Shihlin Electric

AUTOMATION FOR
SMART MANUFACTURING

# SHIHLIN AC MOTOR DRIVE
SL3/SC3/SS2/SE3/SF3/SA3

About Shihlin Electric

Shihlin Electric & Engineering Corp. established in 1955, has devoted to researching and developing power related products, which cover Automobile Equipment System, Breaker Switchgear & System, Heavy Electric System, and Factory Automation. Our persistent belief of "improving over time" in running the operation and corporate development has not only made us a leader in the domestic market, but also performed splendidly in the overseas market. To make our brand awareness highly recognized, we perform cautious deployments and work hard on overseas marketing and sales.

The setup of overseas branches and factories had compliance with the rapid growth of product demand and to cater to the service of customer worldwide. Shihlin Electric, even with over 60 years of experiences, is still improving itself to better keep up with the globalization. Now, we spare no effort in searching for suitable business partner and expand our brand into global markets. We provide not just the qualified products but also excellent service and professional knowledge.

Now, with to the advance of science and technology, the market demand for electrical product would only grow exponentially. We hold great vision for the coming future. As we are in search of excellence, we do will take part in global competition
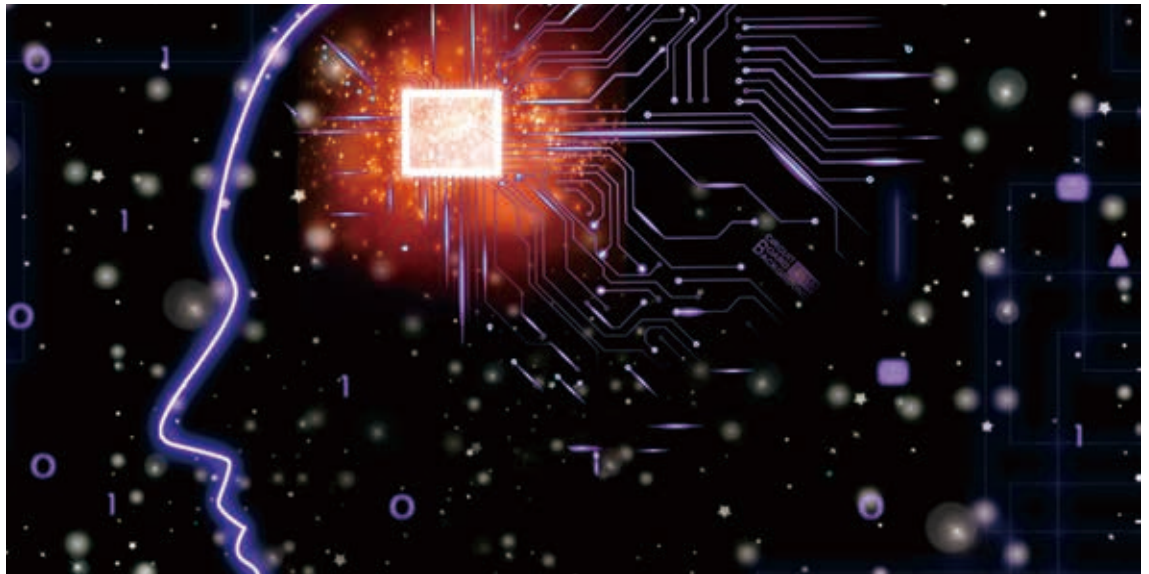
Core Business Units

*Transmission & Distribution Electrical Products

*Power Control, Switches & Breakers

*Factory Automation Products

*Automotive Electrical Component Products

Table of Contents

SL3 series

Mini AC Drive with Vector Control

Product Range

| Model		kW (HP)	0.4 (0.5)	0.75 (1)	1.5 (2)	2.2 (3)
SL3	021	1Ø 220V				
	043	3Ø 440V				

Product Feature

Save space, easier installation

Mini design, the size is smaller than all previous models. Choose between din rail installation and screw installation, save installation space effectively.

Intuitive Layout And Simple Operation

Power input on top and motor output at bottom, reduce the chance of wrong wiring.
Built-in keypad with VR knob, easy to adjust frequency.

Power input

VR knob

Motor output
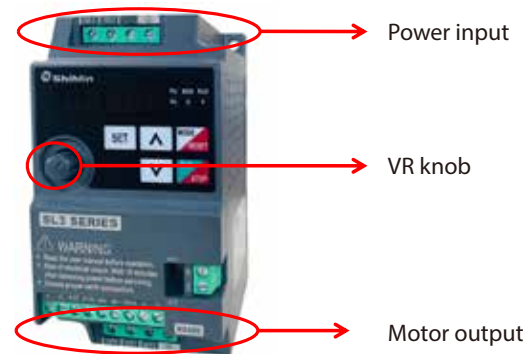
Dual Communication Interface

With two types of RS485 interface, users can easily control multiple units through communication.

Terminal interface (control multiple units)

RJ-45 interface
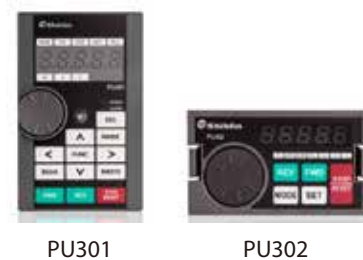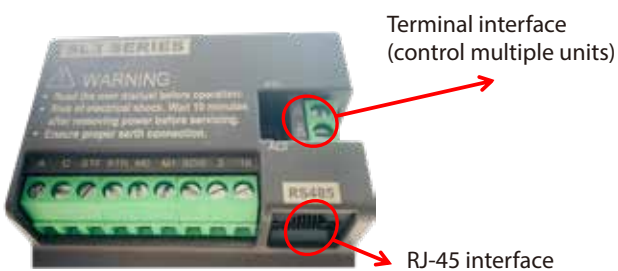
PU301   PU302

Supports exterior keypad: DU06, DU08S, PU301, PU302
*Note:RS485 and keypad will not work simultaneously.

More than enough overload protection

Over current protection level (OC) 260%; Over current limit level (LT) 220%, provides stronger driving ability and longer lifetime.
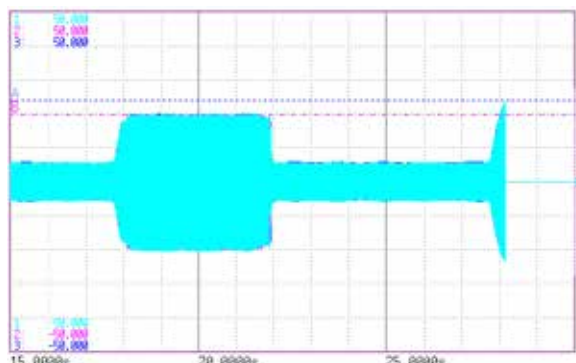
Environmental Resistance Improve

Optimized air channel

Reduce the dust that goes inside, increase the lifetime of SL3 inverter.

Added structure to improve air channel.
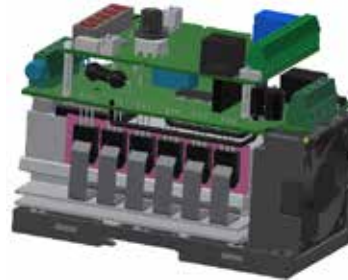
Improved isolation design

Add isolation (thermal conductive) silicon film in Frame A to increase creepage distance.

Lower motor noise

Low noise carrier frequency control(Soft-PWM) can turn motor's metallic noise into a more pleasing buzz. SL3 is embeded with improved algorithm to further lower motor noise.
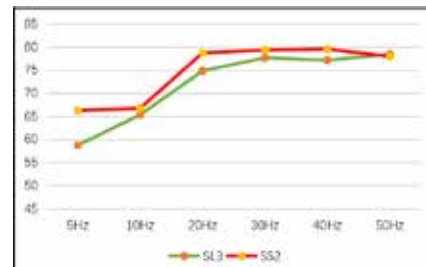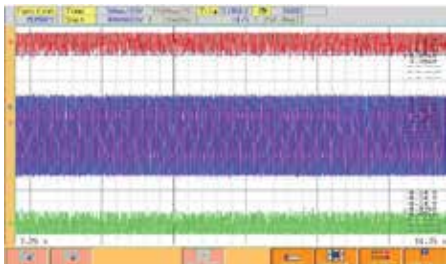
Noise comparison (db)

Compared with previous products, the noise is substantially lower at low speed.

Lower false alarm chance

With better current stall prevention function, the current can be regulated much faster which lowers the chance of triggering alarm.

Other specialized feature

- Built-in Modbus communication, Baud rate up to 38400bps.
- Built-in PID controller for constant pressure and constant temperature applications.
- Alarm record: 12 sets of records with 2 detailed record, check the operating status with full detail.
- Regeneration avoid function: monitor DC bus voltage in real-time and suppress DC bus voltage when it increase abnormally, prevents over voltage alarm.
- Automatic carrier frequency adjustment, prevent IGBT overheat(NTC) alarm.
- Built-in RFI filter for all range, suppress electric interference effectively.
- Free communication software SL-INVConfigurator, for testing, monitoring, upload and save parameters and much more.

Electric Specification

220V series single phase

Frame		A			B
Model SL3-021- □□□ **K**- □□		0.4	0.75	1.5	2.2
Inverter Output	Rated output capacity (kVA)	1	1.5	2.5	4.2
	Rated output current (A)	2.7	4.5	8	11
	Applicable motor capacity (HP)	0.5	1	2	3
	Applicable motor capacity (kW)	0.4	0.75	1.5	2.2
	Overload current rating	150% 60 seconds, 200% 1 seconds (inverse-time characteristics)			
	Carrier frequency (kHz)	1~15kHz			
	Maximum output voltage	3 phase 200-240V			
Power supply	Rated input current (A) *Note 1	6.5	9.3	15.7	24
	Rated input AC voltage/ frequency	single phase 200-240V 50Hz/60Hz			
	Permissible AC voltage fluctuation	single phase 170-264V 50Hz/60Hz			
	Permissible frequency fluctuation	±5%			
	Power supply capacity (kVA)	1.5	2.5	3.5	6.4
	Cooling method	Fan cooling			
	Weight (kg)	0.6	0.6	0.6	0.8

440V series three-phase

Frame		B			
Model SL3-043 - □□□ **K**- □□		0.4	0.75	1.5	2.2
Inverter Output	Rated output capacity (kVA)	1	2	3	4.6
	Rated output current (A)	1.5	2.6	4.2	6
	Applicable motor capacity (HP)	0.5	1	2	3
	Applicable motor capacity (kW)	0.4	0.75	1.5	2.2
	Overload current rating	150% 60 seconds, 200% 1 seconds (inverse-time characteristics)			
	Carrier frequency (kHz)	1~15kHz			
	Maximum output voltage	3 phase 380-480V			
Power supply	Rated input current (A) *Note 1	1.8	3.2	4.3	7.1
	Rated input AC voltage/ frequency	3 phase 380-480V 50Hz/60Hz			
	Permissible AC voltage fluctuation	3 phase 323-528V 50Hz/60Hz			
	Permissible frequency fluctuation	±5%			
	Power supply capacity (kVA)	1.5	2.5	4.5	6.9
	Cooling method	Fan cooling			
	Weight (kg)	0.8	0.8	0.85	0.85

Common Specification

Control method		V/F control
Output frequency range		0.00~599.00Hz
Frequency setting resolution	Digital setting	0.01Hz
	Analog setting	Maximum output frequency±0.1%
Output frequency accuracy	Digital setting	Maximum target frequency±0.01%
	Analog setting	Maximum target frequency±0.1%
Starting torque		150% / 5Hz automatic torque boost
V/F characteristics		Constant torque curve, variable torque curve, five-point VF curve
Acceleration / deceleration curve characteristics		Linear acceleration /deceleration curve, S shape acceleration/deceleration curve 1 & 2 & 3
Drive motor type		Induction motor (IM)
Stalling protection		The stalling protection level can be set to 0~200%
Target frequency setting		Up down button, VR knob setting, DC 0~5V/10V signal, DC 4~20 mAsignal, multi-speed stage level setting, communication setting, PWM pulse setting.
Keypad	Operation monitoring	Output frequency, output current, output voltage, electronic thermalaccumulation rate, temperature rising accumulation rate, output power,analog input signal value, digital input and output terminal status...; alarm history 12 sets with operation details of the latest two sets
	LED indicator (6)	Frequency monitoring indicator, voltage monitoring indicator, currentmonitoring indicator, motor running indicator, mode switch indicator, PU mode indicator
Communication function		RS-485 communication, choose between Shihlin/Modbuscommunication protocol
Protection mechanism / alarm function		Output short circuit protection, over-current protection, over-voltageprotection, under-voltage protection, motor over-heat protection, IGBTmodule over-heat protection, communication error protection, PID errorprotection, memory error protection, CPU error protection, stallprevention, module over-heat protection, input power fail protection, terminal 3-5 disconnect protection, over torque protection, Currentleakage to ground protection, hardware detect circuit error protection
Environment	Ambient temperature	-10 ~ +40°C (non-freezing)
	Ambient humidity	Below 90%Rh (non-condensing)
	Storage temperature	-20 ~ +65°C
	Surrounding environment	Indoor, no corrosive gas, no flammable gas, no flammable powder.
	Altitude	Altitude below 2000 meters, when altitude is above 1,000m, derate the rated current 2% per 100m
	Vibration	Vibration below 5.9m/s² (0.6G)
	Grade of protection	IP20
	Over voltage level	II
	Degree of environmental pollution	2
	Class of protection	Class I
International certification		CE

Wiring Diagram

◎ Main circuit terminal
○ Control circuit terminal

NFB/MCCB

AC
Power
Input

MC

AC reactor

R
S
T

U
V
W

MOTOR

Main circuit

Control circuit

Digital signal input

Forward run command — STF
Reverse run command — STR
Multi-speed command 1 — M0
Multi-speed command 2 — M1

SD/5

Red light   Relay output
RL
A
C
VDC30V
VAC250V

Analog signal input

+10V
+10
1KΩ and above   VR   4-20mA/0-10V   3
SD/5

AVI
ACI

8 → 1
DA+
DB-

RS485 communication

1,2,3,6 Reserved
4 DB-
5 DA+
7 +5V
8 GND

Note : 1.All series include built-in RFI filters, in order to comply with CE regulations; Please refer to manual.
2.When exterior keypad is connect to RJ45 port, RS485 by DA+/DB- will not work;
3.When switching terminal 3-5 voltage/ current input, please check the ACI/AVI switch position, and check parameter 02-20 (P.17) setting.

Appearance and dimensions

Frame A
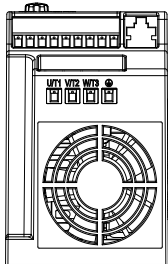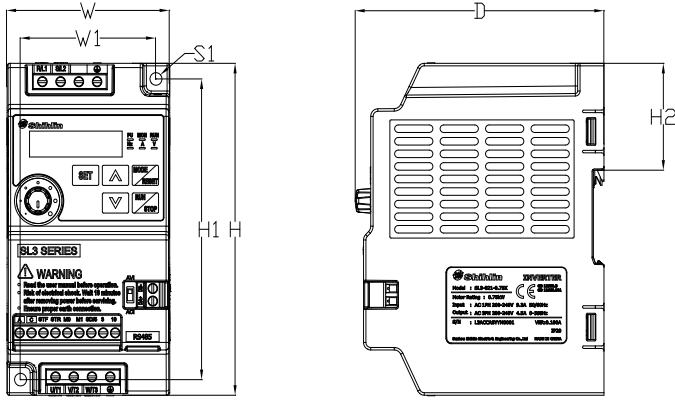
Model	W	W1	H	H1	H2	D	S1
SL3-021-0.4K	68	56	132	120	42.5	104	5 (tighten torque 20~25kgf.cm)
SL3-021-0.75K							
SL3-021-1.5K							

Frame B
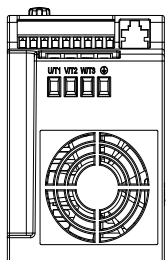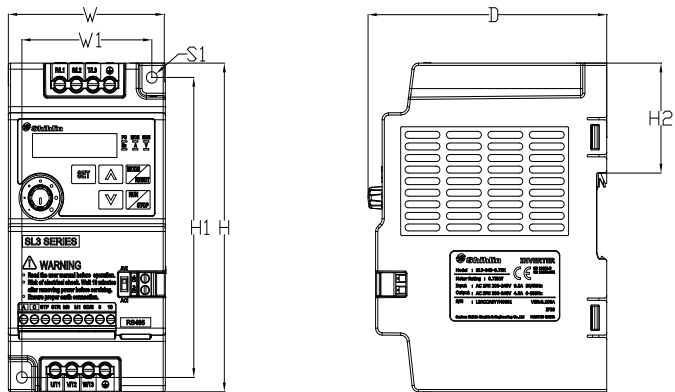
Model	WW	1H		H1	H2	DS	1
SL3-021-2.2K	72	59.5	142	129.5	42.5	110	5 (tighten torque 20~25kgf.cm)
SL3-043-0.4K							
SL3-043-0.75K							
SL3-043-1.5K							
SL3-043-2.2K							

SC3 series

Compact Inverter with Vector Control

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)	7.5 (10)	11 (15)	15 (20)	18.5 (25)	22 (30)
SC3	021	1 phase 220V												
	023	3 phase 220V												
	043	3 phase 440V												

Main Features

* High performance vector control
* Built-in operation wheel
* Full PCB coating and isolated air duct
* Dual RS485 communication interface
* Built-in PID controller
* Built-in RFI filter
* Built-in Modbus communication(up to 115200bps)
* Drive PM motor(Customized model)
* Built-in proportion linkage function
* Built-in 8 sets of programmed operation function
* Built-in 5 point V/F curve
* Built-in multi-function monitoring
* Built-in energy saving algorithm
* Built-in low current/overtorque detection

* Cooling fan auto on/off in different temperature
* 12 sets of alarm record, with detailed information of the latest 2 alarm (with frequency / current / voltage / temperature rising rate /DC bus voltage /operation time record)
* Din rail installation
* External keypad
* Output frequency up to 599Hz
* Output short circuit function

Model Identification

SC3   043   0.75K   XY
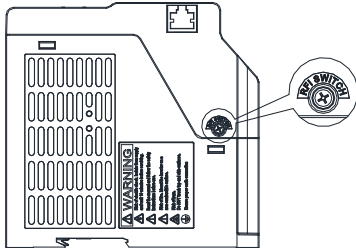
Series	Voltage level	Capacity	Version
SC3 series	043：three phase 440V 023：three phase 220V 021：single phase 220V	0.75kW	None：General model -xy：Customized or specialized or region difference

SC3

SC3 series

Compact Inverter with Vector Control

Product Features

Built-in RFI filer

- A screw switch to turn on/off RFI filter, reduce electromagnetic interference.

Note: Please refer to manual for installation details.

Coating & Isolated Air Duct

- All PCB is coated with insulation material.
- Heat sink is separated and isolated from the PCB, prevent dust/oil from contacting electronic components.

Anti-dust

Anti-oil gas
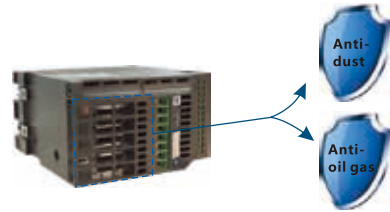
Note: Please do not install the inverter in a heavily polluted environment without any protection.

Dual RS485 interface

- Screw terminal for easy connection with multiple machines.
- RJ45 for easy connection with external keypad.

RJ45

Euro terminal block

Note: External keypad and RS485 cannot work at the same time.

Easy Maintenance

- Fan is removable.
- The fan is designed on the top to effectively reduce the impact of falling dust, and the terminal wiring will not affect the maintenance of the fan.

Optimized Operation Wheel Design

- The position of the operation wheel is lower than the front cover, avoiding all external force from damaging the wheel.

Grouping Parameters - Easy Setup

Group	Parameter Number	Name	Setting Range
01-00	P.1	Maximum frequency	0.00 ～ 01-02 (P.18) Hz
01-01	P.2	Minimum frequency	0 ～ 120.00Hz
01-02	P.18	High-speed maximum frequency	01-00 (P.1) ～ 599.00Hz
01-03	P.3	Base frequency	50Hz system setting: 0 ～ 599.00Hz
			60Hz system setting: 0 ～ 599.00Hz
01-04	P.19	Base voltage	0 ～ 1000.0V
			99999: Change according to the input voltage

SC3 series: Similar functions are grouped into same sectors instead of sequence numbers.

Electrical Specifications

220V Series single-phase

Frame	A			B	
Model **SC3-021- □□□ K-xy**	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% 60 seconds 200% 1 second (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
Rated input current(A) (Note1)	5.4	6.5	9.3	15.7	24
Cooling method	Self cooling	Forced air cooling			
Weight (kg)	0.66	0.6	0.73	1.38	1.4

220V Series three-phase

Frame	A				B	
Model **SC3-023 - □□□ K-xy**	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% 60 seconds 200% 1 second (inverse 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
Rated input current(A) (Note1)	2.1	3.2	5.6	9.3	15	20.6
Cooling method	Self cooling	Forced air cooling				
Weight (kg)	0.69	0.69	0.70	0.73	1.32	1.4

Note 1 : The value of rated input current is not only affected by the power transformer, input reactor and wiring conditions but also fluctuates with the impedance on the power side.

Electrical Specifications

440V Series three-phase

Frame		A			B		
Model **SC3-043- □□□ K-xy**		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% 60 seconds 200% 1 second (inverse 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
	Rated input current(A) (Note1)	1.8	3.2	4.3	7.1	10	14
Cooling method		Self cooling	Forced air cooling				
Weight (kg)		0.74	0.74	0.81	1.37	1.37	1.42

Frame			C		D		
Model **SC3-043- □ K □ KF-xy**			7.5/11	11/15	15/18.5	18.5/22	22
Output	HD	Rated output capacity (kVA)	14	18	25	29	34
		Rated output current (A)	18	24	32	38	45
		Applicable motor capacity (HP)	10	15	20	25	30
		Applicable motor capacity(kW)	7.5	11	15	18.5	22
		Overload current rating	150% 60 seconds (inverse time characteristics)				
		Carrier frequency (kHz)	1~15kHz				
	ND	Rated output capacity (kVA)	84	25	29	34	46
		Rated output current (A)	24	32	38	45	49
		Applicable motor capacity (HP)	15	20	25	30	30
		Applicable motor capacity (kW)	11	15	18.5	22	22
		Overload current rating	120% 60 seconds (inverse time characteristics)				
		Carrier frequency (kHz)	1~15kHz		1~10kHz		
	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)		16	20	27	32	41
	Rated input current (A) (Note1)	HD	20	26	35	40	47
		ND	26	35	40	47	54
Cooling method			Forced air cooling				
Weight(kg)			2.07	2.15	3.45	3.57	3.70

Note 1 : The value of rated input current is not only affected by the power transformer, input reactor and wiring conditions but also fluctuates with the impedance on the power side.
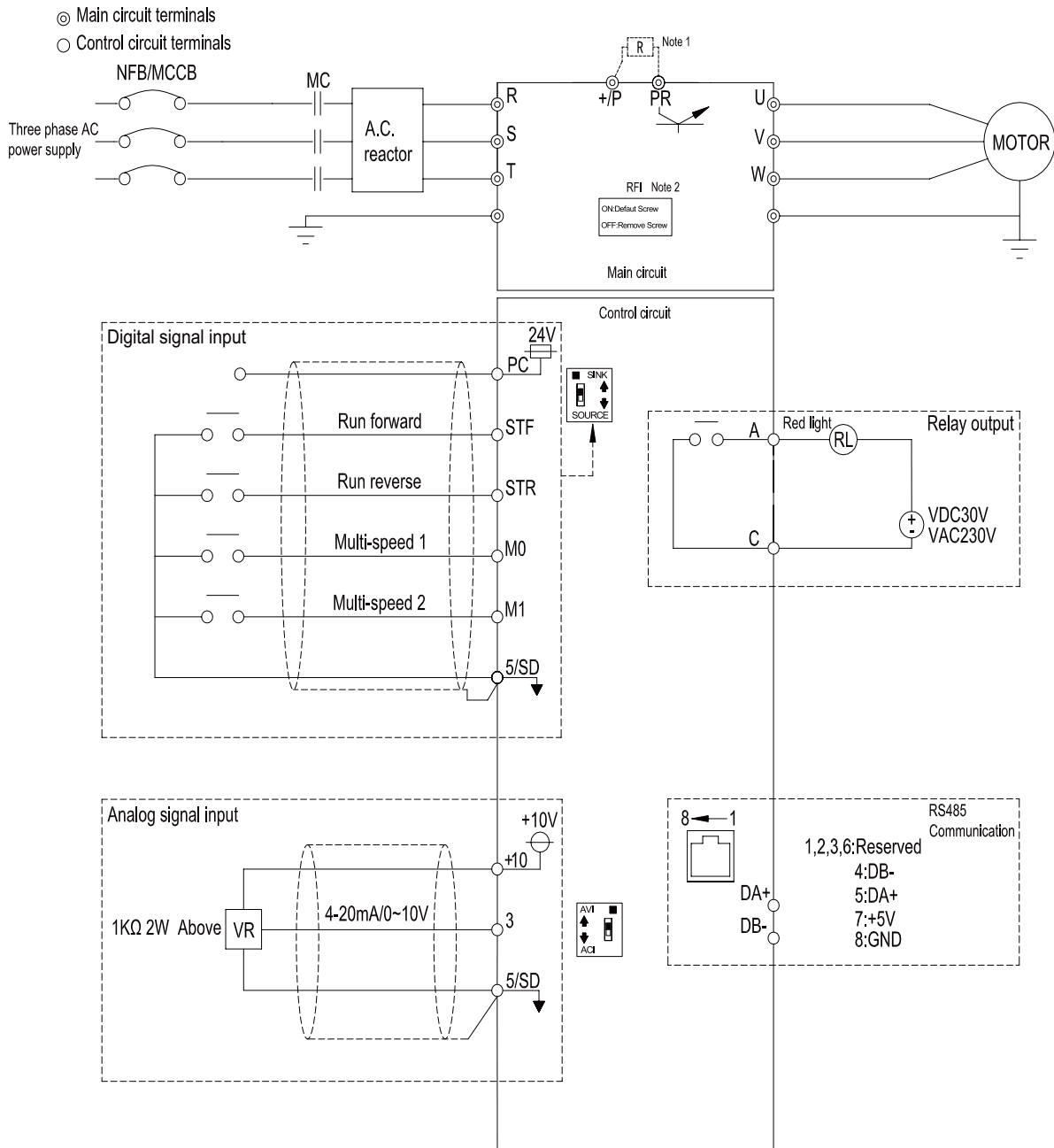
Common Specifications

Control method	SVPWM, V/F control, General flux vector control
Output frequency range	0~599.00Hz
Frequency setting resolution	Digital setting	Within 100Hz, the resolution is 0.01Hz Above 100Hz, the resolution is 0.1Hz.
	Analog setting	DC 0~5V or 4~20mA signal: 11 bit, DC 0~10V signal: 12 bit.
Output frequency accuracy	Digital setting	Maximum target frequency±0.01%.
	Analog setting	Maximum target frequency±0.1%.
Starting torque	Under General flux vector control: 180% 3Hz, 200% 5Hz
V/F characteristics	Constant torque curve, variable torque curve, five-point VF curve
Acceleration / deceleration curve characteristics	Linear acceleration / deceleration curve, S shape acceleration /deceleration curve 1 & 2 & 3
Drive motor	Induction motor (IM)
Stalling protection	The stalling protection level can be set from 0~250%. Default value 150%
Target frequency setting	Built-in keypad setting, DC 0~5V/0~10V signal, DC 4~20 mA signal, multi-speed stage level setting, communication setting.
Keypad	Operation monitoring	Output frequency, output current, output voltage, PN voltage, electronic thermal accumulation rate, temperature rising accumulation rate, output power, analog input signal value, external terminal status···; alarm history 12 sets with operation details of the latest two set.
	LED indicator(6)	Frequency monitoring indicator, voltage monitoring indicator, current monitoring indicator, motor running indicator, mode switch indicator, PU mode indicator.
Communication function	RS485 communication, choose between Shihlin / Modbus communication protocol, baud rate up to 115200bps.
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 error protection, PID error protection, memory error protection, CPU error protection, stall prevention, module over-heat protection, input power fail protection, terminal 3-5 disconnect protection, over torque protection, current leakage to ground protection.
Environment	Ambient temperature	-10 ~ +50°C (non-freezing), side by side installation-10~ +40°C (non-freezing).
	Ambient humidity	Below 90%Rh (non-condensing).
	Storage temperature	-20 ~ +65°C
	Surrounding environment	Indoor, no corrosive gas, no flammable gas, no flammable dust.
	Altitude	Altitude below 2000 m, when altitude is above 1000 m, derate the rated current 2% per 100 m
	Vibration	Vibration below 5.9m/s² （0.6G）
	Grade of protection	IP20
	Over voltage level	II
	Degree of environmental pollution	2
	Class of protection	Class I
International certification	$C \epsilon$

Wiring Diagram

◎ Main circuit terminals
○ Control circuit terminals

NFB/MCCB
MC
A.C. reactor
Three phase AC power supply

R
S
T

R Note 1
+/P PR
RFI Note 2
ON:Defaut Screw
OFF:Remove Screw

U
V
W

MOTOR

Main circuit

Control circuit

Digital signal input

24V
PC
SINK
SOURCE

Run forward — STF
Run reverse — STR
Multi-speed 1 — M0
Multi-speed 2 — M1
5/SD

A
Red light
RL
C

Relay output

VDC30V
VAC230V

Analog signal input

+10V
+10
4-20mA/0~10V
3
5/SD

1KΩ 2W Above VR

AVI
ACI

8 — 1

DA+
DB-

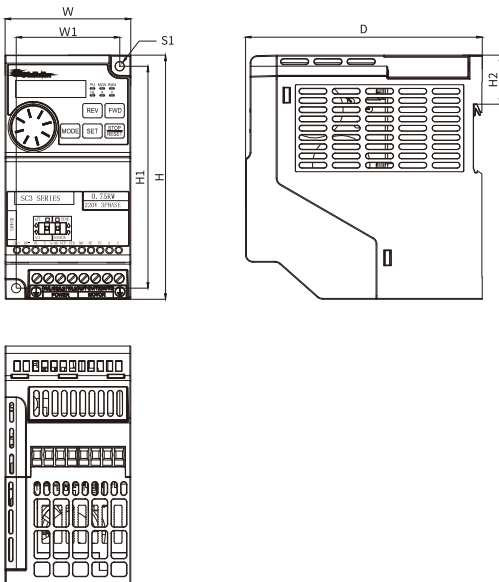RS485 Communication

1,2,3,6:Reserved
4:DB-
5:DA+
7:+5V
8:GND

NOTE

1.There is no +/P and PR terminal in frame A (SC3-043-0.4K~1.5K, SC3-023-0.2K~1.5K, SC3-021-0.2K~0.75K.)

2.All series have built-in RFI filter to suppress electromagnetic interference. In order to comply with CE regulations, please refer to relevant instructions in the manual for installation.
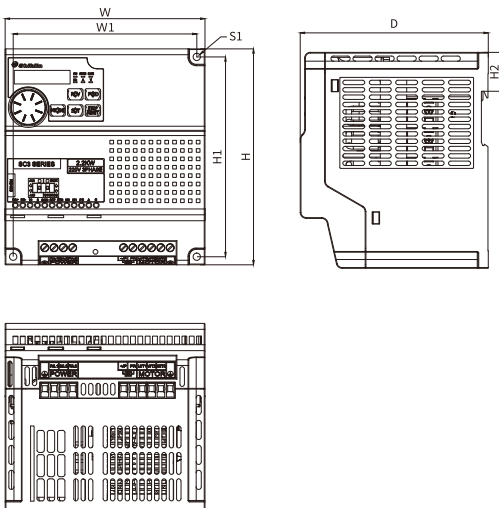
Dimensions

Unit : mm

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 Tightening torque: 20~25kgf. cm
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/C/D

Frame B/C/D							
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 Tightening torque: 20~25kgf. cm
SC3-021-2.2K							
SC3-023-2.2K							
SC3-023-3.7K							
SC3-043-2.2K							
SC3-043-3.7K							
SC3-043-5.5K							
SC3-043-7.5K/11KF	132	115.6	215	198.6	-	150	6.2 Tightening Torque: 20~25kgf. cm
SC3-043-11K/15KF							
SC3-043-15K/18.5KF	175	158.6	260	243.6	-	180	6.2 Tightening Torque: 20~25kgf. cm
SC3-043-18.5K/22KF							
SC3-043-22K							

SS2 series

General Vector Control Inverter

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	021	1 phase 220V	███	███	███	███		
	023	3 phase 220V	███	███	███	███	███	
	043	3 phase 440V	███	███	███	███	███	███

Main Features

* Built-in shuttle knob to adjust output frequency and set parameters easily
* Built-in RS485 communication interface
* Support MODBUS and Shihlin communication protocol
* Built-in proportion linkage control function to support multi inverters connection
* Maximum 599Hz 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

Model Identification

SS2   043   0.75K   XY

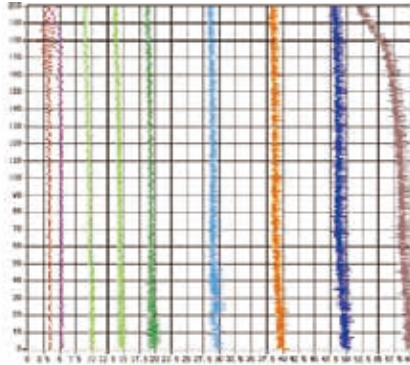| Series	Voltage level	Capacity	Version
SS2 series	043 : three phase 440V 023 : three phase 220V 021 : single phase 220V	0.75kW	None : General model -xy : Customized or specialized or region difference

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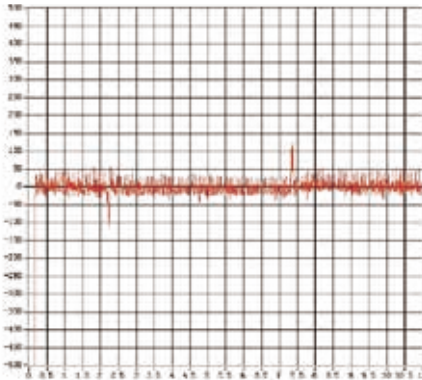
- Motor parameter auto-tuning function.
- Stalling protection level reaches to 250%.

High Performance And Function
- The maximum output frequency up to 599Hz.
- Soft-PWM functions for eliminating motor noises and preventing the temperature of IGBT module too high.
- Built-in energy-saving control function, inverter will control the output voltage automatically in order to reduce the output power losses when inverter is running.
- Cooling fan operation method is selectable.

Built-in Proportion Linkage Function
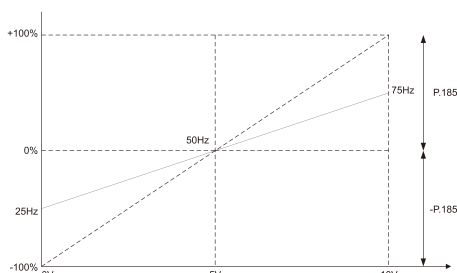
PID Feedback Control Function
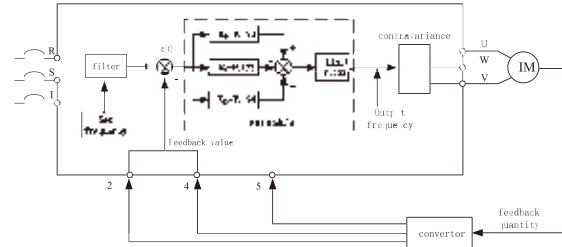
Triangular Wave Function (traverse)
- This is suitable for operations that need traversing and winding movements such as textile operations.
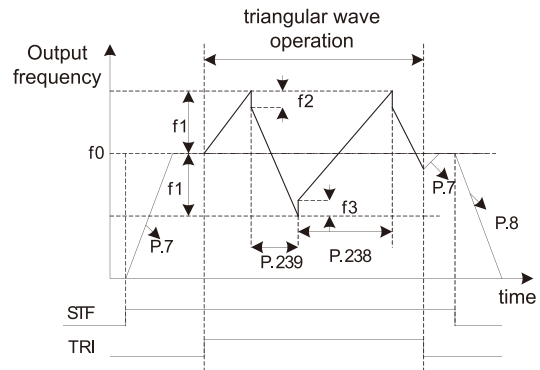
f0 : Setting value of frequency
f1 : Generated amplitude for setting frequency (f0 X P.235)
f2 : Compensation from acceleration to deceleration (f1 X P.236)
f3 : Compensation from deceleration to acceleration (f1 X P.237)

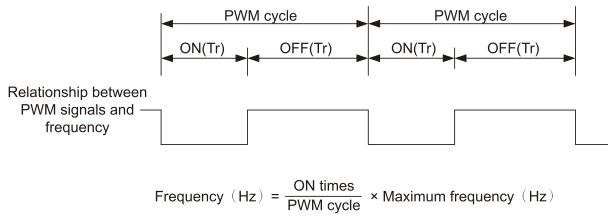### Built-in Frequency And Parameter Setting Knob

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.

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

Programmed Operation Mode With Manual Operation

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.

Easy To Install Design

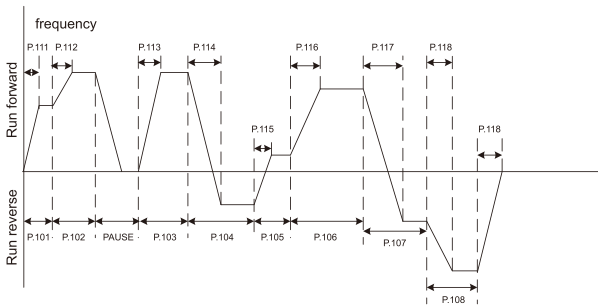- Din rail design for multiple inverters side by side installation.

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

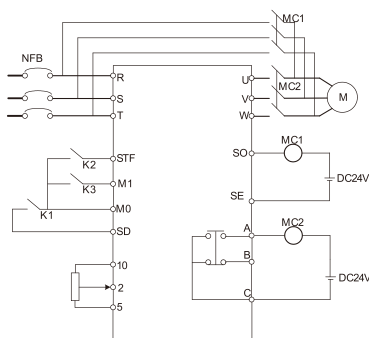- The cooling fan is removable and easy to clean.

automation.seec.com.tw

SS2 series
General Vector Control Inverter

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
Output — Rated output current A (Note)		2.7	4.5	8	11
Output — Overload current rating		150% 60 seconds; 200% 1 second (inverse time characteristics)			
Output — Maximum output voltage		3 Phase 200~240V AC			
Power supply — Rated power voltage		Single phase 200~240V 50Hz/ 60Hz			
Power supply — Power voltage permissible fluctuation		Single phase 170~264V 50Hz / 60Hz			
Power supply — Power frequency permissible fluctuation		±5%			
Power supply — Power source capacity kVA		1.5	2.5	3.5	6.4
Cooling Method		Self-cooling	Forced air cooling		
Inverter weight (kg)		1.2	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
Output — Rated output current A (Note)		3	5	8	11	17.5
Output — Overload current rating		150% 60 seconds; 200% 1 second (inverse time characteristics)				
Output — Maximum output voltage		3 Phase 200~240V AC				
Power supply — Rated power voltage		3 Phase 200~240V 50Hz/60Hz				
Power supply — Power voltage permissible fluctuation		3 Phase 170~264V 50Hz/60Hz				
Power supply — Power frequency permissible fluctuation		±5%				
Power supply — Power source capacity kVA		1.5	2.5	4.5	6.4	10
Cooling Method		Self-cooling	Forced air cooling			
Inverter weight (kg)		1.1	1.2	1.2	1.6	1.7

440V Series Three-Phase

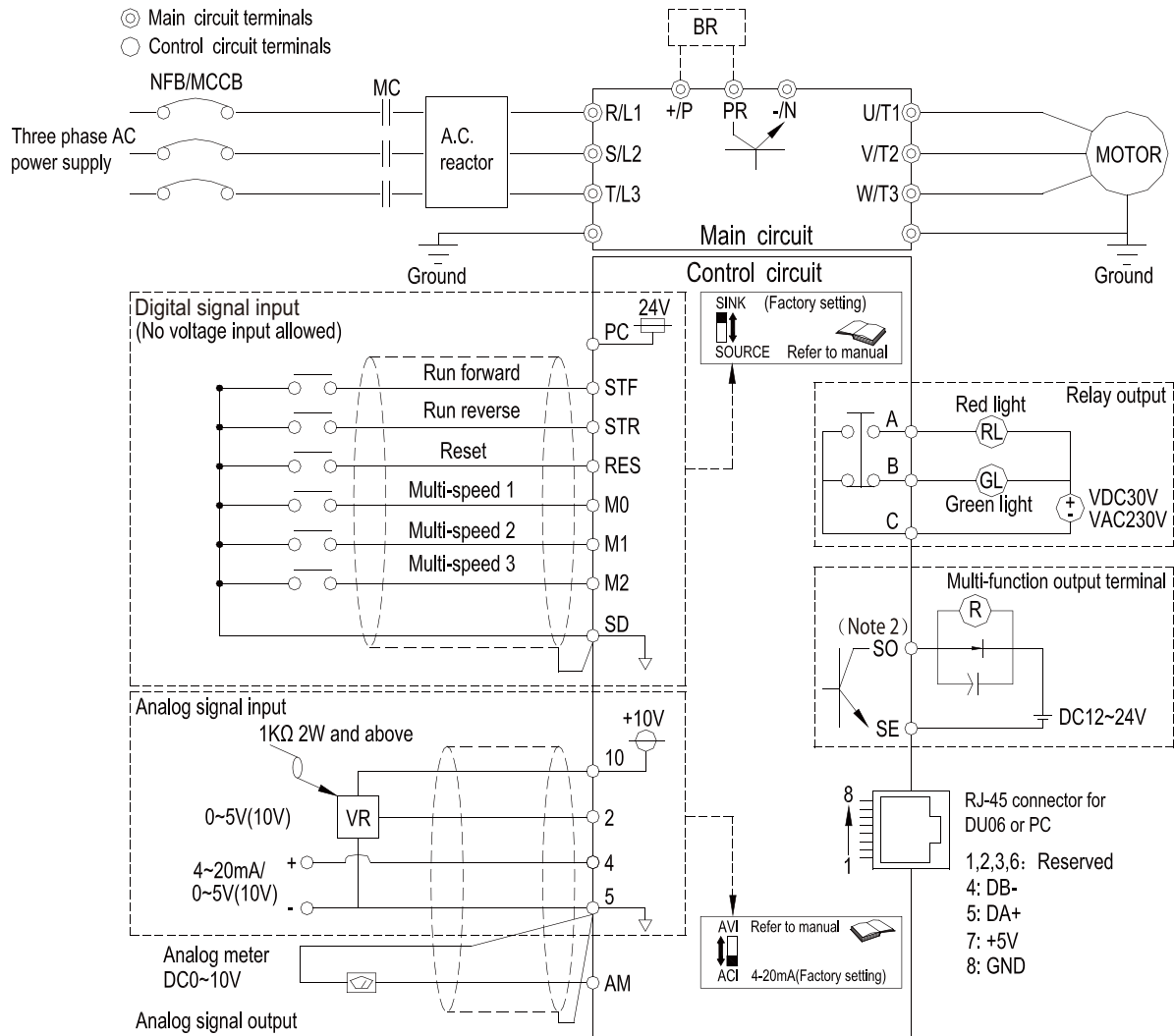| Model **SS2-043-** □□□ K		0.4	0.75	1.5	2.2	3.7	5.5
Applicable Motor Capacity	HP	0.5	1	2	3	5	7.5
	kW	0.4	0.75	1.5	2.2	3.7	5.5
Output — Rated output capacity kVA (Note)		1	2	3	4.6	6.9	9.2
Output — Rated output current A (Note)		1.5	2.6	4.2	6	9	12
Output — Overload current rating		150% 60 Seconds; 200% 1 Second (inverse time characteristics)					
Output — Maximum output voltage		Three-phase 380~480V					
Power supply — Rated power voltage		3 Phase 380~480V 50Hz / 60Hz					
Power supply — Power voltage permissible fluctuation		323~528V 50Hz/60Hz					
Power supply — Power frequency permissible fluctuation		±5%					
Power supply — 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			
Inverter weight (kg)		1.1	1.1	1.2	1.6	1.7	1.7

Note:
The test conditions of rated output current, rated output capacity and inverter power consumption are: the carrier frequency (P.72)
is at factory setting value; the inverter output voltage is at 220V/440V; the output frequency is at 60Hz, and the ambient temperature is 50°C .

Common Specifications

Control Method			SVPWM control, V/F control, general flux vector control.	
Output Frequency Range			0.1~599Hz (The starting frequency setting range is 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).	
Starting 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).	
Stall current protection			The stalling protection level can be set between 0 and 250% (P. 22).	
Target Frequency Setting			Keypad setting, DC 0~5V signal setting, DC 0~10V signal setting, DC 4~20mA signal setting, Multi-speed stage levels setting, communication setting, pulse frequency 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	Inverter running (RUN), output frequency detection (FU), Up to output frequency(SU), overload detection (OL), zero current detection (OMD), alarm (ALARM), Section detection (PO1), Periodical detection (PO2), and Pause detection (PO3), Inverter output (BP), Commercial power-supply output (GP).
	Multi-function output relay	A, B, C	P85	
	Analog output	AM, 5		Multi-function DC (0~10V) Output: output frequency, output current (P.54).
Keypad	Running status monitoring		Output frequency monitoring, output current monitoring, and output voltage monitoring, alarm record	
	HELP mode		Alarm history monitoring.	
	LED indicator (6)		Run indicator, frequency monitoring indicator, voltage monitoring indicator, current monitoring indicator, mode switching indicator, and PU control indicator.	
Communication Function		RS485	Build-in 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, communication abnormality protection, etc.	
Environmental Condition	Ambient temperature		-10 ~ +50C (non-freezing), installation side by side -10~ +40℃ .	
	Ambient humidity		Below 90%Rh (non-condensing)	
	Storage temperature		-20 ~ +65℃	
	Surrounding environment		Indoor, no corrosive gas, no flammable gas, no flammable dust	
	Altitude and vibration		Altitude:below 1000 m, Vibration:below 5.9m/s² (0.6G).	
	Enclosure Rating		IP20	
	Pollution level		2	
	Class of protection		Class 1	
Certification			CE	

Wiring Diagram

Main circuit terminals
Control circuit terminals

NFB/MCCB MC
Three phase AC power supply
A.C. reactor

BR

R/L1 +/P PR -/N U/T1
S/L2 V/T2 MOTOR
T/L3 W/T3

Main circuit
Ground Control circuit Ground

Digital signal input
(No voltage input allowed)

24V
PC
SINK (Factory setting)
SOURCE Refer to manual

Run forward STF
Run reverse STR
Reset RES
Multi-speed 1 M0
Multi-speed 2 M1
Multi-speed 3 M2
SD

Relay output
A Red light RL
B
C GL Green light VDC30V VAC230V

Analog signal input
1KΩ 2W and above

+10V
10
0~5V(10V) VR 2
4~20mA/ 4
0~5V(10V) 5

Multi-function output terminal
（Note 2）
SO R
SE DC12~24V

8
1
RJ-45 connector for DU06 or PC
1,2,3,6：Reserved
4: DB-
5: DA+
7: +5V
8: GND

AVI Refer to manual
ACI 4-20mA(Factory setting)

Analog meter
DC0~10V
AM
Analog signal output

NOTE

1. For the usage of the external thermal relay, please refer to P.80~P.84, P.86 in Chapter 5 (OH) on the manual.
2. Make sure not to short circuit the PC and SD.
3. In the above figure, dotted line area, please refer to 3.5.7on the manual.
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.
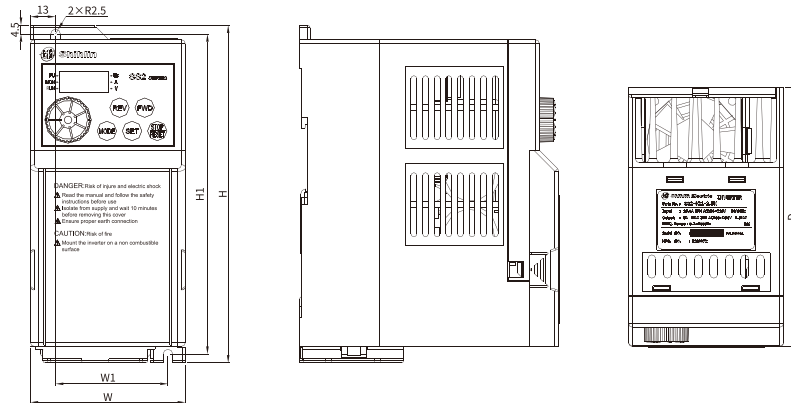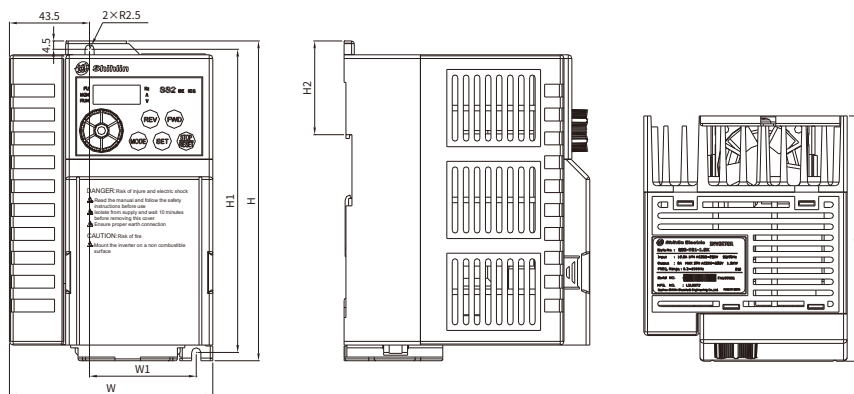
Dimensions

Frame A

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

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					

SE3 series

High Speed Closed Loop/ Communication Inverter
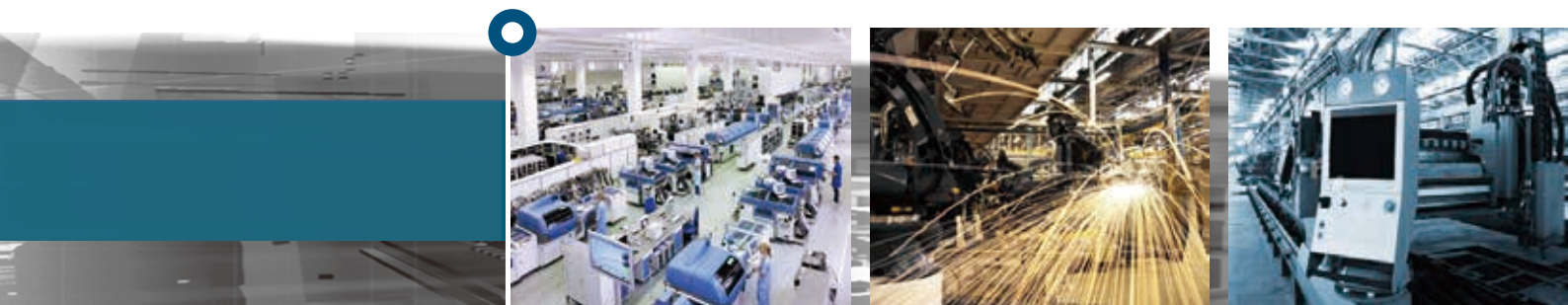
Power Range

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)	15 (20)	18.5 (25)	22 (30)
SE3	021	1 phase 220V												
	023	3 phase 220V												
	043	3 phase 440V												

Product Features

High Performance Vector Control Technology
• High starting torque: Sensorless vector control (SVC)200% 0.5Hz, and closed-loop vector control (FOC + PG) 180% 0Hz.
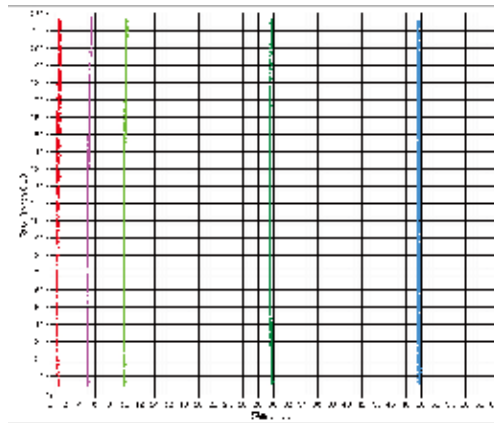
High Performance Synchronous Motor Control Technology
• Support induction motor (IM) and synchronous motor (IPM and SPM) control.

Induction motor (IM)

Synchronous motor (IPM)

Synchronous motor (SPM)

Support Multiple High-speed Bus Connections
• Optional high-speed communications: CANopen, Profibus, DeviceNet, EtherCAT, MODBUS TCP.
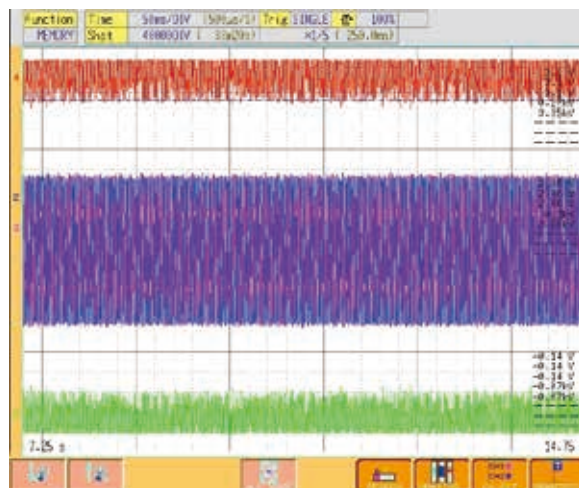
Product Features

Multiple Control Modes for Various Applications

- Position / Speed / Torque / Tension control mode.
- Combination mode (e.g. speed+torque) can be achieved via I/O switch.
- Advanced position control functions: Homing commands, zero speed, Pr/Pt mode(with optional PG cards).

Wire Drawing Machine

Cloth Drawing Machine
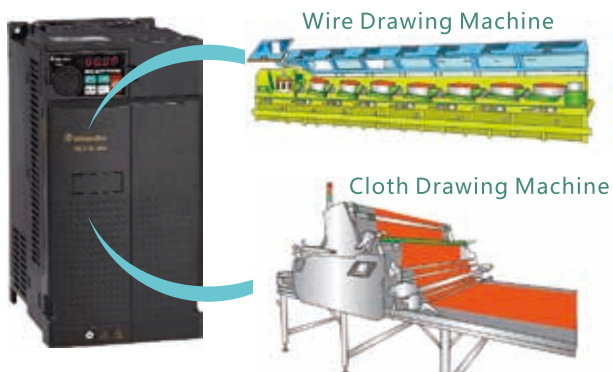
Low-noise Carrier Wave Control (Soft-PWM)

- 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.

Excellent Overload Endurance

- With a current overload capability of 150% for 60 seconds and 200% for 3 seconds, the setting is suitable for handling large sudden load changes applications such as tooling machinery.
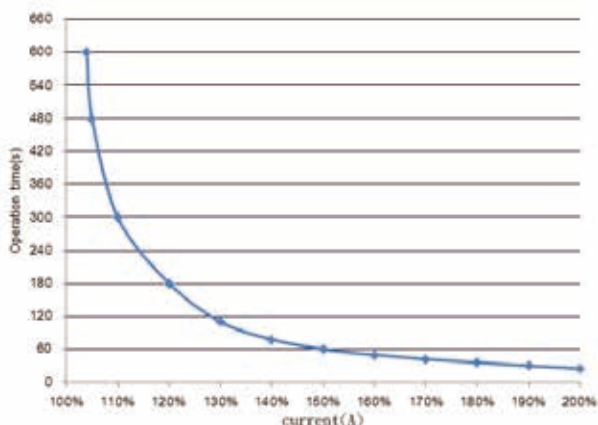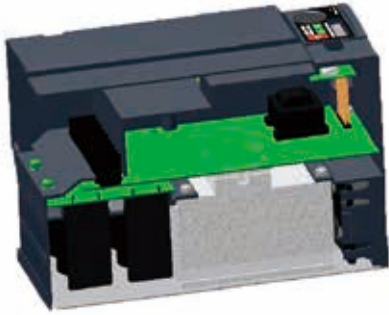
Built-in RFI filer

- Reduce electromagnetic interference.
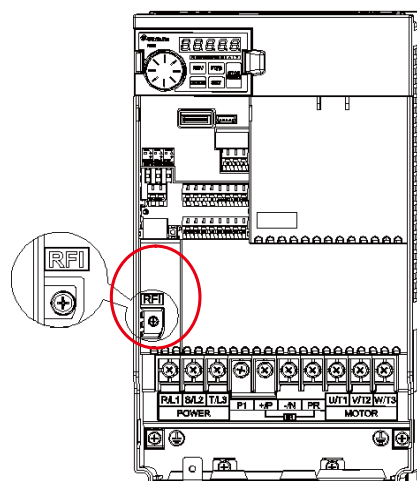
Product Features

Isolated Air Duct

- The air duct of the fan is sealed and isolates the heat dissipation system from the electrical parts, so that the dust won't easily enter the drive through the fan.

Complete Protection Functions

- Phase failure protection, overvoltage protection, overcurrent protection, undervoltage protection, output short-circuit protection, output to ground protection, motor overheat protection, IGBT module overheat protection, communication abnormality protection.
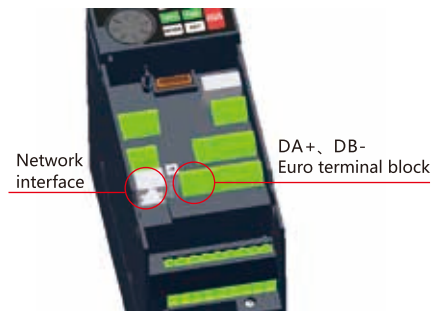
LED Digital Keypad

1. 5-digit 7-segment display
2. Optimized operation JOG Dial

Quick Connect to External Keypad and Easy Wiring

- Standard RJ45 network interface and DA+ DB- terminals are equipped for multi-machine communication.

Network interface

DA+、DB-
Euro terminal block

12 Sets of Alarm Records

- Complete alarm system for recording the output frequency, output current, output voltage, accumulated rate of temperature increase, PN voltage, total operation time, operational status, alarm trigger time. A total of 12 alarm code, 12 groups of alarm code.

P.288	06-40	Alarm code query	0~12	0	176
P.289	06-41	Alarm code display	Read	Read	176
P.290	06-42	Alarm code query	0~10	0	176
P.291	06-43	Alarm code display	Read	Read	176

Built-in PLC Functions

- Provide PLC programming software, easy for editing.
- Applicable for programming small number of points, and support multiple functions.

SE3 series

**High Speed Closed Loop/
Communication Inverter**

Product Features

Grouping Parameters - Easy Setup

Group	Parameter Number	Name	Setting Range	Default
02-10	P.60	Terminal 2-5 filter time	0 ～ 2000ms	30ms
02-11	P.139	Terminal 2-5 voltage signal bias rate	-100.0%~100.0%	0.0%
02-12	P.192	Terminal 2-5 minimum input positive voltage	0 ～ 10.00V	0.00V
02-13	P.193	Terminal 2-5 maximum input positive voltage	0 ～ 10.00V	10.00V
02-14	P.194	Percentage corresponds to terminal 2-5 minimum positive voltage	-100%~100%	0.0%
02-15	P.195	Percentage corresponds to terminal 2-5 maximum positive voltage	-100% ~100%	100%

SE3 series: Similar functions are grouped into same sectors instead of sequence numbers.

Easy Maintenance

• The fan is designed on the top to effectively reduce the impact of falling dust, and the terminal wiring will not affect the maintenance of the fan.

Model Identification

SE3	043	0.75K	XY

Series	Voltage level	Capacity	Version
SE3 series	043：three phase 440V 023：three phase 220V 021：single phase 220V	0.75kW	None：General model -xy：Customized or specialized or region difference

Electrical Specifications

220V series one-phase/three-phase

Frame			A		B	
Model **SE3-021-** ☐ **-xy**			0.4K	0.75K	1.5K	2.2K
Output	HD	Rated output capacity (kVA)	1	1.5	3.2	4.2
		Rated output current (A)	2.7	4.5	8	11
		Applicable motor capacity (HP)	0.5	1	2	3
		Applicable motor capacity(kW)	0.4	0.75	1.5	2.2
		Overload current rating	150% 60 seconds 200% 3 seconds (inverse time characteristics)			
		Carrier frequency (kHz)	1~15kHz			
	ND	Rated output capacity (kVA)	1.2	2	3.4	4.8
		Rated output current (A)	3	5	8.5	12.5
		Applicable motor capacity (HP)	0.5	1	2	3
		Applicable motor capacity (kW)	0.4	0.75	1.5	2.2
		Overload current rating	120% 60 seconds 150% 3seconds (inverse time characteristics)			
		Carrier frequency (kHz)	1~15kHz			
	Maximum output voltage		Three-phase 200-240V			
Power supply	Rated power voltage		One-phase 200-240V 50Hz / 60Hz			
	Power voltage permissible fluctuation		One -phase 170-264V 50Hz / 60Hz			
	Power frequency permissible fluctuation		±5%			
	Power source capacity (kVA)		1.5	2.5	4.5	6.9
	Rated input current(A) (Note1)	HD	5.9	9.7	14.8	23.1
		ND	6.7	10.5	17.9	26.3
Cooling method			Self cooling		Forced air cooling	
Weight(kg)			1.0	1.0	1.5	1.5

Frame			A			B		C		D	
Model **SE3-023-** ☐ **-xy**			0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K	11K	15K
Output	HD	Rated output capacity (kVA)	1.2	2	3.2	4.2	6.7	9.5	12.5	18.3	24.7
		Rated output current (A)	3	5	8	11	17.5	25	33	49	65
		Applicable motor capacity (HP)	0.5	1	2	3	5	7.5	10	15	20
		Applicable motor capacity(kW)	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
		Overload current rating	150% 60 seconds 200% 3seconds (inverse time characteristics)								
		Carrier frequency (kHz)	1~15kHz								
	ND	Rated output capacity (kVA)	1.3	2.1	3.4	4.8	7.4	10.3	13.7	19.4	26.3
		Rated output current (A)	3.2	5.5	8.5	12.5	19.5	27	36	51	69
		Applicable motor capacity (HP)	0.5	1	2	3	5	7.5	10	15	20
		Applicable motor capacity (kW)	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
		Overload current rating	120% 60 seconds 150% 3 seconds (inverse 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)		1.5	2.5	4.5	6.4	10	12	17	20	28
	Rated input current(A) (Note1)	HD	3.5	6.0	9.6	13.2	20.4	30	39.6	58.8	78
		ND	3.8	6.6	10.2	15	23.4	32.4	43.2	61.2	82.8
Cooling method			Forced air cooling								
Weight(kg)			1.0	1.0	1.0	1.5	1.5	4.0	4.1	5.7	5.8

Note1:
The value of rated input current is not only affected by the power transformer, input reactor and wiring conditions but also fluctuates with the impedance on the power side.

Note:
The test conditions of rated output current, rated output capacity and inverter power consumption are:the carrier frequency (P.72) is at the set value; the inverter output voltage is at 220V; the output frequency is at 60Hz, and the ambient temperature is 40℃.

SE3 series

Electrical Specifications

440V series three-phase

Frame			A			B		C			D		
Model **SE3-043- □ -xy**			0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K	11K	15K	18.5K	22K
Output	HD	Rated output capacity (kVA)	1	2	3	4.6	6.9	10	14	18	25	29	34
		Rated output current (A)	1.5	2.7	4.2	6	9	12	17	24	32	38	45
		Applicable motor capacity (HP)	0.5	1	2	3	5	7.5	10	15	20	25	30
		Applicable motor capacity(kW)	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22
		Overload current rating	150% 60 seconds 200% 3 seconds (inverse time characteristics)										
		Carrier frequency (kHz)	1~15kHz										
	ND	Rated output capacity (kVA)	1.4	2.3	3.5	5	8	12	15.6	21.3	27.4	31.6	37.3
		Rated output current (A)	1.8	3	4.6	6.5	10.5	15.7	20.5	28	36	41.5	49
		Applicable motor capacity (HP)	0.5	1	2	3	5	7.5	10	15	20	25	30
		Applicable motor capacity (kW)	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22
		Overload current rating	120% 60 seconds (inverse 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	16	20	27	32	41
	Rated input current(A) (Note1)	HD	2.1	3.7	5.8	6.5	9.9	14.3	18.7	27.5	35.2	41.8	48.5
		ND	2.5	4.2	6.4	7.2	11.6	17.3	22.6	30.8	39.6	47.7	53.9
	Cooling method		Self cooling	Forced air cooling									
	Weight(kg)		1.0	1.0	1.0	1.5	1.5	3.9	4.0	4.0	5.7	5.8	5.8

Note1:
The value of rated input current is not only affected by the power transformer, input reactor and wiring conditions but also fluctuates with the impedance on the power side.

Note:
The test conditions of rated output current, rated output capacity and inverter power consumption are:the carrier frequency (P.72) is at the set value; the inverter output voltage is at 220V; the output frequency is at 60Hz, and the ambient temperature is 40℃.

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	0-599Hz(*1)
Frequency setting resolution	Digital setting	The resolution is 0.01Hz.
	Analog setting	0.01Hz/60Hz(terminal 2: -10 ～ +10V / 13bit) 0.15Hz/60Hz(terminal 2: 0 ～ ±10V / 12bit) 0.03Hz/60Hz(terminal 2: 0 ～ 5V / 11bit) 0.06Hz/60Hz(terminal 4: 0~10V, 4-20mA / 12bit) 0.12Hz/60Hz(terminal 4: 0 ～ 5V / 11bit)
Output frequency accuracy	Digital setting	Maximum target frequency±0.01%.
	Analog setting	Maximum target frequency±0.1%.
Speed control range	IM: When SVC, 1:200; when FOC+PG, 1:1000. PM: When SVC, 1:20; when FOC+PG, 1:1000.
Start torque	200% 0.5 Hz
V/F characteristics	Constant torque curve, variable torque curve, five-point curve, VF separation
Acceleration / deceleration curve characteristics	Linear acceleration / deceleration curve, S shape acceleration /deceleration curve
Drive motor	Induction motor(IM), permanent magnet motor(SPM, IPM)
Stalling protection	The stalling protection level can be set to 0~250%
Target frequency setting	Keypad 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 to parameter description
Built-in simple PLC	Supports 21 basic instructions and 14 application instructions, including PC editing software;
Keypad	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 signal and alarm history 12 groups at most
	LED indicator (7)	Forward rotation indicator, reverse rotation indicator, frequency monitoring indicator, mode switch indicator ,PU control indicator, PLC indicator and run indicator
Communication function	Built-in Shihlin / Modbus communication protocol, can select MODBUS TCP, CANopen, Profibus, DeviceNet, EtherCAT card
Protection mechanism / alarm function	Output short circuit protection, Over-current protection, over-voltage protection, under-voltage protection, motor over-heat protection, IGBT module over-heat protection, communication abnormality protection,
Environment	Ambient temperature	HD ：-10 ~ +50℃ (non-freezing)，ND：-10 ~ +40℃ (non-freezing), please refer to 3.4.2 Class of protection and operation temperature for details.
	Ambient humidity	Below 90%Rh (non-condensing).
	Storage temperature	-20 ~ +65℃ .
	Surrounding environment	Indoor, no corrosive gas, no flammable gas, no flammable dust.
	Altitude	Altitude below 2000 m, when altitude is above 1000 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	2
	Class of protection	Class I
International certification	CE

*1: SE3 series can be customized up to 1500Hz. Please contact us if necessary.

Wiring Diagram

◎ Main circuit terminal
○ Control circuit terminal
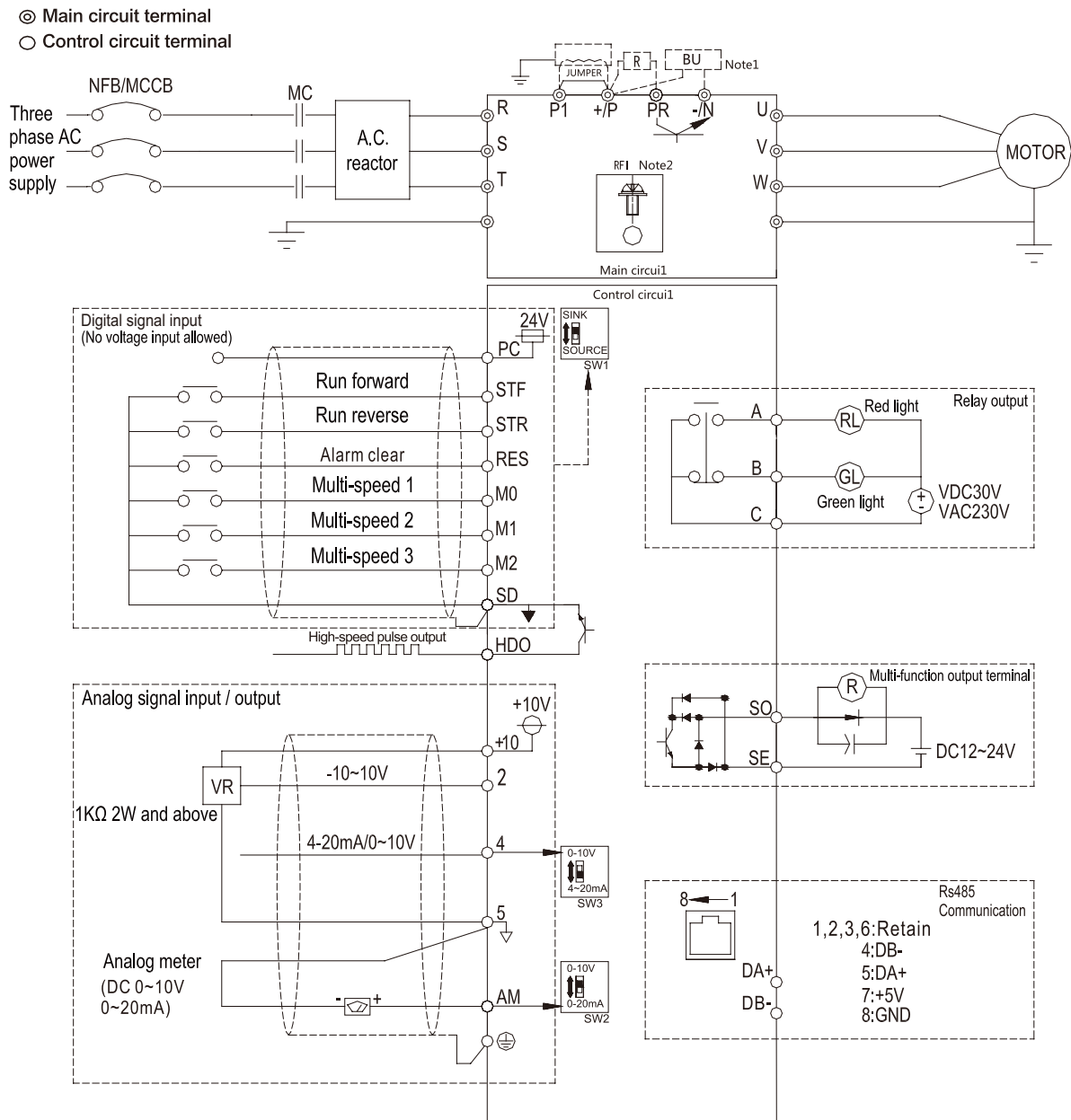
NOTE

1. Make sure 10, SD, SE, 5 and PC are not shorted to each other.
2. The DC reactor between +/P and P1 is optional, please short +/P and P1 when DC reactor is not used.
3. All series have built-in braking unit. Please connect braking resistor between +/P and PR.
4. All series have built-in RFI filter to suppress electromagnetic interference. In order to comply with CE regulations, please refer to relevant instructions in the manual for installation.

Dimensions
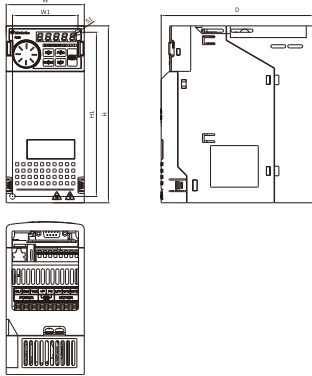
Frame A

Frame A

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	S1 (mm)
SE3-043-0.4~1.5K						
SE3-023-0.4~1.5K	74.0	62.0	167.0	155.0	144.0	5.2
SE3-021-0.4~0.75K						

Frame B
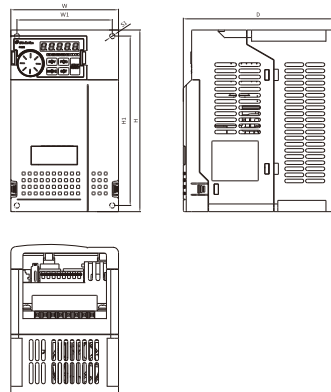
Frame B

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	S1 (mm)
SE3-043-2.2~3.7K						
SE3-023-2.2~3.7K	105.0	93.0	178.0	166.0	146.0	5.2
SE3-021-1.5~2.2K						

Frame C
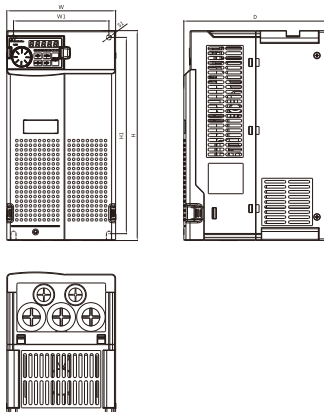
Frame C

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	S1 (mm)
SE3-043-5.5~11K						
SE3-023-5.5~7.5K	141.0	123.6	270.0	252.6	185.0	6.5
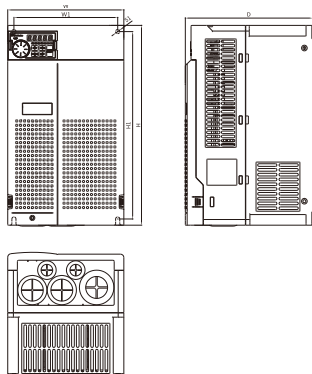
Frame D

Frame D

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	S1 (mm)
SE3-043-15~22K						
SE3-023-11~15K	175.0	156.4	300.0	281.4	191.8	6.2

SF3 series

**Communication
Vector Control Inverter**
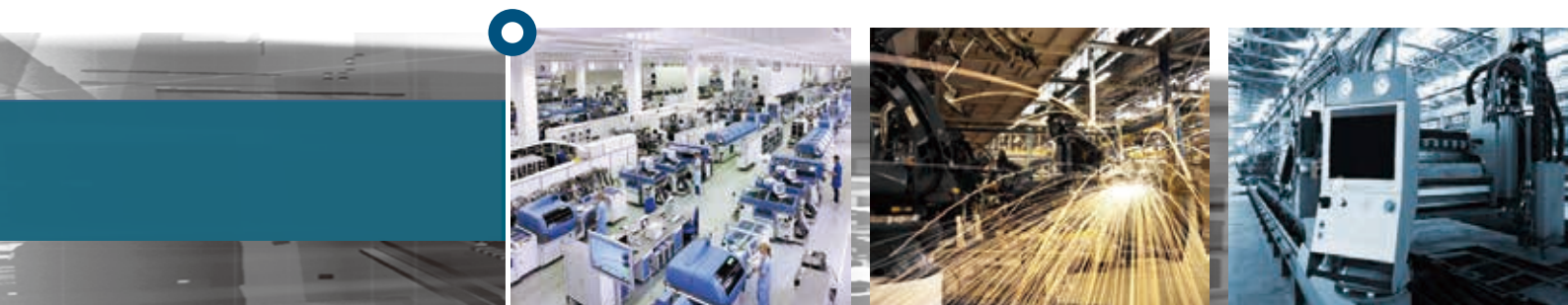
Product Range

Model		kW (HP)		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)
SF3	SF3-043	3 phase 440V	150%60s 200%3s																						
			120%60s																						

Model Identification

SF3   043 5.5K/3.7KG   XY

| Series	Voltage level	Capacity	Version
SF3 series	043：three phase 440V	ND:5.5kW HD:3.7kW	None：General model -xy：Customized or specialized or region difference

Product Features

Multi-Pump Control

• Multi-Pump Control (with EB308R), with multiple relays to support pump control. Controlling maximum of 7 pumps at the same time for 1 inverter.
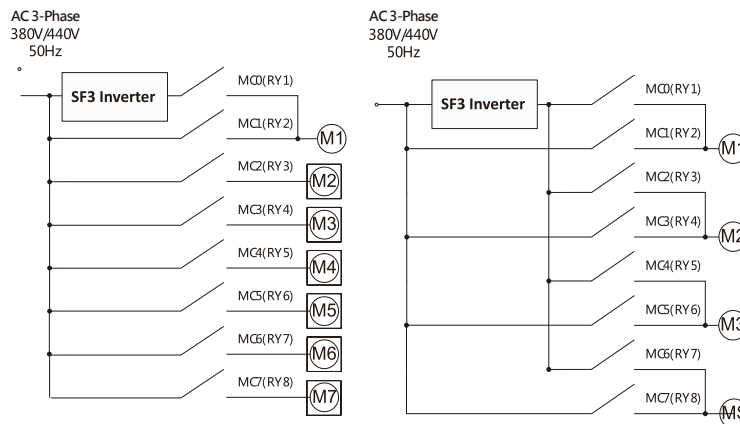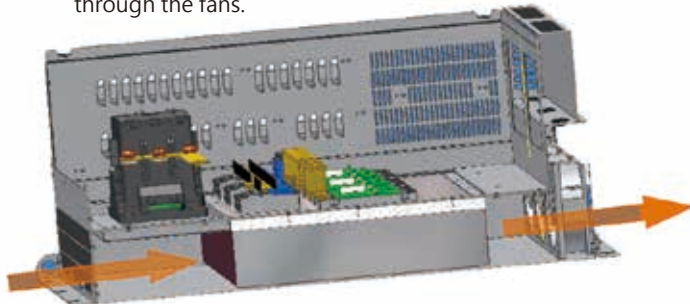
PC Communication Software

• This provides remote control of multiple inverters for parameters setup, copy and monitoring.
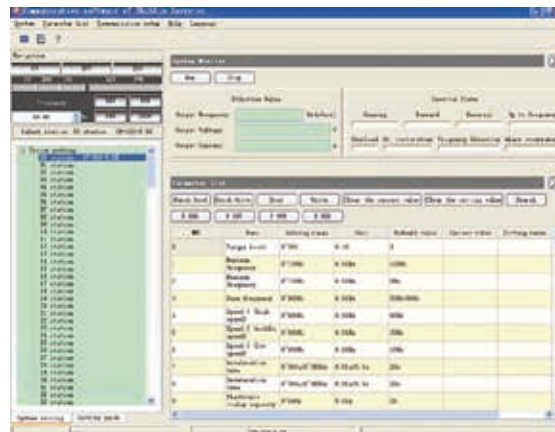
Product

1. Isolated Air Channel

- Ventilation (air flow path) is isolated from the surface of thermal dissipation units and electrical parts. Dust will not be able to infiltrate the interior of the inverter through the fans.

Note: Even though the cooling duct is complete isolated, but if the inverter is installed at the environment where lots of dust or oil gas with out protection, the dust will still pass into inverter.

2. Enhanced PCB Coating

- Protect drive and ensure its operation safety and stability.
- Compliance with international standards IEC 60721-3-3 class 3C2.

Moisture proof

Corrosion proof

Dust proof

3. Terminal Block for Quick Wiring

- Standard RJ45 internet connection with DA+, DB- Euroblock, easy connection for multi-machine communication.
- Support maximum 100kHz pulse input(HDI) and output(HDI) signal.

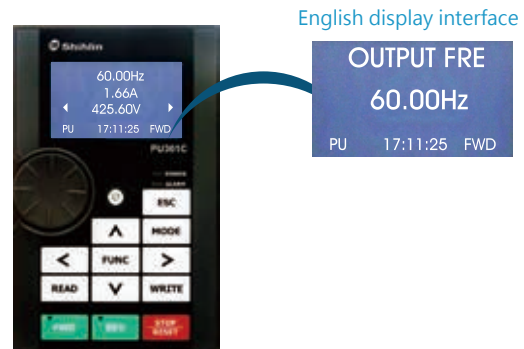Quick switch for application needs

Features

4. LCD Operation Interface

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

English display interface

60.00Hz
1.66A
425.60V
PU   17:11:25   FWD

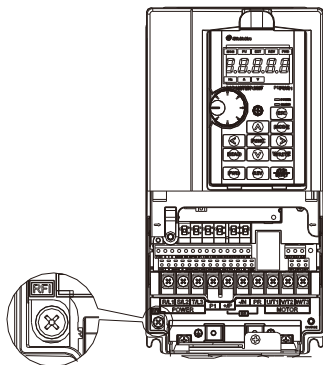OUTPUT FRE
60.00Hz
PU   17:11:25   FWD

5. 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.

Control Box

Inverter

Ventilation ports

Installation Frame

Cooling Fan
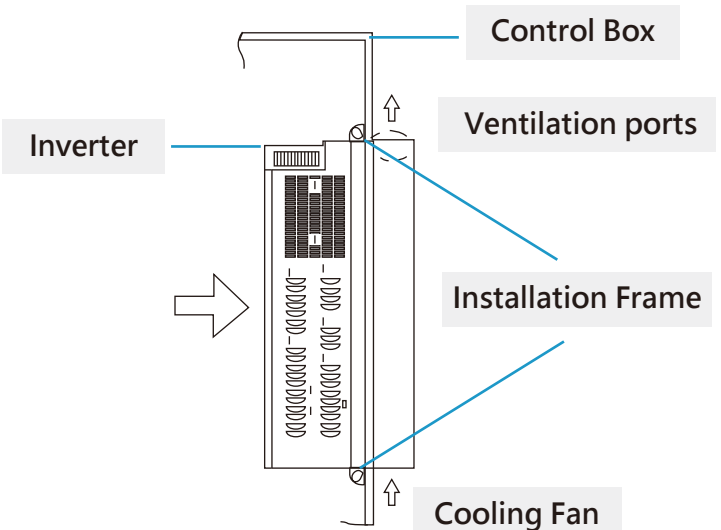
6. Built-in RFI Filter

- Reduce electromagnetic interference.

SF3 series

Communication
Vector Control Inverter

Electrical Specifications

440V three-phase

Frame			A		B			C				D		
Model SF3-043- □ K □ KG			5.5/3.7	7.5 /5.5	11/7.5	15/11	18.5/15	22/18.5	30/22	37/30	45/37	55/45	75/55	90/75
Output	ND	Rated output capacity (kVA)	10	14	18	25	29	34	46	56	69	84	114	137
		Rated output current (A)	13	18	24	32	38	45	60	73	91	110	150	180
		Applicable motor capacity (HP)	7.5	10	15	20	25	30	40	50	60	75	100	120
		Applicable motor capacity(kW)	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
		Overload current rating	120% 60 seconds (inverse time characteristics)											
		Carrier frequency (kHz)	1~15kHz					1~10kHz						
	HD	Rated output capacity (kVA)	6.9	10	14	18	25	29	34	46	56	69	84	114
		Rated output current (A)	9	13	18	24	32	38	45	60	73	91	110	150
		Applicable motor capacity (HP)	5	7.5	10	15	20	25	30	40	50	60	75	100
		Applicable motor capacity (kW)	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75
		Overload current rating	150% 60 seconds (inverse 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											
	Allowable fluctuating range of power voltage		Three-phase 342-528V 50Hz/60Hz											
	Allowable fluctuating range of power frequency		±5%											
	Power source capacity (kVA)		10.4	11.5	16	20	27	32	41	52	65	79	100	110
	Rated input current(A) (Note1)	HD	14	18	21	26	35	40	47	63	74	101	114	157
		ND	18	21	26	35	40	47	63	74	101	114	157	167
	Cooling method		Forced air cooling											
	Weight(kg)		3	3	6	6	6	10	10	10	11	25	26	30

Frame			E		F		G			H	
Model SF3-043- □ K □ KG			110 / 90	132 / 110	160 / 132	185 / 160	220 / 185	250 / 220	280 / 250	315 / 280	355 / 315
Output	ND	Rated output capacity (kVA)	168	198	236	295	367	402	438	491	544
		Rated output current (A)	220	260	310	340	425	480	530	620	683
		Applicable motor capacity (HP)	150	175	215	250	300	355	375	420	475
		Applicable motor capacity(kW)	110	132	160	185	220	250	280	315	355
		Overload current rating	120% 60 seconds (inverse time characteristics)								
		Carrier frequency (kHz)	1~9kHz								
	HD	Rated output capacity (kVA)	137	168	198	236	295	367	402	438	491
		Rated output current (A)	180	220	260	310	340	425	480	530	620
		Applicable motor capacity (HP)	120	150	175	215	250	300	335	375	420
		Applicable motor capacity (kW)	90	110	132	160	185	220	250	280	315
		Overload current rating	150% 60 seconds (inverse time characteristics)								
		Carrier frequency (kHz)	1~10kHz								
	Maximum output voltage		Three-phase 380-480V								
Power supply	Rated power voltage		Three-phase 380-480V 50Hz/60Hz								
	Allowable fluctuating range of power voltage		Three-phase 342-528V 50Hz/60Hz								
	Allowable fluctuating range of power frequency		±5%								
	Power source capacity (kVA)		137	165	198	247	295	367	402	438	491
	Rated input current(A) (Note1)	HD	167	207	240	300	380	400	500	550	650
		ND	207	240	300	380	400	500	550	650	700
	Cooling method		Forced air cooling								
	Weight(kg)		38	39	56	56	93	93	93	120	120

Note1:
The value of rated input current is not only affected by the power transformer, input reactor and wiring conditions but also fluctuates with the impedance on the power side.
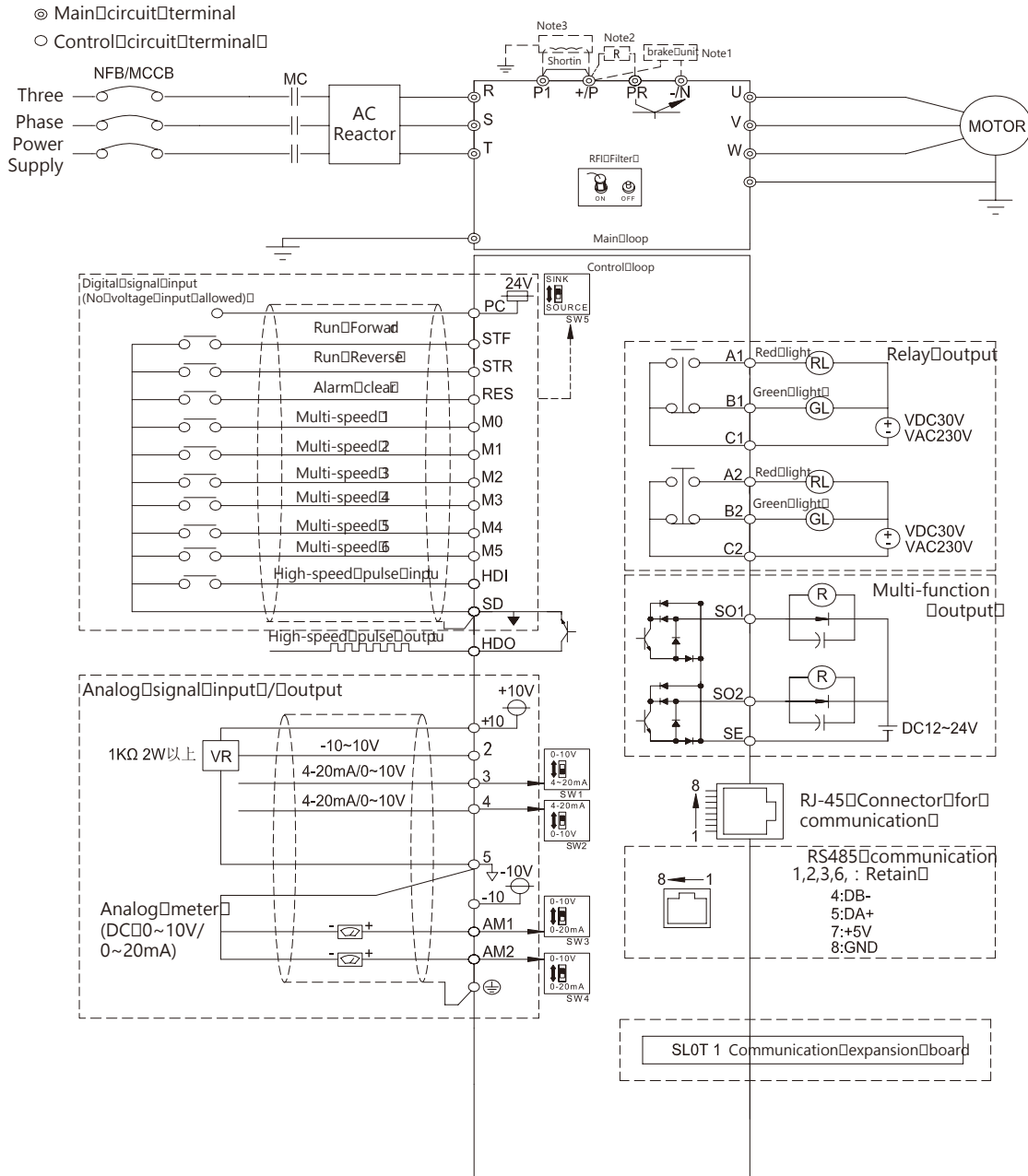
Note:
The test conditions of rated output current, rated output capacity and inverter power consumption are:the carrier frequency (P.72) is at the set value; the inverter output voltage is at 220V; the output frequency is at 60Hz, and the ambient temperature is 40℃.

Common Specifications

Control method		SVPWM, V/F, general flux vector control, sensorless vector control (SVC).
Output frequency range		0~599Hz
Frequency setting resolution	Digital setting	The resolution is 0.01 Hz when the frequency is set within 100 Hz; The resolution is 0.1 Hz when the frequency is set at above 100 Hz.
	Analog setting	11bit, DC 0~+5V or 4~20mA signal setting; 12bit, DC 0~+10V signal setting
Output frequency accuracy	Digital setting	Maximum target frequency±0.01%.
	Analog setting	Maximum target frequency±0.1%.
Speed control range		IM: When SVC, 1:200 , PM: When SVC,1:20.
Start torque		150% 0.5Hz (SVC)。
V/F characteristics		Constant torque curve, variable torque curve, five-point curve, VF separation.
Acceleration / deceleration curve characteristics		Linear acceleration /deceleration curve, S pattern acceleration / deceleration curve1 & 2 & 3.
Drive motor		Induction motor(IM), permanent magnet synchronous motor (SPM, IPM).
Current stall protection		The stall protection level can be set to 0~200%(06-01(P.22)). The default value is 120%(HD) /150%(ND).
Target frequency setting		Keypad setting, DC 0~5V/10V signal, DC -10~+10V signal, DC 4~20 mA signal, multi- speed stage level setting, communication setting, HDI setting.
PID control		Please refer to SF3 user manual.
Built-in simple PLC		Supports 21 basic instructions and 14 application instructions, including PC editing software please refer to manual at build-in PLC chapter.
Keypad	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, external terminal status··· ; at most 12 groups of alarm records, the last group of alarm message is recorded.
	LED indicator (8)	Forward rotation indicator, reverse rotation indicator, frequency monitoring indicator, voltage monitoring indicator, current monitoring indicator, mode switch indicator, PU control indicator and external terminal control indicator.
Communication		RS-485 communication, can select Shihlin/Modbus communication protocol, communication speed up to 115200bps, CANOpen protocol (with optional CP301 expanded board).
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. capacitor overheat, input and output phase loss, to-earth(ground) current leakage protection, circuit error detection···
Environment	Ambient temperature	-10 ~ +40℃ (non-freezing)
	Ambient humidity	Below 90%Rh (non-condensing).
	Storage temperature	-20 ~ +65℃。
	Surrounding environment	Indoor, no corrosive gas, no flammable gas, no flammable dust.
	Altitude	Altitude below 2000. When altitude is above 1000, derate the rated current 2% per 100m.
	Vibration	Vibration below 5.9m/s^2 (0.6G).
	Grade of protection	IP20 for frames A, B and C, IP00 for frame D and above (IP20 accessories is optional)
	The degree of environmental pollution	2
	Class of protection	Class I
International certification		$C\epsilon$

Wiring Diagram

◎ Main circuit terminal
○ Control circuit terminal

Three Phase Power Supply

NFB/MCCB

MC

AC Reactor

Note3 Shortin
Note2 R
brake unit Note1

R P1 +/P PR -/N
S
T

RFI Filter
ON OFF

Main loop

MOTOR

U
V
W

Control loop

Digital signal input (No voltage input allowed)

24V
SINK
SOURCE
SW5

PC

Run Forward — STF
Run Reverse — STR
Alarm clear — RES
Multi-speed1 — M0
Multi-speed2 — M1
Multi-speed3 — M2
Multi-speed4 — M3
Multi-speed5 — M4
Multi-speed6 — M5
High-speed pulse input — HDI
SD
High-speed pulse output — HDO

Relay output

A1 Red light RL
B1 Green light GL
C1

VDC30V
VAC230V

A2 Red light RL
B2 Green light GL
C2

VDC30V
VAC230V

Multi-function output

SO1 R
SO2 R
SE

DC12~24V

Analog signal input/output

+10V

1KΩ 2W以上 VR

+10

-10~10V 2
4-20mA/0~10V 3
4-20mA/0~10V 4

0~10V
4~20mA
SW1

4~20mA
0~10V
SW2

5 -10V
-10

Analog meter (DC 0~10V/ 0~20mA)

AM1

AM2

0~10V
0~20mA
SW3

0~10V
0~20mA
SW4

8
1
RJ-45 Connector for communication

8 — 1

RS485 communication
1,2,3,6, : Retain
4:DB-
5:DA+
7:+5V
8:GND

SL0T 1 Communication expansion board

NOTE

1. Braking resistor wiring method between +/P and PR is only for frame A, B and C. For frame D, E, G and H, the braking resistor is connect between (+/P)-(-N).

2. DC reactor can be added between +/P and P1. When DC reactor is not in used, short those terminals.

3. When adding DC reactor, the jumper between +/P and P1 must be removed.

Dimensions
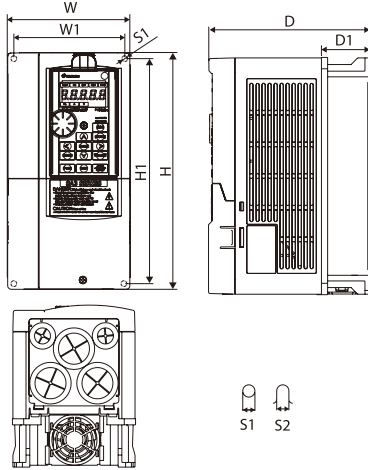
Frame A

Frame A

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
SF3-043-5.5K/3.7KG	130.0	116.0	250.0	236.0	170.0	51.3	6.2	6.2
SF3-043-7.5K/5.5KG								

Frame B
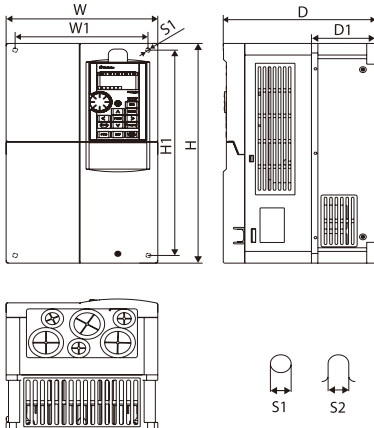
Frame B

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
SF3-043-11K/7.5KG	190.0	173.0	320.0	303.0	190.0	80.5	8.5	8.5
SF3-043-15K/11KG								
S F 3 - 0 4 3 - 18.5K/15KG								

Frame C
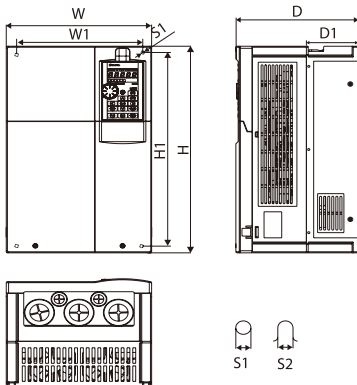
Frame C

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
S F 3 - 0 4 3 - 22K/18.5KG	250.0	231.0	400.0	381.0	210.0	89.5	8.5	8.5
SF3-043-30K/22KG								
SF3-043-37K/30KG								
SF3-043-45K/37KG								

Dimensions

Unit : mm
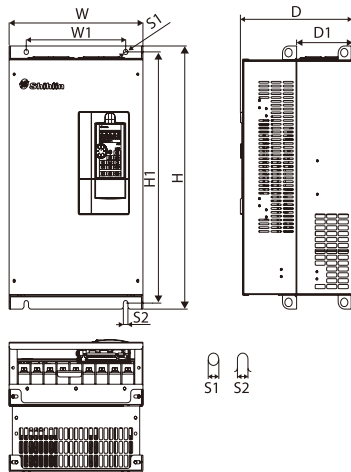
Frame D

Frame D

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
SF3-043-55K/45KG								
SF3-043-75K/55KG	330.0	245.0	550.0	525.0	275.0	137.5	11.0	11.0
SF3-043-90K/75KG								

Frame E
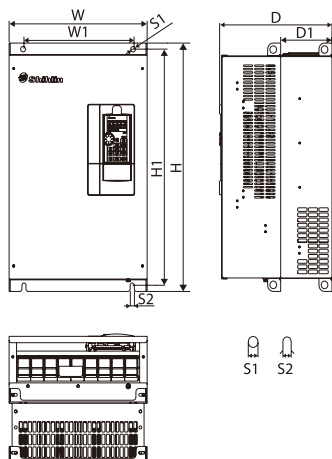
Frame E

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)
SF3-043-110K/90KG								
SF3-043-132K/110KG	370.0	295.0	589.0	560.0	300.0	137.5	11.0	11.0
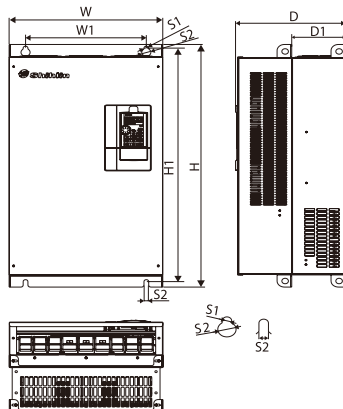
Frame F

Frame F

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)	S3 (mm)
SF3-043-160K/132KG									
SF3-043-185K/160KG	420.0	330.0	800.0	770.0	300.0	145.5	13.0	25.0	13.0

Dimensions

Unit : mm

Frame G
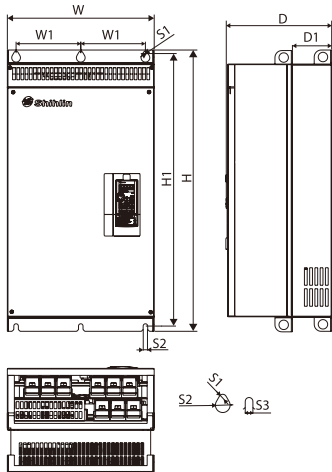
Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)	S3 (mm)
SF3-043-220K/185KG									
SF3-043-250K/220KG	500.0	180.0	870.0	850.0	360.0	150.0	13.0	25.0	13.0
SF3-043-280K/250KG									

Frame H
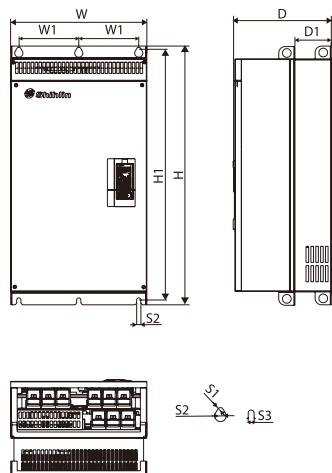
Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	S1 (mm)	S2 (mm)	S3 (mm)
SF3-043-315K/280KG									
SF3-043-355K/315KG	600.0	230.0	1000.0	980.0	400.0	181.5	13.0	25.0	13.0

Keypad Dimensions

PU301、 PU301C

114.7
72
10.95 18 36 4×M3
92.8
9 15
26.9
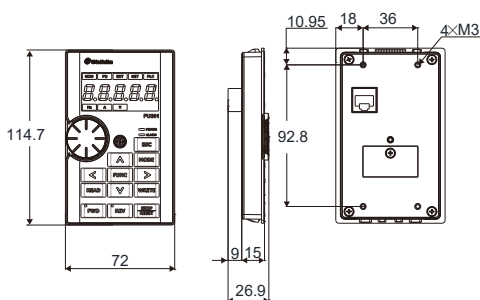
Flat Spring Installation

SMK301 (PU301. PU301C Mounting kit)

M3×5 Pan head screw

Copperplate
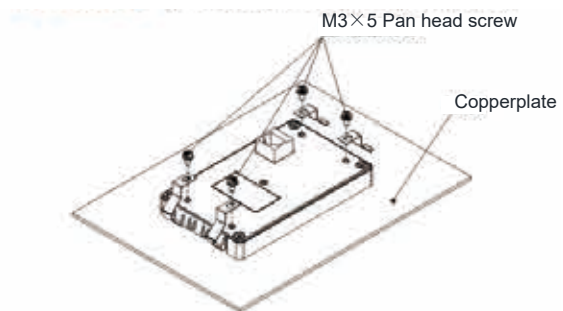
SA3 series

**Advanced Closed Loop
Communication Inverter**
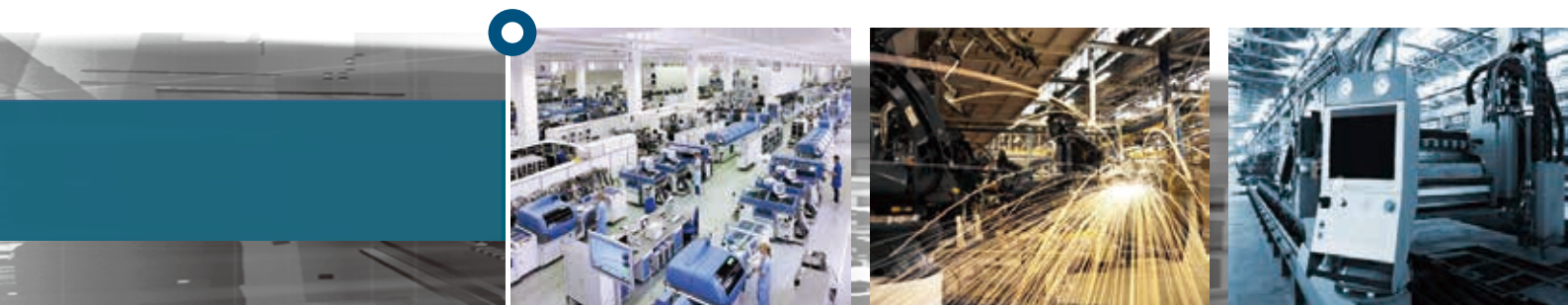
Product Range

| 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) | 355 (475) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SA3** | S A 3 - 023 | 3 phase 220V | 150%60s 200%3s | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 120%60s | | | | | | | | | | | | | | | | | | | | | | | | | |
| | S A 3 - 043 | 3 phase 440V | 150%60s 200%3s | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 120%60s | | | | | | | | | | | | | | | | | | | | | | | | | |

Product Features

High Performance Vector Control Technology
- Vector control and Sensorless vector control.
- High starting torque: Sensorless vector control (SVC)150% 0.3Hz, and closed-loop vector control(FOC + PG) 180% 0Hz.
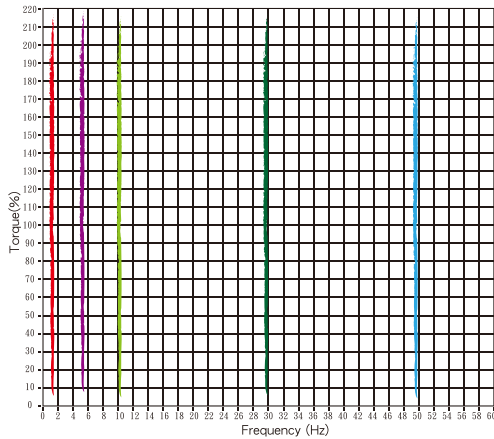

High Response Performance
- Speed accuracy: less than 1% with 0 to 100% load variation.
- For applications with sudden load changes such as cranes and metal processing machinery.
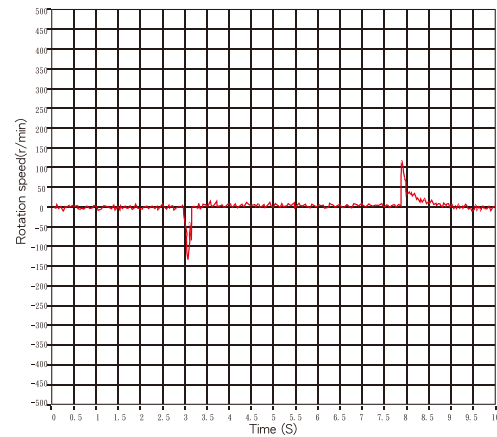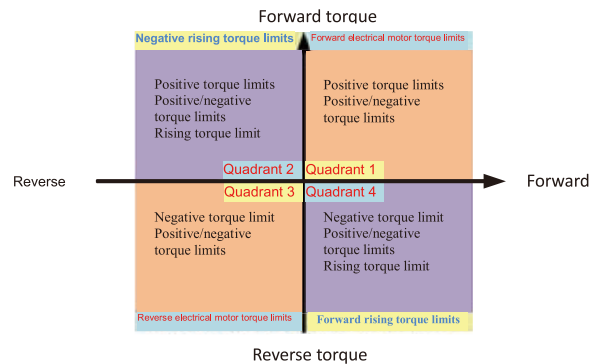

Excellent Overload Endurance
- With a current overload capability of 150% for 60 seconds and 200% for 3 seconds, the setting is suitable for handling large sudden load changes applications such as tooling machinery.
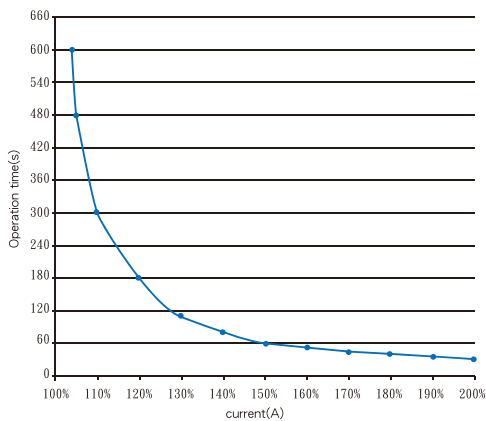

4-Quadrant Torque Control and Limits
- Parameters or analog signals can be used to simply establish limits for 4 torque items.

Product Features

Temporary Compensation at Low Voltage

- When temporary shut-down occurs, output frequency will be controlled to maintain DC bus voltage of the inverter to decelerate the motor.
- When power resumes, inverter will control the motor to accelerate to its previous speed.
- Applicable for machines that are not able to commence free-run while decelerating.
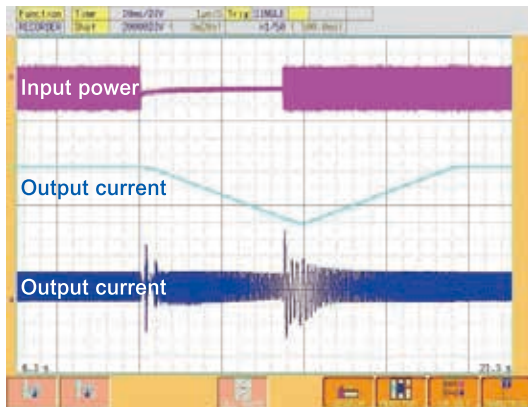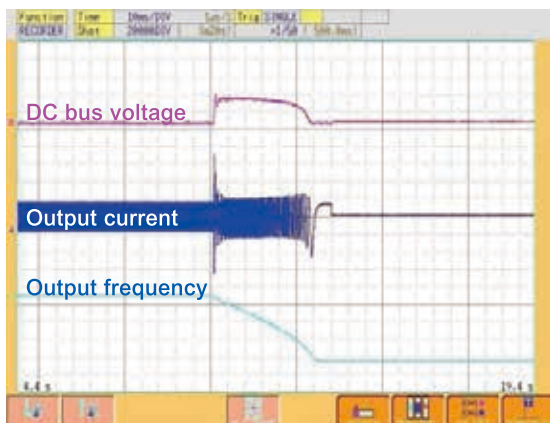

Magnetic Flux Brake

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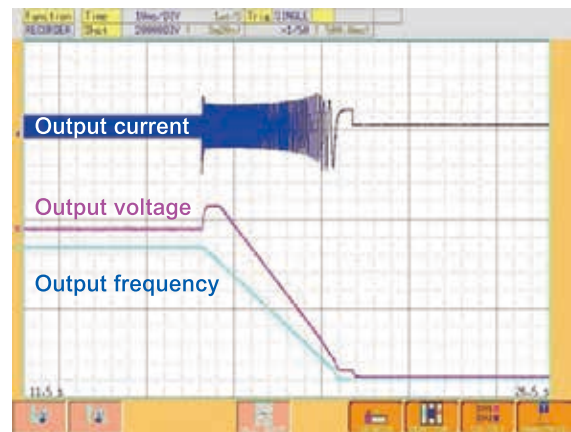

Regeneration Avoidance Functions

- By adjusting output frequency and voltage, 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.
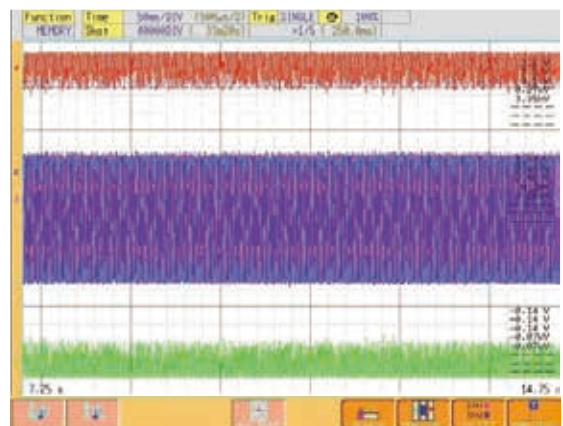
Product Features

Advanced Synchronous Motors Control Technology
• Support both induction and permanent magnet
  motors with open-loop control.

Induction motor (IM)

Synchronous motor (IPM)

Synchronous motor (SPM)

LCD Operation Interface
• Support 2 display styles.
• Able to simultaneously display 6 sets of operational data.
• Calendar support.
• Offer both English and Chinese language interfaces.
• Capable of storing 3 sets of parameters.
• Support shuttle settings.

English display interface

OUTPUT FRE
60.00Hz
PU   17:11:25   FWD

60.00Hz
1.66A
425.60V
PU   17:11:25   FWD

Isolated Air Channel
• 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.
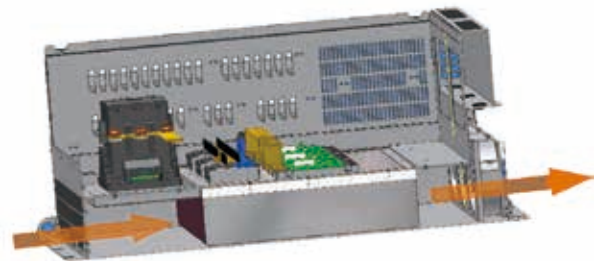
Multiple Control Modes for Various Applications
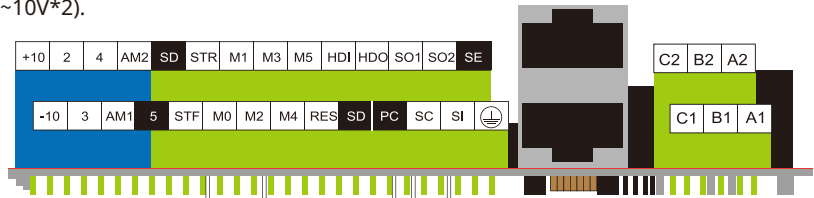• Position / Speed / Torque / Tension control mode
• Combination mode (e.g. speed+torque) can be achieved via I/O switch.
• Advanced position control functions:
  Homing commands, zero speed, Pr/Pt mode(with optional PG cards).
• Support open-loop tension control, feeding disruption inspection and
  automatic spool replacement functions.

Wire Drawing Machine

Cloth Drawing Machine

automation.seec.com.tw
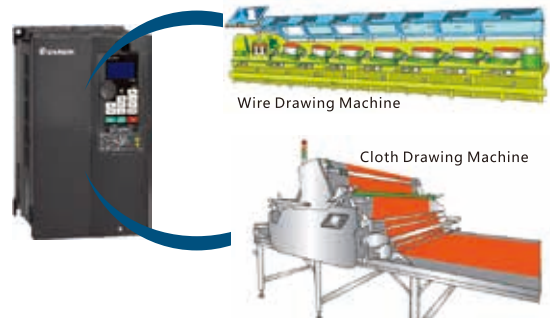
Product Features

Multiple I/O Terminals

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

| +10 | 2 | 4 | AM2 | SD | STR | M1 | M3 | M5 | HDI | HDO | SO1 | SO2 | SE | | | C2 | B2 | A2 |
| -10 | 3 | | AM1 | 5 | STF | M0 | M2 | M4 | RES | SD | PC | SC | SI | ⏚ | | C1 | B1 | A1 |

Built-in PLC Functions

- Provide PLC programming software, easy for editing.
- Applicable for programming small number of points, and support multiple functions.
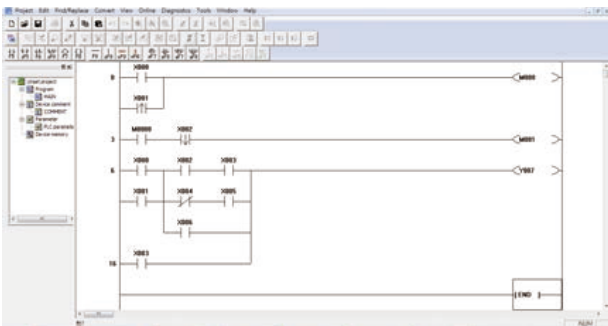
Item		SA3 PLC functions
Programming Language		Ladder diagram + Command
Basic commands		21
Applicable commands		14
Processing speed	Basic commands	1 μs
	Applicable commands	10μs
Hidden program capacity		400 steps(0-399 steps)
1/0 configuration	Input(X)	22 points(X0~X25,octal)
	Output(Y)	20 points (YO~Y23, octal)
Supporting electric relay (M)	General	160 points, MO~M159
	Battery backed	80 points, M160~M239
	Special	64 points,M8000~M8063
Timer(T)	100ms	8 points, TO~T7, timer range: 0~6553.5 seconds
Counter(C)		8 points, CO~C7, counting range: 0~65535
Data register	General	32 points, DO~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.

Control Box
AC Drive
Ventilation ports
Installation Frame
Cooling Fan
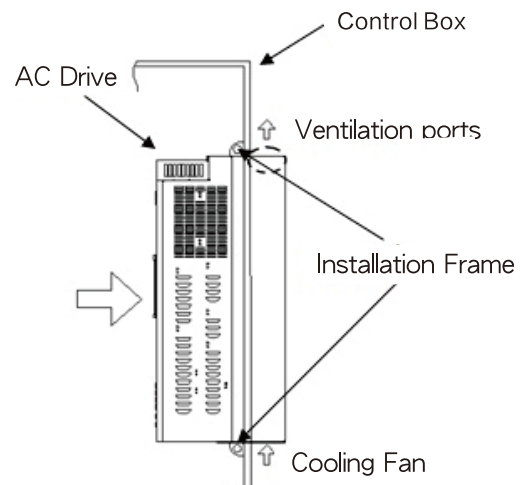
12 Sets of Alarm Records

- Complete alarm system for recording the output frequency, output current, output voltage, accumulated count of temperature increase, PN voltage, total operation time, operational status, alarm output time(only when used with PU301C).

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.

Built-in RFI filer

- Reduce electromagnetic interference.

RFI FILTER
ON/OFF CONNECTOR
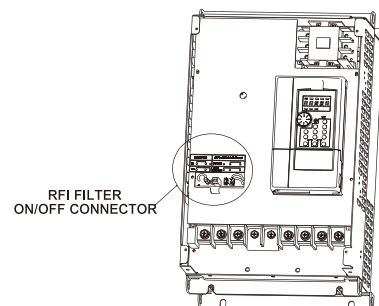
Model Identification

SA3	043	0.75K/1.5KF	XY

Series	Voltage level	Capacity	Version
SA3 series	043：three phase 440V 023：three phase 220V	HD : 0.75kW ND : 1.5kW	None：General model -xy：Customized or specialized or region difference

Electrical Specifications

220V Three-phase Series

Frame			A				B			C		D			E		F	G
Model SA3-023- □ -xy			075K 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	90K 110KF	110K 132KF
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	132	165
		Rated output current (A)	5	8	11	17.5	25	33	49	65	75	90	120	145	170	215	288	346	432
		Applicable motor capacity (HP)	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	120	145
		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	90	110
		Overload current rating	150% 60 seconds 200% 3 seconds (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	165	193
		Rated output current (A)	8	11	17.5	25	33	49	65	75	90	120	145	170	215	288	346	432	506
		Applicable motor capacity (HP)	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	120	145	175
		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	110	132
		Overload current rating	120% 60 seconds (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	132	165
	Rated input current(A) (Note1)	HD	6	12	16	20	28	35	52	72	83	93	124	143	180	250	300	380	450
		ND	12	16	20	28	35	52	72	83	93	124	142	180	250	300	380	450	520
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	89.2	90.2

Note1:
The value of rated input current is not only affected by the power transformer, input reactor and wiring conditions but also fluctuates with the impedance on the power side.

Note:
The test conditions of rated output current, rated output capacity and inverter power consumption are:the carrier frequency (P.72) is at the set value; the inverter output voltage is at 220V; the output frequency is at 60Hz, and the ambient temperature is 40℃.

SA3 series

Advanced Closed Loop Communication Inverter

Electrical Specifications

440 V Three-phase Series

Frame			A					B			C			D
Model SA3-043-□-xy			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% 3 seconds (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% 60 seconds (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
	Rated input current(A) (Note1)	HD	4.0	5.9	8.7	14	17	20	26	35	40	47	63	74
		ND	5.9	8.7	14	17	20	26	35	40	47	63	74	101
	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-□-xy			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% 60 seconds (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
	Rated input current(A) (Note1)	HD	101	114	157	167	207	240	300	380	400	500	550	650
		ND	114	157	167	207	240	300	380	400	500	550	650	700
	Cooling method		Self cooling	Forced air cooling										
	Weight(kg)		33	33	33	42.7	42.7	56.5	84	84	84	84	123	123

Note1:
The value of rated input current is not only affected by the power transformer, input reactor and wiring conditions but also fluctuates with the impedance on the power side.

Note:
The test conditions of rated output current, rated output capacity and inverter power consumption are:the carrier frequency (P.72) is at the set value; the inverter output voltage is at 220V; the output frequency is at 60Hz, and the ambient temperature is 40℃.
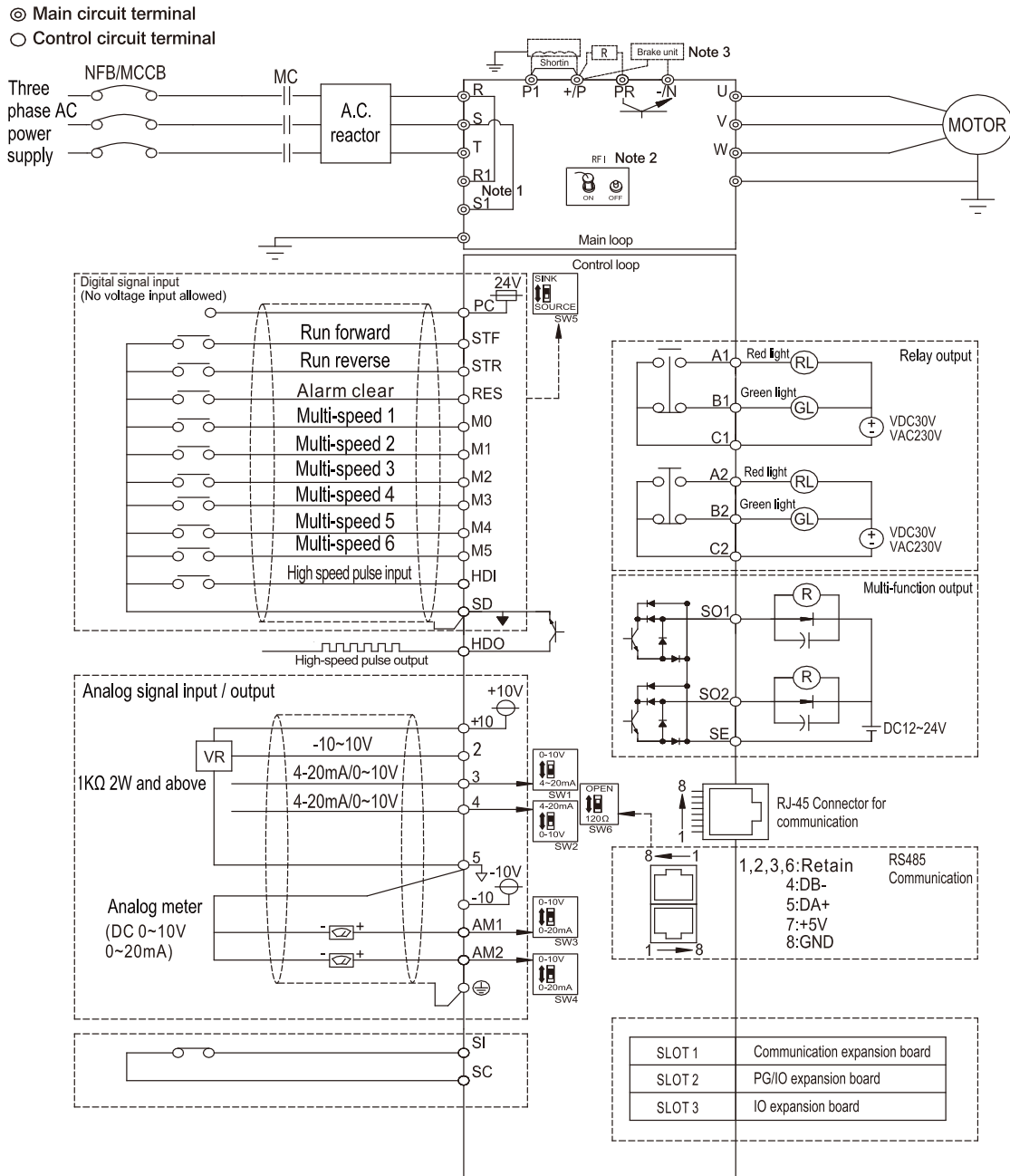
Common Specifications

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		0~599.00Hz
Frequency setting resolution	Digital 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 (terminal 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	Digital setting	Maximum target frequency ± 0.01%.
	Analog setting	Maximum target frequency ± 0.1%.
Speed control range		IM: When SVC, 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 torque curve, five-point curve, VF separation
Acceleration / deceleration curve characteristics		Linear acceleration / deceleration curve, S shape acceleration / deceleration curve1 & 2 & 3
Drive motor		Induction motor (IM), permanent magnet motor(SPM, IPM)
Stalling protection		The stalling protection level can be set to 0~400% (06-01(P.22)). The default value is 150%.
Target frequency setting		Keypad setting, DC 0~5V/10V signal, DC -10~+10V signal, DC 4~20 mA signal, multi-speed stage level setting, communication setting, HDI setting.
PID control		Please refer to 08-00~08-01、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;
Keypad	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 indicator (10)	Forward rotation indicator, reverse rotation indicator, frequency monitoring indicator, voltage monitoring indicator, current monitoring dedicator, NET dedicator, PU control indicator, EXT indicator, PLC indicator and MON monitoring indicator.
Communication function		RS-485 communication, can select Shihlin/Modbus communication protocol, communication speed up to 115200bps, built-in CanOpen protocol (with CP301 expansion card), double RJ-45 connectors (the connector can also be connected to keypad)
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	Heavy duty : -10 ~ +50°C (non-freezing), Light duty : -10 ~ +40°C (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 ~ +65°C
	Surrounding environment	Indoor, no corrosive gas, no flammable gas, no flammable dust.
	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 regulation EN61800-5-1, which is required to declare in CE certification, this series of inverters can be installed in an environment of over-voltage class II when the altitude is less than 3000m. When the altitude is less than 2000m, can be installed in harsher conditions that meet the requirements of over-voltage class III.
	Vibration	Vibration below 5.9m/s² (0.6G)
	Grade of protection	Frame A, B, C, IP20 / NEMA TYPE 1, Frame D and above IP00 / UL OPEN TYPE (optional IP20 accessories can be added).
	The degree of environmental pollution	2
	Class of protection	Class I
International certification		CE

Wiring Diagram

◎ Main circuit terminal
○ Control circuit terminal

NOTE

1.R1 S1 terminal is only for frame D~H.
2.The connection of braking resistor between +/P and PR is only for frame A, B and C. For frame D and above,
  please connect a braking unit between +/P and –N.
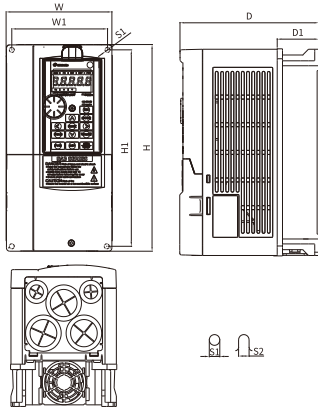3.The DC reactor between + / P and P1 is optional, please short + / P and P1 when DC reactor is not used.
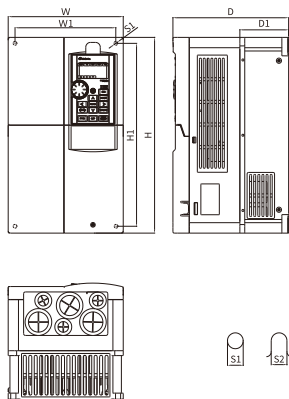
Dimensions

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								
SA3-043-1.5K/2.2KF								
SA3-043-2.2K/3.7KF								
SA3-043-3.7K/5.5KF								
SA3-043-5.5K/7.5KF	130.0	116.0	250.0	236.0	170.0	51.3	6.2	6.2
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								
SA3-043-11K/15KF								
SA3-043-15K/18.5KF	190.0	173.0	320.0	303.0	190.0	80.5	8.5	8.5
SA3-023-5.5K/7.5KF								
SA3-023-7.5K/11KF								
SA3-023-11K/15KF								

Frame C
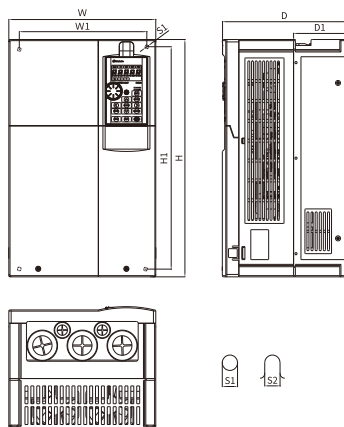
Frame C

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

Dimensions

Unit : mm
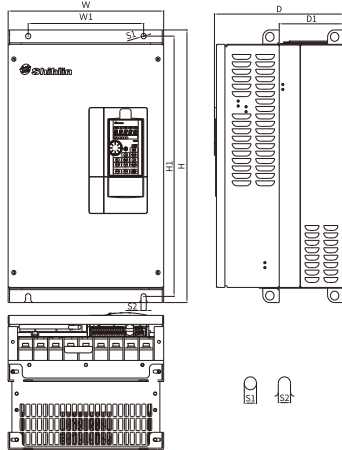
Frame D

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
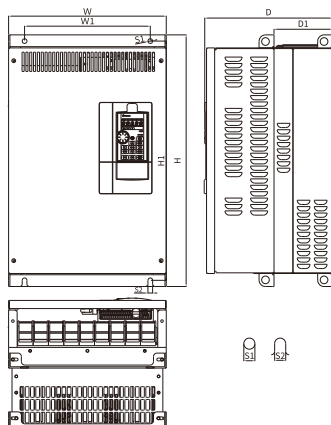
Frame E

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
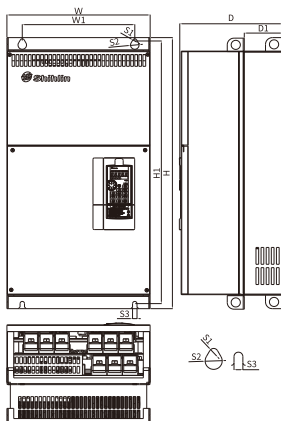
Frame F

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
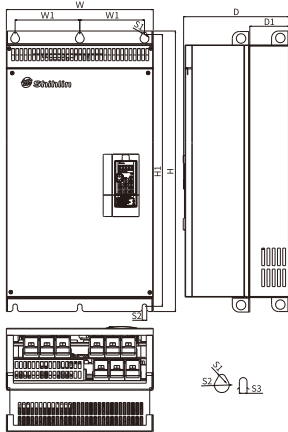
Frame G

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									
SA3-023-90K/110KF									
SA3-023-110K/132KF									

Frame H
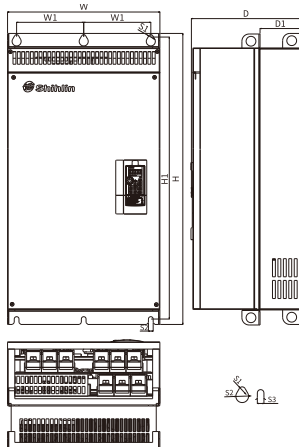
Frame H

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									

Optional Accessory

Expansion Card - SF3 / SE3 / SA3 Series

PD302
Profibus communication
expansion card

DN301
DeviceNet communication
expansion card

CP301
CANopen communication
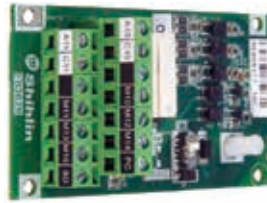expansion card

EP301
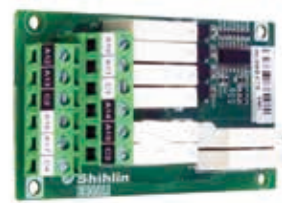Ethernet communication
expansion card

EB362R
I/O expansion card

EB308R
I/O expansion card

EC301-□□
EtherCAT communication
expansion card
□□ SA3:A3, SE3:E3, SF3:F3

PG301C (SE3/SA3 Only)
Encoder feedback card
(supports open collector type output)

PG301L (SE3/SA3 Only)
Encoder feedback card
(supports differential type output)

PG302L (SE3/SA3 Only)
Encoder feedback card
(supports Resolver signal)

CMK301 (SE3 Only)
For installing expansion
card on SE3

Optional Accessory

Keypad

PU301 (SL3/SC3/SE3/SF3/SA3)

PU301C(SA3/SF3)

PU302(SE3)

DU06 (SL3/SC3/SS2)
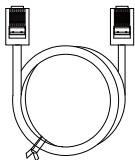

DU10(SS2/SC3)

DU08S (SL3/SC3/SS2)

Others

Data Cable

CBL1R5/03/05GT

CBL1R5/03/05/10GTN2
(SL3/SC3/SF3/SA3)

RS-485 Adapter

USB01
USB to RS-485

AC/DC Reactor
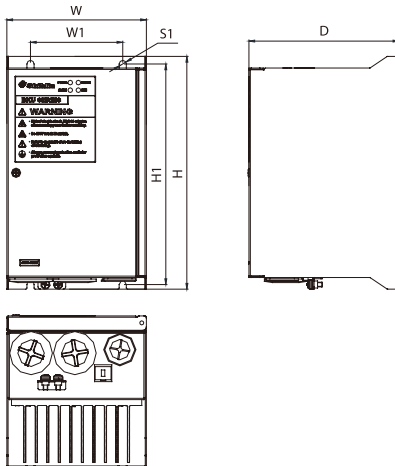
Braking Unit (BKU)

Model Identification

BKU	040	45K		XY

Series	Voltage level	Capacity	Version
BKU series	-040 : 400V -020 : 200V	37kW 45kW 110kW 160kW	None : General model -xy : Customized or specialized or region difference

Feature

Durable appearance , IGBT modularized, great cooling, single and multi use.
wiring friendly, can be used in variety brand of VFD

Dimension

Unit : mm

Frame A

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	S1 (mm)
BKU-020-37K	121	80	200	189.5	130	6.4
BKU-040-45K						

Frame B

Model type	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	S1 (mm)
BKU-020-110K	233.5	193.5	343	329	190	6.4
BKU-040-160K						

Braking Unit & Braking Resistor Application Table

Voltage	Motor Rating	Equivalent Braking Resistor	Braking Unit Model	Unit	Braking Resistor (20%ED, 125% Braking torque) Specification	Unit
200V	22kW	10800W 6.8Ω	BKU-020-37K	1	1200W 6.8R	9
	30kW	13500W 5Ω	BKU-020-37K	1	1500W 5R	9
	37kW	21600W 4Ω	BKU-020-37K	1	1200W 8R	18
	45kW	21600W 3.4Ω	BKU-020-37K	2	1200W 6.8R	18
	55kW	27000W 2.5Ω	BKU-020-37K	2	1500W 5R	18
	75kW	19200W 2Ω	BKU-020-37K	2	1200W 8R	16
	90kW	25000W 2R	BKU-020-110K	1	1000W 50R	25
	110kW	24000W 1.6R	BKU-020-110K	1	1200W 8R	20
400V	37kW	21600W 16Ω	BKU-040-45K	1	1200W 8R	18
	45kW	21600W 13.6Ω	BKU-040-45K	1	1200W 6.8R	18
	55kW	20000W 10Ω	BKU-040-45K	2	1000W 50R	20
	75kW	43200W 6.8Ω	BKU-040-45K	2	1200W 6.8R	36
	90kW	43200W 6.8Ω	BKU-040-45K	2	1200W 6.8R	36
	110kW	36000W 5.6Ω	BKU-040-45K	3	1000W 50R	36
	132kW	54000W 4.4Ω	BKU-040-45K	3	1200W 8R	45
	160kW	38400W 4Ω	BKU-040-160K	1	1200W 8R	32
	185kW	38400W 3.4Ω	BKU-040-160K	2	1200W 6.8R	32
	220kW	57600W 2.7Ω	BKU-040-160K	2	1200W 8R	48
	250kW	48000W 2.5Ω	BKU-040-160K	2	1500W 5R	32
	280kW	67200W 2.3Ω	BKU-040-160K	2	1200W 8R	56
	315kW	67200W 1.9Ω	BKU-040-160K	2	1200W 6.8R	56
	355kW	72000W 1.7Ω	BKU-040-160K	3	1500W 5R	48

Note: If an adjustment of ED percentage is needed, please refer to the user manual for the connections of resistors.

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