

High Performance, High Function System Drive
SOFTSTARTER SS7

2.2kW ~ 1.5MW / 230 ~ 690V



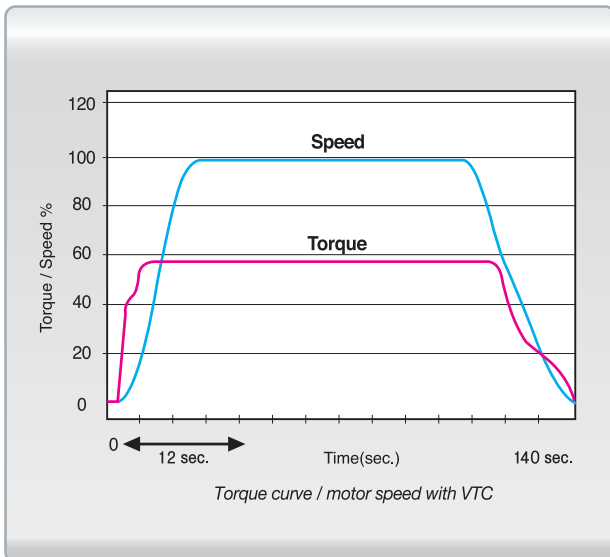
Drive Solution





Optimized Solution for high performance drive 2.2kW - 1.5MW / 230 - 690V

>>> Optimized motor control solution



Serial Communications

SS7 is available with in-built RS232/485 serial ports, developed for integration into the most commonly used industrial communication protocols. While MODBUS protocol is standard, other protocols are supported including PROFIBUS-DP, DeviceNet.

Slow Speed

SS7 Series allows torque adjustment at slow speed, thus it will adapt to any type of load requirement. This setting is ideal for machine positioning, as ceramic mills, etc.

Dynamic Torque Control

SS7 Series are featured with Dynamic Torque Control, exclusive starting method, it means progressive soft starting in those high inertia applications. With this control algorithm, progressive acceleration and optimization of starting current peak is achieved.

D.C. Brake

In some applications the deceleration ramp is not enough. DC Injection setting is provided in SS7 Series for those, specially in high load inertia machines.

Pump Control

An special designed control algorithm for decelerating pumps is provided in SS7 Series. This special adjustment does not operate in function of lineal stop curve for quadratic torque loads, as it is normally operated, but automatically it will adapt to hydraulic system curve.



External or Built in Bypass

SS7 softstarter offers both possibilities. The user can choose the standard model offering the possibility of installing an external contactor for bridging the power stage once acceleration ramp is finished, until the start of deceleration ramp. Otherwise the user can choose the new SS7 model with built in bypass which will offer the same functionality without requiring any external device installation. In any case, SS7 control stage remains monitoring all control operations and motor protections.

Permanent Information

SS7 Series displays constantly, motor status and complete information of the installation where it is integrated. The user will access locally (keypad unit) or remote (serial communications) to the following information :

- Voltage in each phase
- Total and partial
- Motor phi cosine (Power Factor)
- Motor shaft torque
- Power (kW) and current (I) in each phase
- Fault history (5 most recent faults)
- Number of starts
- Analogue input / output status
- Digital input /output status
- Timer, total and partial

Integration and Control

SS7 Series make easy its integration into any automation process. Via 2 analogue inputs 0-10V and 4-20mA, 5 configurable digital inputs, 1 PTC input, 1 analogue output 4-20mA and 3 changeover configurable relays.

Full Protections

All protections included in SS7 Series are translated to a better control and motor security.

- Input phase loss
- Rotor locked
- Phase imbalance > 40%
- High input voltage
- Low input voltage
- Motor overload
- Motor underload
- Motor overtemperature PTC
- Shearpin current
- Input phase sequence

Multivoltage

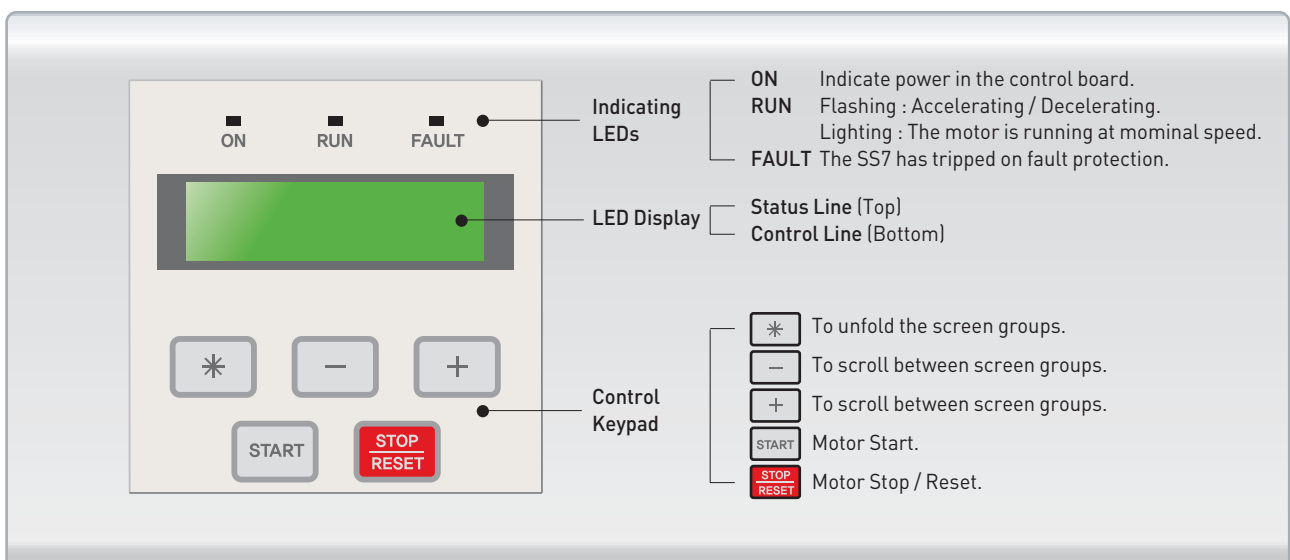
Only one softstarter for 230V/400V/440V and 500V, simply adjusting SS7 current to motor's. For 690V, please consult tables available at standard ratings section.

International Standards

SS7 complies with international standards as CE, cTick, UL and cUL

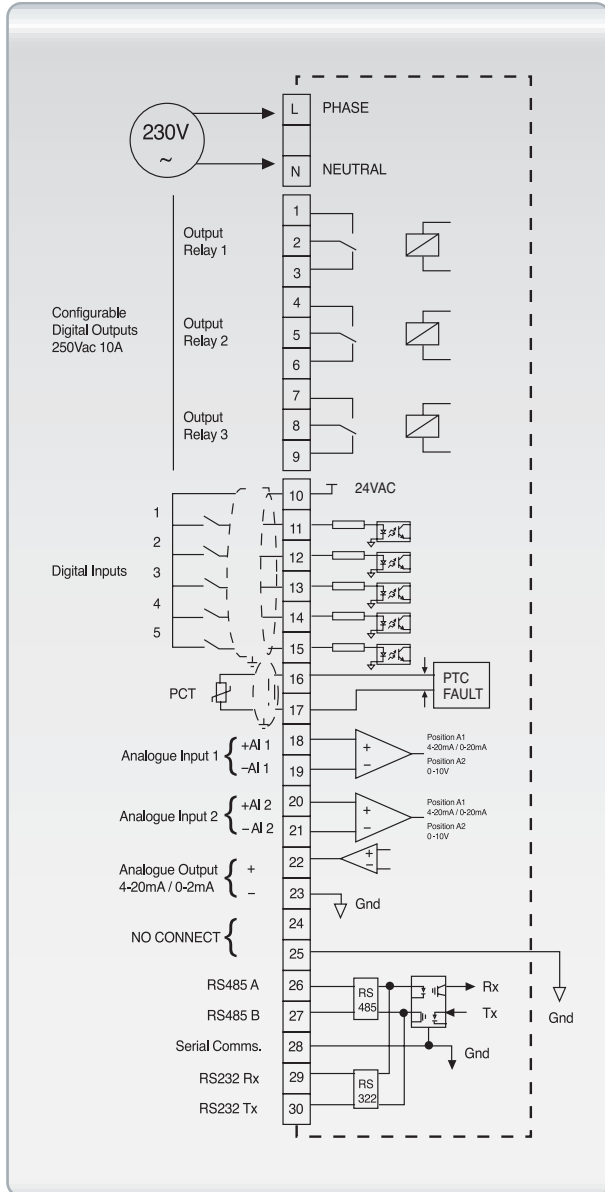


Display Unit + Keypad Control



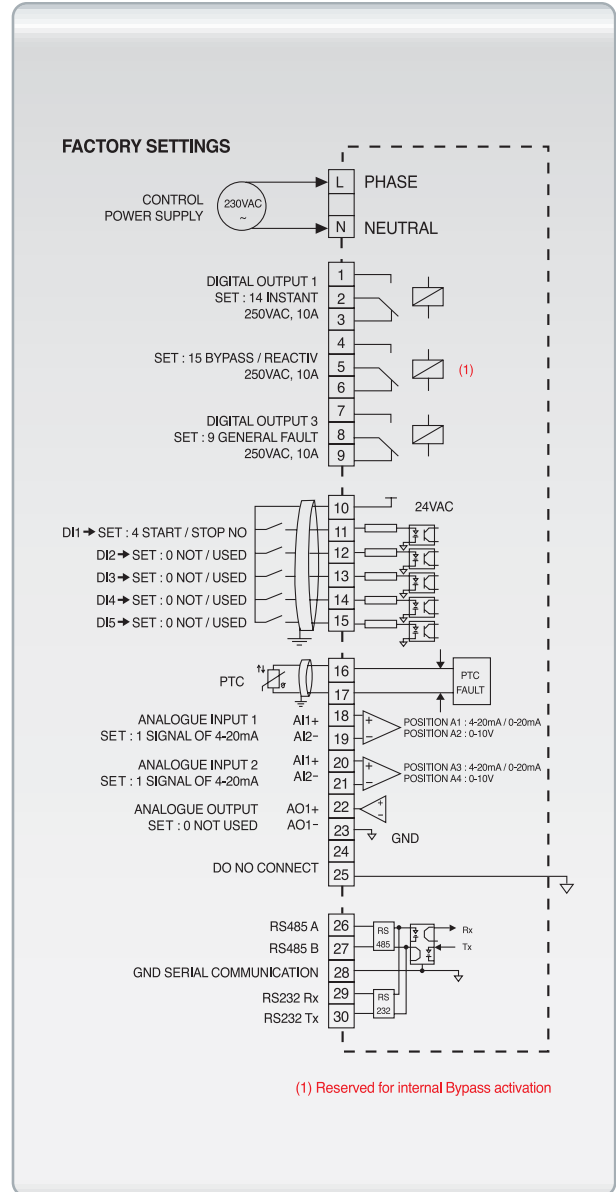
>>> Standard

Configuration of Control Wiring

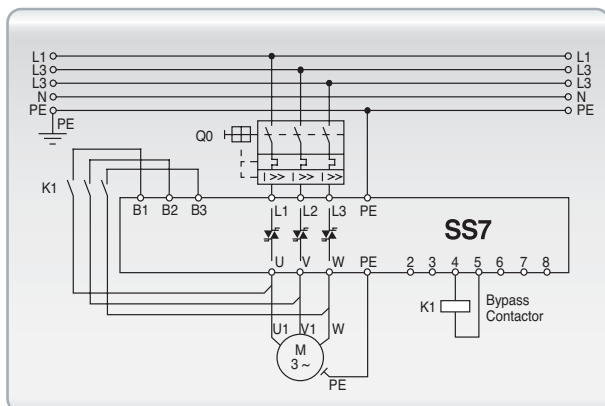


>>> Bypass built in

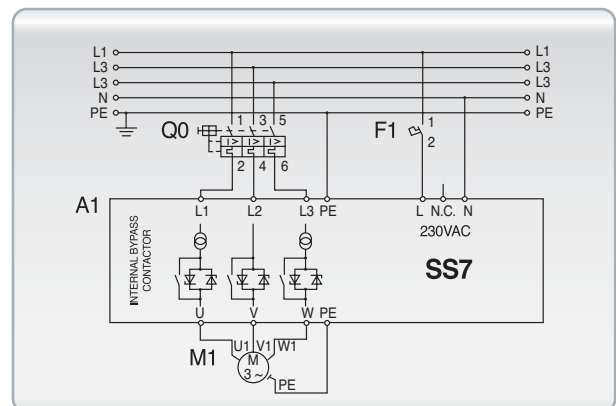
Configuration of Control Wiring



Configuration of Power Wiring



Configuration of Power Wiring



Technical Specifications

Input	Input voltage	3 Phase, 230-500V, 690V (-20%~+15%)
	Supply frequency	47-62Hz
	Control voltage	220-230V (± 10%)
Output	Output voltage	0-100% Supply voltage
	Output frequency	47-62Hz
	Efficiency (at full load)	> 99%
Environmental Conditions	Ambient temperature	-10°C ~ +45 °C
	Altitude losses	Below 3,000m ^{*note 1)}
	Ambient humidity	Less 95% (non-condensing)
	Enclosure	IP20
Serial Communications	Standard	RS232/485, Modbus
	Option	Profibus, DeviceNet
Motor Protections	Input phase missing, High current, Low input voltage, Starting current limit, Rotor locked, Motor overload (thermal model), Underload, Phase unbalance, Motor overtemperature (PTC, normal status 150R-2k7), Shearpin current	
Protections	Thyristor fault, SS7 over temperature	
Sources Control	Local via keypad, Remote via digital inputs, Remote via Serial Communications (Modbus, RS232/485)	

*note 1) More 1,000m, 1% derating each 100m

Adjustments ^{*note 2)}	Torque surge, Initial torque, Initial torque time, Acceleration time, Current limit : 1-In, Overload : 0.8-1.2 In, Overload slope : 0-10, Deceleration time / Freewheel stop, DC braking, Slow Speed (1/7 fundamental frequency), Dual setting Number of starts allowed, Torque control, Water hammer surge control stop
Input Signals	2 analogue inputs, 0-20mA or 4-20mA, 0-10V 5 configurable digital inputs 1 PTC input
Output Signals	1 analogue output 0-20mA or 4-20mA 3 changeover output relays (250VAC, 10A non inductive)
Display Information	Phase current, Supply voltage, Relays status, Digital inputs / PTC status, Analogue inputs value, Analogue output value, Overload status, Motor supply frequency, Motor power factor, Developed power, Motor shaft torque, Fault history (5 most recent faults)
LED's Indications	LED1 (green) : Voltage present on control board
	LED2 (orange) : Blinking , Motor accelerating / decelerating On , motor running
	LED3 (red): Fault present

*note 2) For additional information consult the technical manual

Softstarter applications

According to this information, there are two utilisation categories for the Electronics Softstarter, described as follow :

- 1) Starting Time
- 2) Starting Current
- 3) Ambient Temperature
- 4) Time at OFF status
- 5) Number of Startings per Hour

EXAMPLE

1 90 : 2 AC53b 3 4.5 - 4 30 : 5 330

- 1 Rated Current of the Softstarter under the described conditions : In, (90 Amps)
- 2 The thyristors will be bypassed
- 3 Starting Current, as multiple of the nominal current (In), that means : 4.5 × In

- 4 Starting Time, in seconds, (30s)
- 5 Seconds between the end of starting and the beginning of next starting (10 startings per hour)

Common Applications

Example : The application is: Fan(fresh Air), 400V, 55kW motor

Look at 400VAC table right column (AC53b 4.5-30:330) 55kW means the softstarter coded SS7011B with nominal current of 110A

COMMON APPLICATIONS	CHARACTERISTIC STARTING CURRENT
WATER AND WASTEWATER	
Centrifugal Pumps	3.0 × In
Mono and High Pressure Pumps	4.0 × In
Multistage Pumps	4.0 × In
Vertical Pumps	3.0 × In
Split Chamber Pumps	3.5 × In
Submersible Pumps	3.5 × In
VENTILATION	
Fans (extraction)	3.5 × In
Fans (fresh air)	4.5 × In
Condensor Fans	3.5 × In
Climatization Turbine	4.5 × In
PULP AND PAPER INDUSTRY	
Refine Pumps	4.0 × In
Pulp Pumps	4.0 × In
Vacuum Pumps	4.0 × In
Pulp Machines	4.5 × In
Trommels	4.0 × In
Pulp Mixers	4.0 × In
Filters	4.0 × In
METALS, AGGREGATES AND MINERALS	
Dust Filters Fans	3.5 × In
Conveyor Belts	4.5 × In
Crushers	3.0 × In
Hammer Mills	4.5 × In

COMMON APPLICATIONS	CHARACTERISTIC STARTING CURRENT
Jaw Crushers	4.0 × In
Rotor Bar Mills	4.5 × In
Ball Mills	4.5 × In
Secondary Mills and Sand Pulverizers	3.5 × In
Eccentric Feeder	4.5 × In
Trommels	4.0 × In
Vibrators	4.0 × In
Separators	4.0 × In
Feeders	3.5 × In
FOOD INDUSTRY	
Air Compressors	4.0 × In
Sorters	3.5 × In
Bottle Wash Machines	3.0 × In
Driers	4.5 × In
Centrifuges	4.0 × In
Crushers, Punchers	4.5 × In
Palletizers	4.5 × In
Separators	4.5 × In
Cutters	3.0 × In
Material Handling	3.5 × In
TOOLING MACHINES	
Arm Saws	4.5 × In
Buzz Saws	3.5 × In
Stamping presses	4.5 × In
Crumbing Machines	3.5 × In

COMMON APPLICATIONS	CHARACTERISTIC STARTING CURRENT
Chamfering Tools	3.5 × In
Flatters	3.5 × In
Sanding Machines	4.0 × In
Lathes	4.5 × In
Crusher Machines	3.5 × In
Palletizers	4.5 × In
Presses	4.0 × In
Turn Tables	4.0 × In
Transporters	4.0 × In
PETRO-CHEMICAL	
Centrifugal Machines	4.0 × In
Screw Pumps	4.0 × In
Gas Pumps (Propane, butane)	3.0 × In
Crude Oil Extraction Pumps	4.5 × In
Crude Oil Transfer Pumps	4.5 × In
Hydrocarbon Transfer Pumps (liquid Stage)	3.5 × In
Transport and Packaging	3.5 × In
Conveyors	3.5 × In
GENERAL	
Hydraulic Equipment	3.5 × In
Agitators	4.0 × In
Compressors (Screw compressor, without load)	3.0 × In
Compressors (Reciprocating compressor, without load)	4.0 × In
Conveyors	4.0 × In
Mixers	4.5 × In

>>> Standard

⇒ 230 ~ 500V (-20% ~ +10%)

Frame	Code	Rated I (A)	Power motor until (kW)			
			230V	4000V	440V	500V
1	SS70009	9	2	4	5	5.5
	SS70017	17	5	7	9	11
	SS70030	30	9	15	18.5	18
	SS70045	45	14	22	25	30
	SS70060	60	18	30	35	40
	SS70075	75	22	37	45	50
	SS70090	90	25	45	55	65
2	SS70110	110	35	55	65	80
	SS70145	145	45	75	90	100
	SS70170	170	50	90	110	115
	SS70210	210	65	110	120	150
	SS70250	250	75	132	160	180
3	SS70275	275	85	150	170	200
	SS70330	330	100	185	200	220
	SS70370	370	115	200	220	257
	SS70460	460	145	250	270	315
4	SS70580	580	185	315	375	415
	SS70650	650	200	355	425	460
	SS70800	800	250	450	500	560
	SS70900	900	280	500	560	630
5	SS71000	1000	322	560	616	700
	SS71200	1250	400	710	800	900
	SS71500	1500	500	800	900	1100

⇒ 690V (-20% ~ +10%)

Frame	Code	Rated I (A)	Power motor until (kW)
			690V
1	SS70009.6	9	7.5
	SS70017.6	17	15
	SS70030.6	30	30
	SS70045.6	45	45
	SS70060.6	60	60
	SS70075.6	75	75
	SS70090.6	90	90
2	SS70110.6	110	11
	SS70145.6	145	140
	SS70170.6	170	160
	SS70210.6	210	200
	SS70250.6	250	230
3	SS70275.6	275	250
	SS70330.6	330	315
	SS70370.6	370	355
	SS70460.6	460	450
4	SS70580.6	580	560
	SS70650.6	650	630
	SS70800.6	800	800
	SS70900.6	900	900
5	SS71000.6	1000	960
	SS71200.6	1250	1250
	SS71500.6	1500	1500

>>> Option

Code	Description
I001	Profibus interface SS7
A002	Devicenet Interface SS7
A003	Metasys [JOHNSON CONTROLS] interface SS7
L051	BY-PASS Terminal Kit for SS70009-SS70017
L052	BY-PASS Terminal Kit for SS70030-SS70045
P0015 (X3)	BY-PASS Terminal Kit for SS70060-SS70090
P0016 (X3)	BY-PASS Terminal Kit for SS70110-SS70250
V01	Remote Display Kit 2m with plastic case
V02	Remote Display Kit 1m with plastic case
V09	Remote Display Kit 3m with plastic case
V16	Remote Display Kit 5m with plastic case
MFV50275	D.C. Brake 275A

>>> Bypass built in

⇒ 400Vac (-20% ~ +10%)

Frame	Code	AC53b 3.0 ~ 30:330		AC53b 4.0 ~ 30:330		AC53b 4.5 ~ 30:330	
		Max. Rated I(A)	Motor Power (kW)	Max. Rated I(A)	Motor Power (kW)	Max. Rated I(A)	Motor Power (kW)
1	SS70009.6B	14	7.5	10	5.5	9	4
	SS70017.6B	26	15	19	11	17	7.5
	SS70030.6B	45	22	34	18.5	30	15
	SS70045.6B	68	37	51	30	45	22
	SS70060.6B	90	45	68	37	60	30
	SS70075.6B	113	55	85	45	75	37
	SS70090.6B	135	75	101	55	90	45
2	SS70110.6B	165	90	140	75	110	55
	SS70145.6B	218	110	164	90	145	75
	SS70170.6B	255	150	192	110	170	90
	SS70210.6B	315	185	237	132	210	110
	SS70250.6B	375	200	281	150	250	132
3	SS70275.6B	412	220	310	185	275	150
	SS70330.6B	495	280	370	200	330	185
	SS70370.6B	555	315	416	220	370	200
	SS70460.6B	690	400	518	280	460	250
4	SS70580.6B	870	450	650	355	580	315
	SS70650.6B	975	500	731	400	650	355
	SS70800.6B	1200	630	900	500	800	450

⇒ 500Vac (-20% ~ +10%)

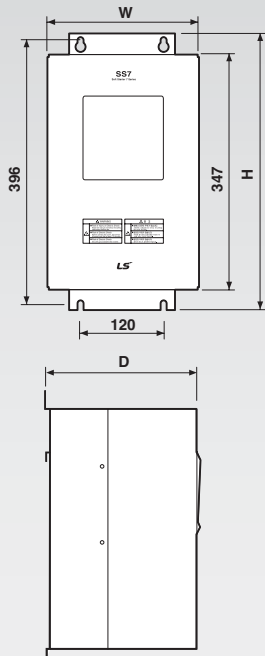
Frame	Code	AC53b 3.0 ~ 30:330		AC53b 4.0 ~ 30:330		AC53b 4.5 ~ 30:330	
		Max. Rated I(A)	Motor Power (kW)	Max. Rated I(A)	Motor Power (kW)	Max. Rated I(A)	Motor Power (kW)
1	SS70009B	14	11	10	7.5	9	5.5
	SS70017B	26	18.5	19	15	17	11
	SS70030B	45	30	34	22	30	18.5
	SS70045B	68	45	51	37	45	30
	SS70060B	90	55	68	45	60	37
	SS70075B	113	75	85	55	75	45
2	SS70090B	135	90	101	75	90	55
	SS70110B	165	110	140	90	110	75
	SS70145B	218	150	164	110	145	90
	SS70170B	255	185	192	132	170	110
	SS70210B	315	220	237	185	210	150
3	SS70250B	375	250	281	200	250	185
	SS70275B	412	280	310	220	275	200
	SS70330B	495	355	370	250	330	220
	SS70370B	555	400	416	280	370	250
4	SS70460B	690	500	518	355	460	315
	SS70580B	870	560	650	450	580	400
	SS70650B	975	630	731	500	650	450
	SS70800B	1200	710	900	630	800	560

⇒ 690Vac (-20% ~ +10%)

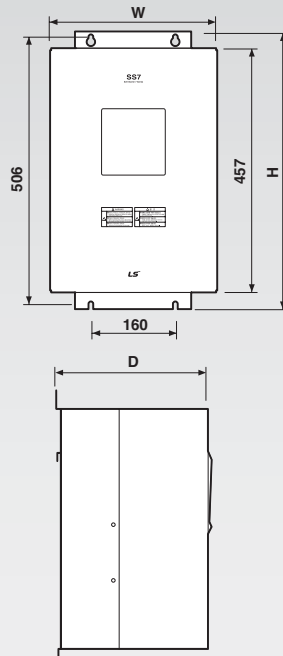
Frame	Code	AC53b 3.0 ~ 30:330		AC53b 4.0 ~ 30:330		AC53b 4.5 ~ 30:330	
		Max. Rated I(A)	Motor Power (kW)	Max. Rated I(A)	Motor Power (kW)	Max. Rated I(A)	Motor Power (kW)
1	SS70009.6B	14	15	10	11	9	7.5
	SS70017.6B	26	22	19	18.5	17	15
	SS70030.6	45	45	34	37	30	30
	SS70045.6B	68	75	51	55	45	45
	SS70060.6B	90	90	68	75	60	55
	SS70075.6B	113	110	85	90	75	75
	SS70090.6B	135	132	101	110	90	90
2	SS70110.6B	165	150	140	132	110	110
	SS70145.6B	218	200	164	150	145	132
	SS70170.6B	255	250	192	200	170	150
	SS70210.6B	315	315	237	220	210	200
	SS70250.6B	375	355	281	250	250	220
3	SS70275.6B	412	400	310	315	275	250
	SS70330.6B	495	450	370	355	330	315
	SS70370.6B	555	500	416	400	370	355
	SS70460.6B	690	630	518	500	460	450
4	SS70580.6B	870	800	650	630	580	560
	SS70650.6B	975	900	731	710	650	630
	SS70800.6B	1200	1000	900	900	800	800

Dimensions

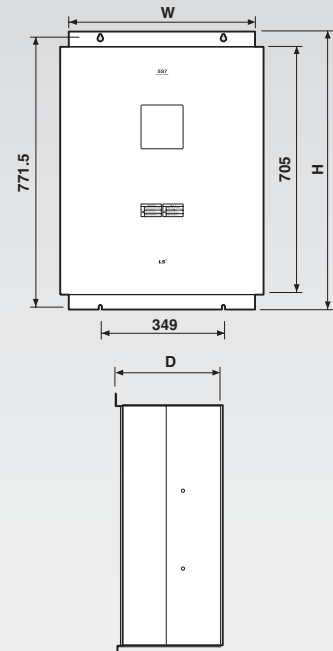
Frame 1



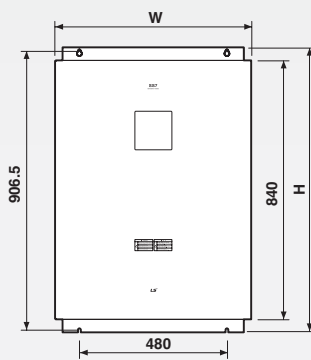
Frame 2



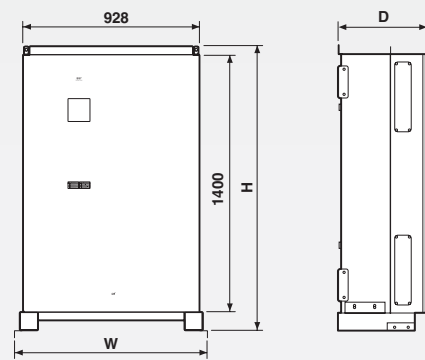
Frame 3



Frame 4



Frame 5



Frame	Code	Dimensions (mm)			Weight (kg)
		H	D	W	
1	SS70009 - SS70090	414	226	230	11.6
	SS70009.6 - SS70090.6				
	SS70009B - SS70090B				12.1
	SS70009.6B - SS70090.6B				
2	SS70110 - SS70250	523	314	260	19
	SS70110.6 - SS70250.6				
	SS70110B - SS70250B				21
	SS70110.6B - SS70250.6B				
3	SS70275 - SS70460	791	580	309	53.6
	SS70275.6 - SS70460.6				
	SS70275B - SS70460B				60.6
	SS70275.6B - SS70460.6B				
4	SS70580 - SS71000	926	640	324	77.6
	SS70580.6 - SS71000.6				
	SS70580B - SS71000B				86.6
	SS70580.6B - SS71000.6B				
5	SS71200 - SS71500	1552	1084	475	300
	SS71200.6 - SS71500.6				



Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.
Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

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