

PRODUCT SERIES

SB70G

High Performance Vector Control Inverter



1Ph 200V	0.55--2.2KW
3Ph 200V	4--5.5KW
3Ph 400V	0.4—1650KW
3Ph 690V	11—1200KW
3Ph1140V	55-1000KW



PRODUCT OVERVIEW

The frequency converter of SB70G series with high-performance VFD employs the high performance frequency converter designed by high-precision rotor field orient vector control algorithm. It also adopts power devices of internationally famous brands and dedicated control digital signal processor (DSP) of American TI electrical machine. The converter possesses abundant system functions, stable and reliable operation and fast response, coordinated with multi mode operation and programmable modules, so it can meet with higher application requirements of clients.



APPLICATION FIELDS



Water supply



Petrifaction



Chemical



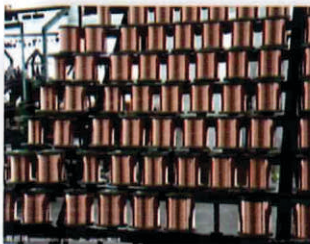
Cement



Weaving



Papermaking



Cable



Water treatment



Electricity



Metallurgy



Mining



Plastics

Frequency converters of DB70G series are widely applied draw bench, blender, extruder, air compressor, grinder, belt conveyor, hoister, centrifuge, numerically-controlled machine tool, food and packing machinery, and drive, fans and bumps used in various industries

FUNCTIONAL CHARACTERISTICS

Extremely high reliability

- Adopt power components of internationally famous brands
- Can conduct test fully loaded continuously under constant temperature 40°C

Extremely high ability of resisting voltage fluctuation

- Fluctuation range: -15%—+10%
- Have the function of automatic voltage regulation

Torque control and over-load ability

- Have 290% spontaneous torque control ability
- Can elevate torque manually, automatically, or manually and automatically
- Rated current 150%/min

Original multi-mode PLC operational function

- 8 modes of PLC operating parameters
- Can choose modes through terminals
- Can store PLC operating states when it loses power
- Provide choices of coding, directness, superposition and number

Programmable modules

- 2 groups of comparators and 4 groups of logical units are internally set
- 4 groups of timers and 6 groups of arithmetic units



Abundant input and output ports

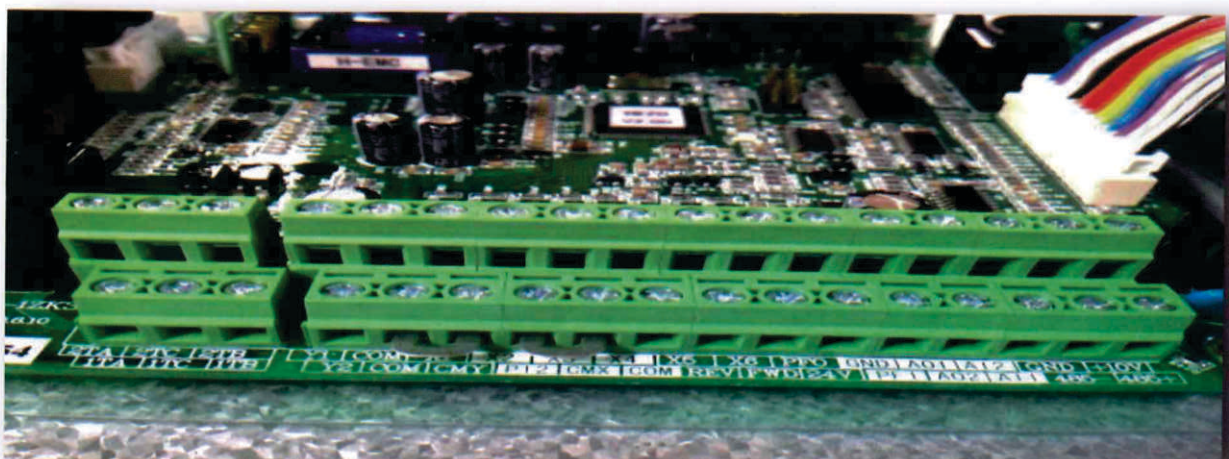
- Possess 8-way programmable bipolar input digital port
- Possess 2-way analog input and 2-way analog output port
- Possess 2-way relay output and 2-way digital output

The design is more user-friendly

- Users can define 30 user parameters
- Can choose to display parameters corrected
- Set the function of duplicating parameters
- Functions of button and locking
- 5 groups of fault types and records of fault state
- 67 monitoring parameters

Impeccable various protective functions

- Start/acceleration/constant speed/over-current deceleration
- Standby/ acceleration/constant speed/over-voltage deceleration
- Input/output phase absence, under-voltage, overload
- Over-heating, under-load/overload warning
- Simulate up to 37 default types like input drop
- 18 alarming types

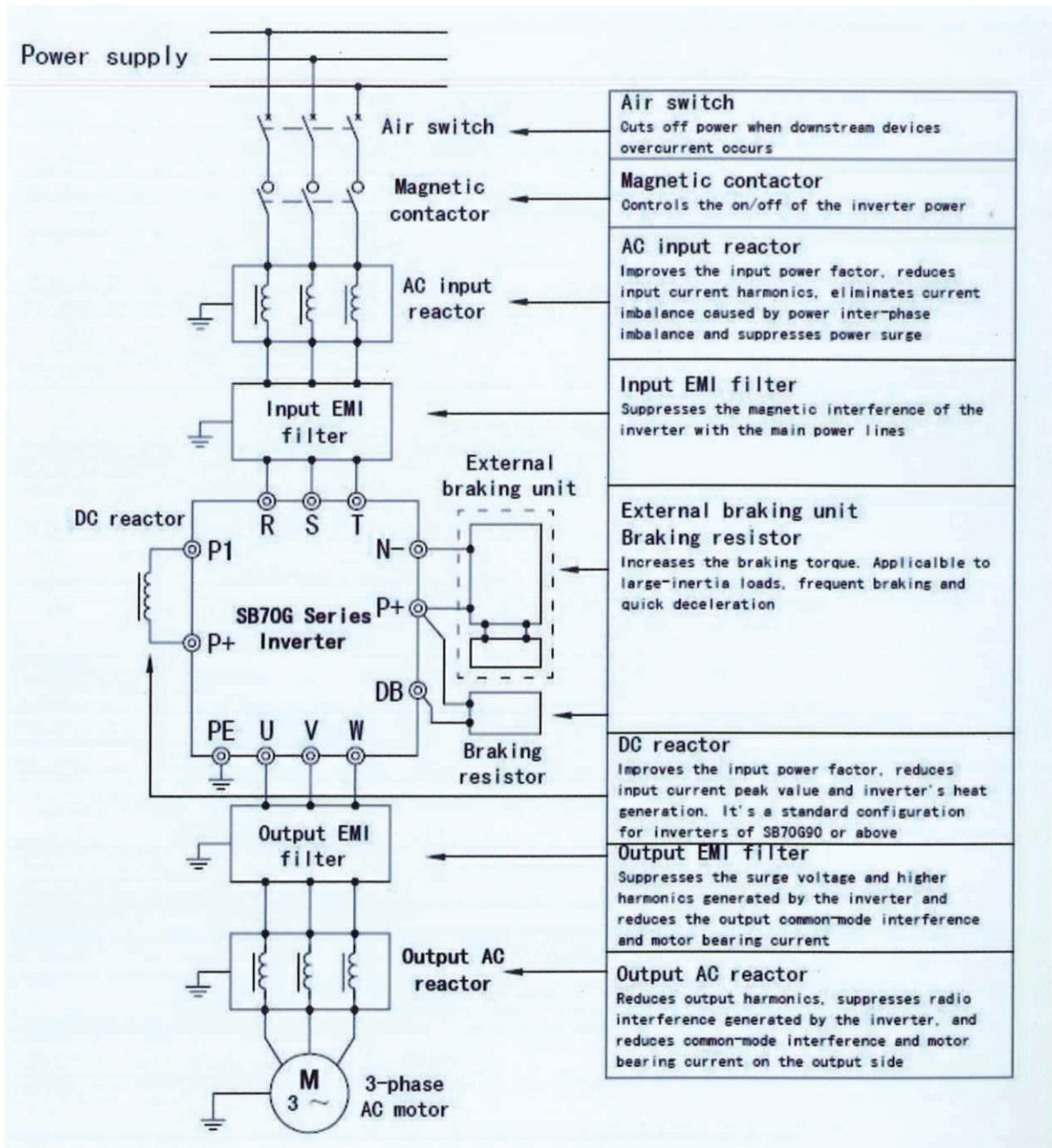


TECHNICAL SPECIFICATIONS

	Item	Description	
Input	Rated voltage and frequency	1Ph: 200V, 3Ph:200V/400V/690V/1140V; 50/60Hz	
	Range	Fluctuation range: -15%~10%; imbalance: <3%; Frequency: 47-63Hz	
Output	Voltage	0~input voltage: with the error less than 5%	
	Frequency range	V/F control: 0~650Hz; Vector control: 0~200Hz	
Basic Specifications	Motor control mode	V/F control without PG,V/F control with PG, vector control without PG, vector control with PG,V/F separate control	
	Steady-state speed precision	vector control without PG:≤1%, vector control with PG:≤0.02%	
	Starting torque	Not less than 150% or rated torque at 0.5Hz	
	Overload capacity	150% of rated current for 1 minute	
	Frequency resolution	Digital reference: 0.01Hz,Analog reference: 0.1% of max frequency	
	Output frequency precision	Analog reference: ±0.02%of max frequency (25±10°C) Digital reference: 0.01Hz (-10~40°C)	
	Operating command channel	Keypad, terminal and communication. They can be switched over by terminals	
	Frequency setting channel	Keypad, communication, UP/DOWN value, AI1, AI2, PFI and arithmetic unit	
	Torque boost	Manual, auto, manual + auto	
	V/F curve	User defined V/F, linear V/F and 5 reduced-curves	
	Accel/decel	Linear or S-curve acceleration/deceleration	
	JOG	Jog frequency: 0.1~50Hz, Jog accel / decel: 0.1~60S	
	Auto energy saving	V/F curve is optimized automatically based on the load condition, achieving auto energy-saving run	
	AVR	Keep the output voltage constant automatically when the voltage of power grid fluctuates	
	Momentary power failure	Ensures uninterrupted operation by controlling the DC link voltage	
	Dynamis braking	Built-in braking unit and external braking resistor for models of 15KW or less	
	DC braking	Braking time: 0-60S, braking current: 0-100% of rated current	
	Terminal	PFI/PFO	Highest input frequency:50KHz/ Open-collector pulse (aquare wave) output of 0-50KHz,programmable
		Analog input	2 channels of analog input, voltage or current type,
		Analog output	2 channels of analog output,0/4-20mA or 0/2-10v,programmable
Digital input		8 channels of optional multi-function digital input	
Communication	Digital output relay output	2 channels of optional multi-function digital output 2 channels of multi-function relay output	
	Communication	Build-in RS485 port, supporting Modbus protocol and USS commands	
Protection Functions		Over-current, overvoltage, under-voltage, input/output phase loss, output short-circuit, overheating, motor overload, external fault, analog input disconnection, stall prevention, etc	

WIRING

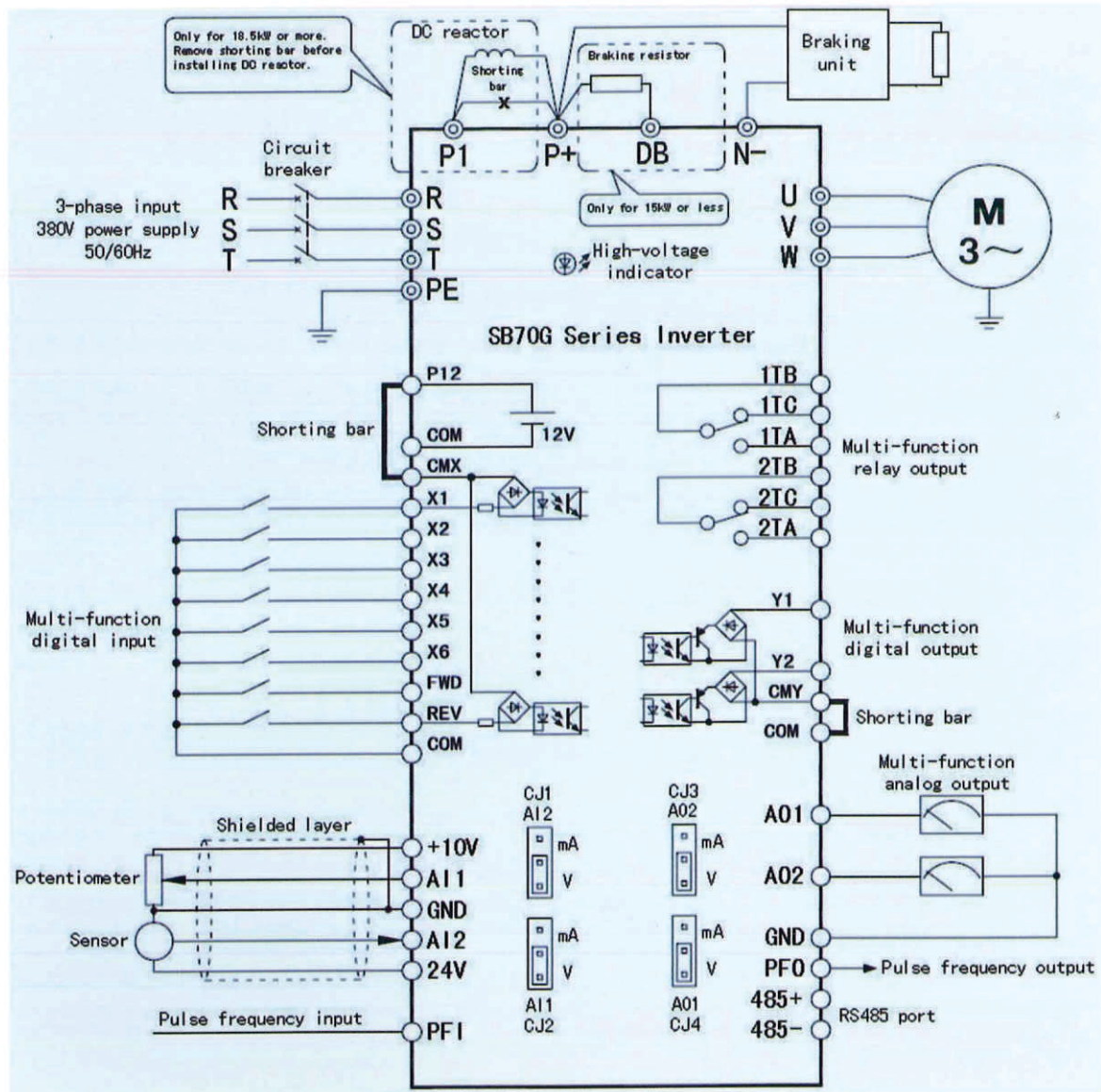
Deployment Recommended Diagram



Functions Of Control Board Terminals

Symbol	Name	Function and description	Specification
485+/-	485 differential signal	RS485 communication prot	Connect 1-32 RS485 station(s) Input impedance:>10K Ω
GND	Ground	Grounding terminal for analog I/O,PFI,PFO,communication,+10v or 24v power	Its inside is isolated from COM,CMX and CMY
+10v	+10v reference power supply	+10v power supply offered to user	Max.output current is 15mA, the voltage accuracy better than 2%
PFO	Pulse frequency output	View analog output menu	0—50 kHz, open collector output; Specification: 24V/50mA
PFI	Pulse frequency input	Refer to F6-22—F6-24	0~50KHz, input impedance of 1.5K Ω ,Max input voltage:30V High level:>6V, Low level:<3V,
AO1/2	Multi-function analog output	view analog output menu . Jumpers CJ4/3are used to select the output type (voltage or current)	Current mode: 0—20mA; load: \leq 500 Ω Voltage mode: 0—10V; output: 10mA
24V	24V power terminal	24V power supply offered to user	Max. output current:80mA
AI1/2	Analog input	Jumpers CJ1/2 are used to select the output type(voltage or current)	Input voltage: -10~+10V 110K Ω Input current: -20~+20mA 250 Ω
X1-X6 PFI FWD REV	Digital input terminal	View digital input menu	Opto-isolation, Bi-directional input Input impedance: \geq 3K Ω Input voltage:<30V Sampling period:1ms
CMX	Digital input common terminal	Common terminal for X1-X6, FWD,REV	Its inside is isolated from COM and P12.
P12	12V power terminal	12V power supply offered to user	Max. output current:80mA
COM		Ground of 12V power	
Y1/2	Digital output terminal	View digital output menu	Opto-isolation, bi-directional, Open collector output, Specification: 24V DC/50mA Action frequency: <500Hz Start-up voltage: 2.5V (relative to CMY)
CMY	Common terminal of Y1/2	Common terminal of Y1/2 digital output	
1TA/B/C 2TA/B/C	Relay output terminal	View digital output menu	TA-TB: normally open TB-TC: normally closed Contacts: AC 250V 3A DC 24V 5A

Basic Wiring Diagram



Description Of Main Circuit Terminals

Symbol	Terminal name	Description
R, S, T	Input terminal	To 3-phase power supply
U, V, W	Output terminal	To 3-phase motor
P1, P+	DC reactor terminal	Connect an external DC reactor(shorted by a bar if reactor is not used)
P+, N-	DC bus terminal	Connect a braking unit, common DC bus or external rectifying unit. Contact us for the usage of the common DC bus.
DB	Braking terminal	Braking resistor is connected between P+ and DB
PE	Grounding terminal	Connect the inverter case to earth.

MODEL SELECTION GUIDE

SB70	G	500	T	4	C
SB70 SERIES	Generic	Power	D: 1ph T: 3ph H:12-pulse rectifier Q:Four-quadrant	2: 200V 4: 400V 6: 690V 11: 1140V	C: Cabinet type No: Wall-mounted type

Notes: 400V--level wall-mounted is usually no suffix T4.

Product Series – 200V

Model	Rated capacity (kVA)	Rated output current (A)	Applicable motor (kW)
SB70G0.55D2	1.1	3	0.55
SB70G0.75D2	1.9	5	0.75
SB70G1.5D2	3.1	8	1.5
SB70G2.2D2	4.2	11	2.2
SB70G4T2	6.9	18	4
SB70G5.5T2	9.9	26	5.5

Product Series – 400V

Model	Rated capacity (kVA)	Rated output current (A)	Applicable motor (kW)	Model	Rated capacity (kVA)	Rated output current (A)	Applicable motor (kW)
SB70G0.4	1.1	1.5	0.4	SB70G220	273	415	220
SB70G0.75	1.6	2.5	0.75	SB70G250	310	475	250
SB70G1.5	2.4	3.7	1.5	SB70G280	342	520	280
SB70G2.2	3.6	5.5	2.2	SB70G315	389	590	315
SB70G4	6.4	9.7	4	SB70G375	460	705	375
SB70G5.5	8.5	13	5.5	SB70G400	490	760	400
SB70G7.5	12	18	7.5	SB70G450	550	855	450
SB70G11	16	24	11	SB70G500	610	950	500
SB70G15	20	30	15	SB70G560	680	1040	560
SB70G18.5	25	38	18.5	SB70G630	765	1180	630
SB70G22	30	45	22	SB70G700	850	1320	700
SB70G30	40	60	30	SB70G800	970	1520	800
SB70G37	49	75	37	SB70G900	1090	1710	900
SB70G45	60	91	45	SB70G1000	1210	1900	1000
SB70G55	74	112	55	SB70G1100	1330	2080	1100
SB70G75	99	150	75	SB70G1200	Customized type		
SB70G90	116	176	90	SB70G1300			
SB70G110	138	210	110	SB70G1400			
SB70G132	167	253	132	SB70G1500			
SB70G160	200	304	160	SB70G1650			
SB70G200	248	377	200				

Digital Input Functions

0: No signal	16: Emergency stop	32: Auxiliary reference disabled disabled	45: Speed/torque control select
1: Multistep frequency 1	17: Inverter run disabled	33: Operation interrupted	46: Multi-PID select 1
2: Multistep frequency 2	18: Coast stop	34: DC braking(at stop)	47: Multi-PID select 2
3: Multistep frequency 3	19: UP/DOWN increase	35: Process PID disabled	48: Multi-PID select 3
4: Multistep frequency 4	20: UP/DOWN decrease	36: PID 2	49: Zero-servo command
5: Multistep frequency 5	21: UP/DOWN clear	37: 3-wire stop command	50: Counter preset
6: Multistep frequency 6	22: PLC control disabled	38: Internal virtual FWD terminal	51: Counter clear
7: Multistep frequency 7	23: PLC operation pause	39: Internal virtual REV terminal	52: Meter-counter clear
8: Multistep frequency 8	24: PLC standby state reset	40: Analog reference frequency hold	53: Wobble frequency injection
9: Accel/decel time select 1	25: PLC mode select 1	41: Accel/decel disabled	54: Wobble state reset
10: Accel/decel time select 2	26: PLC mode select 2	42: Run command source switched to terminal/keypad	55: Fan running time clear
11: Accel/decel time select 3	27: PLC mode select 3	43: Reference frequency switched to AI1(top priority)	56: PFI Location given reverse
12: External fault input	28: PLC mode select 4		
13: Fault reset	29: PLC mode select 5	44: Reference frequency switched to arithmetic unit 1(2nd top priority)	57: Motor Rated current 1
14: Jog forward	30: PLC mode select 6		58: Motor Rated current 2
15: Jog reverse	31: PLC mode select 7		

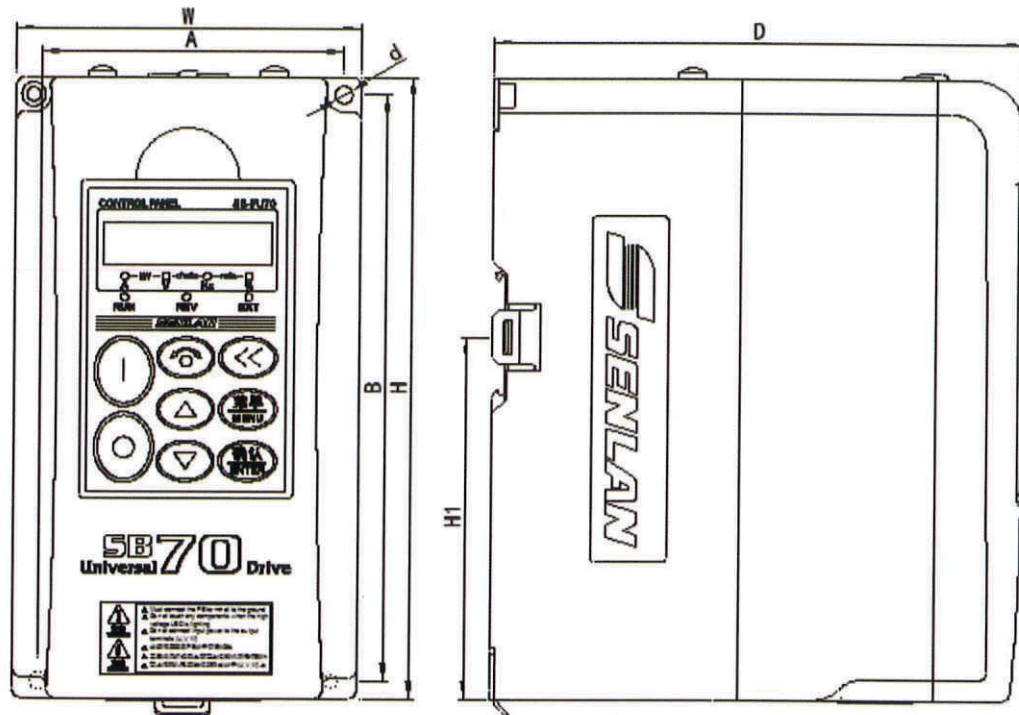
Digital Output Functions

0: Inverter ready	19: Frequency upper limit	38: X5(after positive & negative	57: Encoder A channel
1: Inverter running	20: Frequency lower limit	39: X6(after positive & negative	58: Encoder B channel
2: Frequency reach	21: Running in generating state	40: X7(expansion terminal)	59: PFI terminal status
3: Frequency reach detection	22: Running at zero speed	41: X8(expansion terminal)	60: Virtual revolution-counting pulse
4: Frequency reach detection	23: Zero-servo finished	42: X9(expansion terminal)	61: PLC mode 0 indication
5: Fault output	24: PLC operation	43: X10(expansion terminal)	62: PLC mode 1 indication
6: Holding brake signal	25: PLC operation pause	44: X11(expansion terminal)	63: PLC mode 2 indication
7: Motor load overweight	26: PLC stage finished	45: FWD(after positive & negative	64: PLC mode 3 indication
8: Motor overload	27: PLC cycle finished	46: REV(after positive & negative	65: PLC mode 4 indication
9: Undervoltage lockout	28: PC digital 1	47: Comparator 1 output	66: PLC mode 5 indication
10: External fault trip	29: PC digital 2	48: Comparator 2 output	67: PLC mode 6 indication
11: Fault auto-reset	30: Wobble frequency upper/lower	49: Logic unit 1 output	68: PLC mode 7 indication
12: Restart after momentary	31: Setpoint count reach	50: Logic unit 2 output	69: Designated count 2 reach
13: Alarm output	32: Designated count reach	51: Logic unit 3 output	70: Logic unit 5 output
14: Reverse running	33: Meter-counter setpoint length	52: Logic unit 4 output	71: Logic unit 6 output
15: Stopping	34: X1(after positive & negative	53: Timer 1 output	72: Fan Life expectancy reached
16: Run interruption	35: X2(after positive & negative	54: Timer 2 output	
17: Keypad control	36: X3(after positive & negative	55: Timer 3 output	73: Process PID dormancy
18: Torque limit	37: X4(after positive & negative	56: Timer 4 output	

Analog Output Functions

0: Operating frequency	12: PFI	23: Arithmetic unit 5 output	35: Arithmetic unit 6digital setting
1: Reference frequency	13: UP/DOWN value	24: Arithmetic unit 6 output	36: PC analog 1
2: Output current	14: DC link voltage	25: Low-pass filter 1 output	37: PC analog 2
3: Output voltage	15: Reference frequency after accel or decel	26: Low-pass filter 2 output	38: Factory output 1
4: Output capacity		27: Analog multiple switching output	39: Factory output 2
5: Output torque	16: PG detection frequency	28: Comparator 1 digital setting	40: Output frequency (for factory use)
6: Reference torque	17: Counter error	29: Comparator 2 digital setting	41: Keypad POT value(POT: potentiometer)
7: PID feedback value	18: Count percentage	30: Arithmetic unit 1digital setting	
8: PID reference value	19: Arithmetic unit 1 output	31: Arithmetic unit 2digital setting	42: Counter 2 count value
9: PID output value	20: Arithmetic unit 2 output	32: Arithmetic unit 3digital setting	43: 1 Temp of the radiator
10: AI1	21: Arithmetic unit 3 output	33: Arithmetic unit 4digital setting	44: 2 Temp of the radiator
11: AI2	22: Arithmetic unit 4 output	34: Arithmetic unit 5digital setting	

DIMENSION



*SB70G2.2D2 and below, SB70G4 and below
(can be fixed by standard DIN guide rails).*

Model	Overall dimensions			Mounting dimensions				Structure Form	Weight (kg)
	W (mm)	L (mm)	H1 (mm)	D (mm)	A (mm)	B (mm)	d (mm)		
SB70G0.55D2	100	180	105	157	87.5	170	φ4.5	Wall mounted type	2
SB70G0.75D2									
SB70G0.4									
SB70G0.75									
SB70G1.5									
SB70G1.5D2	135	240	140	170	125	230	φ4.5		3
SB70G2.2D2									
SB70G2.2									
SB70G4									

Product Series – 690V

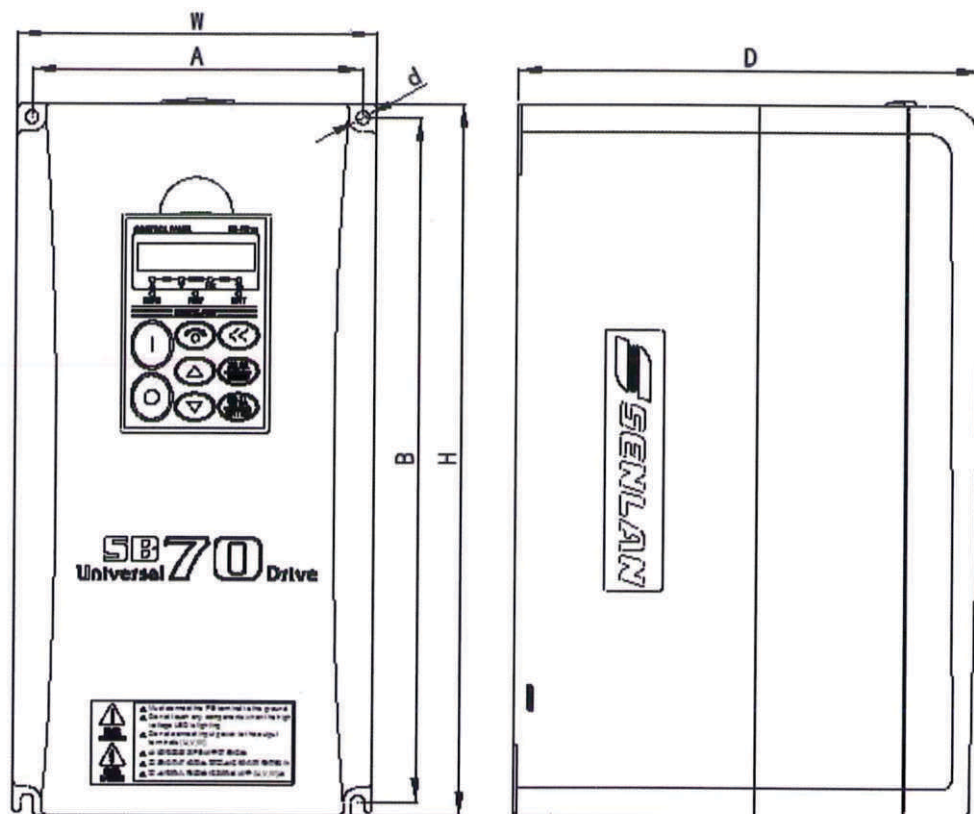
Model	Rated capacity (kVA)	Rated output current (A)	Applicable motor (kW)	Model	Rated capacity (kVA)	Rated output current (A)	Applicable motor (kW)
SB70G11T6	16	13.5	11	SB70G280T6	360	315	280
SB70G18.5T6	25	22	18.5	SB70G315T6	406	355	315
SB70G22T6	29	25	22	SB70G355T6C	417	365	355
SB70G30T6	38	33	30	SB70G375T6C	440	385	375
SB70G37T6	51	45	37	SB70G400T6C	510	446	400
SB70G45T6	62	54	45	SB70G450T6C	576	504	450
SB70G55T6	74	65	55	SB70G500T6C	625	538	500
SB70G75T6	103	86	75	SB70G560T6C	686	600	560
SB70G90T6	116	102	90	SB70G630T6C	791	675	630
SB70G110T6	138	122	110	SB70G710T6C	852	745	710
SB70G132T6	176	148	132	SB70G850T6C	972	850	850
SB70G160T6	195	171	160	SB70G900T6C	1125	984	900
SB70G200T6	240	210	200	SB70G1000T6C	1200	1076	1000
SB70G220T6	274	240	220	SB70G1100Q6C	1257	1100	1100
SB70G250T6	328	287	250	SB70G1200H6C	1372	1200	1200

Notes: As to the products with voltage class of 690V, on-hook products with 18.5~315kW are conventional. Products with other specifications are customized products. If you have any requirement, please consult with the local agency or personnel of our company.

Product Series – 1140V

Power range: 55-1000KW

In addition, the company also can customize special frequency converter with supply voltage being 1140V. If you have any requirement, please consult with the local agency or personnel of our company.



SB70G4T2, SB70G5.5T2,
SB70G5.5~SB70G15

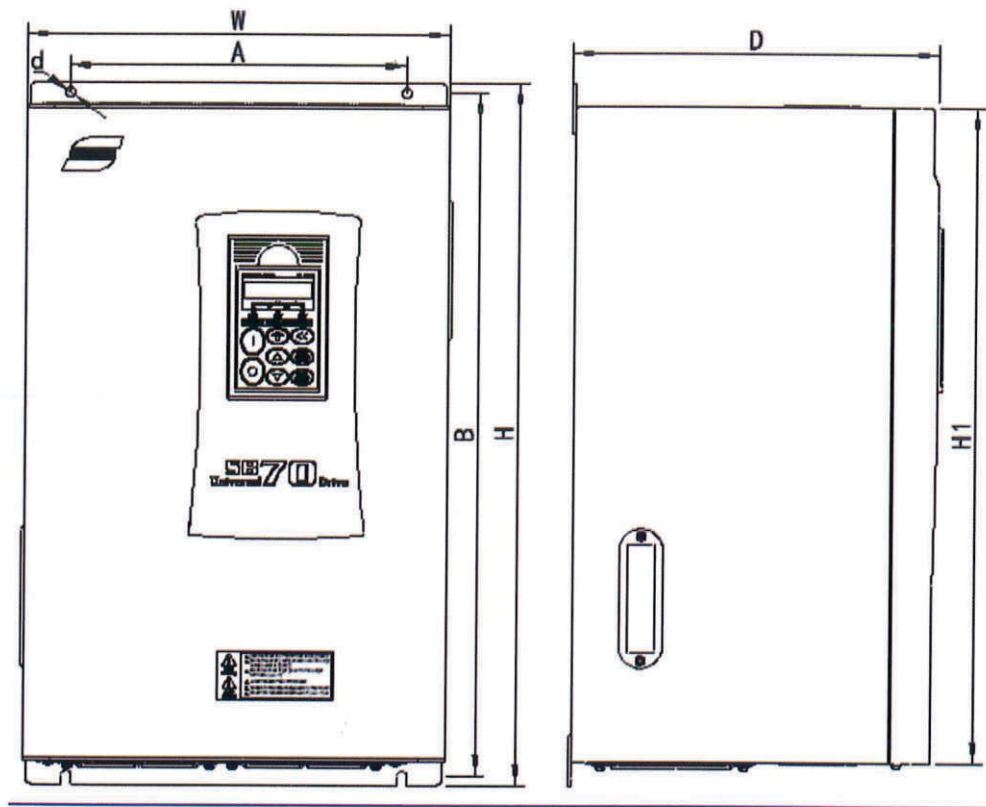
Model	Overall dimensions			Mounting dimensions			Structure Form	Weight (kg)
	W (mm)	H (mm)	D (mm)	A (mm)	B (mm)	d (mm)		
SB70G4T2 SB70G5.5T2	150	300	195	138	288	φ5.5	Wall mounted type	7
SB70G5.5 SB70G7.5								
SB70G11 SB70G15	200	380	225	185	367	φ7		10

Outlines and installation dimensions of SB70G11T6~SB70G315T6 are shown in the following table:

Model	Overall dimensions			Mounting dimensions				Structure Form	Weight (kg)
	W (mm)	H (mm)	H1 (mm)	D (mm)	A (mm)	B (mm)	d (mm)		
SB70G11T6	415	580	535	325	300	560	φ9	Wall mounted type	33
SB70G18.5T6									
SB70G22T6									
SB70G30T6									
SB70G37T6	430	665	620	325	300	645	φ10		58
SB70G45T6									
SB70G55T6									
SB70G75T6	520	820	770	375	350	800	φ12		78
SB70G90T6									
SB70G110T6	590	860	810	375	420	840	φ12		104
SB70G132T6									
SB70G160T6	650	1045	980	385	420	1018	φ14		113
SB70G200T6									
SB70G220T6	720	1306	1240	405	500	1278	φ14		125
SB70G250T6									
SB70G280T5									
SB70G315T6									

Outlines and installation dimensions of SB70G355T6 and above are shown in the following table:

Model	Overall dimensions			Mounting dimensions				Structure Form	Weight (kg)
	W (mm)	H (mm)	H1 (mm)	D (mm)	A (mm)	B (mm)	d (mm)		
SB70G355T6C	800	2200	320	800	550	700	φ12	Cabinet type	350
SB70G375T6C									350
SB70G400T6C									400
SB70G450T6C	1200	2200	320	600	1050	450	φ14		450
SB70G500T6C									500
SB70G560H6C	1600	2200	320	600	460/660	500	φ14		600
SB70G630T6C	1200	2200	320	600	1050	450	φ14		650
SB70G710T6C	1200	2200	320	600	1040	506	φ14		730
SB70G850T6C									
SB70G900T6C	Customized type								
SB70G1000T6C									
SB70G1100Q6C									
SB70G1200H6C									



SB70G18.5~SB70G375, SB70G18.5T6~SB70G315T6

Outlines and installation dimensions of SB70G18.5~SB70G375 are shown in the following table:

Model	Overall dimensions			Mounting dimensions				Structure Form	Weight (kg)
	W (mm)	H (mm)	H1 (mm)	D (mm)	A (mm)	B (mm)	d (mm)		
SB70G18.5 SB70G22	290	460	430	265	200	448	φ7	Wall mounted type	23
SB70G30	310	514	480	265	246	500	φ7		33
SB70G37 SB70G45	370	570	530	288	300	554	φ9		48
SB70G55	380	610	560	300	250	590	φ10		58
SB70G75	440	686	650	320	300	670	φ10		82
SB70G90 SB70G110	480	780	730	345	350	760	φ10		113
SB70G132	520	810	760	360	350	788	φ12		130
SB70G160 SB70G200	590	980	920	370	350	955	φ14		200
SB70G220 SB70G250	640	1020	960	380	430	995	φ14		230
SB70G280 SB70G315	720	1100	1030	405	450	1068	φ17		268
SB70G375	820	1250	1180	405	500	1218	φ17		300

SELECTION OF ACCESSORIES

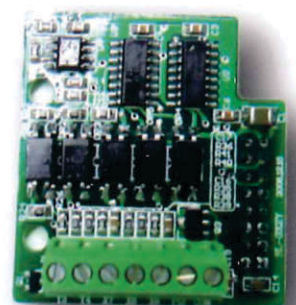
Brake unit

- If the frequency converter has brake units internally set, just choose the appropriate braking resistance.
- If the frequency converter does not have brake units internally set, brake units of SZ series and braking resistance are needed.
- Braking resistance should be determined according to the actual generated power of loading, frequency of power generation, etc.
- Resistance should not be more than 1.5~2.0 times of the value recommended.



Exchange electric reactor

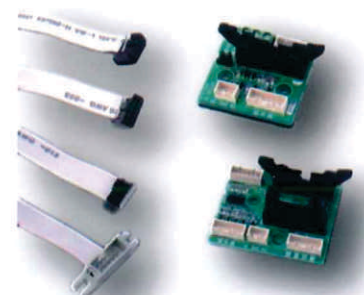
- Exchange electric reactor on the input side can restrain ultra-harmonics of input current of frequency converter, improving power factors of the input side.
- Advise to use it under following conditions:
 - The capacity of power grid is far higher than that of frequency converter and the power of frequency converter is more than 30kW;
 - Thyristor loads or power factor compensation devices with on-off control are connected to the same power source;
 - Voltage unbalance of three-phase sources is more than 3%;
 - Need to improve the voltage factors of input side.
- Exchange electric reactors on the output side have the following functions:
 - Reduce output harmonic of frequency converter;
 - Prevent electrical insulation from being destroyed;
 - Reduce common mode interference on the output side.Reduce shaft current of electrical machine.



Digital I/O expansion board

The digital I/O expansion board is used to expand the digital input and output terminals:

- SL-5X: 5 channels of digital input
- SL-5Y: 5 channels of digital output
- SL-3X2Y: 3 channels of digital input plus 2 channels of digital output

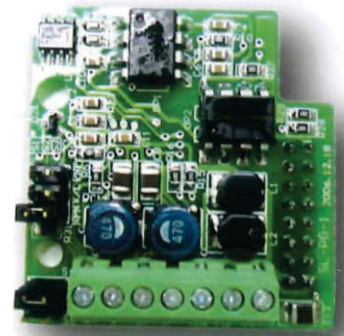


Communication components

- Extension cord components on the operation panel
- Background monitor software SB Monitor
- Profibus-DP module

Encoder Interface Board (SL-PG0)

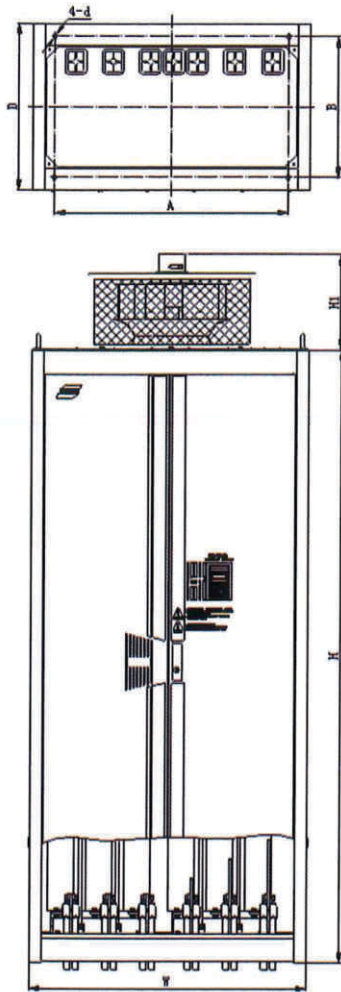
- The encoder interface board is used to receive signals from the encoder, so that the inverter can implement PG V/F control or PG vector control. It is also used in the high-speed counting of numbers or meters. Moreover, it can be connected to the reference frequency via the analog input 16.
- Support for open collector type, voltage, complementary push-pull type differential output type.



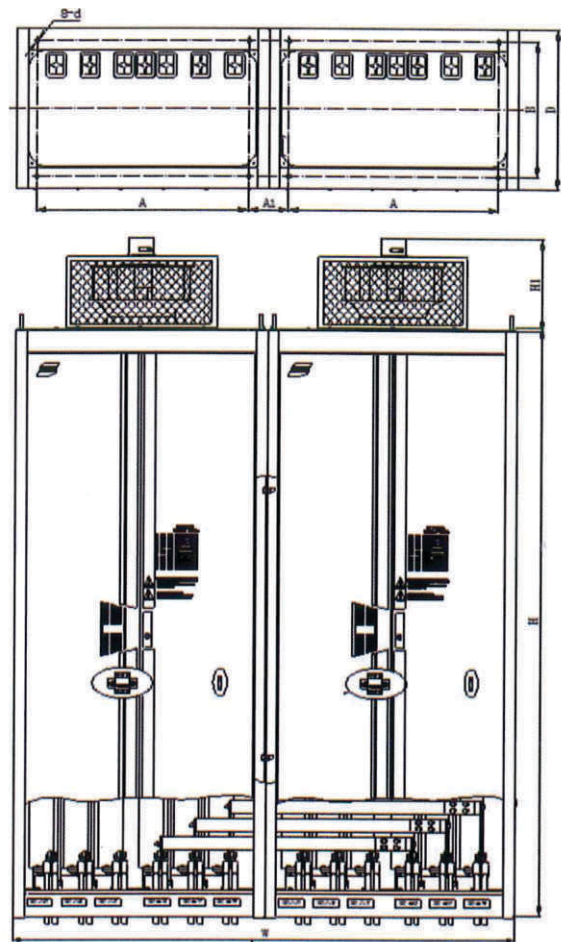
Options of operational panel

- SB-PU70E has parameter copy function. It is especially useful in the same setting of multiple sets of frequency converters.
- SB-PU03 is operational panel with panel potentiometer, making it convenient for users to regulate given quantity.
- SB-PU05 is operational panel with encoder, suitable for occasions needing high-precision potentiometers, like machine tool.
- SB-PU04 is liquid crystal (LCD) operational panel, supporting functions of Chinese/English display, parameter copy etc.





*SB70G400T4C and above,
SB70G355T6C and above*



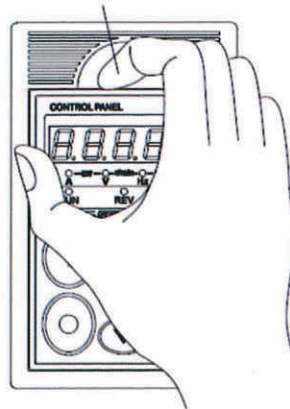
*Outside drawings of
cabinet models in parallel*

Model	Overall dimensions				Mounting dimensions			Structure Form	Weight (kg)
	W (mm)	H (mm)	H1 (mm)	D (mm)	A (mm)	B (mm)	d (mm)		
SB70G400C	1000	2200	-	600	840	507	φ14	Cabinet type	600
SB70G450C									630
SB70G500C									650
SB70G560C	Customized type								
SB70G630	720	1100	1030	-	450	1068	φ17	Wall-mounted type in parallel	536
SB70G700	820	1250	1180	-	500	1218	φ17		600
SB70G800C	1840	2200	341	600	774	454	φ14	Cabinet type in parallel	1210
SB70G900C									1270
SB70G1000C									1320
SB70G1100C	Customized type								
SB70G1200C									
SB70G1400C									
SB70G1650C									

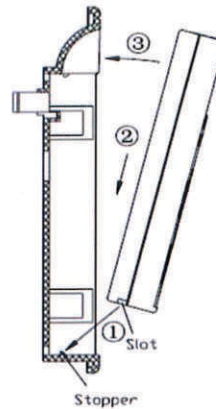
ASSEMBLING AND DISASSEMBLING PANEL

Taking Out And Putting In The Keyboard

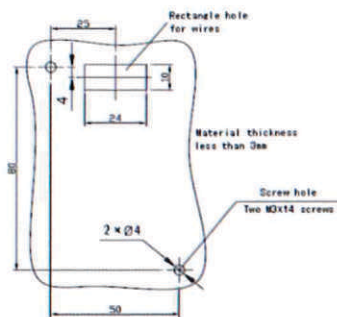
Press the spring piece and pull out



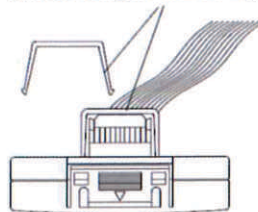
Installation of keypad



Installing The Keyboard



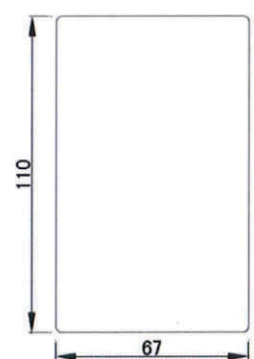
Holder T/SL-23(accessory) prevents the extension line connector coming off from the keypad



Keypad mounting box



Size of cabinet holes
Material thickness: 1"1.5mm



Opening And Installation Of Plastic Casing

