



## Comprehensively specified inverters for AC motors 0.4kW-110kW (0.5HP-150HP)

The SD1 range is the ultimate variable speed drive for you! Easy to set up, and comprehensively specified for use in virtually any application, the SD1 is IMO's first complete range of variable speed drives which offer STO (non-UL approved models only), along with a huge range of enhanced features, normally found on much more advanced inverter drives.

- Single-phase (110VAC) 0.4kW-1.1kW (0.5HP-1.4HP)
- Single-phase (220VAC) 0.4kW-2.2kW (0.5HP-3HP)
- Three-phase (220VAC) 0.4kW-7.5kW (0.5HP-10HP)
- Three-phase (380VAC) 0.75kW-110kW (1HP-150HP)

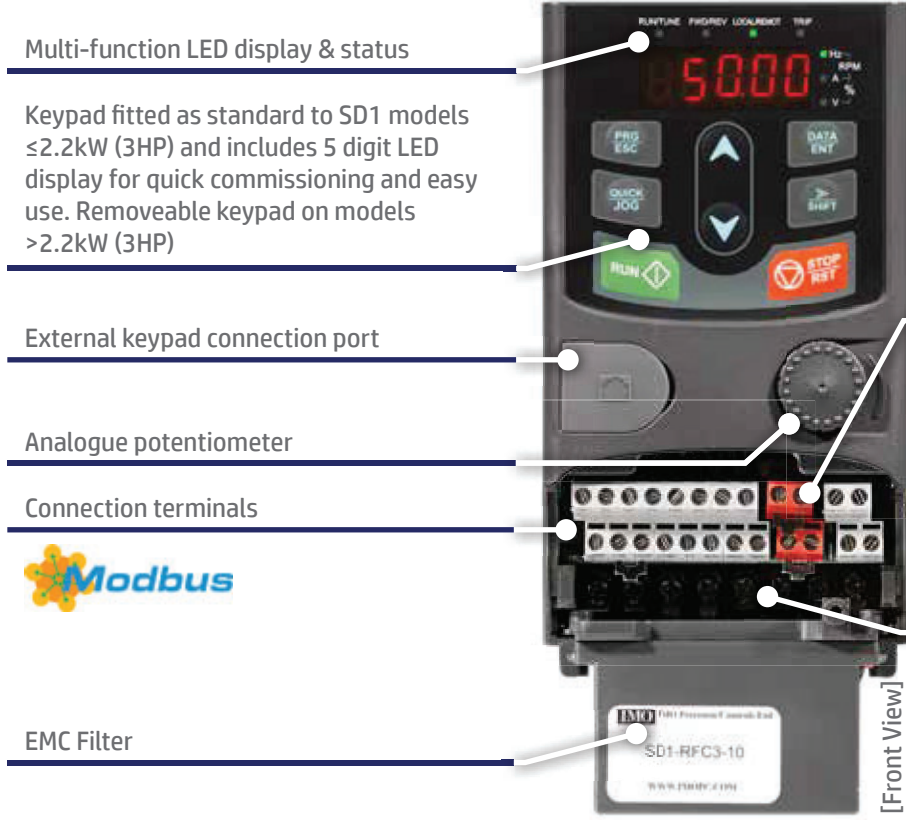
A range of EMC filter options makes the SD1 suitable for virtually every industrial, commercial or domestic application.

- IP20
- Torque Vector Control
- Optional PM DC Motor Operation
- STO (Safe Torque OFF) - SIL2 / SIL3
- Up to 150% Starting Torque
- Front Mounted RJ45 Socket ( $\leq 2.2\text{kW}/3\text{HP}$ )
- Din Rail Mountable ( $\leq 2.2\text{kW}/3\text{HP}$ )
- Fixed Keypad with Potentiometer ( $\leq 2.2\text{kW}/3\text{HP}$ )
- Detachable Keypad ( $\geq 4\text{kW}/5.5\text{HP}$ )
  
- HDI Input (Pulse)
- 1/2 Analogue Inputs
- 1/2 Analogue Outputs
- 2 Output Relays
- Transistor Output
- 4/5 Digital Inputs
- Selectable PNP/NPN I/O
  
- Integral Modbus-RTU / RS485
- PID Control as Standard
- DC Injection Braking
- Integral Brake Chopper ( $\leq 30\text{kW}/40\text{HP}$ )
- Motor Auto-tune (Static & Dynamic)
- Internal DC Reactor ( $\geq 18.5\text{kW}/25\text{HP}$ )
  
- Conformal Coating as Standard
- Internal C3 Filter ( $\geq 4\text{kW}/5.5\text{HP}$ )
- Optional C3 Filter ( $\leq 2.2\text{kW}/3\text{HP}$ )
- Optional C1 & C2 Filter
- CE, UKCA
- RoHS & Reach Compliant
- UL / cUL<sup>2</sup> / TUV
- 2 Year Warranty

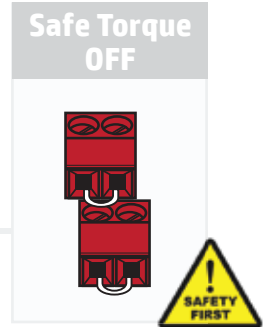


\* UL/cUL approval up to 11kW. Please check Ratings & Specifications for approved models.

# SD1 Features



Safe Torque OFF (STO) is standard on all models\*



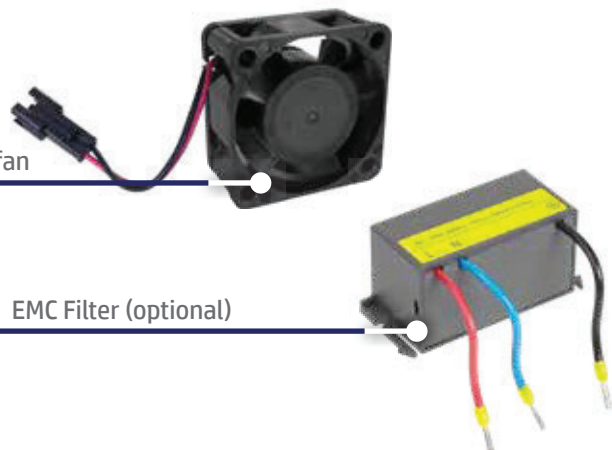
Shielded Barrier Strip on all models  $\leq 4\text{kW}$  (5.5HP)



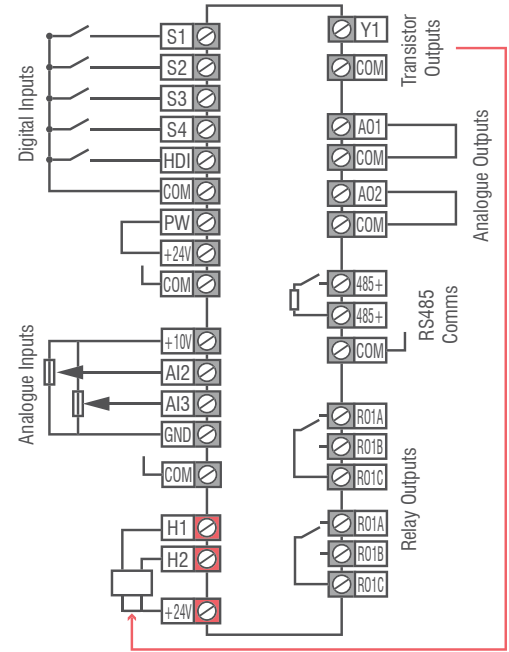
\* STO available on non-UL approved models only.



**NOTE:**  
 0.4kW - 2.2kW (0.5HP - 3HP)  
 External Filter  
 4kW - 11kW (5.5HP - 15HP)  
 Internal Filter



## Terminal Layout



Note: For a more detailed control connections diagram, please refer to the SD1 technical datasheet found at [www.imopc.com](http://www.imopc.com)

## SD1 Application Examples

With the array of advanced features and filter options, the SD1 is suited for use in virtually any application, whether it be industrial, commercial or domestic. The following are examples of, but not limited to, the type of application where the SD1 can be employed:-

Fan Applications	Pump Applications	Conveyor Applications	Hoist Applications
HVAC Water Treatment Plants Automatic Milking Systems	HVAC Waste Water Process Cooling	Mining & Metals Logistics Food Machinery	Elevators & Lifts RTG Cranes Material handling

**The versatile and feature-rich SD1 is ideal for hundreds of different applications in all segments of industry**

## SD1 Technical Specifications

Function Description		Specification
Power Input	Input Voltage (V)	AC 1PH 110V (-15%) to 120V (+10%) AC 1PH 200V (-15%) to 240V (+10%) AC 3PH 200V (-15%) to 240V (+10%) AC 3PH 380V (-15%) to 460V (+10%)
	Input Current (A)	Refer to the rated value
	Input Frequency (Hz)	50Hz/60Hz, allowable range: 47 to 63Hz
Power Output	Output Voltage (V)	0 to Input voltage (SD1-XXA-11 - AC 3ph 230VAC)
	Output Current (A)	Refer to the rated value
	Output Power (kW)	Refer to the rated value
	Output Frequency (Hz)	0 to 400Hz
Technical Control Performance	Control Mode	SVPWM control, SVC
	Motor Type	Asynchronous motor, Permanent magnet motor (optional)
	Speed Regulation Ratio	Asynchronous motor 1:100 (SVC)
	Speed Control Precision	±0.2% (SVC)
	Speed Fluctuation	±0.3% (SVC)
	Torque Response	<20ms (SVC)
	Torque Control Precision	10% (SVC)
	Starting Torque	0.5Hz / 150% (SVC)
Running Control Performance	Overload Capacity	150% of rated current: 1 minute; 180% of rated current: 10 seconds; 200% of rated current: 1 second
	Frequency Setup Mode	Digital, analog, pulse frequency, multi-step speed running, simple PLC, PID, Modbus communication. Shift between the set combination and set channel
	Auto-Adjustment of the Voltage	Automatic voltage regulation. Compensates for supply voltage transients
	Fault Protection Function	Provides comprehensive fault protection functions: Overcurrent; Undervoltage; Overheating; Phase Loss; Overload etc.
Peripheral Interface	Speed Tracking Restart	Provides smooth ramping during start up
	Analog Input	1 (AI2) 0-10V / 0-20mA and 1 (AI3) -10V to +10V
	Analog Output	2 (AO1, AO2) 0-10V / 0-20mA
	Digital Input	4 standard inputs (max. frequency: 1kHz) 1 high speed inpput (max. frequency: 50kHz)
	Digital Output	1 Y1 terminal output
Other	Relay Output	2 programmable relay outputs R01A NO, R01B NC, R01C common terminal R02A NO, R02B NC, R02C common terminal Contact capacity: 3A/250VAC
	Mounting Method	Wall & rail mounting
	Ambient Operating Temperature	-10°C to +50°C (derating 1% for every additional 1°C when above 40°C)
	DC Reactor	Standard internal DC reactor for inverters (≥18.5kW)
	Installation Mode	Wall and rail installation of inverters (1PH/200V,3PH/380V, ≤2.2kW and 3PH/200V, ≤0.75kW) Wall and flange installation of inverters (3PH/380V, ≥4kW and 3PH/200V, ≥1.5kW)
	Braking Unit	Standard for inverters ≤37kW, optional for inverters of 45 to 110kW
	Protection Level	IP20 Note: Plastic cased inverter should be installed in a metal distribution cabinet, which conforms to IP20 (top surface conforms to IP3X)
	Cooling	Fan cooling
	Braking Unit	Built-in
	EMC Filter	Internal C3 filters for inverters 3PH/380V, ≥4kW and 3PH/200V, ≥1.5kW. Optional external filters to meet the requirement of IEC61800-3 C2, IEC61800-3 C3 For drives >4kW, if internal C3 filter is required, fit supplied jumper link to EMC/J10 observing all safety precautions
	Safety	All SD1 inverters comply to safety standards and are marked accordingly. STO function to SIL level 2/3

## SD1 Ratings & Specifications

Single Phase 110VAC (Output Voltage - 230VAC)					
Model	Frame Size	Output Power		Input Current	Output Current
SD1-2.5A-11	2	0.4kW	0.5HP	8.1A	2.5A
SD1-4.2A-11	2	0.75kW	1.0HP	15.1A	4.2A
SD1-5.8A-11	2	1.1kW	1.4HP	20.0A	5.8A

NOTE: 110VAC models do not include STO and output voltage is 230V.

Single Phase 220VAC					
Model	Frame Size	Output Power		Input Current	Output Current
SD1-2.5A-21	1	0.4kW	0.5HP	6.5A	2.5A
SD1-4.2A-21	1	0.75kW	1.0HP	9.3A	4.2A
SD1-7.5A-21	2	1.5kW	2.0HP	15.7A	7.5A
SD1-10A-21	2	2.2kW	3.0HP	24.0A	10.0A

Three Phase 220VAC					
Model	Frame Size	Output Power		Input Current	Output Current
SD1-2.5A-23	2	0.4kW	0.5HP	3.7A	2.5A
SD1-4.2A-23	2	0.75kW	1.0HP	5.0A	4.2A
SD1-7.5A-23	3	1.5kW	2.0HP	7.7A	7.5A
SD1-10A-23	3	2.2kW	3.0HP	11.0A	10.0A

Three Phase 380VAC					
Model	Frame Size	Output Power		Input Current	Output Current
SD1-2.5A-43	2	0.75kW	1.0HP	3.4A	2.5A
SD1-4.2A-43	2	1.5kW	2.0HP	5.0A	4.2A
SD1-5.5A-43	2	2.2kW	3.0HP	5.8A	5.5A
SD1-9.5A-43	3	4.0kW	5.5HP	13.5A	9.5A
SD1-14A-43	3	5.5kW	7.5HP	19.5A	14.0A
SD1-18.5A-43	4	7.5kW	10.0HP	25.0A	18.5A
SD1-25A-43	4	11.0kW	15.0HP	32.0A	25.0A
SD1-32A-43	4	15.0kW	20.0HP	40.0A	32.0A
SD1-38A-43	5	18.5kW	25.0HP	47.0A	38.0A
SD1-45A-43	5	22.0kW	30.0HP	51.0A	45.0A
SD1-60A-43	6	30.0kW	40.0HP	70.0A	60.0A
SD1-75A-43	6	37.0kW	50.0HP	80.0A	75.0A
SD1-92A-43	7	45.0kW	60.0HP	98.0A	92.0A
SD1-115A-43	7	55.0kW	75.0HP	128.0A	115.0A
SD1-150A-43	7	75.0kW	100.0HP	139.0A	150.0A
SD1-180A-43	8	90.0kW	125.0HP	168.0A	180.0A
SD1-215A-43	8	110.0kW	150.0HP	201.0A	215.0A

## SD1 Accessories

Model	Description
SD1-KP	Remote Keypad
SD1-KP-CPY	Remote Keypad with Copy function
SD1-KP-MB	Keypad Mounting Bracket

## SD1 Options & Ordering Information

SD1	-	2.5A	-	21
Series Name		Nominal Power (see Output Current)		Input Voltage & Phase
				11
				21
				23
				43

11	110V Single Phase
21	220V Single Phase
23	220V Three Phase
43	380V Three Phase

## SD1 Dimensions



Frame Size 1		
Height	Width	Depth
160mm (6¼")	80mm (3⅛")	123.5mm (4⅞")



Frame Size 2		
Height	Width	Depth
185mm (7¼")	80mm (3⅛")	140.5mm (5½")



Frame Size 3		
Height	Width	Depth
256mm (10¼")	146mm (5¾")	167mm (6⅝")



Frame Size 4		
Height	Width	Depth
320mm (12⅝")	170mm (6¾")	196.3mm (7¾")



Frame Size 5		
Height	Width	Depth
340.6mm (13⅝")	200mm (7⅞")	184.3mm (7¼")

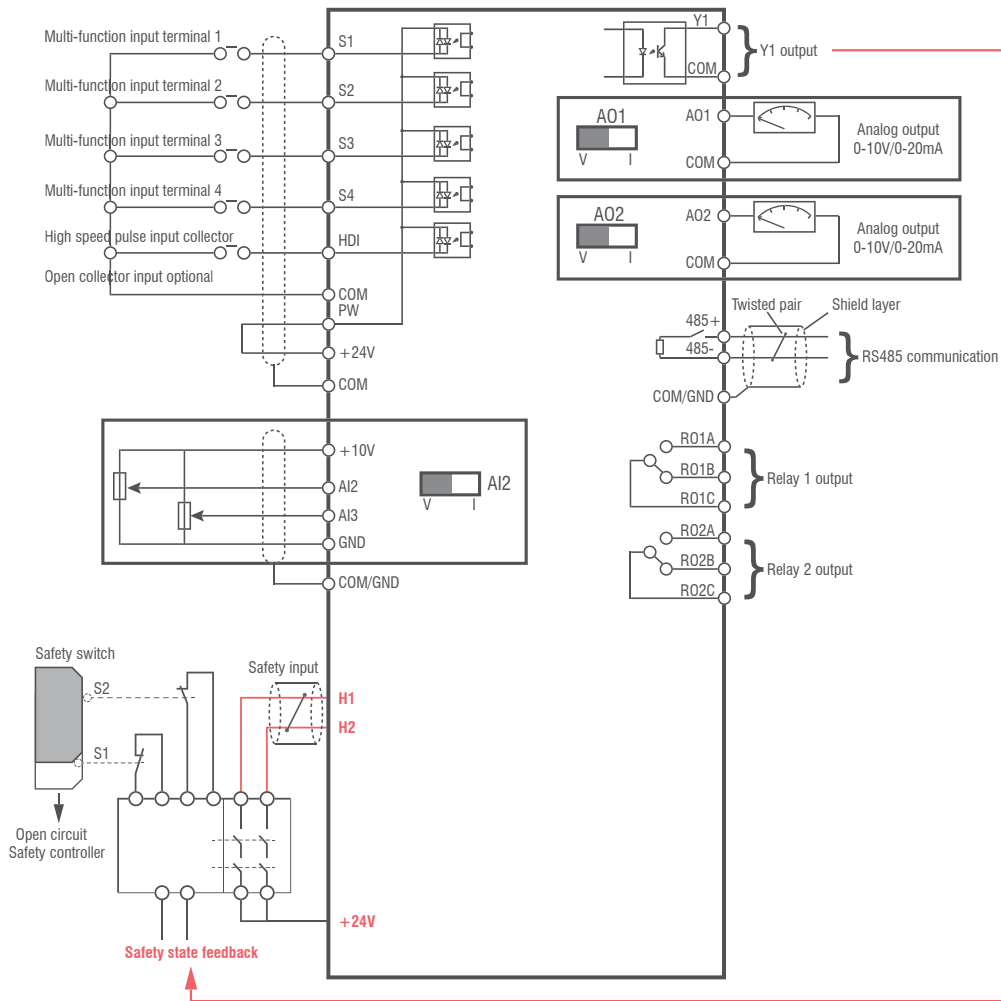
Frame Size 6		
Height	Width	Depth
400mm (15¾")	250mm (9⅞")	202mm (8")

Frame Size 7		
Height	Width	Depth
560mm (22")	282mm (11¼")	238mm (9⅝")

Frame Size 8		
Height	Width	Depth
554mm (21⅞")	338mm (13¼")	329.2mm (13")

Note: Imperial measurements tolerance  $\pm 1/4"$

# SD1 Power & Control Connections



NOTE: This is a typical circuit which, depending on the rating is subject to change. Please check the user manual for more details.

## SD1 Optional External EMC Filters

Single Phase 220Vac				
Model	C3 Filter / Current		C2 Filter / Current	
SD1-2.5A-21	SD1-RFC3-10	10A	SD1-RFC2-10	10A
SD1-4.2A-21	SD1-RFC3-10	10A	SD1-RFC2-10	10A
SD1-7.5A-21	SD1-RFC3-10	10A	SD1-RFC2-16	16A
SD1-10A-21	SD1-RFC3-10	10A	SD1-RFC2-16	16A

Three Phase 220Vac				
Model	C3 Filter / Current		C2 Filter / Current	
SD1-2.5A-23	SD1-RFC3-7	7A	SD1-RFC2-6	6A
SD1-4.2A-23	SD1-RFC3-7	7A	SD1-RFC2-6	6A
SD1-7.5A-23	Internal	-	SD1-RFC2-16	16A
SD1-10A-23	Internal	-	SD1-RFC2-16	16A
SD1-16A-23	Internal	-	SD1-RFC2-32	32A
SD1-20A-23	Internal	-	SD1-RFC2-32	32A
SD1-30A-23	Internal	-	SD1-RFC2-45	45A

Three Phase 400Vac				
Model	C3 Filter / Current		C2 Filter / Current	
SD1-2.5A-43	SD1-RFC3-7	7A	SD1-RFC2-6	6A
SD1-4.2A-43	SD1-RFC3-7	7A	SD1-RFC2-6	6A
SD1-5.5A-43	SD1-RFC3-7	7A	SD1-RFC2-6	6A
SD1-9.5A-43	Internal	-	SD1-RFC2-16	16A
SD1-14A-43	Internal	-	SD1-RFC2-16	16A
SD1-18.5A-43	Internal	-	SD1-RFC2-32	32A
SD1-25A-43	Internal	-	SD1-RFC2-32	32A