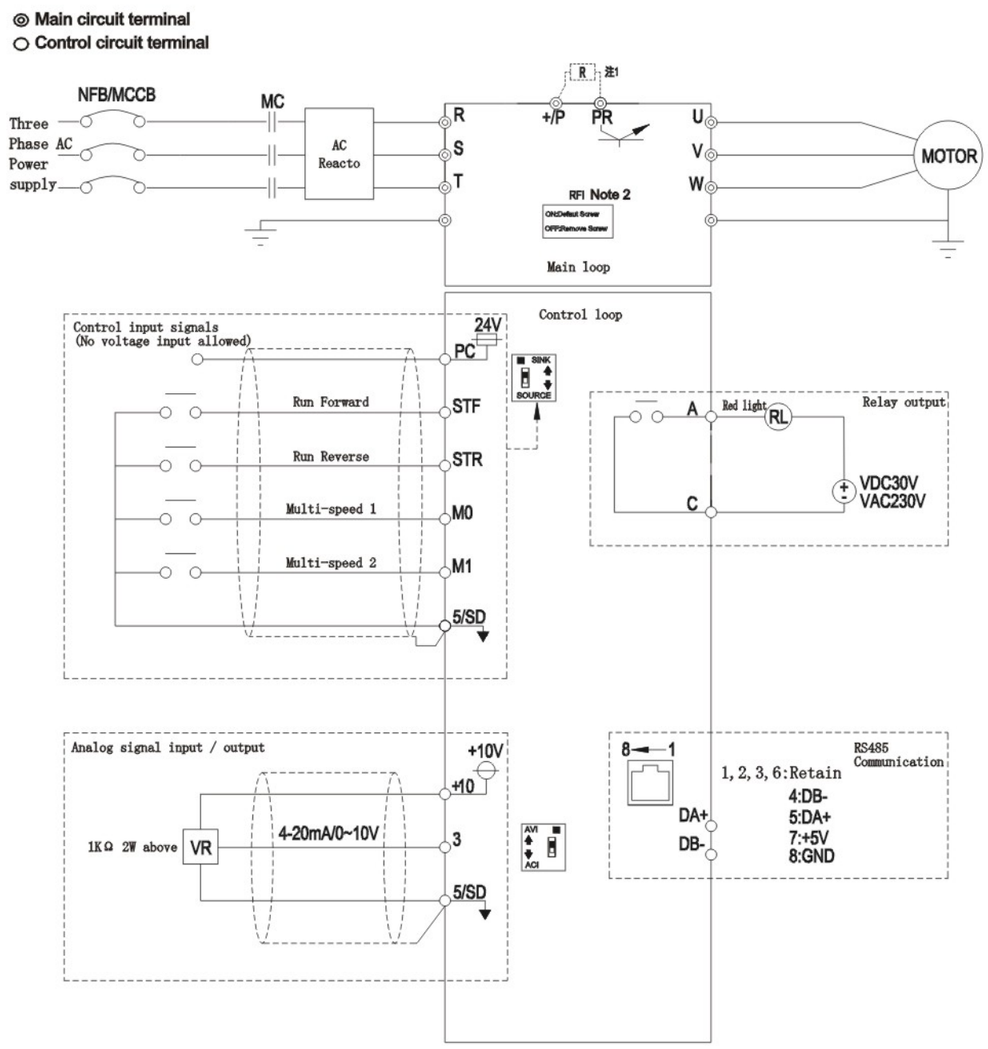
440V Series three-phase

Frame		A			B		
ModelS SC3-043-□□□K- □□		0.4	0.75	1.5	2.2	3.7	5.5
Output	Rated output capacity (kVA)	1	2	3	4.6	6.9	9.2
	Rated output current (A)	1.5	2.6	4.2	6	9	12
	Applicable motor capacity (HP)	0.5	1	2	3	5	7.5
	Applicable motor capacity (kW)	0.4	0.75	1.5	2.2	3.7	5.5
	Overload current rating	150% 60seconds 200% 1secondinverse time characteristics					
	Carrier frequency (kHz)	1~15kHz					
	Maximum output voltage	Three-phase 380-480V					
Power supply	Rated power voltage	Three-phase 380-480V 50Hz / 60Hz					
	Power voltage permissible fluctuation	Three-phase 323-528V 50Hz / 60Hz					
	Power frequency permissible fluctuation	±5%					
	Power source capacity (kVA)	1.5	2.5	4.5	6.9	10.4	11.5
	Cooling method	Self cooling	Forced air cooling				
	Weight (kg)	0.74	0.74	0.81	1.37	1.37	1.42

Common Specifications

Control method		SVPWM control, V/F control,
Output frequency range		0~650.00Hz
Frequency setting resolution	Digital setting	The frequence is set within 100Hz,the resolution is 0.01Hz.
		The frequence is set more than100Hz,the resolution is 0.1Hz.
	Analog setting	DC 0~5V or 4~20mAsignal set is 11 digits.
		DC 0~10V signal set is12digits.
Output frequency accuracy	Digital setting	Maximum target frequency±0.01%.
	Analog setting	Maximum target frequency±0.1%.
Start torque		150% 5Hz
V/Fcharacteristics		Constant torque curve, variable torquecurve, five-point curve
Acceleration / deceleration curve characteristics		Linear acceleration /deceleration curve, S pattern acceleration /deceleration curve1 & 2 & 3
Drive motor		Induction motor(IM)
Stalling protection		The stalling protection level can be set to 0~400%(06-01(P.22)). The default value is 150%.
Target frequency setting		Parameter unit setting, DC 0~5V/10V signal, DC -10~+10V signal, DC 4~20 mA signal, multiple speed stage level setting, communication setting.
Parameter unit	Operation monitoring	Output frequency, output current, output voltage, PN voltage, electronic thermal accumulation rate, temperature rising accumulation rate, output power, analog value input signal, output terminal status...; alarm history 12 groups at most, the last group of alarm message is recorded.
	LED indication lamp (6)	frequency monitoring indication lamp, voltage monitoring indication lamp, current monitoring indication lamp, motor operation lamp, mode switchinglamp, Pucontrolindication lamp
Communication function		RS-485 communication, can select Shihlin/Modbus communication protocol, communication speed115200bpsor above.
Protection mechanism / alarm function		Output short circuit protection, Over-current protection, over-voltage protection, under-voltage protection, motor over-heat protection (06-00(P.9)), IGBT module over-heat protection, communication abnormality protection, to-earth (ground) leakage currents protection, circuit error detection...
Environment	Ambient temperature	-10 ~ +50℃ (non-freezing)
	Ambient humidity	Below 90%Rh (non-condensing).
	Storage temperature	-20 ~ +65℃.
	Surrounding environment	Indoor, no corrosive gas, no flammable gas, no flammable powder.
	Altitude	Altitude below 2000 meters,when altitude is above 1,000 m,derate the rated current 2% per 100 m
	Vibration	Vibration below 5.9m/ s2 (0.6G).
	Grade of protection	IP20
	The degree of environmental pollution	Ⅱ
	Class of protection	Class I
International certification		CE

Wiring Diagram

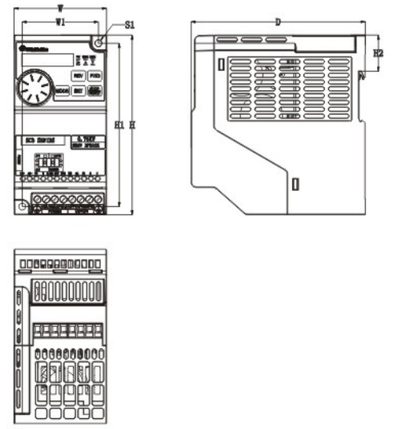


NOTE

1 : SC3-043-0.4K~1.5K , SC3-023-0.2~1.5K , SC3-021-0.2~0.75K have not + / P and PR terminals.
2 : Full range of built-in RFI filter to suppress electromagnetic interference, but if you want to meet CE standard, please refer to the instructions in the operating manual for installation.

Dimensions

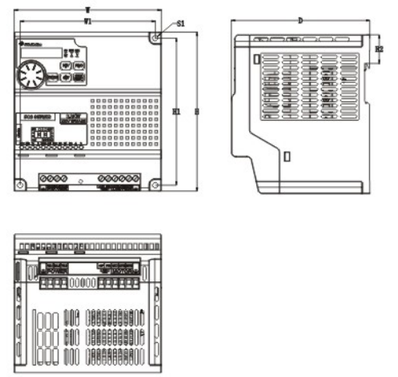
Frame A



Frame A

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	H2 (mm)	D (mm)	S1 (mm)
SC3-021-0.2K	68	56	132	120	26.5	128	5
SC3-021-0.4K							
SC3-021-0.75K							
SC3-023-0.2K							
SC3-023-0.4K							
SC3-023-0.75K							
SC3-023-1.5K							
SC3-043-0.4K							
SC3-043-0.75K							
SC3-043-1.5K							

Frame B



Frame A

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	H2 (mm)	D (mm)	S1 (mm)
SC3-021-1.5K	136	125	147	136	26.5	128	5
SC3-021-2.2K							
SC3-023-2.2K							
SC3-023-3.7K							
SC3-043-2.2K							
SC3-043-3.7K							
SC3-043-5.5K							

SS2 Series

Compact Design
Vector Control AC Drive

Product Range

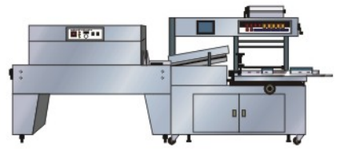
Model		KW (HP)	0.4 (0.5)	0.75 (1)	1.5 (2)	2.2 (3)	3.7 (5)	5.5 (7.5)
SS2	SS2021	1-phase 220V	■	■	■	■		
	SS2023	3-phase 220V	■	■	■	■	■	
	SS2043	3-phase 440V	■	■	■	■	■	■

Main Features

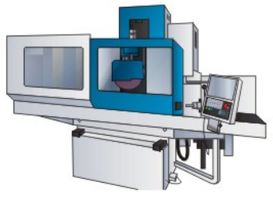
* Built-in shuttle knop to adjust output frequency and set parameters easily
* Built-in RS-485 communication interface
* Support MODBUS and Shihlin communication protocol
* Built-in proportion linkage control function to support multi inverters connection
* Maximum 650Hz frequency output
* Support DIN rail mount
* The resolution of frequency setting: digital 0.01Hz ; analog 1/1000
* The accuracy of output frequency: 0.01%
* Multi-function input/output terminals
* Support 2 analog setting types: 0-10V and 4-20mA

Application

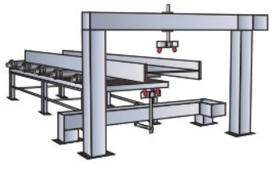

Mixer Machine


Packing Machine

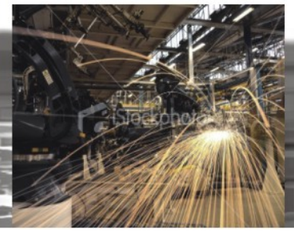

Constant pressure Water supply


Grinding Machine


Desktop type lathe


Plating Machine

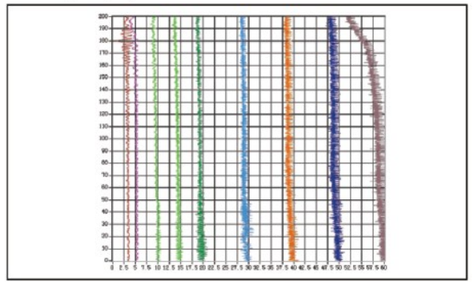




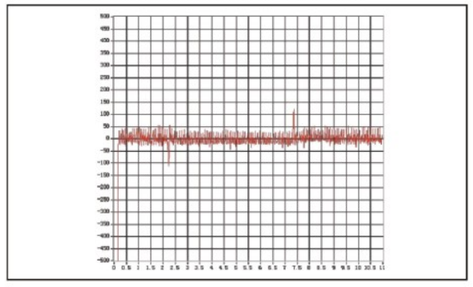

Product Features

General flux vector control technique

- General flux vector control technique
- A 32-bit RISC CPU for high-speed computation.
- Starting torque, 150%3Hz



- Speed accuracy is within 1% (0%~100% loading changes)

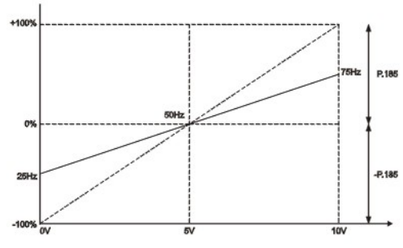


- Motor parameter auto-tuning function
- Stalling protection level reaches to 250%.

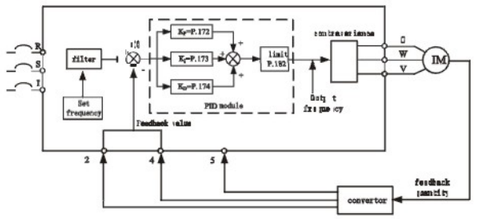
High performance and function

- The maximum output frequency up to 650Hz
- Soft-PWM functions for eliminating motor noises and preventing the temperature of AC drive module too high.
- Built-in energy-saving control function, the AC drive will control the output voltage automatically in order to reduce the output power losses when the AC drive is running.
- Cooling fan operation method is selectable.

Built-in proportion linkage function

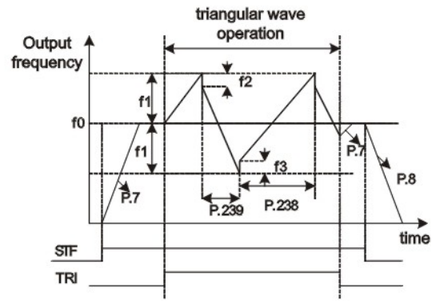


PID feedback control function



Triangular wave function (traverse)

- This is suitable for operations that need traversing and winding movements such as textile operations.



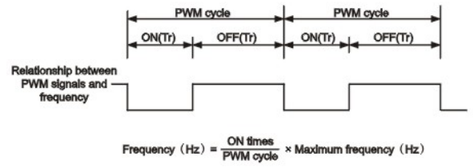
f0 : Setting value of frequency
f1 : Generated amplitude for setting frequency （f0×P.235）
f2 : Compensation from acceleration to deceleration （f1×P.236）
f3 : Compensation from deceleration to acceleration （f1×P.237）

Built-in frequency and parameter setting knob

Product Features

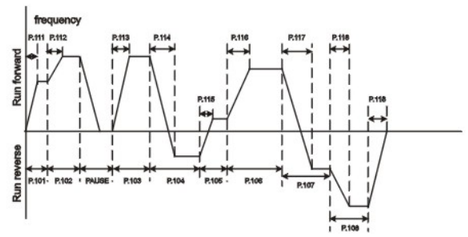
PWM control function

- The operating frequency can be controlled with the PWM signals output from PLC.
- The terminal M2 can be set as PWM signal input.



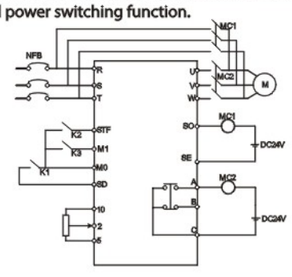
$$\text{Frequency (Hz)} = \frac{\text{ON times}}{\text{PWM cycle}} \times \text{Maximum frequency (Hz)}$$

Programmed operation mode with manually operated



Equipped with grid power frequency switching mechanism

- It provides automatic switch between the grid power and frequency conversion.
- If the motor is running at rated frequency, using grid power frequency has a much better efficiency.
- In order to prevent the motor from stopping for a long time during the maintenance of AC drive, it is recommended AC drive to have grid power switching function.

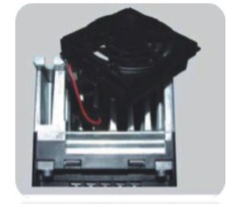


Easy to install design

- Din rail design-Multiple AC drives can be mounted side-by-side in the panel.

- Built-in standard RJ45 port for RS485 communication.
- Screwless terminal blocks designed

- The cooling fan is removable and easy to clean.



Electric Specifications

220V Series Single-Phase

Model SS2-021-□□□K		0.4K	0.75K	1.5K	2.2K
Applicable Motor Capacity	HP	0.5	1	2	3
	kW	0.4	0.75	1.5	2.2
Output	Rated output capacity kVA (Note)	0.95	1.5	2.5	4.2
	Rated output current A (Note)	2.7	4.5	8	11
	Overload current rating	150% 60 seconds; 200% 1 second (inverse time characteristics)			
	Maximum output voltage	3 Phase 200~240V AC			
Power Supply	Rated power voltage	Single phase 200~240V 50Hz / 60Hz			
	Power voltage permissible fluctuation	Single phase 170~264V 50Hz / 60Hz			
	Power frequency permissible fluctuation	±5%			
	Power source capacity kVA	1.5	2.5	3.5	6.4
Cooling Method		Self-cooling	Forced air cooling		
Weight (kg)		1.1	1.2	1.6	1.7

220V Series Three-Phase

Model SS2-023-□□□K		0.4	0.75	1.5	2.2	3.7
Applicable Motor Capacity	HP	0.5	1	2	3	5
	kW	0.4	0.75	1.5	2.2	3.7
Output	Rated output capacity kVA (Note)	1.2	2	3.2	4.2	6.7
	Rated output current A (Note)	3	5	8	11	17.5
	Overload current rating	150% 60 seconds; 200% 1 second (reverse time characteristics)				
	Maximum output voltage	3 Phase 200~240V AC				
Power Supply	Rated power voltage	3 Phase 200~240V 50Hz / 60Hz				
	Power voltage permissible fluctuation	3 Phase 170~264V 50Hz / 60Hz				
	Power frequency permissible fluctuation	±5%				
	Power source capacity kVA	1.5	2.5	4.5	6.4	10
Cooling Method		Self-cooling	Forced air cooling			
Weight (kg)		1.1	1.2	1.2	1.6	1.7

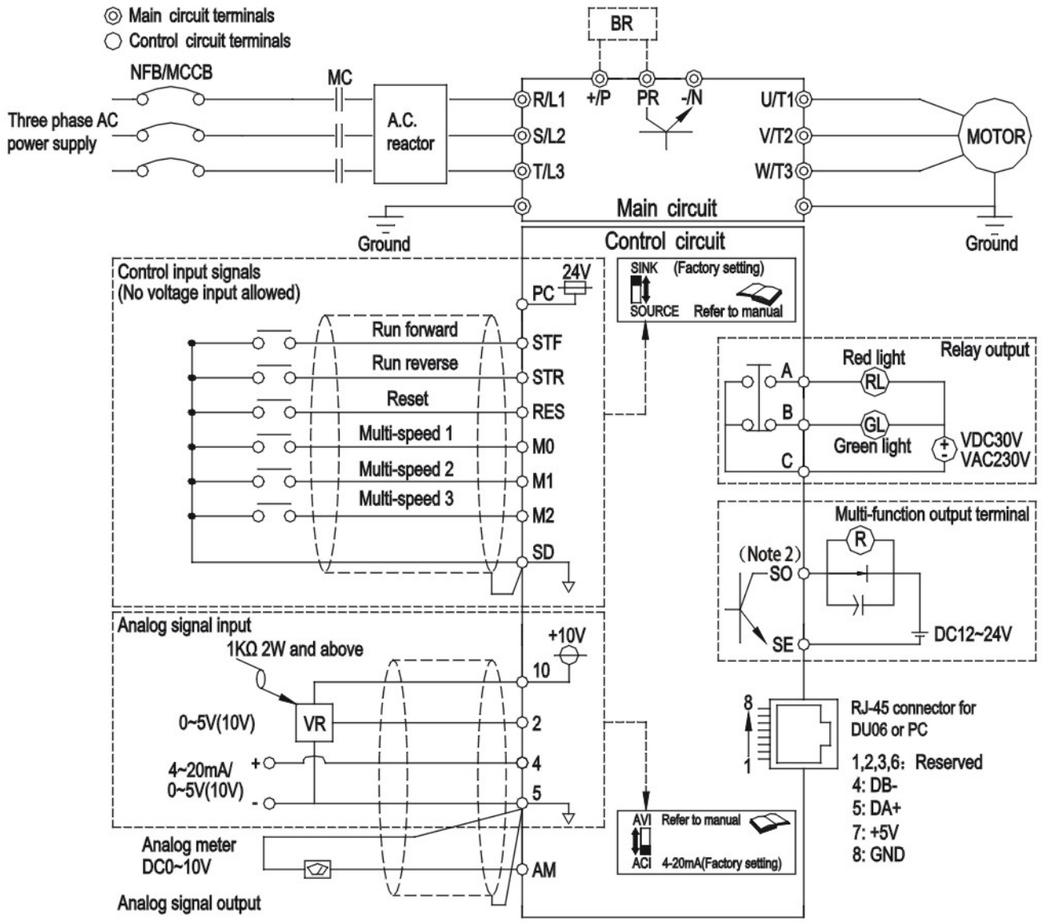
440V Series Three-Phase

Model SS2-043-□□□K		0.4	0.75	1.5	2.2	3.7	5.5
Applicable Motor Capacity	HP	0.5	1	2	3	5	7.5
	kW	0.4	0.75	1.5	2.2	3.7	5.5
Output	Rated output capacity kVA (Note)	1	2	3	4.6	6.9	9.2
	Rated output current A (Note)	1.5	2.6	4.2	6	9	12
	Overload current rating	150% 60 Seconds; 200% 1 Second					
	(reverse time characteristics)	Three-phase 380~480V					
Power Suppl	Rated power voltage	3 Phase 380~480V 50Hz / 60Hz					
	Power voltage permissible fluctuation	323~528V 50Hz / 60Hz					
	Power frequency permissible fluctuation	±5%					
	Power source capacity kVA	1.5	2.5	4.5	6.9	10.4	13.8
Cooling Method		Self-cooling	Self-cooling	Forced air cooling			
Weight (kg)		1.1	1.1	1.2	1.6	1.7	1.7

Common Specifications

Control Method			SVPWM control, V/F control, general flux vector control.
Output Frequency Range			0. 1~650Hz (The starting frequency setting range betwee 0 and 60Hz).
Frequency Resolution	Digital setting		If the frequency value is set below 100Hz, the resolution will be 0.01Hz. If the frequency value is set above 100Hz, the resolution will be 0.1Hz.
	Analog setting		When setting the signal DC 0~5V, the resolution will be 1/500; When setting the signal DC 0~10V or 4~20mA, the resolution will be 1/1000.
Output Frequency Accuracy	Digital setting		Maximum target frequency ±0.01%.
	Analog setting		Maximum target frequency ±0.5%.
Voltage / Frequency output Characteristics			Base voltage (P.19), base frequency (P.3) can be arbitrarily set. Constant torque model and applicable load model can be selected (P.14).
Start Torque			150% 3Hz, 200% 5Hz: when using the general flux vector control.
Torque Boost			The torque boost setting range between 0 and 30% (P.0), auto boost, slip compensation.
Acceleration / Deceleration Curve Characteristics			The resolution (0.01s/0.1s) of acceleration/deceleration time (P.7, P.8) is switched by P.21. The setting range has 0~360s or 0~3600s for selection. And different acceleration/deceleration curve model can be selected by P.29.
DC Braking			The DC braking action frequency range between 0 and 120Hz (P.10); the DC braking time is 0~60 Seconds (P.11); and the DC braking voltage is 0~30% (P.12). Linear braking and idling braking selection (P.71).
Stalling Protection			The stalling protection level can be set between 0 and 250% (P.22).
Target Frequency Setting			Operation panel setting, DC 0~5V signal setting, DC 0~10V signal setting, DC 4~20mA signal setting, two voltage input or one voltage and one current input can be selected; Multi-speed stage levels setting, communication setting.
PID Control			Please refer to P.170~P.183 in Chapter 5.
Multifunction Control Terminals			Motor starting (STF, STR), the second function (RT), '16-speed operation' (RL, RM, RH, REX), external thermal relay (OH), reset (RES), etc. (can be set by the user (P.80~P.84, P.86))
Multiple Output Terminals	Multi-function output terminals	SO、SE	P.40	AC drive running (RUN), output frequency detection (FU), Up to frequency (SU), overload detection (OL), zero current detection (OMD), alarm (ALARM), Section detection (PO1), Periodical detection (PO2), and Pause detection (PO3), AC drive output (BP), Commercial power-supply output (GP).
	Multi-function output relay	A、B、C	P.85	
	Analog output	AM、5		Multi-function DC (0~10V) Output: output frequency, output current (P.54).
Operation Panel	Running status monitoring			Output frequency monitoring, output current monitoring, and output voltage monitoring.
	HELP mode			Alarm history monitoring.
	LED indication lamp(6)			Run indication lamp, frequency monitoring indication lamp, voltage monitoring indication lamp, current monitoring indication lamp, mode switching indication lamp, and PU control indication lamp.
Communication Function		RS485		Internal RS485 communication, RJ-45 connector.
Protection Mechanism / Alarm function				Output short circuit protection,Over-current protection, (+/P)-(-/N)over-voltage protection, under-voltage protection, motor over heat protection (P.9), IGBT module over-heat protection, braking transistor abnormality protection, communication abnormality protection, etc.
Environmental Condition	Ambient temperature			-10 ~ +50℃ (non-freezing), installation side by side -10~ +40℃.
	Ambient humidity			Below 90%Rh (non-condensing)
	Storage temperature			-20 ~ +65℃
	Operating environment			Indoor, no corrosive gas, no flammable gas, no flammable dust
	Altitude and vibration			Maximum operating altitude is 2000 Meters. If AC drive is installed at altitude 1000~2000m, decrease 2% of rated current for every 100m increase in altitude.
	Grade of protection			IP20
	The degree of environmental pollution			2
	Class of protection			Class I
Certification				CE

Wiring Diagram

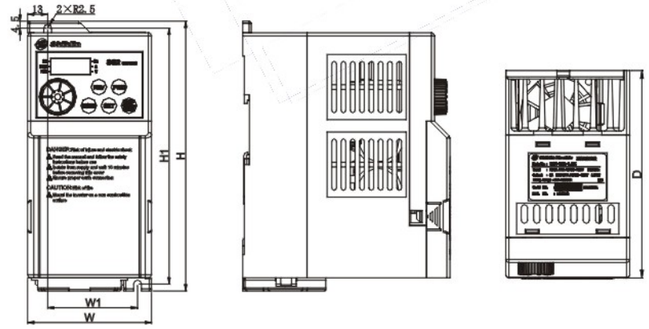


NOTE

1. For the usage of the external thermal relay, please refer to P.80~P.84, P.86 in Chapter 5.
2. Make sure not to short circuit the PC and SD.
3. In the above figure, Dotted line metal, please refer 3.5.7
4. The SO terminal can select to FM or 10X function, please refer to P.64, P.74.
5. For single-phase series inverters, there is no T/L3 terminal, and the corresponding wiring(dotted line) doesn't need to be connected.

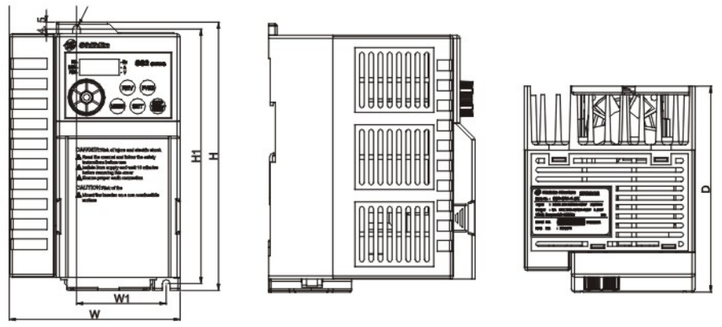
Dimensions

Frame A



Model	H(mm)	H1(mm)	W(mm)	W1(mm)	D(mm)
SS2-021-0.4K	174	165	80	58	134
SS2-021-0.75K					
SS2-023-0.4K					
SS2-023-0.75K					
SS2-023-1.5K					
SS2-043-0.4K					
SS2-043-0.75K					
SS2-043-1.5K					

Frame B



Model	H(mm)	H1(mm)	W(mm)	W1(mm)	D(mm)
SS2-021-1.5K	174	165	110.5	58	134
SS2-021-2.2K					
SS2-023-2.2K					
SS2-023-3.7K					
SS2-043-2.2K					
SS2-043-3.7K					
SS2-043-5.5K					

SE2 Series

High Performance Vector Control AC Drive

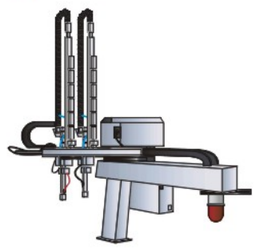
Product Range

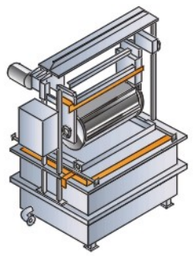
Model		KW (HP)	0.4 (0.5)	0.75 (1)	1.5 (2)	2.2 (3)	3.7 (5)	5.5 (7.5)	7.5 (10)	11 (15)
SE2	SE2021	1-phase 220V	■	■	■	■				
	SE2023	3-phase 220V	■	■	■	■	■	■	■	
	SE2043	3-phase 440V	■	■	■	■	■	■	■	■

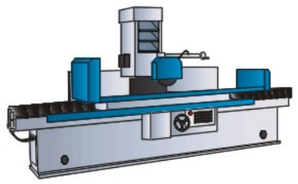
Main Features

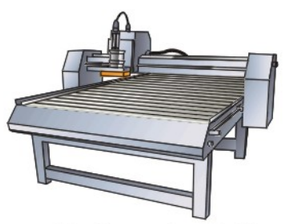
* High starting torque, 150%/1Hz and 200% /3Hz
* With auto-tuning function
* Output frequency from 0.2Hz to 1000Hz
* Speed accuracy:less than 1% with 0~100% load variation
* High-precision static motor parameter auto-tuning function
* Excellent performance with load capacity of 200%/1s
* Built-in RS-485 communication interface
* Support MODBUS and Shihlin communication protocol
* Built-in brake transistor
* A build in EMC input filter is available
* Energy saving function realizes power-saving control
* Constant pressure setting for water pump
* Support various expansion card: I/O card, RS-485/422 card, 4-20mA power card

Applications

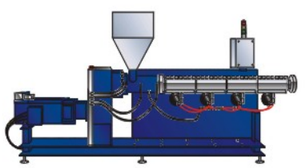

Robot Arm

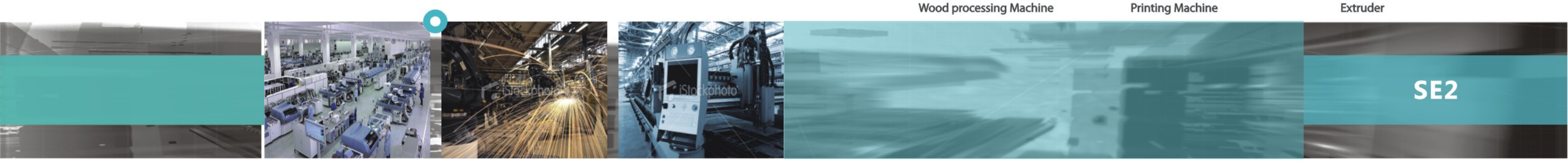

Plating Machine


Grinding Machine


Wood processing Machine


Printing Machine

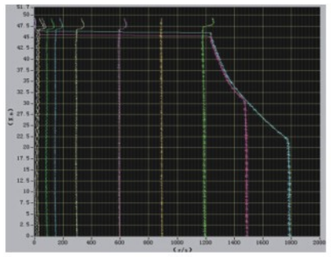

Extruder



Product Features

High-performance sensorless vector control technique

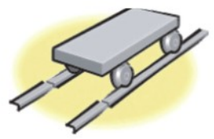
- A 32-bit RISC CPU for high-speed computation.
- Starting torque, 150% / 1Hz
- High-precision motor parameter auto-tuning function.
- Speed accuracy is within 1% (0%~100% loading change)
- Speed control ratio up to 1:100



Torque-Speed Curve

Excellent performance with load capacity of *200% 1s*

- For impact load, safe to use (punch/trolley/injector/screw machinery/machine tool, and so on).

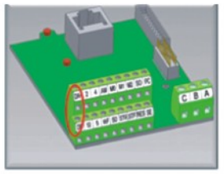


Built-in brake transistor

- The entire series have a built-in brake transistor (0.4KW~11KW).
- The brake resistor connection enhances the brake torque capacity.

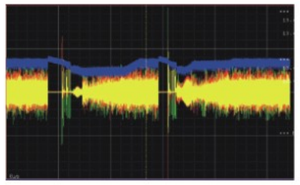
Built-in RS-*485* interface

- Support for MODBUS and Shihlin protocol.
- Capable of simultaneous connections to HMI, PLC and other devices.



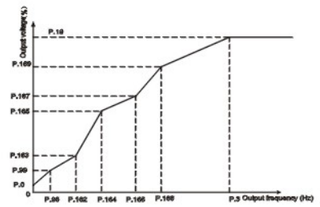
Tracking compensation mechanism

- The enhanced tracking mechanism can detect the rotation speed and direction of motor in idle state, to smooth machine start without jittering.



5-point V/F free setting

- It is more adaptable to various complicated load environment, such as multiple working frequencies.



Equipped with Soft-PWM mechanism

- Soft-PWM controls the motor noises, transforming the metal sound into a delightful complex tone.
- It provides low noise operation and reduces interference to external RF, ensuring stable operations of nearby PLC and encoder devices.

Product Features

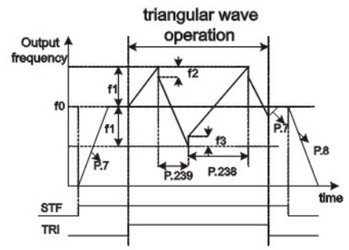
The range of the output frequency is expanded to *0 – 1,000* Hz

- It is good choice for high-speed motor applications, such as engraving machines, grinders, centrifuges, etc.

Parameter No.	Parameter Name	Setting Range
P.4-P.6	Multiple frequencies	0-1000Hz
P.24-P.27		
P.142-P.149		
P.3/P.47	Base frequency	0-1000Hz
P.18	High-speed upper limit frequency	120-1000Hz
P.38-P.39	The highest frequency of the module	1-1000Hz

Triangular wave mechanism (traverse)

- This is suitable for traversing and windingmovements such as textile operations.

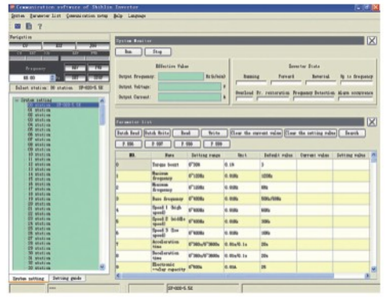


Operating time accumulation and parameters protection

- Time accumulation: the accumulated operating time of the frequency AC drive can be displayed.
- Password protection: It provide 4-digital password to restrict theread and write of parameters, and prevent operative mistakes.

PC client communication software

- This provides remote control of multiple frequency AC drives for parameters setup, copy and monitoring.



Support various expansion boards.

- SE2-PD01: Profibus communication module
- SE2-DN01: Device-NET communication module
- SE-IB01: 4-20 mA current output expansion board.
- SE-CB01: terminal-type communication expansion board
- SE-EB01: I/O expansion board (Relay output)

Built-in EMC input filter

- There is a built-in EMC input filter design. It qualifies the EN61800-3 specifications and it can reduce electromagnetic interruption effectively.

Electric Specifications

220V Single-phase Series

Model SE2-021-□□□K		0.4K	0.75K	1.5K	2.2K
Applicable Motor Capacity	HP	0.5	1	2	3
	kW	0.4	0.75	1.5	2.2
Output	Rated Output Capacity kVA	1.2	1.9	3.0	4.2
	Rated Output Current A	3.0	5.0	8.0	11.0
	Overload current rating	150% 60 seconds; 200% 1 second (inverse time characteristics)			
	Maximum Output Voltage	3 Phase 200~240V AC			
Power	Rated Power Voltage	single phase 200~240V 50Hz / 60Hz			
	Permitted Power and Voltage Range	single phase 180~264V 50Hz / 60Hz			
	Adjustable Power and Frequency Range	±5%			
	Power supply capacity kVA	1.8	3	4.5	6.4
Cooling Method		Self-cooling	Forced Air cooling		
Weight (Kg)		1.2	1.2	1.9	1.9

220V Three-phase Series

Model SE2-023-□□□K		0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K
Applicable Motor Capacity	HP	0.5	1	2	3	5	7.5	10
	kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5
Output	Rated Output Capacity kVA	1.2	1.9	3.0	4.2	6.7	9.2	12.6
	Rated Output Current A	3.0	5.0	8.0	11.0	17.5	24	33
	Overload current rating	150% 60 seconds; 200% 1 second (inverse time characteristics)						
	Maximum Output Voltage	3 Phase 200~240V AC						
Power	Rated Power Voltage	3 Phase 200~240V 50Hz / 60Hz						
	Permitted Power and Voltage Range	3 Phase 170~264V 50Hz / 60Hz						
	Adjustable Power and Frequency Range	±5%						
	Power supply capacity kVA	1.8	3	4.5	6.4	10	13.8	19
Cooling Method		Self-cooling	Forced Air cooling					
Weight (Kg)		1.2	1.2	1.2	1.9	1.9	3.8	3.8

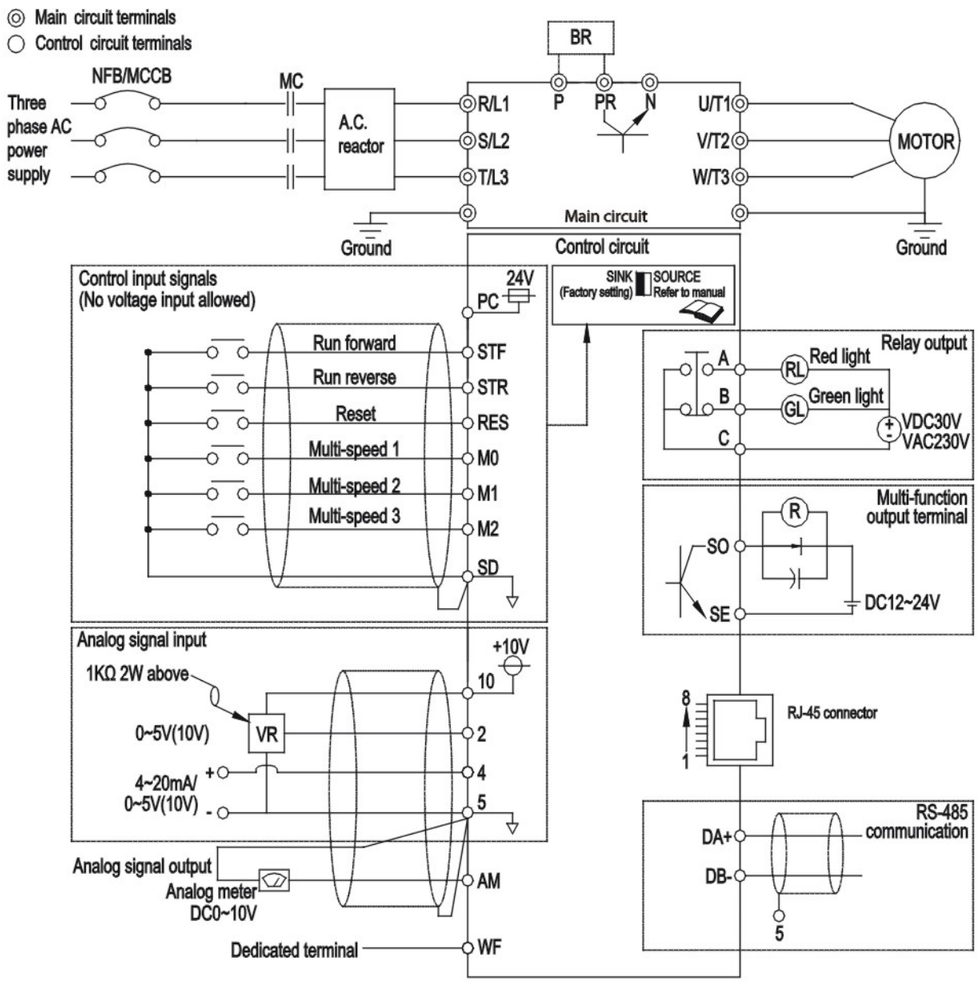
440V Three-phase Series

Model SE2-043-□□□K		0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K	11K
Applicable Motor Capacity	HP	0.5	1	2	3	5	7.5	10	15
	kW	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11
Output	Rated Output Capacity kVA	1.2	2.0	3.2	4.6	6.9	9.2	13	18
	Rated Output Current A	1.5	2.6	4.2	6.0	9.0	12	17	23
	Overload current rating	150% 60 Seconds; 200% 1 Second (inverse time characteristics)							
	Maximum Output Voltage	Three-phase 380~480V							
Power	Rated Power Voltage	Three-phase 380~480V 50Hz / 60Hz							
	Permitted Power and Voltage Range	323~506V 50Hz / 60Hz							
	Adjustable Power and Frequency Range	±5%							
	Power supply capacity kVA	1.8	3	4.8	6.9	10.4	13.8	19.5	27
Cooling Method		Self-cooling	Forced Air cooling						
Weight (Kg)		1.2	1.2	1.2	1.9	1.9	3.8	3.8	3.8

Common Specifications

Control method			SVPWM control, V/F control, facility vector control, Sensorless vector control.
Output frequency range			0.2~1000Hz (The starting frequency setting range is 0~600Hz). Please refer to P.187 in Chapter 4.
Resolution for setting frequency	Digital setting		When P.187=0, if the frequency set value is below 100Hz, the resolution will be 0.01Hz. If the frequency set value is above 100Hz, the resolution will be 0.1Hz. When P.187=1, the resolution of frequency will be 0.1Hz.
	Analog setting		When setting DC 0~5V signals, the resolution will be 1/500; When setting DC 0~10V or 4~20mA signals, the resolution will be 1/1000.
Output frequency accuracy			0.01Hz
Voltage / frequency output characteristics			Base frequency voltage (P.19), base frequency (P.3) can be arbitrarily set in available range. Constant torque model, applicable load model can be selected (P.14).
Start torque			150% (1Hz): When the sensorless vector control is started.
Torque boost			The torque boost setting range is 0~30% (P.0), auto boost, slip compensation.
Acceleration/deceleration curve characteristics			The resolution (0.01s/0.1s) of acceleration/deceleration time (P.7, P.8) is switched by P.21. The setting range has 0~360s or 0~3600s for selection. And different acceleration/deceleration curve model can be selected by P.29.
DC braking			The DC braking action frequency is 0~120Hz (P.10); the DC braking time is 0~60 Seconds (P.11); and the DC braking voltage is 0~30% (P.12). Linear braking and Idling braking selection (P.71).
Stalling protection			The stalling protection level can be set to 0~400% (P.22).
Target frequency setting			Operation panel setting; DC 0~5V signal setting, DC 0~10V signal setting and DC 4~20mA signal setting, 2 voltage input or one voltage and one current input can be selected; Multi-speed stage levels setting; Communication setting.
PID control			Please refer to P.170~P.183 in Chapter 4.
Multi-function control terminals			Motor starting (STF, STR), the second function (RT), the 16-speed operation (RL, RM, RH, REX), external thermal relay (OH), reset (RES) , etc. (they can be set by the user with P.80~P.84, P.86)
Multi-function output terminals	Multi-function output terminals (SO, SE)	P.40	AC drive running (RUN), output frequency detection (FU), Up to frequency (SU), overload alarm (OL), zero current detection (OMD), alarm (ALARM), Section detection (PO1), Periodical detection (PO2), and Pause detection (PO3), AC drive output (BP), Commercial power-supply output (GP).
	Multi-function output relay	P.85	
	Multi function analogy meter		Multi-function DC (0~10V)(AM) Output: output frequency, output current (P.54).
Operation panel	Running status monitoring		Output frequency monitoring, output current monitoring, and output voltage monitoring.
	HELP mode		Alarm history monitoring, alarm history clear, all parameters clear, and firmware version read.
	LED indication lamp(6)		Run indication lamp, frequency monitoring indication lamp, voltage monitoring indication lamp, current monitoring indication lamp, mode switching indication lamp, and PU/external terminals control indication lamp.
Communication function	RS485		Internal RS485 communication.
	Communication expansion board		Optional accesssories: Terminal type, RJ11, RJ-45, Profibus or Device Net communication expansion board.
Protection mechanism / Alarm function			Output short circuit protection, Over-current protection, P-N over-voltage protection, under-voltage protection, motor over heat protection (P.9), IGBT module over heat protection, braking transistor abnormality protection, communication abnormality protection, etc.
Environmental condition	Ambient temperature		-10 ~ +50℃ (non-freezing)
	Ambient humidity		Below 90%Rh (non-condensing)
	Storage temperature		-20 ~ +65℃
	Environment around		In room, no corrosive gas, no flammable gas, no flammable dust
	Altitude and vibration		Maximum operating altitude is 2000 Meters. If AC drive is installed at altitude 1000~2000m, decrease 2% of rated current for every 100m increase in altitude.
Certification			Meet the requirements of CE certification standards (the –DL type).

Wiring Diagram

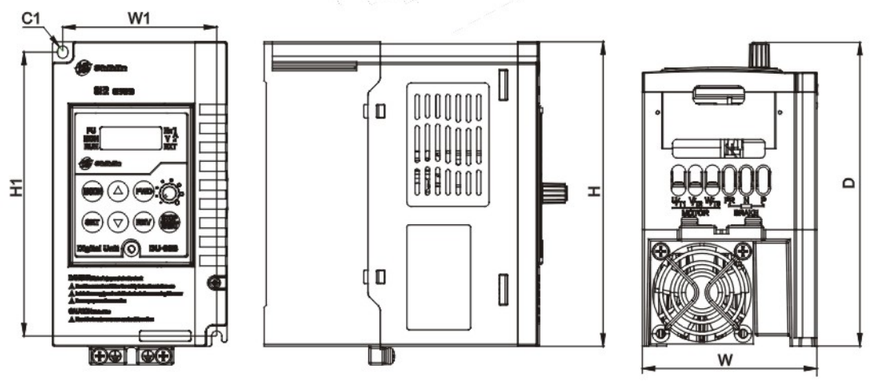


NOTE

1. For the usage of external thermal relay, please refer to P.80~P.84, P.86 in Chapter 4.
2. Make sure do not to short PC and SD.
3. In the above figure, Dotted line metal, please refer 2.5.7
4. The SE2-TYPE inverter have internal RS485 communication, and can also uses pluggable communications expansion boards CB01, CB02, CB03, PD01, DN01; For detailed instructions, please refer to appendix 5.

Dimensions

Frame



Model	H(mm)	W(mm)	D(mm)	W1(mm)	H1(mm)	C1(mm)
SE2-021-0.4K	148	85	148	75	138	Φ 5
SE2-021-0.75K	148	85	148	75	138	Φ 5
SE2-021-1.5K	186	100	157	90	176	Φ 5
SE2-021-2.2K	186	100	157	90	176	Φ 5
SE2-023-0.4K	148	85	148	75	138	Φ 5
SE2-023-0.75K	148	85	148	75	138	Φ 5
SE2-023-1.5K	148	85	148	75	138	Φ 5
SE2-023-2.2K	186	100	157	90	176	Φ 5
SE2-023-3.7K	186	100	157	90	176	Φ 5
SE2-023-5.5K	266	141	201.5	126	244	Φ 6
SE2-023-7.5K	266	141	201.5	126	244	Φ 6
SE2-043-0.4K	148	85	148	75	138	Φ 5
SE2-043-0.75K	148	85	148	75	138	Φ 5
SE2-043-1.5K	148	85	148	75	138	Φ 5
SE2-043-2.2K	186	100	157	90	176	Φ 5
SE2-043-3.7K	186	100	157	90	176	Φ 5
SE2-043-5.5K	266	141	201.5	126	244	Φ 6
SE2-043-7.5K	266	141	201.5	126	244	Φ 6
SE2-043-11K	266	141	201.5	126	244	Φ 6

SF-G Series

Dual-load, High Performance Vector Control AC Drive

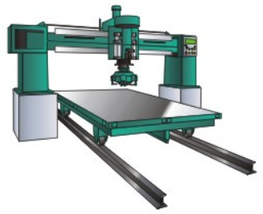
Product Range

Model		KW (HP)	2.2 (3)	3.7 (5)	5.5 (7.5)	7.5 (10)	11 (15)	15 (20)	18.5 (25)	22 (30)	30 (40)	37 (50)	45 (60)	55 (75)	75 (100)	90 (120)	110 (150)	132 (175)	160 (215)	185 (250)	220 (300)	250 (335)	280 (375)	315 (420)	355 (475)
SF-G	SF020-G	3-phase 220V	120%, 60s→																					
			150%, 60s→																					
	SF040-G	3-phase 440V	120%, 60s→																					
			150%, 60s→																					

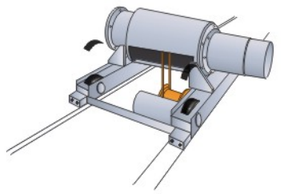
Main Features

* Dual specifications with HD: 150% 60s / LD: 120% 60s
* V/F control, general purpose magnetic flux vector control, SVC sensor-less vector control, FOC+PG closed loop vector control, high torque output at low speed, and the best power saving control mode.
* Increased load capacity to 200% / s
* Embedded regeneration brake transistor(22kW or below)
* Strengthened PID function, Multi-channel control function for fan and pump
* RS-485 interface, selection between Shihlin protocol/standard Modbus protocol
* Strengthened speed tracking compensation capability
* Soft PWM function
* Multiple function pulse output
* Remote control panel through RJ45
* Support various expansion boards : injection molding machine specific expansion boards, Multi-channel control function for fan and pump

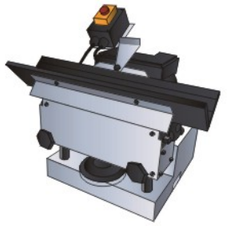
Application



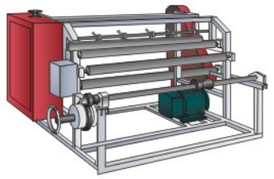
Polishing Machine



Crane



Chamfer Machine



Slitting Machine

CNC tooling Machine

Solder Equipment

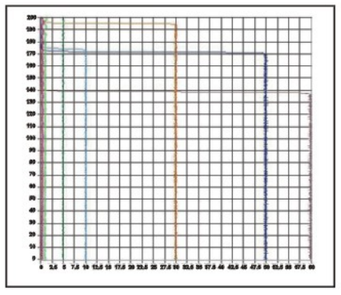
Product Features

Dual-load specifications

- Light load 120% 60s / heavy load (-G) 150% 60s.
- The default capacity is light load for air conditioners, pumps, air compreessors, conveyors and other machines using light loads.
- The parameters can be adjusted to heavy load by inner parameter setting for punches, cranes, trolleys,screw machinery, machine tools, and injection devices (for PM01 injector expansion card).

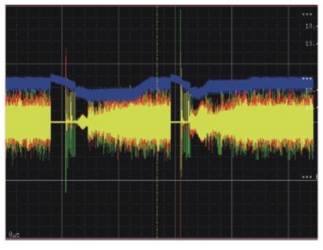
High-performance vector control technology

- A 32-bit RISC CPU for high-speed computation.
- SVC sensor1ess vector control with high starting torque of 1Hz150%, and FOC+PG closed loop vector control of OHz 150%.
- Speed accuracy: less than 1% with 0-100% load variation.
- An exclusive pioneer of high-precision motor parameter auto-tuning function.



Tracking compensation mechanism

- The enhanced tracking mechanism can detect the rotation speed and direction of motor in idle state, to smooth machine start without jittering.



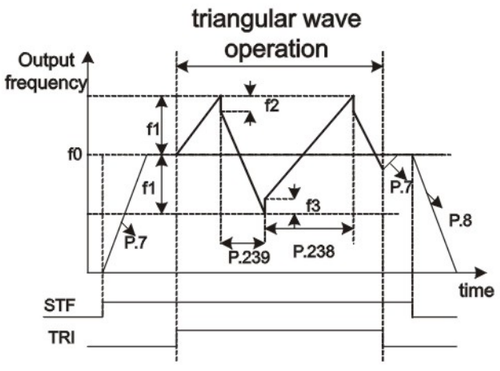
Built-in brake transistor (under 22kw)

- Built-in brake transistor (under 22kw).
- Its connection with the brake resistor to improve the braking torque capability .

Equipped with Soft-PWM mechanism

- Soft-PWM controls the motor noises, transforming the metal sound into a delightful complex tone.
- It provides low noise operation and reduces interference to external RF, ensuring stable operations of nearby PLC and encoder devices.

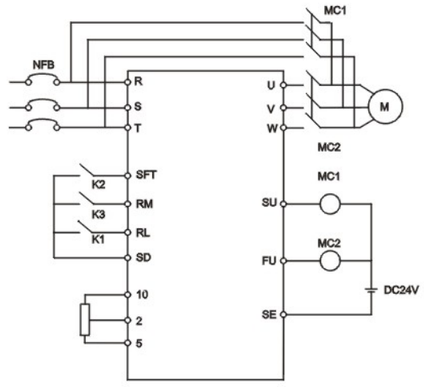
f0 : Setting value of frequency
f1 : Generated amplitude for setting frequency （f0 ×P.235）
f2 : Compensation from acceleration to deceleration （f1 ×P.236）
f3 : Compensation from deceleration to acceleration （f1 ×P.237）



Product Features

Equipped with grid power frequency switching mechanism

- It provides automatic switch between the grid power and frequency conversion.
- If the motor is running at rated frequency, using grid power frequency has a much better efficiency.
- In order to prevent the motor from stopping for a long time during the maintenance of AC drive, it is recommended AC drive to have grid power switching function.



Operating time accumulation and parameters protection

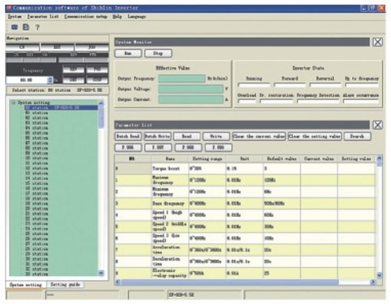
- Time accumulation: the accumulated operating time of the frequency AC drive can be displayed.
- Password protection: It provide 4-digital password to restrict the read and write of parameters, and prevent operative mistakes.

Built-in RS-*485* interface

- Support for MODBUS and Shihlin protocol.
- Capable of simultaneous connections to HMI, PLC and other devices.

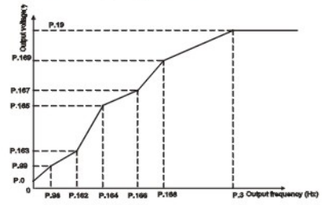
PC client communication software

- This provides remote control of multiple frequency AC drive for parameters setup, copy and monitoring.



5-point V/F free setting

- It is more adaptable to various complicated load environment, such as multiple working frequencies.

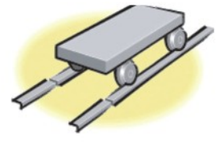


Containing with *12* sets of abnormality alert records

- The 12 sets of alert records can be easily accessed .
- The system can record abnormal side power input(phase failure), short circuit of side output, over current,over voltage, module overheating, motor overheating, fan abnormalities, communication abnormalities, and so on.

Excellent performance with load capacity of *200% 1 s* (-G)

- For impact load, safe to use (punch/trolley/injector/ screw machinery/machine tool, and so on) .



Electric Specifications

220V Series Three-phase

Model SF-020- □□□ / □□□ K-G		5.5	7.5/5.5	11/7.5	15/11	18.5/15
Applicable motor capacity	HP	7.5	10/7.5	15/10	20/15	25/20
	kw	5.5	7.5/5.5	11/7.5	15/11	18.5/15
Output	Rated output capacity kVA	9.5	12.5/9.5	18.3/12.5	24.7/18.3	28.6/24.7
	Rated output current A	25	33/25	49/33	65/49	75/65
	Overload current rating	120% 60 seconds /150% 60 seconds (inverse time characteristics)				
	Maximum output voltage	Three-phase 200 - 240V				
Power supply	Rated power voltage	Three-phase 200 - 240V 50Hz / 60Hz				
	Power voltage permissible fluctuation	Three-phase 180- 264V 50Hz / 60Hz				
	Power frequency permissible fluctuation	±5%				
	Power source capacity kVA	12	17/12	20/17	28/20	34/28
Cooling method		Forced air cooling				
weight (kg)		5.6	5.6	7.0	8.3	9.0

Model SF-020- □□□ / □□□ K-G		22/18.5	30/22	37/30	45/37	55/45
Applicable motor capacity	HP	30/25	40/30	50/40	60/50	75/60
	kw	22/18.5	30/22	37/30	45/37	55/45
Output	Rated output capacity kVA	34.3/28.6	45.7/34.3	55/45.7	65/55	81/65
	Rated output current A	90/75	120/90	145/120	170/145	212/170
	Overload current rating	120% 60 seconds 150% 60 seconds (inverse time characteristics)				
	Maximum output voltage	Three-phase 200 - 240V				
Power supply	Rated power voltage	Three-phase 200 - 240V 50Hz /60Hz				
	Power voltage permissible fluctuation	Three-phase 180- 264V 50Hz / 60Hz				
	Power frequency permissible fluctuation	±5%				
	Power source capacity kVA	41/34	52/41	65/52	79/65	99/79
Cooling method		Forced air cooling				
weight (kg)		20	21	37	37	67

440V Series Three-phase

Model SF-040- □□□ / □□□ K-G		5.5	7.5/5.5	11/7.5	15/11	18.5/15	22/18.5	30/22	37/30
Applicable motor capacity	HP	7.5	10/7.5	15/10	20/15	25/20	30/25	40/30	50/40
	kw	5.5	7.5/5.5	11/7.5	15/11	18.5/15	22/18.5	30/22	37/30
Output	Rated output capacity kVA	10	14/10	18/14	25/18	29/25	34/29	46/34	56/46
	Rated output current A	13	18/13	24/18	32/24	38/32	45/38	60/45	73/60
	Overload current rating	120% 60 seconds 150% 60 seconds (inverse time characteristics)							
	Maximum output voltage	Three-phase 380 - 480V							
Power supply	Rated power voltage	Three-phase380 - 480V 50Hz / 60Hz							
	Power voltage permissible fluctuation	Three-phase 342- 528V 50Hz / 60Hz							
	Power frequency permissible fluctuation	±5%							
	Power source capacity kVA	11.5	16/11.5	20/16	27/20	32/27	41/32	52/41	65/52
Cooling method		Forced air cooling							
weight (kg)		5.6	5.6	5.6	5.6	8.3	8.3	25	25

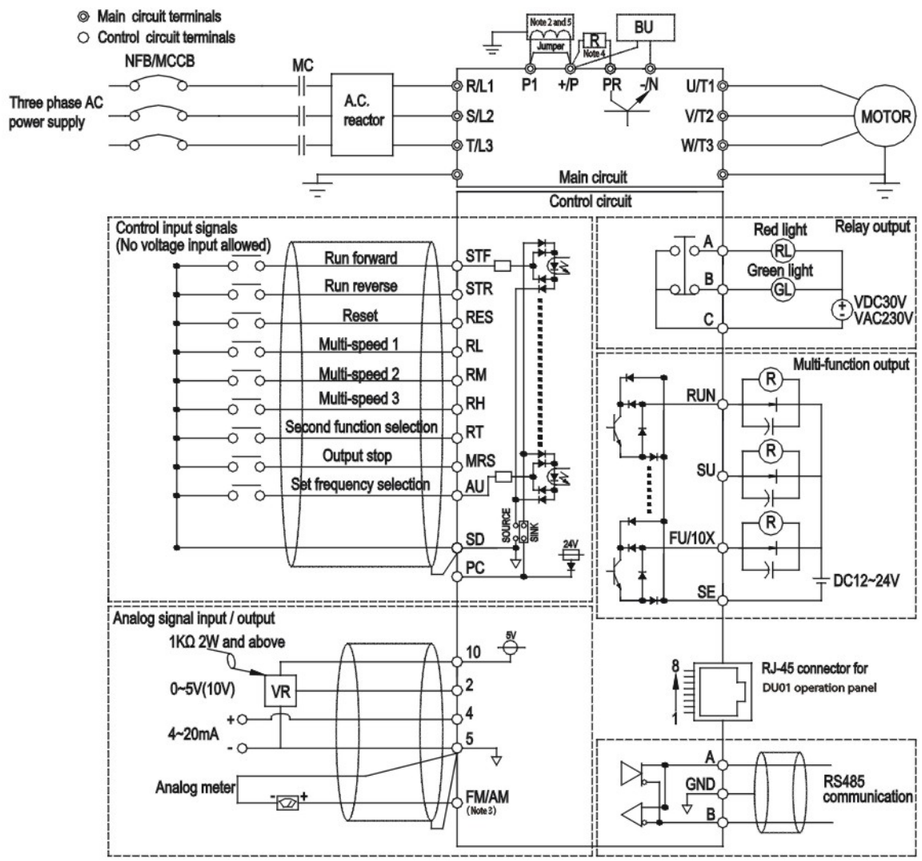
Model SF-040- □□□ / □□□ K-G		45/37	55/45	75/55	90/75	110/90	132/110	160/132
Applicable motor capacity	HP	60/50	75/60	100/75	120/100	150/120	175/150	215/175
	kw	45/37	55/45	75/55	90/75	110/90	132/110	160/132
Output	Rated output capacity kVA	69/56	84/69	114/84	137/114	168/137	198/168	236/198
	Rated output current A	91/73	110/91	150/110	180/150	220/180	260/220	310/260
	Overload current rating	120% 60 seconds 150% 60 seconds (inverse time characteristics)						
	Maximum output voltage	Three-phase 380 - 480V						
Power supply	Rated power voltage	Three-phase380 - 480V 50Hz / 60Hz						
	Power voltage permissible fluctuation	Three-phase 342- 528V 50Hz / 60Hz						
	Power frequency permissible fluctuation	±5%						
	Power source capacity kVA	79/65	100/79	110/100	137/110	165/137	198/165	247/198
Cooling method		Forced air cooling						
weight (kg)		25	37	37	37	67	67	67

Model SF-040- □□□ / □□□ K-G		185/160	220/185	250/220	280/250	315/280	355/315
Applicable motor capacity	HP	250/215	300/250	335/300	375/335	420/375	475/420
	kw	185/160	220/185	250/220	280/250	315/280	355/315
Output	Rated output capacity kVA	295/236	367/295	402/367	438/402	491/438	544/491
	Rated output current A	340/310	425/340	480/425	530/480	620/530	683/620
	Overload current rating	120% 60 seconds / 150% 60 seconds (inverse time characteristics)					
	Maximum output voltage	Three-phase 380 ~ 480 V					
Power supply	Rated power voltage	Three-phase 380 ~ 480V 50Hz / 60Hz					
	Power voltage permissible fluctuation	Three-phase 342 ~ 528V 50Hz / 60Hz					
	Power frequency permissible fluctuation	±5%					
	Power source capacity kVA	295/247	367/295	402/367	438/402	491/438	544/491
Cooling method		Forced air cooling					
weight (kg)		84	90	94	94	123	123

Common Specifications

Control method			SVPWM control , V/F control, close-loop V/F control (VF+PG), general flux vector control, sensorless vector control (SVC), close-loop vector control (FOC+PG)
Output frequency range			0.2-400Hz (The starting frequency setting range is 0-60Hz)
Voltage 1 frequency output characteristics	Digital setting		If the frequency set value is below 100Hz, the resolution will be 0.01 Hz; If the frequency set value is above 100Hz, the resolution will be 0.1 Hz
	Analog setting		When setting DC 0-5V signals, the resolution will be 1/500 ; When setting DC 0-10V or 4-20mA signals, the resolution will be 1/1000
Output frequency accuracy	Digital setting		Maximum target frequency :±0.01 %
	Analog setting		Maximum target frequency :±0.5%
Voltage I frequency output characteristics			Base frequency voltage (P.19), base frequency (P.3) can be arbitrarily set ; Constant torque model and applicable load model can be selected (P.14)
Start torque			150% 1H z : When the sensorless vector control is started
Torque boost			The torque boost setting range is 0-30% (P.O), auto boost, slip compensation
Acceleration / deceleration curve characteristics			The resolution (0.01s/0.1s) of acceleration/deceleration time (P.7, P.8) is switched by P.21. The setting range has 0~360s or 0~3600s for selection. And different acceleration/deceleration curve model can be selected by P.29.
DC braking			The DC braking action frequency is 0-120Hz (P.10); the DC braking time is 0- 60s (P.11) The DC braking voltage is 0-30% (P.12).Linear braking and idling braking selection (P.71)
Stalling protection			The stalling protection level can be set to 0-400% (P.22)
Target frequency setting			Operation panel setting; DC 0-5V signal, DC 0-10V signal, DC 4-20 mA signal, multiple speed stage level setting, communication setting
PID control			Please refer to manual P.170-P.182 in Chapter 5
Multi-function control terminals			Motor starting (STF, STR), the second function (RT), 16-speed operation (RH, RM, RL, REX), external thermal relay (OH), reset (RES),etc.(they can be set by the user with HYPERLINK \l "P.80~P.84, P.86 and P.126~P.128).
Output terminal	Multi-function output terminals	SU, SE	P.40	AC drive running (RUN), output frequency detection (FU), Up to frequency (SU), overload alarm (OL), zero current detection (OMD), alarm (ALARM), section detection (P01), periodical detection (P02), and pause detection (P03), AC drive output (BP), work frequency output (GP)
		RUN, SE	P.129	
		FU/10X , SE	P.130	
	Multi-function output relay	A ,B ,C	P.85	
	Analog output	AM,5		Multi-function DC (0-10V) output: output frequency, current (P.54)
	Pulse output	FM,SD		Output the pulse of 0-2300Hz
Operation Panel	Operation monitoring			Output frequency monitoring, output current monitoring, and output voltage monitoring, abnormality record (Maximum 12 sets)
	LED indication lamp(8)			Forward rotation indication lamp, reverse rotation indication lamp, frequency monitoring indication lamp, voltage monitoring indication lamp, current monitoring indication lamp, mode switching indication lamp, PU terminals control indi cation lamp, and external terminals control indication lamp
Communication function				RS-485 communication, can select Shihlin/Modbus protocol communication protocol
Protection mechanism / alarm function				Output short circuit protection, Over-current protection, (+/P)-(-/N) over-voltage protection under-voltage protection, motor over-heat protection (P.9), IGBT module over-heat protection, communication abnormality protection, etc
Environmental Condition	Ambient temperature			-10~+40℃ (non-freezing)
	Ambient humidity			Below 90%Rh (non-condensing)
	Storage temperature			-20 ~ +65℃
	Surrounding environmen			Indoor, no corrosive gas, no flammable gas, no flammable powder
	Altitude and vibration			Maximum operating altitude is 2000 Meters. If AC drive is installed at altitude 1000~2000m, decrease 2% of rated current for every 100m increase in altitude.
	Grade of protection			IP20
	The degree of environmental pollution			2
	Class 01 protection			Class I
International certification				CE

Wiring Diagram

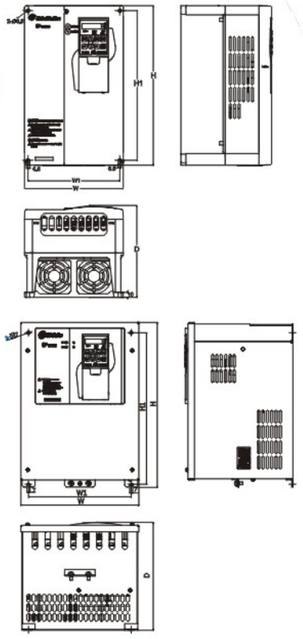


NOTE

1. Please refer to P.80~P.84, P.86 and P.126~P.128 (OH) of Chapter 5 for the applications of external thermal overload relay.
2. Make sure not to short PC and SD.
3. The AC resistor between +/P and P1 is optional. Please short +/P and P1 when AC resistor is not used.
4. When selecting FM function for the FM/AM output terminal, the reference ground is SD. For more details, please refer to P.64.
5. The brake resistor connection approach between +/P and PR is for frames A and B only. For connecting the brake unit of frame C, D, E, F to between +/P and -/N, please refer to terminal arrangement in 3.4.5
6. Inverters corresponding to frame C、E、F have build-in DC reactors, you can also refer to DC reactor specification on page 34 before adding DC reactors in addition.(When adding DC reactors,please remove the short circuit piece between P1 and +/P.)

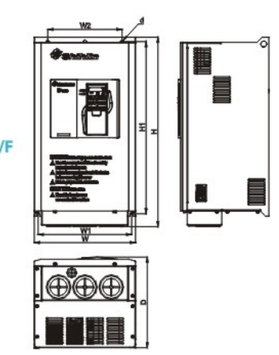
Dimensions

Frame A/B

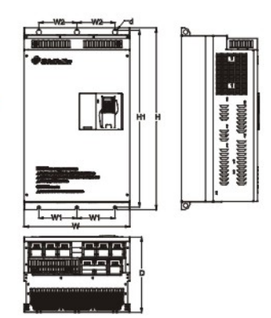


Frame C

Frame D/E/F



Frame G/H



Frame A/B

Model	Frame	H (mm)	H1 (mm)	W (mm)	W1 (mm)	D (mm)
SF-020-5.5K	A	323	303	200	186	186
SF-020-7.5K/5.5K-G						
SF-040-5.5K						
SF-040-7.5K/5.5K-G						
SF-040-11K/7.5K-G						
SF-040-15K/11K-G						
SF-020-11K/7.5K-G	B	350	330	230	214	195
SF-020-15K-11K-G						
SF-020-18.5K/15K-G						
SF-040-18.5K/15K-G						
SF-040-22K-18.5K-G						

Frame C

Model	Frame	H (mm)	H1 (mm)	W (mm)	W1 (mm)	D (mm)
SF-020-22K-18.5K-G	C	379	348	271	236	248
SF-020-30K/22K-G						

Frame D/E/F

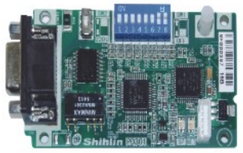
Model	Frame	H (mm)	H1 (mm)	W (mm)	W1 (mm)	W2 (mm)	D (mm)	d (mm)
SF-040-30K/22K-G	D	561	510	300	277	220	270	9
SF-040-37K/30K-G								
SF-040-45K-37K-G								
SF-020-37K/30K-G	E	595	566	370	336	336	286	13
SF-020-45K-37K-G								
SF-040-55K/45K-G								
SF-040-75K/55K-G								
SF-040-90K/75K-G								
SF-020-55K/45K-G	F	850	821	425	381	381	286	13
SF-040-110K/90K-G								
SF-040-132K/110K-G								
SF040-160K/132K-G								

Frame G/H

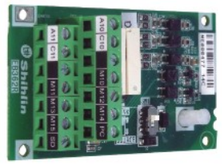
Model	Frame	H (mm)	H1 (mm)	W (mm)	W1 (mm)	W2 (mm)	D (mm)	d (mm)
SF-040-185K/160KG	G	870	850	500	180	180	360	13
SF-040-220K/185KG								
SF-040-250K/220KG								
SF-040-280K/250KG								
SF-040-315K/280KG	H	1000	980	600	230	230	400	13
SF-040-355K/315KG								

SA3 Series

PD301
PROFIBUS communication expansion board



EB362R
I/O expansion board



PG302L
Speed feedback board (supports Resolver signal)

DN301
DeviceNet communication expansion board

EB308R
I/O expansion board

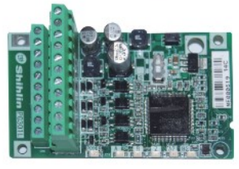
PU301C
PU301C LCD Controller

CP301
CANopen communication expansion board

EP301
Ethernet communication expansion board

PG301C
Speed feedback board (supports open collector type output)

PG301L
Speed feedback board (supports differential type output)



SS2 Series

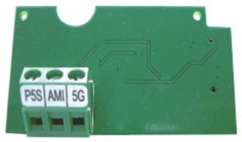
DU*06* operation panel

DU*08*

SE2 Series

SE2-PD*01*
Profibus communication board

SE-IB*01*
4-20mA current expansion board



SE-EB*01*
I/O expansion board

SE2-DN*01*
Device-Net communication board

DU*03B*
external operation panel

DU03C-S
external operation panel

DU07
external operation panel

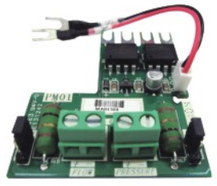
SF-G Series

PG01

PG01 expansion board

PM01

Injection modeling machine specific expansion board



PU01

For SE2, SF-G

WS01

Fan and water pump Multi-channel control board

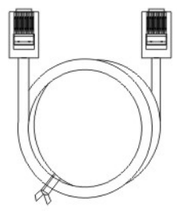
DU01

DU09

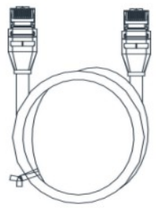
For SE2, SF-G

Common

Transmission Cable



CBL1R5/03/05GT



CBL1R5/03/05/10GTN2 (SA3&SC3)

DU01S

DU01S operation panel

(SE2/SF-G)

RS485 to USB

communication converter

AC/DC Reactor

Back up resistance