

SD500 Series

VARIABLE SPEED DRIVE

Easy to drive





A dream
a promise,
the commitment.

We had always dreamt about an integral service that included, commissioning support, 24 hour technical assistance, rapid workshop response with less than 1 day repair or replacement commitment. Three year warranty, immediate delivery, customized training and professional application engineering.



POWER ELECTRONICS®

Further information at

www.power-electronics.com

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01 SD500

the SD500 series goes further

Available in 200 to 230VAC and 380 to 480VAC, in a power range that goes from 0.75kW to 90kW, with a much more advanced software, ready to control a wide range of applications.

WARRANTY
3
YEARS
for the whole series



PLC Board with additional I/O, auto-diagnosis function, real-time clock, ...

Conformal coating

Continuing with our protection philosophy, the electronic boards receive the same conformal coating as with all the Power Electronics products.

- ✓ High Control Precision
- ✓ Reliable and Robust Performance
- ✓ Improved Programming Interface
- ✓ Easy Data Presentation
- ✓ Advanced Keyboard and Programming Unit
- ✓ Expanded Range of Options (Encoder board, PLC board,...)
- ✓ Three-phase input voltage: 200-230VAC and 380-480VAC
- ✓ Modbus Communication (optional DeviceNet, Profibus, Ethernet...)
- ✓ Harmonic built-in filter for the full range
- ✓ IP21 Protection Degree

**New modular design
of accessories**

Easy set up and programming

The SD500 offers a complete set of efficiently organised parameters that are presented in order to speed up the programming, the commissioning and the maintenance, with extended descriptions to facilitate navigation through them.

**Certification
and Approval by
Standards
CE, UL, cUL, CTick**



02 SD500

> technical specifications

INPUT	Power Supply	200 to 230 Vac (-15% to +10%) Three phase 380 to 480Vac (-15% to +10%) Three phase	
	Input frequency	50±60 Hz ±5%	
	Input power factor	96%	
	Input EMC filter	From 0,75kW to 22kW - Classification C2 From 30kW onwards - Classification C3 ^[1]	
	DC Reactance	Integrated as standard	
OUTPUT	Output voltage to motor	200 to 230Vac Three phase ^[2] 380 to 480Vac Three phase ^[2]	
	Overload current capacity	Constant Torque: 150% during 60 sec Variable Torque: 110% during 60 sec	
	Output Frequency	0 to 400Hz ^[3]	
	Frequency Tolerance	Operation with digital signals: 0.01% of the maximum frequency Operation with analogue signals: 0.1% of the maximum frequency	
	Resolution of the Frequency set	Operation with digital signals: 0.01Hz Operation with analogue signals: 0.06Hz (maximum frequency 60Hz)	
	Modulation Frequency	Maximum 15kHz ^[4]	
	Standard protection	IP21	
ENVIRONMENTAL CONDITIONS	Operation temperature	Constant torque: -10°C to +50°C	
	Storage temperature	-20°C to +65°C	
	Relative humidity	<90%, without condensation	
	Altitude	1000m	
	Altitude loss factor (> 1000)	1% for every 100m; maximum of 3000m	
	Vibration	5,9m/sec ² (=0,6G)	
	Air pressure	70 to 106 kPa	
	Location of the installation	According to Hardware and Installation Manual	
	Ventilation	Forced refrigeration: 0.75kW to 15kW (230 / 400V) and 22kW (400V) Aspiration refrigeration: 22kW (230V), 30 to 75kW (400V)	
	Display protection	IP54	
	CONTROL	Control Method	V/f Control Slip compensation Open Loop Vector Control (sensorless) Closed Loop Vector Control
V/f Characteristics		Lineal V/f, quadratic, defined by the user	
Starting torque		Manual / Automatic	
Operation Methods		Selectable through keyboard, terminals or communications	
Analogue Inputs		1 input 0-10Vdc, ±10Vdc 1 input 4-20mA / 0-20mA	
Digital Inputs		8 configurable inputs	
PTC Connection		Yes. With analogue or digital specific setup for PTC. ^[5]	
Analogue Outputs		1 0-10V output (Max. Output Voltage 10V, Max. Output Current 10mA) 1 0-20mA / 4-20mA Output (Max. Output Current 20mA)	
Relay Output		1 Changeover programmable relay (250VAC, 5A; 30VDC, 5A) 1 Programmable normally open relay (250VAC, 5A; 30VDC, 5A) 1 Programmable open collector transistor output (24VDC, 50mA)	
Dynamic Braking Unit		Built-in for 0.75 – 22kW (230VAC and 400VAC) Optional for the rest	
KEYBOARD AND PROGRAMMING UNIT		Type	Removable
		Distance	3 meters ^[6]
		Connection	RJ45
		Alphanumeric Display	4 Lines of 16 characters
		Status Leds	ON LED: Power on the control board RUN LED Power on, the motor is powered by the SD500 FAULT LED: Flashing indicates the equipment is in fault
	Membrane Keyboard	7 keys to control and configure the drive, start key, stop/reset key and local/remote control. Equipped with separate memory.	

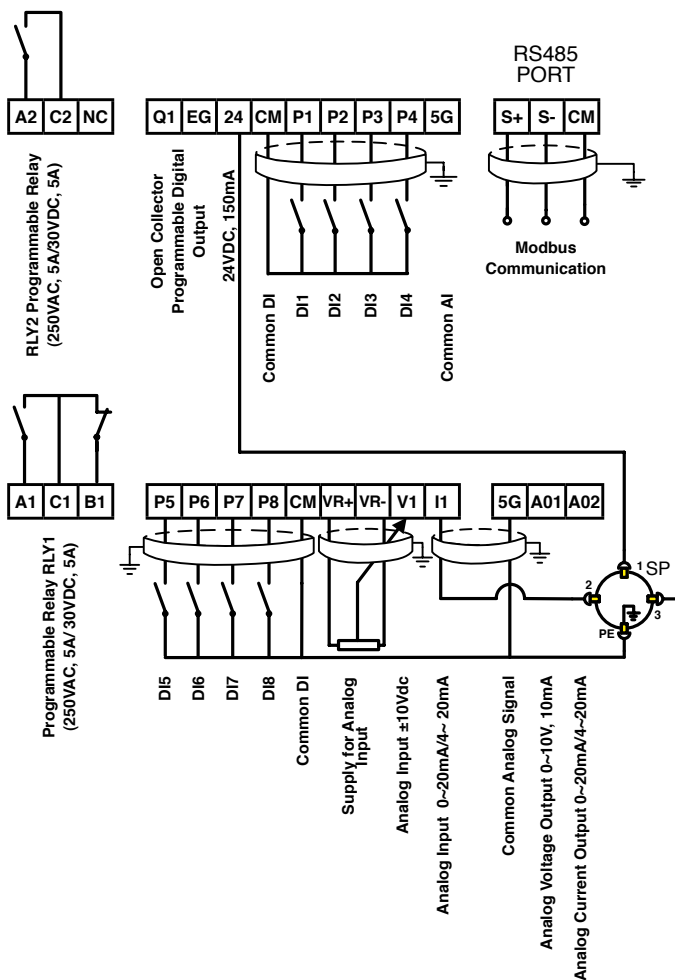
PROTECTIONS	Overvoltage	Low Voltage	Overcurrent
	Overcurrent detection	Overtemperature of the inverter	Motor thermal Protection
	Phase loss protection	Overload Protection	Communication Error
	Reference Signal Loss	Hardware Failure	Cooling Fan Fault
	Pre-PID failure	Absence of motor Trip	External brake failure
	etc...		
ALARMS	Current Limitation	Overload	Underload
	Encoder failure	Fan failure	Loss of keyboard commands
	Loss of speed commands		
COMMUNICATION	Standard Hardware:	RS485 Port	
	Standard Protocol:	Modbus-RTU	
	Optional Hardware:	Profibus-DP Board, Ethernet Board, LonWorks, DeviceNet/CANopen Board	
	Optional Protocols:	Profibus, Modbus TCP, LonWorks, CANopen, DeviceNet	
ACCESSORIES	PLC Board	Encoder Board	I / O Board Expansion Board
CERTIFICATION	CE, UL, cUL, cTick		

- [1] For other application categories, an optional external filter will be used. For additional information ask Power Electronics.
- [2] The maximum output voltage may not exceed the input voltage supplied.
- [3] The maximum frequency is 300Hz when selecting the open loop control in the programming parameters.
- [4] The maximum allowable depends directly on the power of the drive. Consult the SD500 Software and Programming manual for additional information.
- [5] For connection diagram see Hardware and installation manual.
- [6] It is recommended to use a cable not longer than 3 meters for the keyboard. For other configurations ask Power Electronics.

O3 SD500

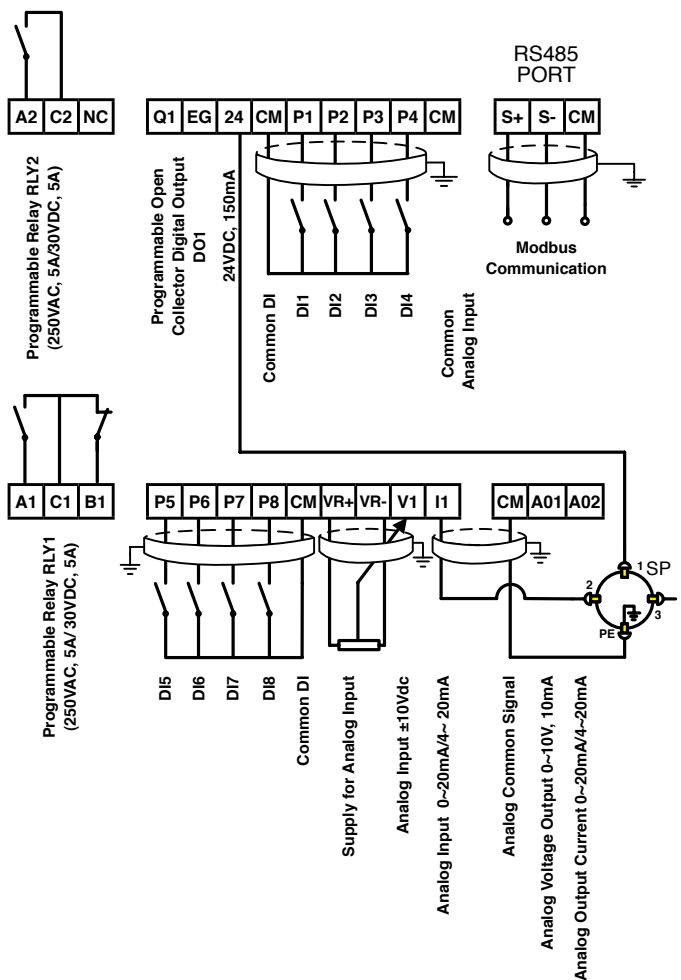
> control terminals

Terminals up to 22kW



SD50DTC0007AI

Terminals from 30kW



SD50DTC0009AI

04 SD500

> flexibility for its application

More flexible than ever, the SD500 is a drive capable of controlling a large number of applications.

Its many options and accessories will give the performance needed to control all type of installations and machinery.



Pumping Stations

The extensive characteristic pumping programme of the Power Electronics drives is also available in the SD500.

In addition, the use of the PLC board allows us to implement improvements with custom programming, increase of the number of inputs and outputs available, auto-diagnosis and real-time clock, among others.

We will obtain a significant improvement in the energy consumption, and will reduce the downtime to a minimum.

HVAC

The use of the SD500 will slow down the speed of the extraction fans to supply the required flows and pressures so the difference of air flow between the supply and the extraction is preserved.

Other Industrial sectors

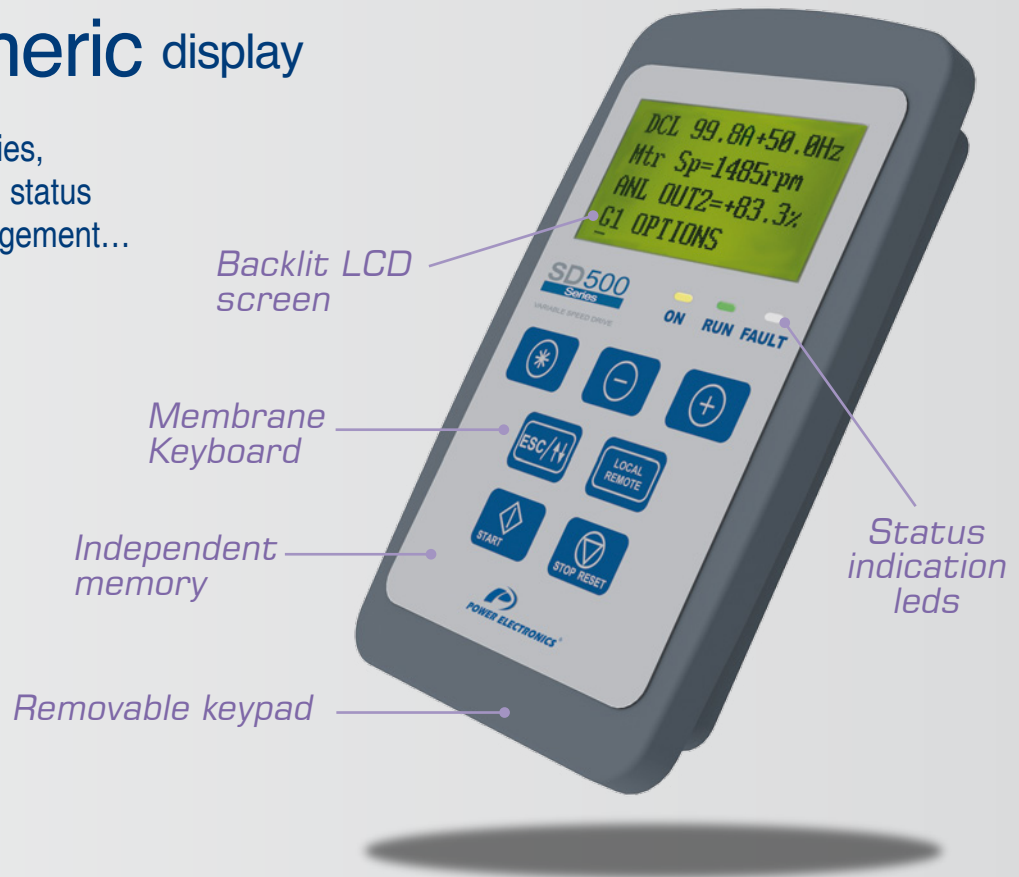
Tile production process, food industry, transport and handling of goods, dosage tools... wherever precision and regulation, demand management is required or if improvement and decrease of the maintenance times is needed, our SD500 will accomplish.

05 SD500

> alphanumeric display

Now with more possibilities, like tracking parameters, status information, alarm management... among others.

- > Reading/Writing Functions
- > Status Visualization Lines



Navigation Parameters

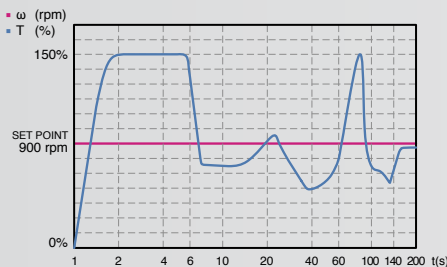


- Allows the access to the parameter groups and subgroups.
- & Pressed simultaneously increases the numerical setting value or listed option.
- & Pressed simultaneously decreases the numerical setting value or listed option.
- Allows scrolling and navigation of the different groups of parameters in ascending order, and the setting (increase) of their values.
- Allows scrolling and navigation of the different groups of parameters in descending order, and the setting (decrease) of their values.
- Allows the access to the various user-configurable lines. It also allows to go back (escape) from a menu item to a previous step.
- Allows to start the drive when it is set in local control mode.
- Allows to stop the drive while it is operating. Allows resetting a drive in fault.
- Allows the switching between local and remote control modes.

06 SD500 > one step further

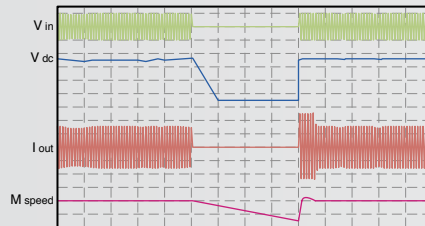
With a fully modular electronic design the SD500 manages to put at the user's disposal all required tools for the control of the installation.

In addition, its technology implements an extremely effective low speed control torque, a scalar V/f control and a closed and open loop vector control, slip compensation...



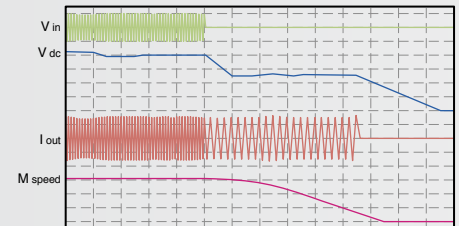
GREATER PRECISION IN THE TORQUE/SPEED CONTROL

With the Encoder card, it is possible to obtain a powerful torque control in all the range of speeds even considering zero speed.



RIDE-THROUGH FOR SUDDEN POWER SUPPLY LOSS

The SD500 will maintain the motor speed under control during a certain time until the recovery of the voltage supply.



KINETIC ENERGY CONTROL

This allows the drive to make a stable stop in the event of a failure or power loss.

07 SD500 > standard ratings

CONFIGURATION TABLE					
CODE: SD5016 2 2					
SD5	016	2	2		
SD500 Series	Output Current	Rated Voltage		Protection Degree	
016	16A	2	200 - 230V		2 IP21
060	60A	4	380 - 480V		
...	...				

200Vac - 230Vac (-15% to +10%)									
FRAME	CODE	Operation Temperature 50°C HEAVY LOAD				Operation Temperature 40°C NORMAL LOAD			
		Rated Current (A)	Motor Power at 230Vac		150% Overload for 60s	Rated Current (A)	Motor Power at 230Vac		Overload ≥ 110% for 60s
			kW	HP			kW	HP	
1	SD5005 2 2	5	0.75	1	7.5	6.8	1.5	2	7.5
	SD5008 2 2	8	1.5	2	12	11	2.2	3	12
	SD5012 2 2	12	2.2	3	18	16	3.7	5	18
	SD5016 2 2	16	3.7	5	24	22	5.5	7.5	24
2	SD5024 2 2	24	5.5	7.5	36	33	7.5	10	36
	SD5030 2 2	32	7.5	10	48	44	11	15	48
3	SD5045 2 2	46	11	15	69	60	15	20	69
	SD5060 2 2	60	15	20	90	74	18.5	25	90
4	SD5075 2 2	74	18.5	25	111	90	22	30	111
	SD5090 2 2	88	22	30	132	120	30	40	132

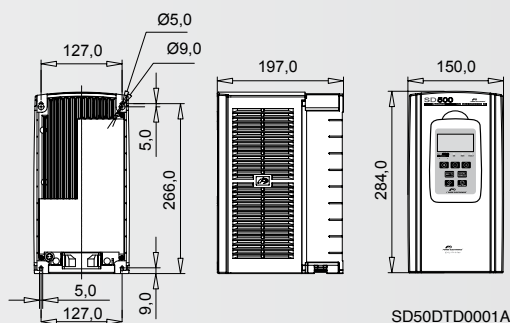
380Vac - 480Vac (-15% to +10%)									
FRAME	CODE	Operation Temperature 50°C HEAVY LOAD				Operation Temperature 40°C NORMAL LOAD			
		Rated Current (A)	Motor Power at 400Vac		150% Overload for 60s	Rated Current (A)	Motor Power at 400Vac		Overload ≥ 110% for 60s
			kW	HP			kW	HP	
1	SD5002 4 2	2.8	0.75	1	4.4	4	1.5	2	4.4
	SD5004 4 2	4	1.5	2	6	5.4	2.2	3	6
	SD5006 4 2	6	2.2	3	9	8	3.7	5	9
	SD5008 4 2	8.5	3.7	5	13.2	12	5.5	7.5	13.2
2	SD5012 4 2	12	5.5	7.5	18	16	7.5	10	18
	SD5018 4 2	16.5	7.5	10	25	23	11	15	25
3	SD5024 4 2	24	11	15	36	32	15	20	36
	SD5030 4 2	30	15	20	45	40	18.5	25	45
4	SD5039 4 2	39	18.5	25	58	48	22	30	58
	SD5045 4 2	45	22	30	67	61	30	40	67
5	SD5060 4 2	61	30	40	91	78	37	50	91
	SD5075 4 2	75	37	50	112	100	45	60	112
6	SD5090 4 2	91	45	60	136	115	55	75	136
	SD5110 4 2	110	55	75	165	150	75	100	165
6	SD5150 4 2	152	75	100	228	180	90	125	228

NOTES

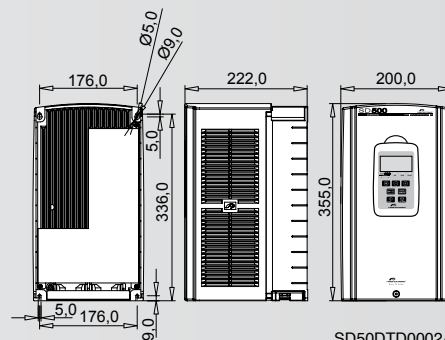
- Rated power for standard AC 4 pole motors (1500rpm).
- For other configurations contact Power Electronics.
- Check the rated current of the motor plate to ensure compatibility with the chosen frequency converter.

08 SD500

> dimensions



SD50DTD0001A



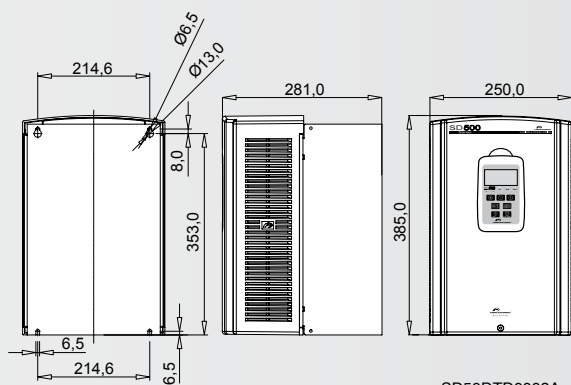
SD50DTD0002A

FRAME 1

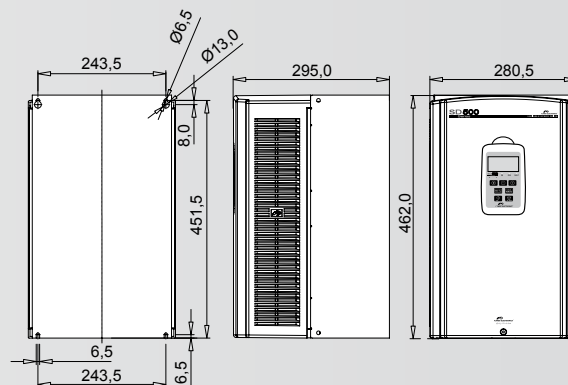
INPUT VOLTAGE	DRIVES	WEIGHT (Kg)
200 - 230VAC (-15% to +10%)	SD5005 2 2 SD5008 2 2 SD5012 2 2 SD5016 2 2	5.5
380 - 480VAC (-15% to +10%)	SD5002 4 2 SD5004 4 2 SD5006 4 2 SD5008 4 2	5.5

FRAME 2

INPUT VOLTAGE	DRIVES	WEIGHT (Kg)
200 - 230VAC (-15% to +10%)	SD5024 2 2 SD5030 2 2	10
380 - 480VAC (-15% to +10%)	SD5012 4 2 SD5018 4 2	10



SD50DTD0003A



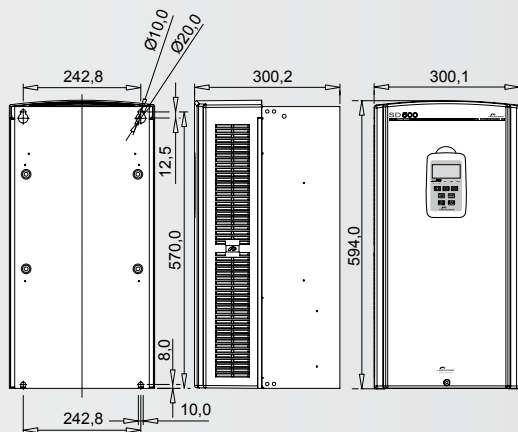
SD50DTD0004A

FRAME 3

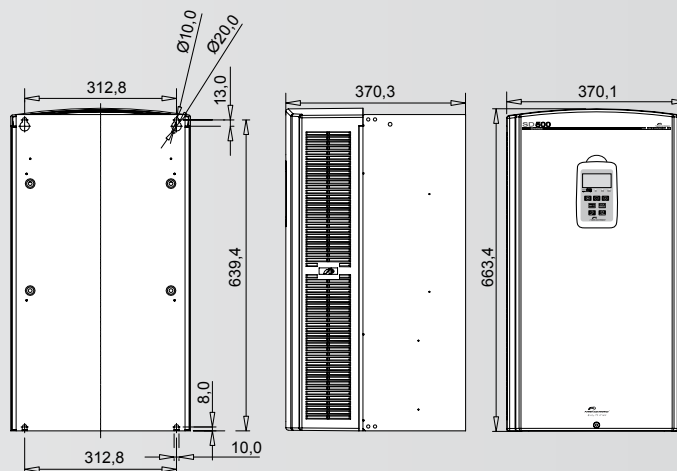
INPUT VOLTAGE	DRIVES	WEIGHT (Kg)
200 - 230VAC (-15% to +10%)	SD5045 2 2 SD5060 2 2	20
380 - 480VAC (-15% to +10%)	SD5024 4 2 SD5030 4 2	20

FRAME 4

INPUT VOLTAGE	DRIVES	WEIGHT (Kg)
200 - 230VAC (-15% to +10%)	SD5075 2 2 SD5090 2 2	30
380 - 480VAC (-15% to +10%)	SD5039 4 2 SD5045 4 2	30



SD50DTD0005A



SD50DTD0006A

FRAME 5

INPUT VOLTAGE	DRIVES	WEIGHT (Kg)
200 - 230VAC (-15% to +10%)	-	-
380 - 480VAC (-15% to +10%)	SD5060 4 2 SD5075 4 2 SD5090 4 2	41

FRAME 6

INPUT VOLTAGE	DRIVES	WEIGHT (Kg)
200 - 230VAC (-15% to +10%)	-	-
380 - 480VAC (-15% to +10%)	SD5110 4 2 SD5150 4 2	63

SD500

> accessories

ACCESSORIES	
REFERENCE	DESCRIPTION
SD5EC	Encoder module
SD5IO	Input / Output Expansion module
SD5RC2	Connection cable for keyboard of 2m
SD5RC3	Connection cable for keyboard of 3m
SD5PLC	PLC Control module
SD5DP	Profibus-DP Communication module
SD5ET	Ethernet Communication module
SD5CO	CANopen Communication module
SD5DN	DeviceNet Communication module
SD5LW	LonWorks Communication module
DBSD4045	Dynamic Brake for drives from 30kW to 37kW. Not UL type.
DBSD4145	Dynamic Brake for drives from 45kW to 75kW. Not UL type.
DBSD4045U	Dynamic Brake for drives from 30kW to 37kW. UL type.
DBSD4145U	Dynamic Brake for drives from 45kW to 75kW. UL type.



Ethernet Communication Module



Specifications

- Transmission Speed: 10Mbps, 100Mbps
- Transmission Method: Baseband
- Maximum distance between nodes: 100m
- Maximum number of nodes: Hub Connection
- Auto negotiation
- Maximum frame size: 1500 bytes
- Access Method to communications area: CSMA / CD
- Checking Method for error frames: CRC32
- Recommended Channel Connection: 3 channels

PLC Module

Specifications

- Operation method:
 - Stored program cyclic operation
 - Role of Task Interruption
- Method of I/O control:
- Number of instructions: Basic: 29; Rev: 223
- Processor time: Basic instruction: 0.4µs/operation
- Program memory capacity: 2k
- 6 digital inputs
- 4 relay outputs
- Operating modes: RUN, STOP, PAUSE
- Self-diagnosis Functions: Watchdog timer, memory error detection, I/O error detection
- Recovery of memory after shutdown
- PID Control
- RS485 Communication: MODBUS protocol support
- External interrupts: 6
- Input filter: 0 ~ 1000ms
- RTC (Real Time Clock): year / month / day / hour / minute / second using KGLWIN
- Operating system KGL WIN

Communication Module CanOpen

Specifications

- Power supply: Supplied from the inverter
- Network Topology: Bus
- Baud rate: 20kbps, 50kbps, 100kbps, 125kbps, 250kbps, 500kbps, 800kbps, 1Mbps
- Maximum number of nodes: 64 (including the master)
- Supported media type: PDO, SDO, Sync, NMT
- Terminating resistor: 120Ω 1/2W Lead Type
- PDO available: PDO1 (CIA 402 Drive control and Motion device profile)
- Maximum Transmission Distance: 2500m (20kbps) - 500m (125kbps)



Communication Module Profibus - DP

Specifications

- Device Type: Profibus DP Slave
- Auto baud rate
- Sync mode
- Freeze mode
- Maximum input length: 8 words
- Maximum output length: 8 words
- Maximum data length: 16 words
- Transmission speeds: 9.6K, 19.2K, 93.75K, 187.5K, 500K, 1.5M, 3M, 6M, 12M
- Modular station
- Maximum number of modules: 2



dV/dt Output Filters

Supply voltage 230VAC						
SIZE	FILTER			DRIVE		
	REFERENCE	DIMENSIONS (mm)			REFERENCE	Inom (A) @ 40°C
		W	H	D		
1	SD50F006	147	170	132	SD5005 2 2	6.8
	SD50F012				SD5008 2 2	11
	SD50F024 2				SD5012 2 2	16
					SD5016 2 2	22
2	SD50F030 2	195	200	145	SD5024 2 2	33
					SD5030 2 2	44
3	SD50F060 2	250	165	133	SD5045 2 2	60
					SD5060 2 2	74
4	SD50F090 2	280	205	135	SD5075 2 2	90
					SD5090 2 2	120

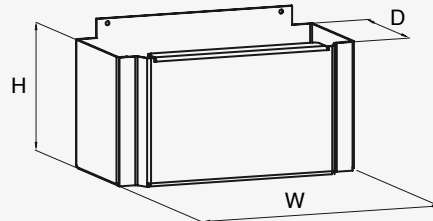
NOTE: Filters for motor cables of 150m with shielded cable and 300m with unshielded cable (carrier freq.: 2kHz). For other configurations contact Power Electronics.



Supply voltage 400VAC						
SIZE	FILTER			DRIVE		
	REFERENCE	DIMENSIONS (mm)			REFERENCE	Inom (A) @ 40°C
		W	H	D		
1	SD50F006	147	170	132	SD5002 4 2	4
					SD5004 4 2	5.4
	SD50F012				SD5006 4 2	8
					SD5008 4 2	12
2	SD50F024 4	195	200	145	SD5012 4 2	16
					SD5018 4 2	23
3	SD50F030 4	250	165	135	SD5024 4 2	32
					SD5030 4 2	40
4	SD50F039 4	280	205	135	SD5039 4 2	48
	SD50F045 4				SD5045 4 2	61
5	SD50F060 4	300	205	130	SD5060 4 2	78
	SD50F090 4				SD5075 4 2	100
6	SD50F110 4	370	205	138	SD5090 4 2	115
					SD5110 4 2	150
	SD50F150 4				SD5150 4 2	180

Extension Box SD500

SIZE	REFERENCE	DIMENSIONS (mm)		
		W	H	D
T1	SD5EB1	147	85	132
T2	SD5EB2	195	100	145
T3	SD5EB3	250	165	135
T4	SD5EB4	280	205	135
T5	SD5EB5	300	205	130
T6	SD5EB6	370	205	138



Communication Module DeviceNet

Specifications

- Power supply:
 - Powered from the drive
 - External power supply: 11~25VDC, 60mA
- Network topology: Free, Bus
- Transmission speed: 125kbps, 250kbps, 500kbps
- Maximum number of nodes: 64 (including the master)
- Supported media type: Explicit Peer to Peer Messaging
- Faulted Node Recovery (Off-Line), Master / Scanner, Polling
- Terminating resistor: 120Ω 1/4W Lead Type



Extension Module Input/Output

Specifications

- 3 digital outputs NO (250Vac/30Vdc, 5A)
- 3 digital inputs (selection of PNP/NPN, 0~25V)
- 1 voltage analogue input
- 1 current analogue input (0~20mA) Internal Impedance: 249Ω
- 1 voltage analogue output (±10V, 10mA, 11 bits resolution)
- 1 current analogue output (0~20mA, 12 bits resolution)
- Scan time:
 - Digital outputs: 1.5ms minimum
 - Analogue output: Minimum 3ms
- Protection: IP20
- Cooling method: Self cooled





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