

SF-G Series

Dual-load, High Performance
Vector Control AC Drive



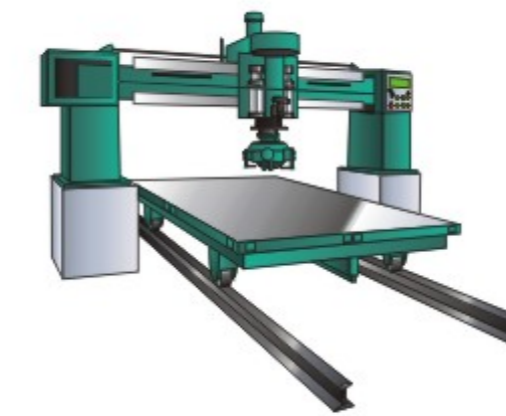
Product Range

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

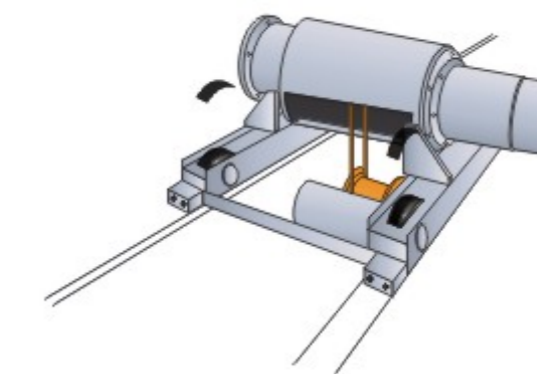
Main Features

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

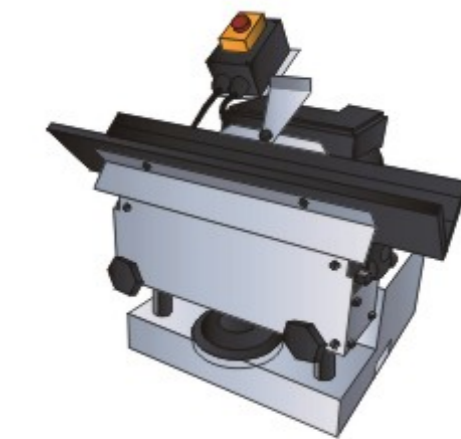
Application



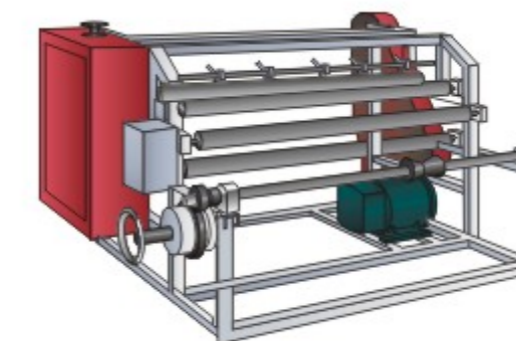
Polishing Machine



Crane



Chamfer Machine



Slitting Machine



CNC tooling Machine



Solder Equipment



SF-G

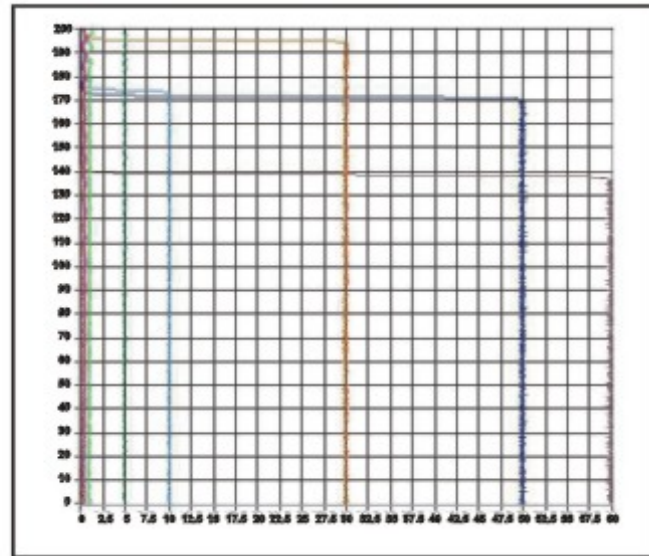
Product Features

Dual-load specifications

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

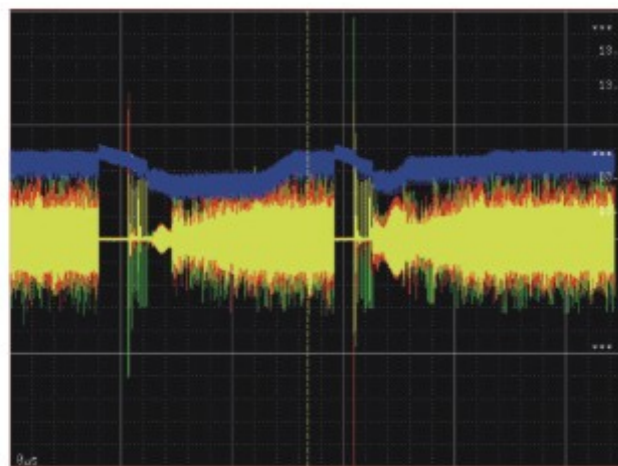
High-performance vector control technology

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



Tracking compensation mechanism

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

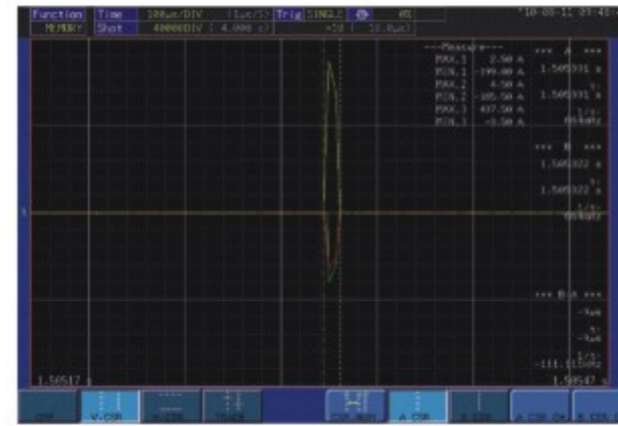


Built-in brake transistor (under 22kw)

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

Hardware protection design

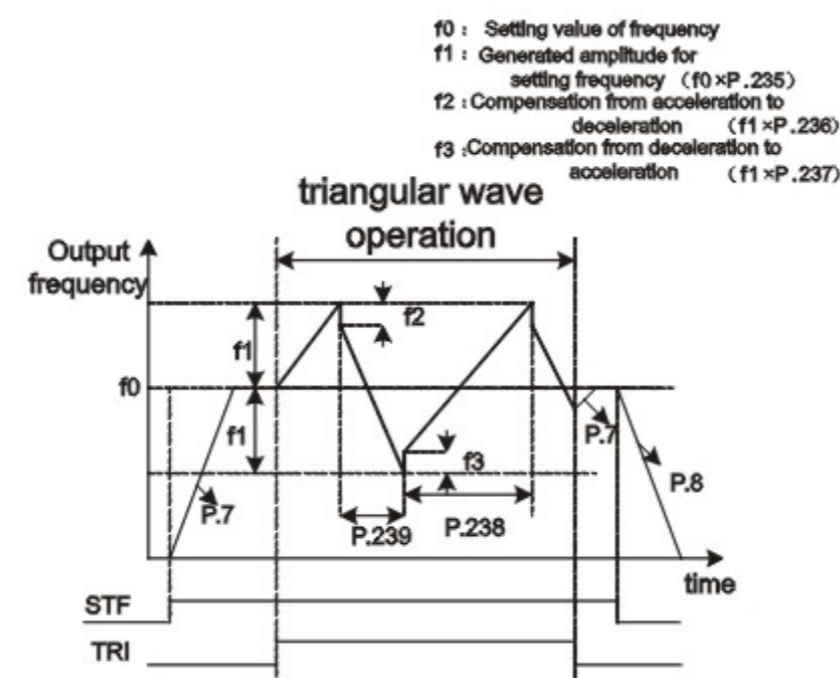
- With input power phase failure protection, ground short circuit protection and output short circuit protection
- Hardware design to substantially increase the protection effectiveness.
- Under circumstances of damaged motor insulation or erroneous wiring, to protect the output modules and reduce the failure rate.



The above picture shows the automatic waveform of SCP abnormality alert from the short circuit of the three-phase output

Equipped with Soft-PWM mechanism

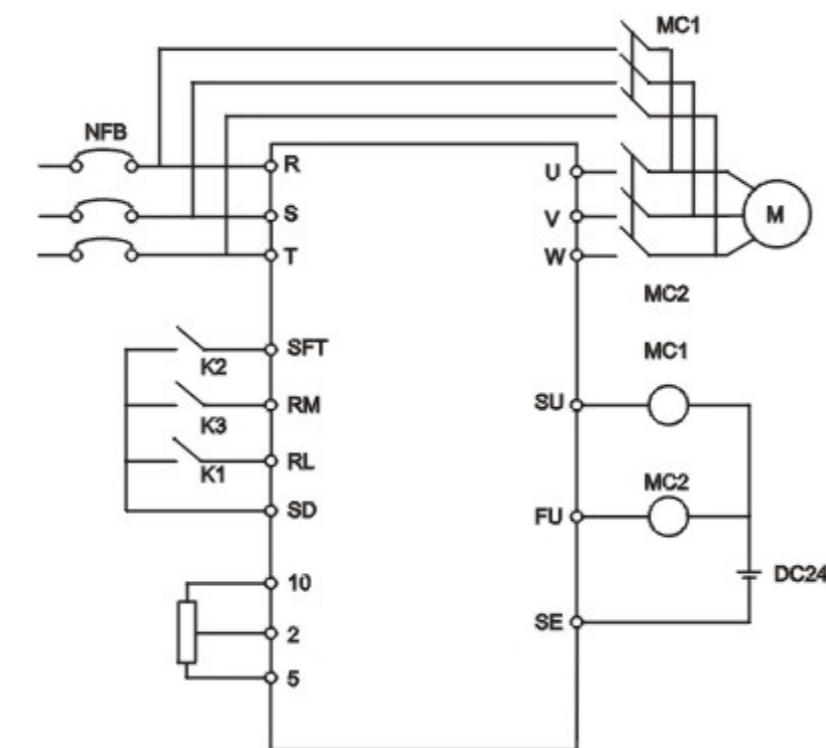
- Soft-PWM controls the motor noises, transforming the metal sound into a delightful complex tone.
- It provides low noise operation and reduces interference to external RF, ensuring stable operations of nearby PLC and encoder devices.



Product Features

Equipped with grid power frequency switching mechanism

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



Operating time accumulation and parameters protection

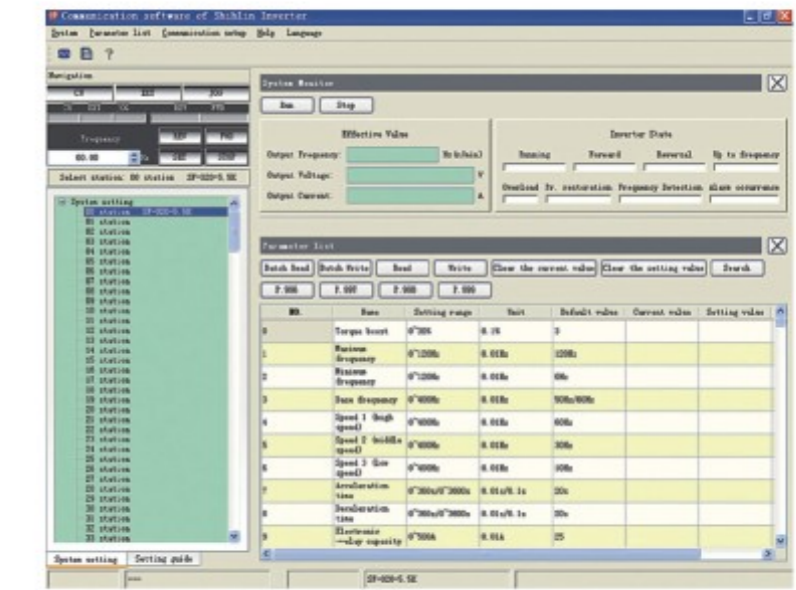
- Time accumulation: the accumulated operating time of the frequency AC drive can be displayed.
- Password protection: It provide 4-digital password to restrict the read and write of parameters, and prevent operative mistakes.

Built-in RS-485 interface

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

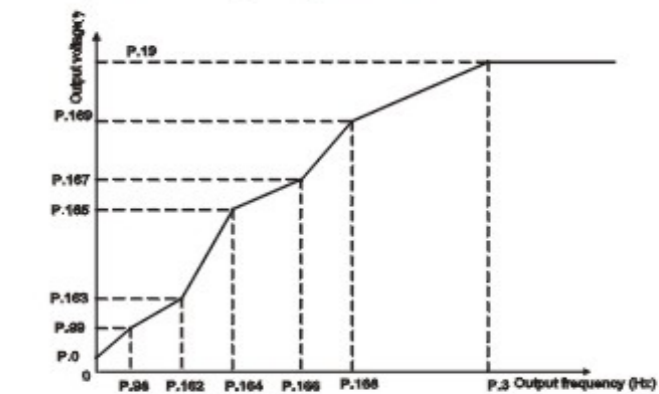
PC client communication software

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



5-point V/F free setting

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

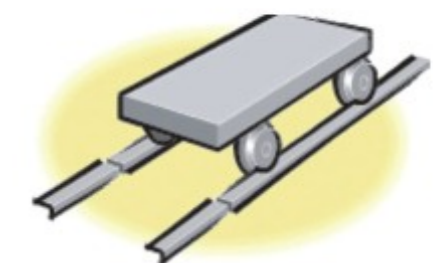


Containing with 12 sets of abnormality alert records

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

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

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



Electric Specifications

220V Series Three-phase

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

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

440V Series Three-phase

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

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

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

Common Specifications

Control method	SVPWM control, V/F control, close-loop V/F control (VF+PG), general flux vector control, sensorless vector control (SVC), close-loop vector control (FOC+PG)
Output frequency range	0.2-400Hz (The starting frequency setting range is 0-60Hz)
Voltage 1 frequency output characteristics	Digital setting: If the frequency set value is below 100Hz, the resolution will be 0.01 Hz; If the frequency set value is above 100Hz, the resolution will be 0.1 Hz
	Analog setting: When setting DC 0-5V signals, the resolution will be 1/500; When setting DC 0-10V or 4-20mA signals, the resolution will be 1/1000
Output frequency accuracy	Digital setting: Maximum target frequency :±0.01 %
	Analog setting: Maximum target frequency :±0.5%
Voltage 1 frequency output characteristics	Base frequency voltage (P.19), base frequency (P.3) can be arbitrarily set; Constant torque model and applicable load model can be selected (P.14)
Start torque	150% 1Hz: When the sensorless vector control is started
Torque boost	The torque boost setting range is 0-30% (P.O), auto boost, slip compensation
Acceleration / deceleration curve characteristics	The resolution (0.01s/0.1s) of acceleration/deceleration time (P.7, P.8) is switched by P.21. The setting range has 0~360s or 0~3600s for selection. And different acceleration/deceleration curve model can be selected by P.29.
DC braking	The DC braking action frequency is 0-120Hz (P.10); the DC braking time is 0- 60s (P.11) The DC braking voltage is 0-30% (P.12).Linear braking and idling braking selection (P.71)
Stalling protection	The stalling protection level can be set to 0-400% (P.22)
Target frequency setting	Operation panel setting; DC 0-5V signal, DC 0-10V signal, DC 4-20 mA signal, multiple speed stage level setting, communication setting
PID control	Please refer to manual P.170-P.182 in Chapter 5

Multi-function control terminals
Motor starting (STF, STR), the second function (RT), 16-speed operation (RH, RM, RL, REX), external thermal relay (OH), reset (RES),etc.(they can be set by the user with HYPERLINK \ "P.80~P.84, P.86 and P.126~P.128).

Output terminal	Multi-function output terminals	SU, SE	P.40	AC drive running (RUN), output frequency detection (FU), Up to frequency (SU), overload alarm (OL), zero current detection (OMD), alarm (ALARM), section detection (P01), periodical detection (P02), and pause detection (P03), AC drive output (BP), work frequency output (GP)
		RUN, SE	P.129	
FU/10X, SE	P.130			
Multi-function output relay	A, B, C	P.85		
	Analog output	AM, 5	Multi-function DC (0-10V) output: output frequency, current (P.54)	
Pulse output	FM, SD		Output the pulse of 0-2300Hz	

Operation Panel	Operation monitoring	Output frequency monitoring, output current monitoring, and output voltage monitoring, abnormality record (Maximum 12 sets)
	LED indication lamp(8)	Forward rotation indication lamp, reverse rotation indication lamp, frequency monitoring indication lamp, voltage monitoring indication lamp, current monitoring indication lamp, mode switching indication lamp, PU terminals control indication lamp, and external terminals control indication lamp

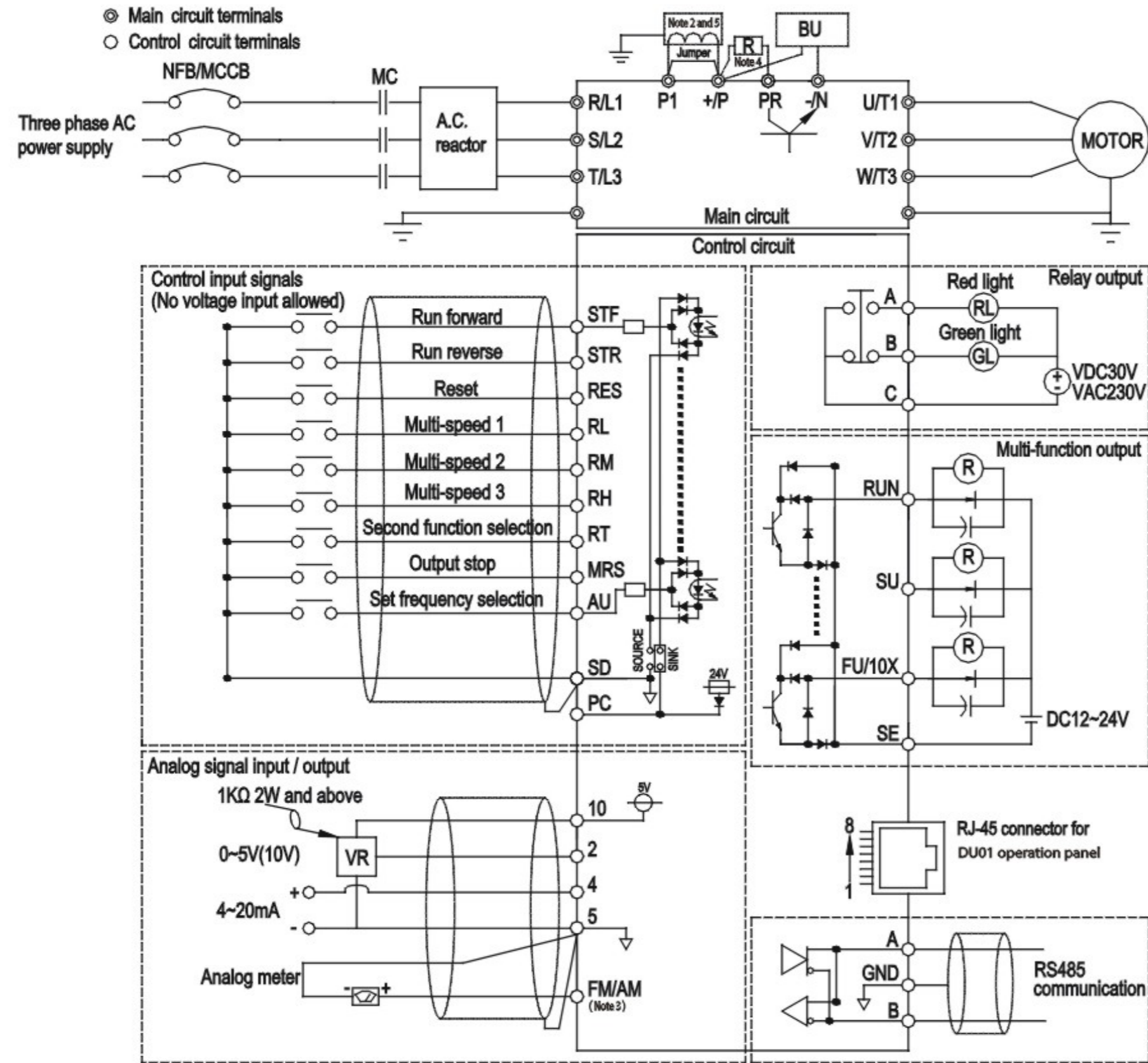
Communication function: RS-485 communication, can select Shihlin/Modbus protocol communication protocol

Protection mechanism / alarm function: Output short circuit protection, Over-current protection, (+P)-(-N) over-voltage protection under-voltage protection, motor over-heat protection (P.9), IGBT module over-heat protection, communication abnormality protection, etc

Environmental Condition	Ambient temperature	-10~+40°C (non-freezing)
	Ambient humidity	Below 90%Rh (non-condensing)
	Storage temperature	-20 ~ +65°C
	Surrounding environmen	Indoor, no corrosive gas, no flammable gas, no flammable powder
	Altitude and vibration	Maximum operating altitude is 2000 Meters. If AC drive is installed at altitude 1000~2000m, decrease 2% of rated current for every 100m increase in altitude.
	Grade of protection	IP20
The degree of environmental pollution	2	
Class 01 protection	Class I	

International certification:

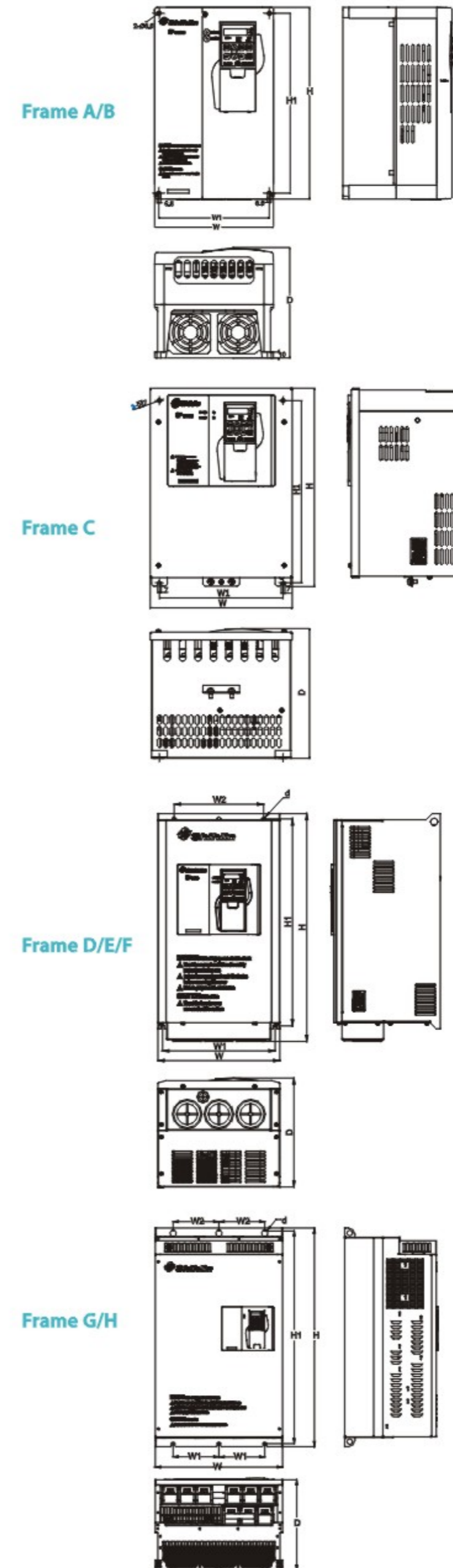
Wiring Diagram



NOTE

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

Dimensions



Frame A/B

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

Frame C

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

Frame D/E/F

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

Frame G/H

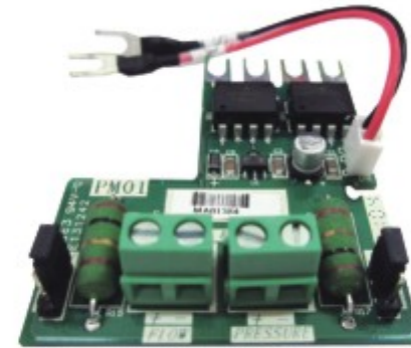
Model	Frame	H (mm)	H1 (mm)	W (mm)	W1 (mm)	W2 (mm)	D (mm)	d (mm)
SF-040-185K/160KG	G	870	850	500	180	180	360	13
SF-040-220K/185KG								
SF-040-250K/220KG								
SF-040-280K/250KG	H	1000	980	600	230	230	400	13
SF-040-315K/280KG								
SF-040-355K/315KG								

SF-G Series

PG01
PG01 expansion board



PM01
Injection modeling machine specific expansion board



PU01
For SE2, SF-G



WS01
Fan and water pump Multi-channel control board

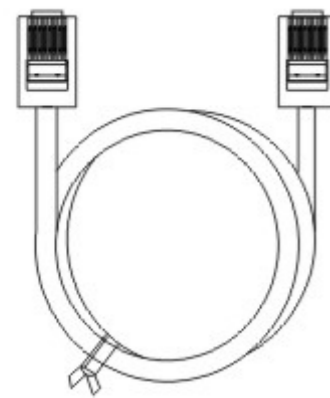


DU09
For SE2, SF-G

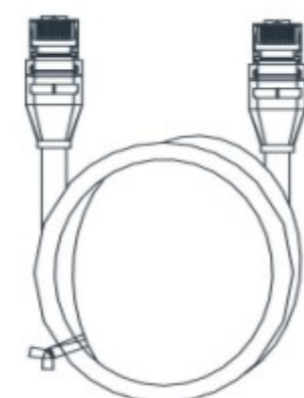


Common

Transmission Cable

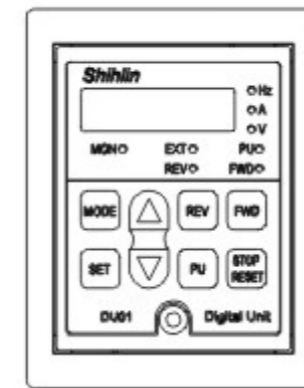


CBL1R5/03/05GT



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

DU01S
DU01S operation panel



(SE2/SF-G)

RS485 to USB
communication converter



AC/DC Reactor



Back up resistance

