

SF3-043-5.5K/3.7KG ~ 355K/315KG

Thank you for choosing Shihlin inverters SF3 series.

This instruction will explain the general using of SF3 and points which need attention. Please read this instruction carefully before installation in order to use the inverter correctly and safely. **Safety Instructions**

**Safety Instructions**

- ✓ **Installation, operation, maintenance and inspection must be performed by qualified personnel.**
- ✓ **In this instruction, the safety instruction levels are classified into "Warning" and "Caution".**
- ⚠ **Warning: Incorrect handling may cause hazardous conditions, resulting in death or severe injury.**
- ⚠ **Caution: Incorrect handling may cause hazardous conditions, resulting in medium or slight injury, or may cause only material damage.**

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⚠ **Warning**

- ✓ Do not open the front cover or the wiring cover when the inverter is power ON. Do not run the inverter with the front cover or the wiring cover removed. Otherwise, you may come into contact with high voltage terminals and charging parts and result in electric shock.
- ✓ If change wiring or inspection is needed, first turn off the power of the inverter. When the inverter CHARGE LED is on, it indicates that there is still high voltage inside the inverter. Do not touch the internal circuit and components. Use a voltmeter to measure the voltage between +P and -N, it needs to be below 24Vdc before operating.
- ✓ The inverter must be connected to the ground properly.
- ✓ Do not operate or touch the heat sink or cables with wet hands. Otherwise you may get an electric shock.
- ✓ Do not change the cooling fan while power ON. It is dangerous to change the cooling fan while power ON.

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⚠ **Caution**

- ✓ The voltage applied to each terminal must be the ones specified in the Instruction Manual. Otherwise burst, damage, etc. may occur.
- ✓ Do not conduct a high voltage test on the components inside the inverter, semiconductors in the inverter are easy to break and damage by high voltage.
- ✓ After the inverter run in a period of time, the temperature will rise, don't touch the area outside the keypad otherwise burn may occur.
- ✓ Do not misconnect between terminals. Otherwise burst, damage, etc. may occur.
- ✓ The polarity (+ and -) must be correct. Otherwise burst, damage, etc. may occur.
- ✓ Inverter must be installed on a nonflammable wall without holes (so that nobody touches the inverter heat sink on the rear side, etc.). Mounting it to or near flammable material may cause a fire.
- ✓ If the inverter has become faulty, the inverter power must be switched OFF. A continuous flow of large current may cause a fire.
- ✓ Do not connect a resistor directly to the DC terminals +P and -N. Doing so could cause a fire.

1) Product model

**SF3-043-5.5K/3.7KG-xy**

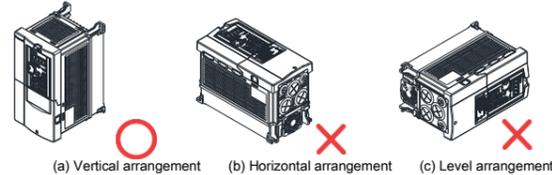
Series category	Voltage level	Capacity	Others
SF3 series	-043 : 400V three phase	Heavy duty : 3.7kW Normal Duty : 5.5kW	none : general model -xy : customized or specialized or reign model

2) Installation Environment

Ambient temperature	-10 ~ +40°C (non-freezing) Set "constant rated current, lower carrier frequency when temperature rise", or "constant carrier frequency, lower rated current when temperature rise"
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	Below 2000 meters, when altitude is over 1000 meters, lower 2% capacity per 100 meters higher.
Vibration	Lower than 5.9m/s <sup>2</sup> (0.6G)
Protection	A, B, C frame IP20, D frame or above IP00( can add IP20 accessories )
Pollution level	2

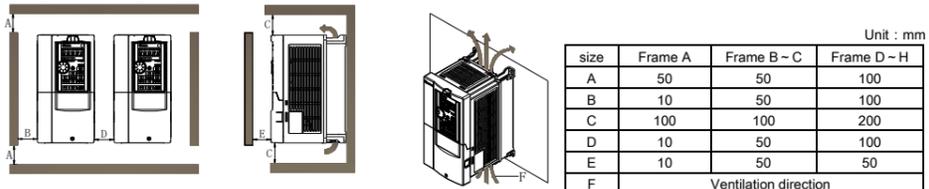
3) Installation and Wiring

➢ Please ensure vertical arrangement to keep the cooling effect:

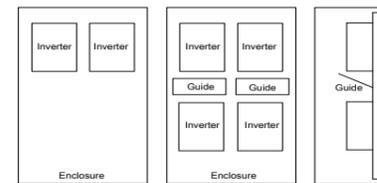


➢ Please comply with installation conditions shown below to ensure enough ventilation space and wiring space for inverter cooling

Arrangement of single or paralleling inverter:



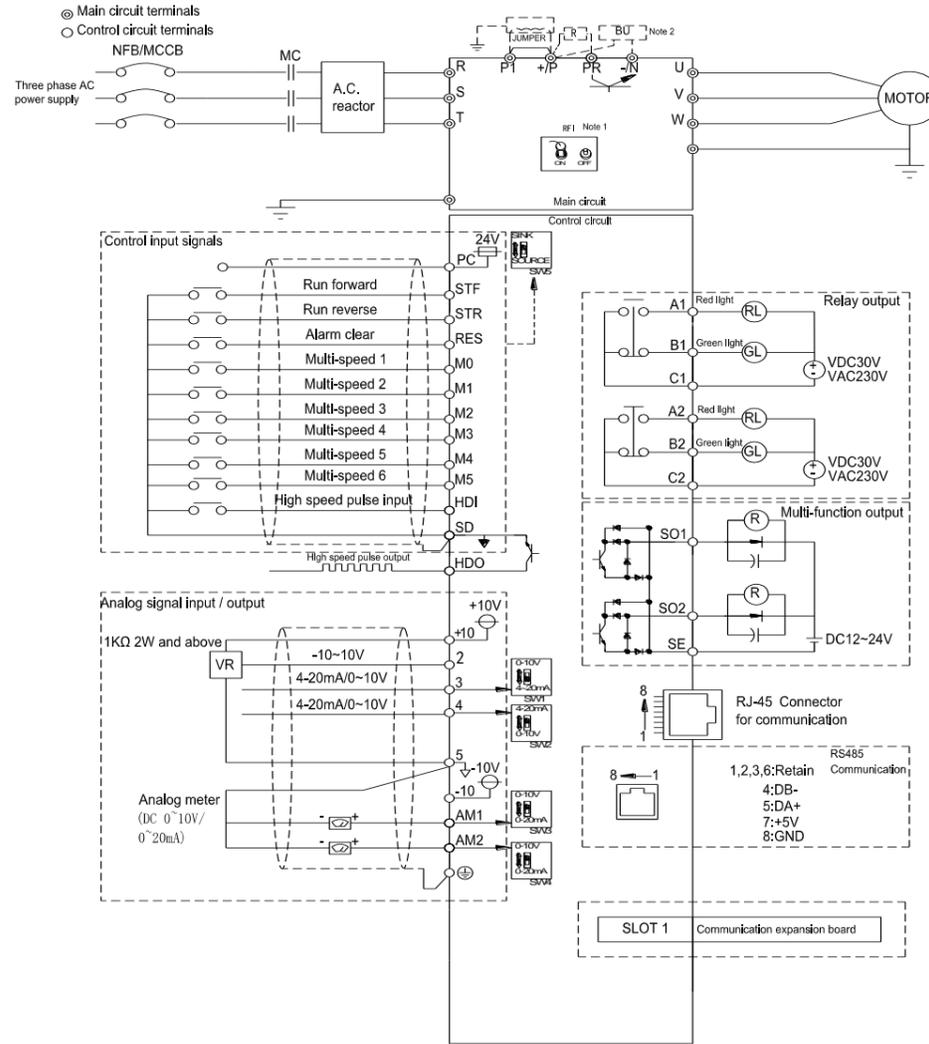
Arrangement of multiple inverters:



Note1: When mounting different sizes inverters in parallel, please align the top of the inverters, so that it is easier to change the cooling fan

Note2: When it is inevitable to arrange inverters vertically to minimize space, please provide guides since heat from the bottom inverters can increase the temperature in the upper inverters, causing failures in inverter.

4) Terminal Connection Diagrams



Note1: All series built-in RFI filter for restraining electromagnetic interference, to in line with CE standard, please refer to the related instructions in Instruction Manual for installing.

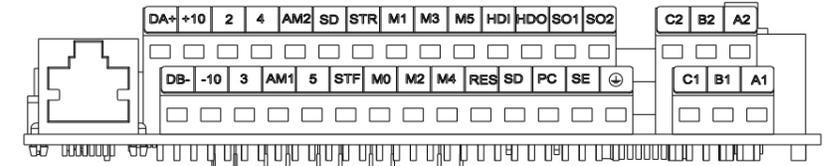
Note2: SF3-043-45K/37KG and under is equipped with brake resistor, please connect between +P and PR to use the brake resistor.

5) Main Circuit Wiring and Terminal Specification

Inverter model	Terminal screw specifications	Tightening torque (Kgf.cm)	Recommended wiring specification (mm <sup>2</sup> )				Recommended wiring specification (AWG)			
			R, S, T	U, V, W	+P, P1	Grounding Cable	R, S, T	U, V, W	+P, P1	Grounding Cable
SF3-043-5.5K/3.7KG	M4	16	6	6	6	6	10	10	10	10
SF3-043-7.5K/5.5KG			6	6	6	6	10	10	10	10
SF3-043-11K/7.5KG	M5	20	6	6	6	6	10	10	10	10
SF3-043-15K/11KG			10	10	10	10	8	8	8	8
SF3-043-18.5K/15KG			16	16	16	16	6	6	6	6
SF3-043-22K/18.5KG	M6	25	25	25	25	16	4	4	4	4
SF3-043-30K/22KG			25	25	25	16	4	4	4	4
SF3-043-37K/30KG			35	35	35	35	2	2	2	2
SF3-043-45K/37KG			70	70	70	35	3/0	3/0	3/0	1/0
SF3-043-55K/45KG	M8	60	70	70	70	35	3/0	3/0	3/0	2
SF3-043-75K/55KG			95	95	95	50	4/0	4/0	4/0	1/0
SF3-043-90K/75KG	M10	100	120	120	120	70	250	250	250	3/0
SF3-043-110K/90KG			120	120	120	70	250	250	250	3/0
SF3-043-132K/110KG			185	185	185	95	500	500	500	3/0
SF3-043-160K/132KG	M12	140	95×2P	95×2P	95×2P	95	4/0×2P	4/0×2P	4/0×2P	4/0
SF3-043-185K/160KG			240	240	240	120	4/0×2P	4/0×2P	4/0×2P	4/0
SF3-043-315K/280KG			150×2P	150×2P	150×2P	150	300×2P	300×2P	300×2P	300
SF3-043-355K/315KG			95×4P	95×4P	95×4P	95×2P	4/0×4P	4/0×4P	4/0×4P	4/0
SF3-043-220K/185KG	M12	140	120×2P	120×2P	120×2P	120	250×2P	250×2P	250×2P	250
SF3-043-250K/220KG			120×2P	120×2P	120×2P	120	250×2P	250×2P	250×2P	250
SF3-043-280K/250KG			150×2P	150×2P	150×2P	150	300×2P	300×2P	300×2P	300

6) Control Terminal

➢ Arrangement of control terminal



Control terminal description

Terminal type	Terminal name	Function instructions	Terminal specifications
Switch signal input	STF	There are totally 10 multi-function control terminals, which can switch mode of SINK/SOURCE.	Input impedance: 4.7 kΩ Action current: 5mA (when 24VDC) Voltage range: 10~28VDC Maximum frequency: 1kHz
	STR		
	RES		
	M0		
	M1		
	M2		
Analog signal input	M3	When current input the input impedance is 235Ω. When voltage input the input impedance is 24kΩ	Maximum frequency: 100kHz
	M4		
	M5		
	HDI		
	HDO		
Relay output	A1	Multi-function relay output terminals. A-C is normal open contact, B-C is normal close contact, C is common terminal.	Maximum voltage: 30VDC or 250VAC Maximum current: Resistor load 5A NO/3A NC Inductance load 2A NO/1.2A NC (cosφ=0.4)
	B1		
	C1		
	A2		
	B2		
	C2		
Open collector output	SO1	Multi-function open collector output terminal	Maximum voltage: 48VDC Maximum current: 50mA
	SO2		
Analog signal output	AM1	Multi-function analog signal output terminal	Output voltage: 0~10VDC Maximum current: 3mA ; Output current: 0~20mA Maximum load: 500Ω
	AM2		
Pulse output	HDO	Multi-function pulse output terminal, compatible with FM and 10X.	Minimum load: 4.7kΩ Maximum current: 50mA Maximum voltage: 48VDC Maximum frequency: 100kHz
	SE		
Communication terminal	DA+, DB-	RS-485	Highest rate: 115200bps Longest distance: 500m
	RJ45		
Common terminal	SD	Common terminal ( SINK ) of STF, STR, RES, M0, M1, M2, M3, M4, M5, HDI, HDO	---
	SE	Common terminal of SO1, SO2 open collector output	---
	5	Common terminal of 10, -10, 2, 3, 4, AM1, AM2, DA+, DB-	---
	PC	Common terminal ( SOURCE ) of STF, STR, RES, M0, M1, M2, M3, M4, M5, HDI, HDO	Output voltage: 24VDC±20% Maximum current: 200mA

- Note1 : When connecting control terminal with external devices, please pay attention to the voltage and current specifications of terminals, avoiding damaging the inverter.
- Note2 : The function of the control terminal is decided by inverter parameters, please refer to Instruction Manual for setting.
- Note3 : Please pay attention to polarity when connecting external power and devices.
- Note4 : When the relay is controlled by the open collector output terminal, surge absorbers should be in parallel on the both ends of windings.

➢ Wiring method

• Power supply connection

For the control circuit wiring, strip off the sheath of a cable, and use it with a blade terminal. For a single wire, strip off the sheath of the wire and apply directly.

Insert the blade terminal or the single wire into a socket of the terminal.

(1) Strip off the sheath for the below length. If the length of the sheath peeled is too long, a short circuit may occur with neighboring wires. If the length is too short, wires might come off.

Wire the stripped cable after twisting it to prevent it from becoming loose. It doesn't need soldering.



(2) Crimp the blade terminal.

Insert wires to the blade terminal, and check that the wires come out for about 0 to 0.5 mm from a sleeve.

Check the condition of the blade terminal after crimping. Do not use a blade terminal of which the crimping is inappropriate, or the face is damaged.



• Please do use blade terminals with insulation sleeve. Blade terminals commercially available:

Cable gauge (mm <sup>2</sup> )	Blade terminals model	L (mm)	d1 (mm)	d2 (mm)	Manufacturer	Tool type
0.3	AI 0.25-6 WH	10.5	0.8	2	Phoenix Contact Co., Ltd.	CRIMPFOX 6
0.5	AI 0.5-6 WH	12	1.1	2.5		
0.75	AI 0.75-6 GY	12	1.3	2.8		
0.75(for two wires)	AI-TWIN2×0.75-6 GY	12	1.3	2.8		



Note1: Please Use a small flathead screw driver (tip thickness: 0.6mm, width: 3.0mm). If a flathead screwdriver with a narrow tip is used, terminal block may be damaged.

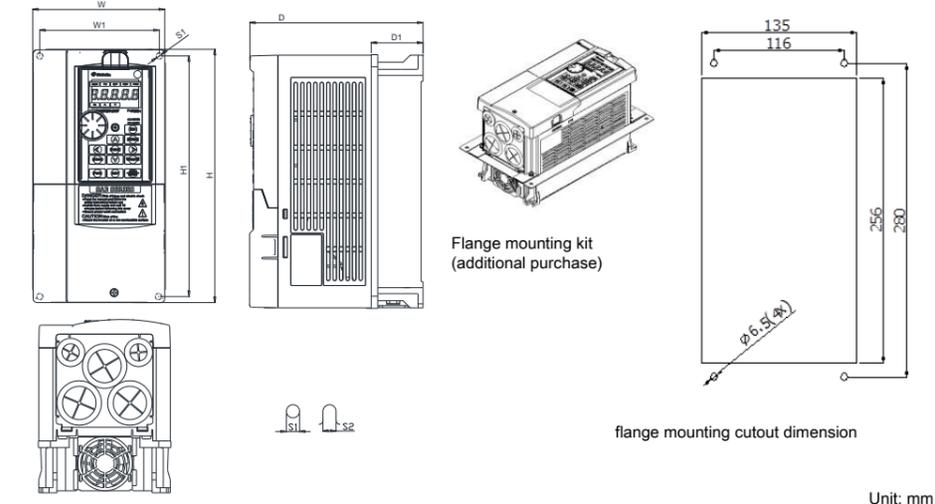
Note2: Tightening torque is 1.5~2.5kgf.cm, too large tightening torque can cause crew slippage, too little tightening torque can cause a short circuit or malfunction.

➢ Wiring Precautions

- After wiring, wire offcuts must not be left in the inverter. Wire offcuts can cause an alarm, failure or malfunction. Always keep the inverter clean. When drilling mounting holes in an enclosure etc., please take caution not to allow chips to enter the inverter.
- To prevent a malfunction due to noise, keep the signal cables 10 cm (3.94 inches) or more away from the power cables. Also, separate the main circuit cables at the input side from the main circuit cables at the output side.
- Set the voltage/current input switch correctly. Incorrect setting may cause a fault, failure or malfunction.

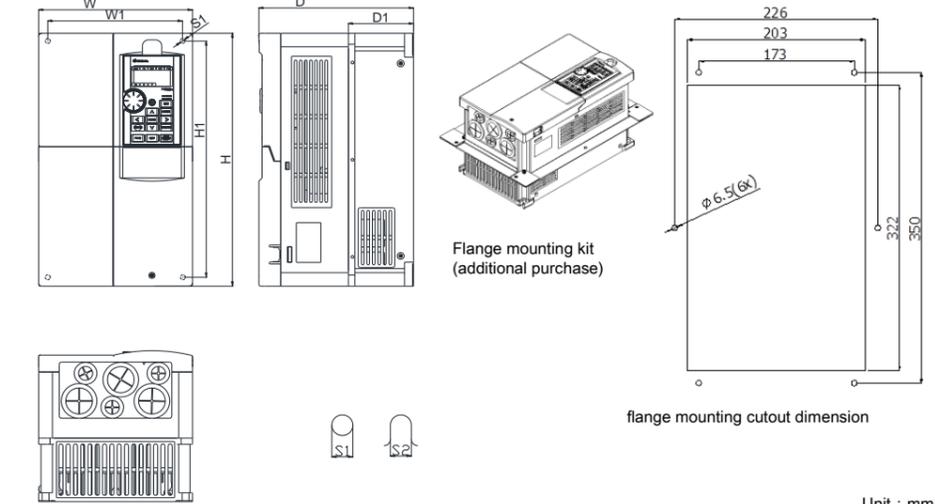
7) Appearance and Dimensions

➤ Frame A



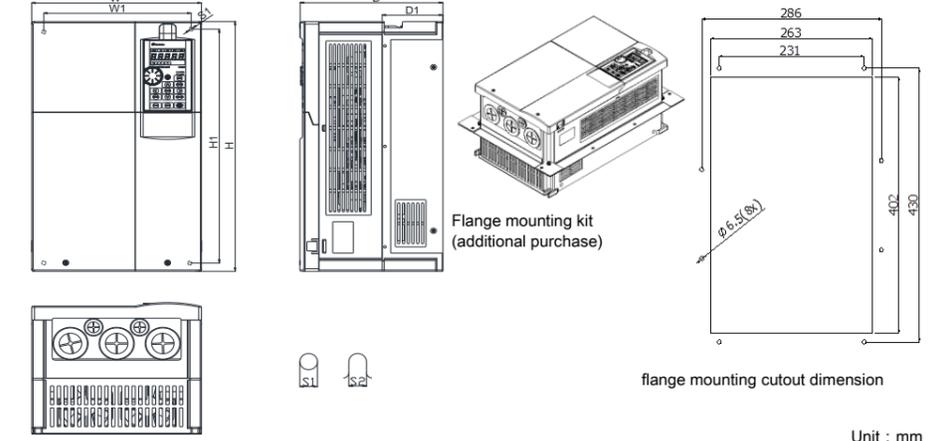
model	W	W1	H	H1	D	D1	S1	S2
SF3-043-5.5K/3.7KG	130.0	116.0	250.0	236.0	170.0	51.3	6.2	6.2
SF3-043-7.5K/5.5KG								

➤ Frame B



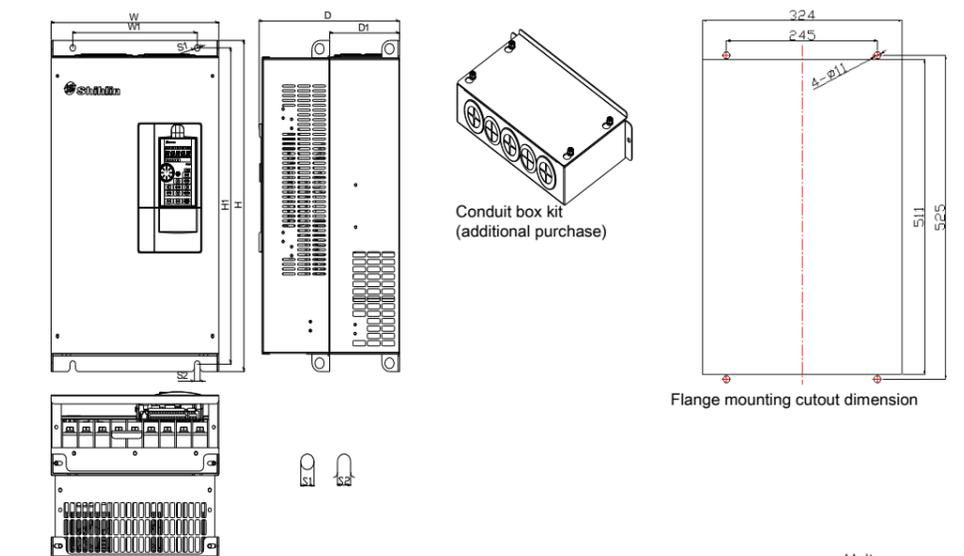
model	W	W1	H	H1	D	D1	S1	S2
SF3-043-11K/7.5KG	190.0	173.0	320.0	303.0	190.0	80.5	8.5	8.5
SF3-043-15K/11KG								
SF3-043-18.5K/15KG								

➤ Frame C



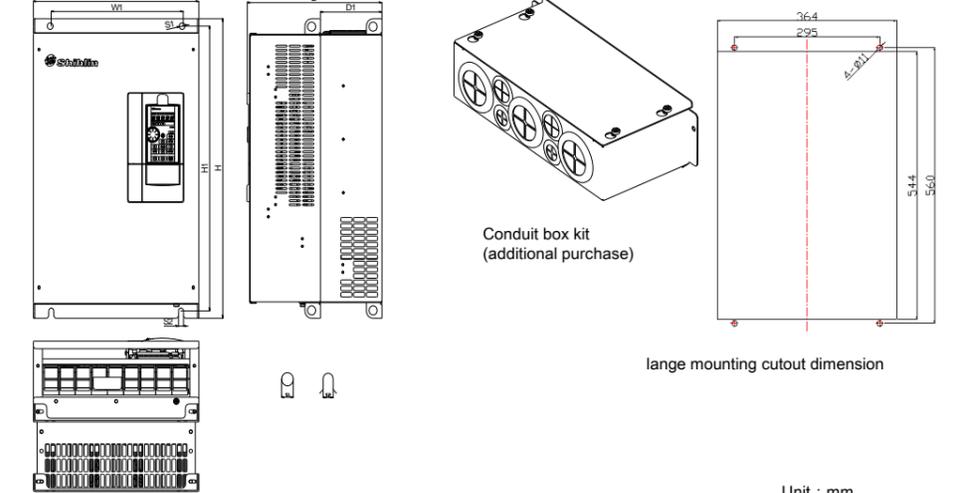
model	W	W1	H	H1	D	D1	S1	S2
SF3-043-22K/18.5KG	250.0	231.0	400.0	381.0	210.0	89.5	8.5	8.5
SF3-043-30K/22KG								
SF3-043-37K/30KG								
SF3-043-45K/37KG								

➤ Frame D



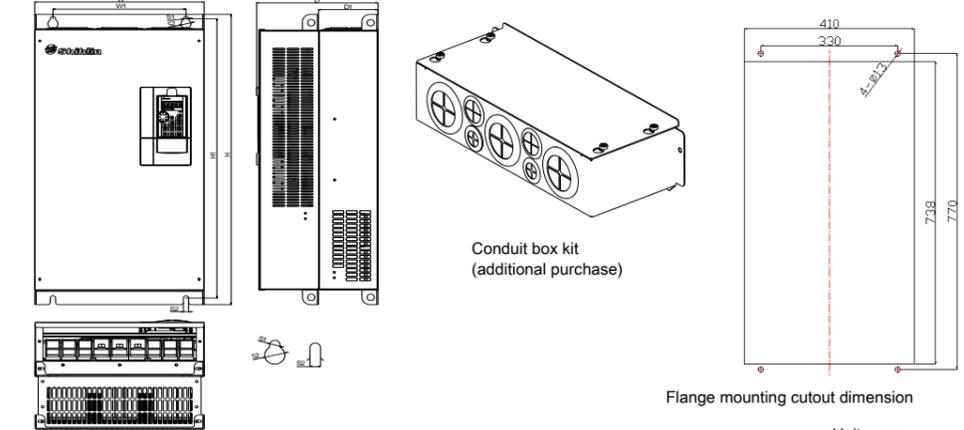
model	W	W1	H	H1	D	D1	S1	S2
SF3-043-55K/45KG	330.0	245.0	550.0	525.0	275.0	137.5	11.0	11.0
SF3-043-75K/55KG								
SF3-043-90K/75KG								

➤ Frame E



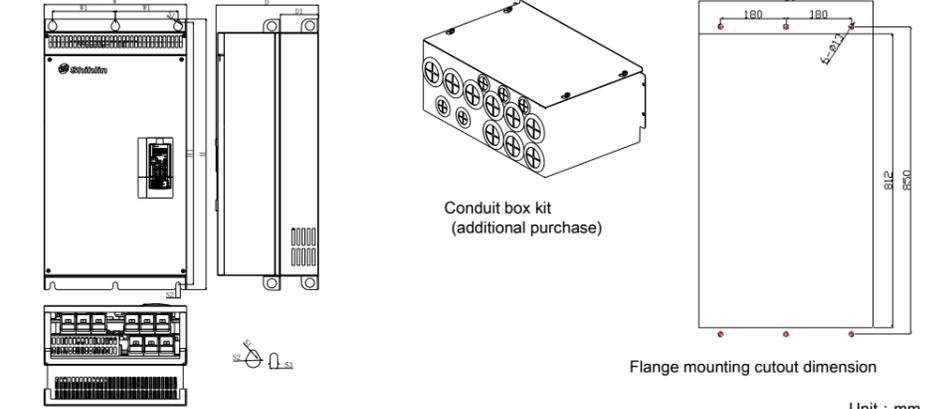
Model	W	W1	H	H1	D	D1	S1	S2
SF3-043-110K/90KG	370.0	295.0	589.0	560.0	300.0	137.5	11.0	11.0
SF3-043-132K/110KG								

➤ Frame F



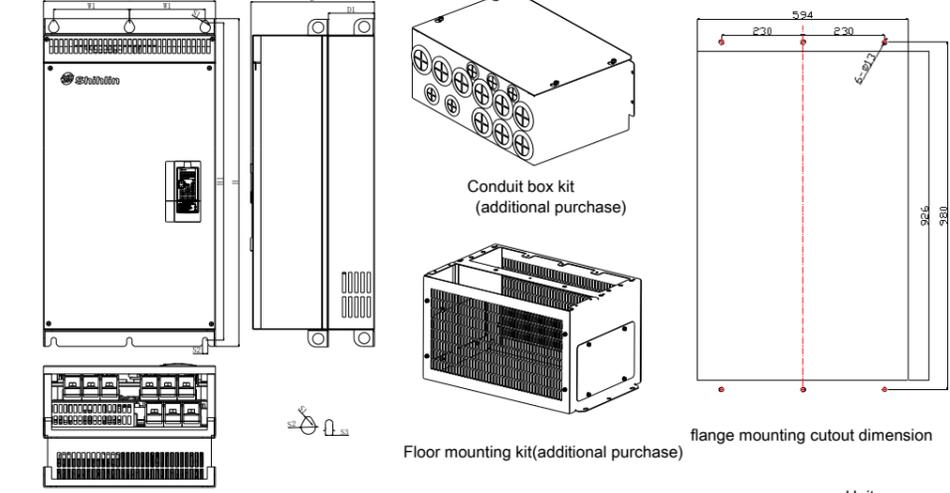
Model	W	W1	H	H1	D	D1	S1	S2	S3
SF3-043-160K/132KG	420.0	330.0	800.0	770.0	300.0	145.5	13.0	25.0	13.0
SF3-043-185K/180KG									

➤ Frame G



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

➤ Frame H



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

8) Optional Equipment

Category	Name	Description	Order code	
Parameter unit	PU301	LED parameter unit	SNKPU301	
	PU301C	LCD parameter unit	SNKPU301C	
	Expansion card	PD302	Profibus-DP communication card	SNKPD302
		DN301	DeviceNet communication card	SNKDN301
		CP301	Canopen communication card	SNKCP301
		EP301	Ethernet communication card	SNKEP301
		EC301	EtherCAT communication card	SNKEC301
		EB362R	6 digital input, 2 relay output	SNKEB362R
	EB308R	8 relay output	SNKEB308R	
	Other optional equipment	ACL****	AC reactor (External optional equipment for all models)	Refer Instruction Manual
DCL****		DC reactor (External optional equipment for all models)	Refer Instruction Manual	
FMK30*		Flange mounting kit (suitable for Frame A, B, C)	Refer Instruction Manual	
CTK301		Floor mounting kit (suitable for Frame H)	Refer Instruction Manual	
WBK30*		Conduit box kit (suitable for Frame D ~ H)	Refer Instruction Manual	
CBL1R5		The data transmission line (1.5 m)	SNKCBL1R5GTN2	
CBL03G		The data transmission line (3 m)	SNKCBL03GTN2	
CBL05G		The data transmission line (5 m)	SNKCBL05GTN2	
CBL10G		The data transmission line (10 m)	SNKCBL10GTN2	
SMK301		Snap mounting kit	SNKSMK301	
BKU-040	400V 45KW Brake Unit	SNKBKU04045K		
BKU-040	400V 160KW Brake Unit	SNKBKU040160K		

9) Others

➤ For convenient display, there is slight difference between the figures in this instruction and actual products, which will not affect the rights and interests of the customers.  
 ➤ To improve our products, the parameters and contents may be modified, please contact the agent or refer to Shihlin websites (<http://automation.seec.com.tw>) to download the latest version

