

Engineering supply.
Integrated control.
Industrial performance.

Variable frequency drives, integrated motor drives, solar pumping systems, soft starters and drive accessories.



S230	S300	S500	PV300
Compact economy drive	General purpose drive	High performance vector drive	Solar pump inverter

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SKY MATRIX PTE. LTD.

SKY MATRIX presents an industrial automation portfolio covering variable speed motor control, integrated drives and application specific systems. The catalogue supports equipment selection, project enquiries and technical coordination.

The portfolio includes drives for induction motors and permanent magnet synchronous motors, fan and pump control, solar pumping, magnetisation power supplies and soft starters. Standard products and application configurations address industrial equipment, utilities and automated production lines.

Typical applications include fans, pumps, textile machinery, irrigation, cement and chemical processes, municipal water supply, metallurgy, printing, hydraulic equipment, packaging and lifting equipment.

Portfolio at a glance

Category	Scope
Power range	0.4-710 kW across the listed drive families
Supply classes	Single phase 220-240 V; three phase 220-240 V and 380-480 V, depending on model
Motor technologies	Induction and permanent magnet synchronous motors; model specific control options
Control architecture	HMI, PLC, fieldbus and drive level control
Equipment	VFDs, integrated drives, solar inverters, soft starters, filters, reactors and cabinets

Company registration and contact details refer to SKY MATRIX in Singapore. Product, factory and application photographs are reference illustrations from the source portfolio; they do not establish the location or ownership of a SKY MATRIX production facility.

Production and quality control

The source portfolio describes integrated manufacturing management, product inspection, testing and quality control throughout production. Electronic assembly, component installation, inspection and final testing support consistent product quality.

For a project, the selected drive must match the motor, electrical supply, duty cycle, installation environment, braking requirements and control system. Confirm the relevant model documentation and applicable certification during technical review.

Technical coordination

- Confirm motor type, rated power, voltage, current, frequency and speed.
- Check normal duty and overload duty, acceleration and deceleration, speed range and torque.
- Select braking, reactors, EMC filters and feedback interfaces as required.
- Confirm communication protocol, terminal assignments, HMI and PLC integration.
- Review installation dimensions, ventilation, environmental derating and enclosure protection.
- Request model specific drawings, test documentation and certification for the supplied equipment.

Incoming review	Assembly	Testing	Release
Electrical and mechanical specifications	Component installation and configuration	Functional and protection checks	Identification and technical documentation

Section	Catalogue spread	Control layer	Products / function
S series model designation / S230 introduction	05	Supervisory interface	HMI and remote monitoring
S230 features, specifications, ratings, dimensions and connections	06-08	Logic control	PLC and fieldbus
S300 introduction, features, specifications and ratings	09-12	Drive control	S230, S300, S500
S500 vector drive, specifications, ratings and dimensions	13-17	Integrated drives	S580 fan / pump; S590 compressor
S500 options / connections; S580 integrated drive	18-19	Special systems	PV300 solar pumping; S520 magnetisation
S590 compressor drive / PV300 solar pumping	20-23	Actuators	Servo, induction and synchronous motors
S520 magnetisation power supply	24		
Application examples	25-27		
Low and high voltage soft starters	28		
Filters, reactors and braking units	29-30		
Control cabinets and company details	31		

Choose the drive family first, then verify the complete model rating and the required options. Product series designations are retained to preserve compatibility with technical documents and spares enquiries.

Model designation: SXX - 4T - 1.5 - G - B

Field	Meaning
SXX	Series: S230, S300, S500, PV300 or S520
2S	Single phase 200 V class
2T	Three phase 220 V class
4T	Three phase 380-460 V class
0.4 / 0.75 / 1.5 ... 710	Rated power in kW
G / P	G: heavy duty; P: fan and pump duty
B / no suffix	B: built-in braking unit; no B: no built-in braking unit



S230 economy drive

The S230 series addresses low power machinery requiring compact dimensions and simple speed adjustment. Supply versions include single phase 220 V, three phase 220 V and three phase 380 V, with model dependent ratings from 0.4 to 11 kW.

High power density and protective functions suit electronic equipment, logistics, ceramics, machine tool spindles, woodworking, glass grinding, food filling, medical centrifuges, automated production lines and textile equipment.

S230 | FEATURES & TECHNICAL DATA

Compact form factor | Sensorless vector and V/f control

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- Book style housing saves installation space; close parallel installation is supported. The source specifies installation volume down to 21 mm³/W and 36 million units/m³; verify these unusual units before design use.
- Built-in process PID, simple PLC, textile traverse frequency, fixed length and multi-step speed functions.
- Source lists sine/cosine rotary encoder, quadrature incremental encoder and open collector encoder support; confirm the required feedback option for the selected model.
- Expandable RS485, CAN and CANopen communication; Modbus and synchronous control support.
- Enclosed electronics and an independent cooling duct limit dust contamination. Protective coating and reinforced IGBT arrangements improve environmental resistance.
- Speed tracking restart identifies motor speed and direction for smooth restarting.
- External keypad support; straightforward switching between induction and synchronous motor settings.
- Overexcitation during deceleration, overmodulation and overload suppression improve operating performance.
- The source catalogue claims CE conformity; obtain documentation for the ordered model.

Parameter	Specification
Supply	1 phase 220-240 V: 0.4-2.2 kW; 3 phase 220-240 V: 0.4-11 kW; 3 phase 380-480 V: 0.4-11 kW; tolerance -15% / +10%
Maximum frequency	0-600 Hz
Motor type	Induction / synchronous
Carrier frequency	0.8-16 kHz; automatic adjustment to load
Frequency resolution	Digital 0.01 Hz; analogue 0.025% of maximum frequency
Control	Sensorless vector (SVC); V/f
Overload	150% rated current for 60 s; 180% for 2 s
Torque boost	Automatic; manual 0.1-30.0%
V/f curve	Linear and multipoint
Ramps	Linear or S curve; two acceleration / deceleration settings, 0-6500 s
DC braking	0 Hz to maximum frequency; 0.05-100.0 s; current 0-100%
Jog	0-50 Hz; ramp 0-6500 s
Simple PLC / PID	Up to 16 speed steps; built-in process PID

S230 | OPERATION & RATINGS

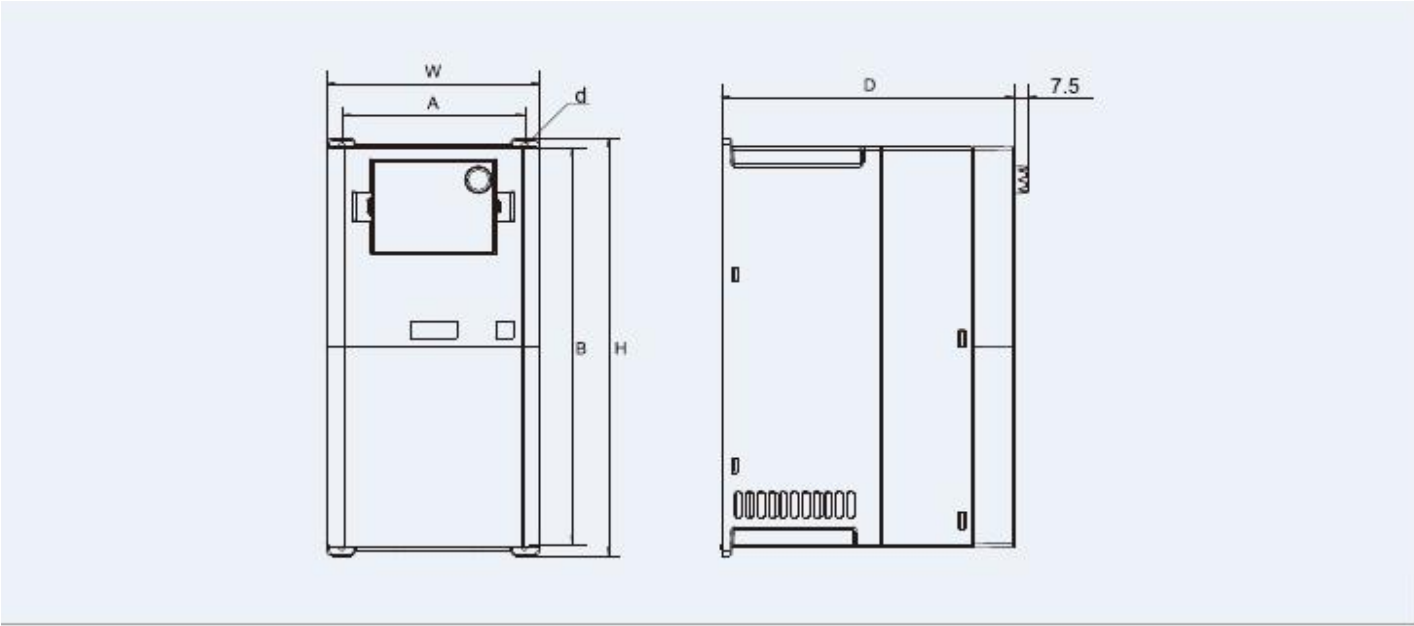
Configuration parameters and recommended accessories

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Parameter	Specification
AVR / limiting	Automatic output voltage regulation; current / voltage limitation; fast current limiting
Power interruption	DC bus energy compensation supports short ride-through; RUN indicates operation
Timer	0-6500 minutes
Commands	Keypad, terminals or communication
Frequency sources	Digital, analogue voltage, analogue current, DI4 pulse and serial interface; five auxiliary source methods
Inputs	5 DI, one supports pulse input to 20 kHz; 1 AI supports 0/4-20 mA and 0-10 V by option
Outputs	1 relay; 1 analogue output 0-10 V
Communication	RS485; optional CANlink
Keypad	LED parameter display; complete or partial key lock
Protection	Short circuit, input / output phase loss, overvoltage, undervoltage, overtemperature and overcurrent
Environment	Indoor, away from sunlight, dust, corrosive / combustible gas, smoke, steam and salt
Altitude / vibration	Below 1000 m; source specifies 10% derating above this; vibration below 5.9 m/s ² (0.6 g)
Temperature / enclosure	Source lists -10 to +50 C with derating; storage -20 to +60 C; IP20; TN / TT systems
Humidity	The source repeats altitude wording in this row; confirm humidity rating with the supplier

Model	Motor kW	Supply kVA	Input A	Output A	Brake resistor W / ohm	Qty	Brake unit	Reactor A	L mH	Filter A
1 phase 220-240 V (-15% / +10%), 50/60 Hz										
S230-2S 0.4GB	0.4	1.0	5.4	2.3	80W 200Ω	1	Optional			8
S230-2S 0.75GB	0.75	1.5	8.2	4	80W 150Ω	1				12
S230-2S 1.5GB	1.5	3	14	7	100W 100Ω	1				20
S230-2S 2.2GB	2.2	4	23	9.6	100W 70Ω	1				30
S230-2S 3.7GB	3.7	12	40	17	150W 40Ω	1				
3 phase 220-240 V (-15% / +10%), 50/60 Hz										
S230-2T 0.4GB	0.4	1.5	3.4	2.1	90W 300Ω	1	Optional	10	5	7
S230-2T 0.75GB	0.75	3	5	3.8	160W 170Ω	1		10	5	7
S230-2T 1.5GB	1.5	4.5	7.8	6.8	340W 80Ω	1		10	5	16
S230-2T 2.2GB	2.2	5.9	10.5	9	500W 55Ω	1		15	3	16
S230-2T 4.0GB	3.7	8.9	14.6	13	800W 33Ω	1		15	3	30
S230-2T 5.5GB	5.5	17	26	25	1300W 22Ω	1	Built-in	40	1.45	42
S230-2T 7.5GB	7.5	21	35	32	1700W 16Ω	1		50	1.2	42
S230-2T 11GB	11	30	46.5	45	2300W 12Ω	1		80	0.17	75
3 phase 380-480 V (-15% / +10%), 50/60 Hz										
S230-4T 0.4GB	0.4	1.0	2.4	1.2	80W 1450Ω	1	Optional	10	5	7
S230-4T 0.75GB	0.75	1.5	3.4	2.1	140W 800Ω	1		10	5	7
S230-4T 1.5GB	1.5	3	5	3.8	300W 380Ω	1		10	5	7
S230-4T 2.2GB	2.2	4	5.8	5.1	440W 260Ω	1		10	5	7
S230-4T 4.0GB	4.0	6.0	13.5	9.5	740W 150Ω	1		15	3	16
S230-4T 5.5G/PB	5.5	8.9	14.6	13	1100W 100Ω	1		35	3	30
S230-4T 7.5G/PB	7.5	11	20.5	17	1500W 75Ω	1	Built-in	40	1.45	30
S230-4T 11G/PB	11	17	26	25	2200W 50Ω	1		40	1.45	42



Frame / kW	W	H	D	A	B	Hole	kg
E02 / 0.75-2.2	85	170	128	157.5	67.5	5.5	1
E03 / 3.7-5.5	97	194	142.5	85	184	4.7	1.3
E04 / 7.5-11	124	245	170	106	233	5	2.5

Option	Part number	Model	Description
Remote keypad	96030026	MDKE230	LED keypad; all models
Mounting frame	14600039	KZ230	Remote keypad mounting
Keypad cable	12070190	ESCAB-1	100 cm
Keypad cable	12070130	ESCAB-3	300 cm

Power and control interfaces

Terminal / circuit	Function
L1/L2/L3 to R/S/T	AC supply via circuit breaker, contactor and fuses
U/V/W; PE	Motor output and protective earth
(+) / PB	Braking resistor connection
DI1 / DI2	Forward run / jog forward (source defaults)
DI3 / DI4 / DI5	Fault reset / input 1 / input 2; pulse input selection
+10 V / AI1 / GND	Frequency reference 0-10 V or 4-20 mA; 1-5 kohm potentiometer
24 V / COM	Digital I/O supply and common
AO1 / GND	Analogue output 0-10 V or 0-20 mA
FM / COM	Open collector pulse output 0-100 kHz; source default P5-00=0
485A / 485B / PE	Modbus RTU communication
TA / TB / TC	Relay: max. 250 VAC 3 A; max. 30 VDC 1 A; fault output default P5-02=2
PG interface	Optional encoder card, as shown in source schematic

Dimensions are in mm. Terminal overview translates the source connection diagram; use the model installation manual for final wiring, jumper settings and option compatibility.

S300 | GENERAL PURPOSE DRIVE

Wide supply range | Induction and synchronous motor control

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- Wide voltage design: single phase 200-240 V, three phase 200-240 V and three phase 380-480 V, depending on model.
- Braking arrangement: standard built-in brake below 22 kW; selectable arrangement for 22-75 kW. Check the rating table for the exact version.
- Short duration braking capability is stated as 1.1-1.4 times rated drive power. Protection covers brake resistor short circuit, braking circuit overcurrent and braking overload.
- Switch between induction and synchronous motor control through parameter settings.
- Process PID, simple PLC, textile traverse frequency and fixed length functions cover a broad range of applications.
- Smooth starting reduces starting current disturbances and the effect on the supply network.

The S300 series is a general purpose drive for induction and synchronous motors. Programmable user functions, stable operation and application functions support textile, paper, machine tool, packaging, food, ventilation, pumping and other automated equipment.

The source describes conformity with major international standards; confirm model specific certification before purchase.

S300 | FEATURES & TECHNICAL DATA

Reliable operation, energy efficiency and independent cooling

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- Power interruption ride-through uses regenerative energy from the rotating motor to maintain DC bus voltage above the undervoltage threshold for a short time.
- Intelligent energy saving adjusts excitation current according to motor load and torque demand, reducing losses at light load.
- Long life component selection and 3D product modelling support reliability throughout the operating life.
- Automatic application of protective coating improves resistance to environmental contamination.
- Independent ventilation duct limits contamination of electronics; long life cooling fan selection limits temperature rise.
- The source claims CE conformity and international support. Obtain the supplied model documents.

Parameter	Specification
Supply	1 phase 220-240 V: 0.4-3.7 kW; 3 phase 220-240 V: 0.4-11 kW; 3 phase 380-480 V: 0.4-75 kW; -15% / +10%
Maximum frequency	0-600 Hz
Carrier frequency	0.8-12 kHz; automatic load dependent adjustment
Resolution	Digital 0.01 Hz; analogue 0.025% of maximum frequency
Control	V/f and SVC
Starting torque	G: 150% at 0.5 Hz; P: 100% at 0.5 Hz
Speed range / accuracy	SVC 1:100; steady speed accuracy +/-0.5%
Overload	G: 150% for 60 s, once per 300 s; P: 120% for 60 s
Torque boost / V/f	Automatic or manual 0.1-30.0%; linear, multipoint, full and partial V/f separation
Speed tracking restart	From stop frequency, maximum frequency or fixed frequency
Ramps	Linear / S curve; 4 acceleration and deceleration settings, 0-6500 s
DC braking	0 Hz to maximum frequency; 0-36 s; 0-100% current
Jog	0-50 Hz; 0-6500 s ramp
PLC / PID / AVR	16 speed steps, built-in PID, automatic voltage regulation
Additional functions	Current / voltage limitation, fast current limiting, power interruption ride-through and 5 virtual DI/DO sets

S300 | OPERATION & RATINGS

Communication, I/O and model selection

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Parameter	Specification
Timer / motor switching	0-6500 min; two motor parameter sets
Communication	Default RS485 Modbus; optional CANlink, CANopen and EtherCAT
Software	Parameter monitoring and virtual oscilloscope for internal operating conditions
Command sources	Keypad, terminals and communication
Frequency sources	10 source methods: digital, AI1/AI2/AI3, DI5 pulse, multi-step, simple PLC, PID and serial communication; 10 auxiliary source methods
Digital inputs	5 DI; DI5 pulse input up to 100 kHz
Analogue inputs	2 AI; one 0-10 V, the other 0-10 V or 0/4-20 mA
Outputs	1 high speed pulse output 0-100 kHz; transistor output; relay; analogue output 0/4-20 mA or optional 0-10 V
Display / key lock	LED parameters; complete or partial key lock
Protection	Short circuit, input / output phase loss, overvoltage, undervoltage, overheating, overcurrent
Options	LED keypad, braking components, I/O cards, programmable user card and RS485 card
Environment	Indoor, protected from sunlight, dust, corrosive / combustible gas, smoke, steam and salt
Altitude / humidity	Below 1000 m; source specifies 10% derating above this; RH 95% non-condensing
Temperature / vibration	-10 to +50 C with derating; storage -20 to +60 C; below 5.9 m/s ² (0.6 g); IP20

Model	kW	HP	Supply kVA	Input A	Outp ut A	Brake resistor W / ohm	Qty	Brake unit	Reactor A	L mH	Filter A
1 phase 220-240 V (-15% / +10%), 50/60 Hz											
S300-2S 0.4GB	0.4	0.75	1.0	5.4	2.3	80W 200Ω	1	Built-in			8
S300-2S 0.75GB	0.75	1	1.5	8.2	4	80W 150Ω	1				12
S300-2S 1.5GB	1.5	2	3	14	7	100W 100Ω	1				20
S300-2S 2.2GB	2.2	3	4	23	9.6	100W 70Ω	1				30
S300-2S 3.7GB	3.7	5	12	40	17	150W 40Ω	1				
3 phase 220-240 V (-15% / +10%), 50/60 Hz											
S300-2T 0.4GB	0.4	0.5	1.5	3.4	2.1	90W 300Ω	1	Built-in	10	5	7
S300-2T 0.75GB	0.75	1	3	5	3.8	160W 170Ω	1		10	5	7
S300-2T 1.5GB	1.5	2	4.5	7.8	6.8	340W 80Ω	1		10	5	16
S300-2T 2.2GB	2.2	3	5.9	10.5	9	500W 55Ω	1		15	3	16
S300-2T 4.0GB	3.7	5	8.9	14.6	13	800W 33Ω	1		15	3	30
S300-2T 5.5GB	5.5	7.5	17	26	25	1300W 22Ω	1		40	1.45	42
S300-2T 7.5GB	7.5	10	21	35	32	1700W 16Ω	1		50	1.2	42
S300-2T 11GB	11	15	30	46.5	45	2300W 12Ω	1		80	0.17	75
3 phase 380-480 V (-15% / +10%), 50/60 Hz											
S300-4T 0.4GB	0.4	0.75	1.0	2.4	1.2	80W 1450Ω	1	Built-in	10	5	7
S300-4T 0.75GB	0.75	1	1.5	3.4	2.1	140W 800Ω	1		10	5	7
S300-4T 1.5GB	1.5	2	3	5	3.8	300W 380Ω	1		10	5	7
S300-4T 2.2GB	2.2	3	4	5.8	5.1	440W 260Ω	1		10	5	7
S300-4T 4.0GB	4.0	5.33	6.0	13.5	9.5	740W 150Ω	1		15	3	16
S300-4T 5.5G/PB	5.5	7.5	8.9	14.6	13	1100W 100Ω	1		35	3	30
S300-4T 7.5G/PB	7.5	10	11	20.5	17	1500W 75Ω	1		40	1.45	30
S300-4T 11G/PB	11	15	17	26	25	2200W 50Ω	1		40	1.45	42
S300-4T 15GB	15	20	21	35	32	3000W 38Ω	1		50	1.2	42
S300-4T 18.5GB	18.5	25	24	38.5	37	4000W 32Ω	1		50	0.28	55
S300-4T 22GB	22	30	30	46.5	45	4500W 27Ω	1		60	0.24	75

S300 | HIGHER RATINGS, OPTIONS & CONNECTIONS

30-75 kW ratings | Optional braking unit and keypad

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Model	kW	HP	Supply kVA	Input A	Outp ut A	Brake resistor W / ohm	Qty	Brake unit	Reactor A	L mH	Filter A
3 phase 380-480 V (-15% / +10%), 50/60 Hz											
S300-4T 30G	30	40	40	62.5	60	6000W 20Ω	1	Optional	80	0.17	75
S300-4T 37G	37	50	57	76.0	75	7000W 16Ω	1		90	0.16	75
S300-4T 45G	45	60	69	92.0	91	9000W 13Ω	1		120	0.12	100
S300-4T 55G	55	75	85	113	112	11000W 10.5Ω	1		150	0.095	130
S300-4T 75G	75	100	114	157	150	15000W 7.7Ω	1		200	0.07	180

Option	Part number	Model	Description
Brake unit	99050001	ES100-110	30-75 kW
Remote keypad	96030012	MDKE310	S300 basic keypad
Mounting frame	14600011	KZ500	S300 / S500
Keypad cable	12070101	ESCAB-2	200 cm
Keypad cable	12070130	ESCAB-3	300 cm

Connection overview

Circuit	Function
R/S/T; U/V/W; PE	Supply, motor and protective earth
(+) / (-) / PB	DC bus, optional DC reactor and braking resistor connections
DI1-DI6 / GND	Forward, jog, reset, auxiliary inputs and pulse input selection
+10 V / AI1 / GND	0-10 V frequency reference; 1-5 kohm potentiometer
+10 V / AI2 / GND	0-10 V or 4-20 mA frequency reference
AO1 / GND	0-10 V / 0-20 mA analogue output
DO / COM	Open collector pulse output to 100 kHz; source default P5-00=0
TA / TB / TC	Relay: max. 250 VAC 3 A; max. 30 VDC 1 A; fault default P5-02=2
485+ / 485- / PE	Modbus RTU
24 V / RJ45	24 V control supply and external keypad port

Install the circuit breaker, contactor, fuses, shielding and earthing according to the applicable installation manual. Confirm jumpers and available I/O for the ordered hardware.

S500 | HIGH PERFORMANCE VECTOR DRIVE

Current vector technology | Induction and permanent magnet motors

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- Energy efficiency: supports high efficiency motor technologies and minimum current algorithms for the required load.
- Performance: induction motor SVC speed range up to 1:500; source states 150% load from zero speed, torque accuracy 5% and linearity 3%. Confirm the control mode for these figures.
- Dynamic response: the source claims a 70% reduction in speed dip under impact load.
- Safety and diagnostics: IGBT self-check, encoder checks, harmonic analysis and programmable stopping actions; automatic fallback from encoder vector to sensorless operation.
- Optional Safe Torque Off (STO) is described in the source; availability and safety certification must be confirmed.
- Thermal design uses computer modelling, airflow and temperature distribution analysis.
- Short power interruption ride-through uses regenerative load energy to support the DC bus.
- The source claims CE conformity; obtain model specific documents.

S500 high performance vector drives control induction motors and permanent magnet synchronous motors. The portfolio addresses cable machinery, machine tools, metal products, petrochemicals, natural gas, lifting equipment, pulp and paper, textiles, printing, dyeing and ceramics.

The design emphasises reliability, ease of use, serviceability, environmental resistance, installation space and application functions.

- ESDriver Ms / ESDriverShop software supports online monitoring, oscilloscope operation, parameter upload / download, U0 group monitoring, diagnostics and automatic commissioning records.
- Flexible terminals: DI offers 51 logic functions, DO offers 42 functions and AO offers 16 functions. Analogue channels can use four point / five k-broken-line characteristic settings as described in the source.
- Five virtual DI/DO groups reduce external wiring. DI7 and FM support high speed pulse signals to 100 kHz.
- Two integrated PID parameter sets can switch automatically according to deviation, DI status and frequency conditions. Flexible reference and feedback selection, feedback loss detection and industry parameter sets simplify commissioning.
- User development functions and built-in logic, mathematical and word conversion modules support application adaptation. Input, output and internal drive parameters can be linked.

Parameter / mode	Specification
Supply	1 phase 220-240 V: 0.4-2.2 kW; 3 phase 220-240 V: 0.4-11 kW; 3 phase 380-480 V: source specification row says 0.4-22 kW, while the rating tables extend to 710 kW; confirm the ordered frame
Motor / control	Induction (IM) and PMSM; SVC, encoder vector (FVC) and V/f
V/f functions	Energy saving, overvoltage / overcurrent suppression, vibration suppression, torque boost, slip compensation, start delay, V/f separation and overexcitation deceleration
IM FVC	200% starting torque; torque response 2 ms; speed accuracy 0.02%; speed fluctuation 0.05%; torque accuracy +/-2%; field weakening up to 5:1
IM SVC	200% starting torque; torque response 2 ms; torque accuracy above 5 Hz +/-3%; speed accuracy within 10% of rated slip; field weakening up to 5:1
PMSM FVC	200% starting torque; torque response 2 ms; speed accuracy 0.02%; speed fluctuation 0.05%; torque accuracy +/-2%
PMSM SVC	200% starting torque; torque response 2 ms; speed accuracy 0.05%; torque accuracy above 5 Hz +/-3%
Encoder types	ABZ (differential, open collector or push-pull); resolver; sine/cosine, depending on card

The source contains malformed numerical speed-range entries. These are not converted into new guaranteed ratings; obtain a verified model datasheet.

S500 | TECHNICAL SPECIFICATIONS

Control, communication, programmable functions and environment

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Function	Specification
Command channels	DI/DO, virtual I/O and expansion cards; multiple parameter sets; programmable start / stop commands
Reference resolution	Digital 0.01 Hz; analogue 0.1% of maximum frequency
Speed / torque setting	Acceleration / deceleration curves, dynamic ramp switching, multipoint and S curves; PID; three AI channels +/-10 V; 0-20 mA; communication; DI5 pulse; multi-step; programmable reference
Communication	Modbus RTU / ASCII / TCP/IP, Profibus DP, CANlink, CANopen, Profinet, EtherCAT and source-listed Ethernet/P option; confirm card
Output limitation	Torque, power, current, speed and frequency limits; forward / reverse torque limits
Process PID	Flexible reference / feedback; 2 parameter sets; output limits and initialisation
Protection	Overvoltage, overcurrent, overload, motor temperature, load loss and automatic fault reset
Free programming	Byte / word conversion, logic, add/subtract/multiply/divide, floating point, absolute value, comparison, selectors, filters, delays, multipoint curves and DC values
Self-check / long cable	Drive and motor tests, earth short circuit, phase loss, encoder check and interphase short circuit; long cable and output filter support
Electromagnetic coil	Individually set current frequency; three phase variable frequency AC supply for electromagnetic stirring, welding and related applications

Function	Specification
Software / thermal inputs	Parameter transfer, oscilloscope, remote diagnostics; motor temperature inputs: PT100, PT1000, KTY84-130, PTC130 and PTC150
Command / frequency	Keypad, terminals, communication; 10 main and 10 auxiliary frequency source methods
Inputs	7 DI; 2 AI, AI1 -10 to +10 V, AI2 -10 to +10 V or 0/4-20 mA; motor temperature input selectable by parameter
Outputs	1 DO; 2 relays; 1 FM digital / pulse output; 1 AO, 0/4-20 mA or 0-10 V
Display	LED parameter and operating state display; LCD keypad with Chinese, English and Russian languages as supplied
Keypad functions	Fast parameter copying; complete or partial key lock
Location	Indoor, protected from sunlight, dust, corrosive / combustible gas, smoke, steam and salt
Altitude	Below 1000 m; source specifies 10% derating above this
Operating temperature	-10 to +40 C; source also lists -10 to +50 C with derating
Humidity / vibration	95% RH non-condensing; below 5.9 m/s ² (0.6 g)
Storage	-20 to +60 C

S500 | MODEL RATINGS

Power, current, braking and input accessory selection

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Model	Mot or kW	Mot or HP	Supply kVA	Input A	Outp ut A	Brake resistor W / ohm	Qty	Brake unit	Reactor A	L mH	Filter A
1 phase 220-240 V (-15% / +10%), 50/60 Hz											
S500-2S 0.4GB	0.4	0.75	1.0	5.4	2.3	80W 200Ω	1	Built-in			8
S500-2S 0.75GB	0.75	1	1.5	8.2	4	80W 150Ω	1				12
S500-2S 1.5GB	1.5	2	3	14	7	100W 100Ω	1				20
S500-2S 2.2GB	2.2	3	4	23	9.6	100W 70Ω	1				30
S500-2S 3.7GB	3.7	5	12	40	17	150W 40Ω	1				
3 phase 220-240 V (-15% / +10%), 50/60 Hz											
S500-2T 0.4GB	0.4	0.5	1.5	3.4	2.1	90W 300Ω	1	Built-in	10	5	7
S500-2T 0.75GB	0.75	1	3	5	3.8	160W 170Ω	1		10	5	7
S500-2T 1.5GB	1.5	2	4.5	7.8	6.8	340W 80Ω	1		10	5	16
S500-2T 2.2GB	2.2	3	5.9	10.5	9	500W 55Ω	1		15	3	16
S500-2T 4.0GB	3.7	5	8.9	14.6	13	800W 33Ω	1		15	3	30
S500-2T 5.5GB	5.5	7.5	17	26	25	1300W 22Ω	1		40	1.45	42
S500-2T 7.5GB	7.5	10	21	35	32	1700W 16Ω	1		50	1.2	42
S500-2T 11GB	11	15	30	46.5	45	2300W 12Ω	1		80	0.17	75
3 phase 380-480 V (-15% / +10%), 50/60 Hz											
S500-4T 0.4GB	0.4	0.75	1.0	2.4	1.2	80W 1450Ω	1	Built-in	10	5	7
S500-4T 0.75GB	0.75	1	1.5	3.4	2.1	140W 800Ω	1		10	5	7
S500-4T 1.5GB	1.5	2	3	5	3.8	300W 380Ω	1		10	5	7
S500-4T 2.2GB	2.2	3	4	5.8	5.1	440W 260Ω	1		10	5	7
S500-4T 4.0GB	4.0	5.33	6.0	13.5	9.5	740W 150Ω	1		15	3	16
S500-4T 5.5G/PB	5.5	7.5	8.9	14.6	13	1100W 100Ω	1		35	3	30
S500-4T 7.5G/PB	7.5	10	11	20.5	17	1500W 75Ω	1		40	1.45	30
S500-4T 11G/PB	11	15	17	26	25	2200W 50Ω	1		40	1.45	42
S500-4T 15GB	15	20	21	35	32	3000W 38Ω	1		50	1.2	42
S500-4T 18.5GB	18.5	25	24	38.5	37	4000W 32Ω	1		50	0.28	55
S500-4T 22GB	22	30	30	46.5	45	4500W 27Ω	1		60	0.24	75

Model	Mot or kW	Mot or HP	Supply kVA	Input A	Outp ut A	Brake resistor W / ohm	Qty	Brake unit	Reactor A	L mH	Filter A
Source supply row: 1 phase 220-240 V; confirm 4T model supply											
S500-4T 30G	30	40	40	62.5	60	6000W 20Ω	1	Optional	80	0.17	75
S500-4T 37G	37	50	57	76.0	75	7000W 16Ω	1		90	0.16	75
S500-4T 45G	45	60	69	92.0	91	9000W 13Ω	1		120	0.12	100
S500-4T 55G	55	75	85	113	112	11000W 10.5Ω	1		150	0.095	130
S500-4T 75G	75	100	114	157	150	15000W 7.7Ω	1		200	0.07	180
S500-4T 90G	90	125	134	180	176	9000W 10.2Ω	2		250	0.056	180
S500-4T 110G	110	150	160	214	210	11000W 8.0Ω	2		250	0.056	250
S500-4T 132G	132	200	192	256	253	13000W 6.8Ω	2		330	0.042	250
S500-4T 160G	160	250	231	307	304	16000W 5.8Ω	2		330	0.042	320
S500-4T 185G	185	275	242	350	340	18000W 5.1Ω	2				
S500-4T 200G	200	300	250	385	377	21000W 4.1Ω	2		490	0.028	400
S500-4T 220G	220	300	280	430	426	27000W 3.2Ω	2		490	0.028	600
S500-4T 250G	250	400	355	468	465	20000W 4.3Ω	3		490	0.028	600
S500-4T 280G	280	370	396	525	520	23000W 3.8Ω	3		660	0.021	600
S500-4T 315G	315	500	445	590	585	26000W 3.4Ω	3		660	0.021	600
S500-4T 350G	350	420	500	665	650	29000W 3.0Ω	3		800	0.017	800
S500-4T 400G	400	530	565	785	725	29000W 3.0Ω	3		800	0.017	800
S500-4T 450G	450	610		890	820	32000W 3.0Ω	4				
S500-4T 500G	500	680		935	860	34000W 3.0Ω	4				
S500-4T 550G	550	762		1020	950						
S500-4T 630G	630	857		1180	1100						
S500-4T 710G	710	950		1340	1250						

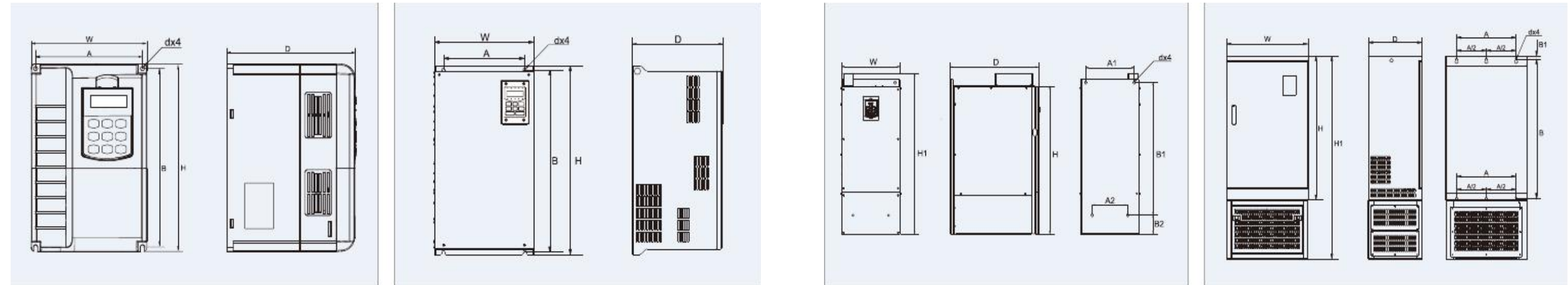
Original rating rows and values are retained. Blank cells indicate that the source gives no value. Motor power appears in kW and HP; input / output currents are A. Accessory sizing must be confirmed for duty and braking cycle.

S300 / S500 | OUTLINE & MOUNTING DIMENSIONS

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Mechanical drawings | All dimensions in mm

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Frame / kW	W	H	D	A	B	Hole mm	Mass kg
D01 / 0.75-3.7	118	185	156.7	106.6	175.3	4.5	1.8
D02 / 5.5-11	160	247	178	148	235	5.5	3

Frame / kW	W	H	D	A	B	Hole mm	Mass kg
D03 / 15-18	217	335	194	140	324	6	8
D04 / 22	228	361	203.5	139	349	6	9.4
D06 / 30-37	285	463	224	235	447	6	15.4
D07 / 45	300	542	272	245	523	10	23.4
C07 / 55	300	542	272	245	523	10	24
D07 / 45	305	613	294	200	592	10	24.7
D07 / 55	305	613	294	200	592	10	25
D07 / 75	305	613	294	200	592	10	28
C08 / 75-110	338	580	315	270	560	10	34
C08U / 75-90	338	580	315	270	560	10	44
C08U / 110	338	580	315	270	560	10	51.5
D08 / 90	400	753	293	280	731.5	10	42.5
D08 / 110	400	753	293	280	731.5	10	42.5
D08 / 132	400	753	293	280	731.5	10	45.7
C09 / 132-160	400	815	315	320	790	11	53
C09U / 132-160	400	915	315	320	790	11	60

Frame / kW	W	H	H1	D	A1	A2	B1	B2	Hole mm	kg
C10 / 185-220	340	810	880	515	283	207	727	103.5	13	78.6
C10V / 200	340	810	880	515	283	207	727	103.5	13	80
C11V / 250-280	340	810	880	515	283	207	727	103.5	13	83.3
C12V / 315-355	340	960	1030	570	258	207	890	103.5	13	116.5

Frame / kW	W	H	H1*	D	A	B	B1	Hole	kg
D09 / 160	520	865	1219	343	380	836.5	18.5	12	70.2
D09 / 200	520	865	1219	343	380	836.5	18.5	12	74.4
D09 / 220	520	865	1219	343	380	836.5	18.5	12	74.4
D10 / 250-350	800	1172	1495	412	600	1143	19	14	165
D10 / 400	800	1172	1495	412	600	1143	19	14	168
D11 / 450-560	1080	N/A	1800	500	620	N/A	20	12	300
D11 / 630-710	1080	N/A	1800	500	620	N/A	20	12	310

Notes: DC reactors for 160-220 kW and 250-355 kW frames are optional; H1 applies with a reactor and H without. Mounting uses 3 upper and 3 lower holes. 400-710 kW models have built-in reactors.

S500 | OPTIONS & EXPANSION CARDS

Braking, I/O, programmable control, fieldbus and encoder feedback

Option	Model / part	Description
DC reactor	Frame dependent	15-37 kW: built-in reactor described in source; 45-400 kW: optional. Confirm frame configuration.
Braking unit	S100-110 / 99050001	External brake unit for 90 kW and above; unit rating 110 kW
I/O expansion	S50IO1	5 DI, 1 AI, 1 relay, 1 DO, 1 AO, Modbus / CANlink
I/O expansion	S50IO2	3 DI
I/O expansion	S50IO3	3 DI, 1 relay, 1 Modbus
Programmable card	S50PC1	User programming method described as compatible with H1U PLC
Isolated Modbus	S50TX1	Communication adapter
CANlink	S50CAN1	Communication adapter
CANopen	S50CAN2	Communication adapter
Profibus DP	S50DP2	Fieldbus card
Profinet	S500-PNT	Fieldbus adapter
EtherCAT	S500-ECAT	Fieldbus adapter

Option	Model / part	Description
PG feedback	PG-03 / 91020073	Resolver interface, DB9
PG feedback	PG-02-M / 91020079	Photoelectric encoder, adaptive 5 V supply, DB15
PG feedback	PG-02B-24V / 91020152	ABZ encoder; adaptive 5 / 12 / 24 V supply
Remote keypad	MDKE500 / 96030007	S500 keypad
Mounting frame	KZ500 / 14600011	S300 / S500 keypad frame
Keypad cable	ESCAB-2 / 12070101	200 cm
Keypad cable	ESCAB-3 / 12070130	300 cm

Selection guidance

- Confirm encoder signal type and supply voltage.
- Select the required fieldbus and firmware compatibility.
- Check available slots and terminal resources before ordering.

Accessories and photographs are reference selections. Confirm card version, connector, firmware, supply voltage and installation compatibility.

S500 CONNECTIONS / S580 INTEGRATED DRIVE

Control terminal overview | Fan and pump motor mounted drive

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S500 circuit	Function
R/S/T; U/V/W; PE	Supply / motor / earth; breaker, contactor and fuse protection
DC bus / braking	Built-in brake at 22 kW and below; optional 30-75 kW; external brake at 90 kW and above. Source schematic states DC reactors optional for all models; verify by frame.
DI1-DI7 / COM	Forward, jog, reset, inputs 1/2 and pulse input selection to 100 kHz
+10 V / AI1 / AI2 / GND	0-10 V reference, 4-20 mA selection; 1-5 kohm potentiometer
AO1 / AO2 / GND	0-10 V or 0-20 mA outputs as shown in schematic; verify fitted I/O against rating specification
FM / COM	Open collector pulse output to 100 kHz; default P5-00=0
T1 / T2 relay groups	Max. 250 VAC 3 A; max. 30 VDC 1 A; fault default P5-02=2
485A / 485B / PE	Modbus RTU
PTC+ / PTC-	Motor temperature protection
PG / RJ45	Optional encoder card / external keypad



S580 fan and pump integrated drive

Motor mounted drive for 0.4-18.5 kW, IP65 enclosure and stated 4 g vibration resistance. Supports induction and permanent magnet motors. Open heatsink design supports cooling, cleaning and servicing; PTC input improves motor protection. Flexible mounting and a four line LCD panel with four orientation choices support integration. The source states CE certification.

- Induction motor SVC / VVVF; PMSM SVC.
- Speed and torque control; optional integrated filter.
- Suitable for fan and pump applications in demanding environments.



S590 integrated compressor drive

Dual inverter integrated drive for synchronous or asynchronous twin screw compressors, 7.5-22 kW. The main motor and fan drives integrate with a touch HMI, 24 V supply, solenoid valve control and temperature / pressure inputs, replacing much of a conventional electrical control cabinet.

Combined dual drive control and maximum temperature management improve compressor control. A two-stage constant pressure algorithm maintains efficient operating conditions. The source claims up to 80% reduction in electrical cabinet assembly time. Design and tests are described as following IEC standards.

PV300 solar pump system

System element	Role
Photovoltaic modules	DC energy source
PV300 inverter	MPPT and variable speed pump control
Pump motor	Single or three phase AC pump, by model
Water storage / distribution	Tank, irrigation, domestic supply or other water demand

The source schematic shows a PV array, isolating switch Q1, inverter, submersible pump and elevated reservoir. The illustrated well depth range is 0-400 m; actual pump head and installation depth depend on pump selection.

- Agricultural irrigation
- Desert management and revegetation
- Forestry and plantation water supply
- Domestic water use
- Pasture and livestock water supply

PV300 | SOLAR PUMP INVERTER

Single and three phase AC pump control | MPPT

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Features

- Compatible with a broad range of pumps, including 220 V single phase pumps and different PV array configurations.
- AC and DC input support permits mains backup and round-the-clock system operation.
- Built-in MPPT with source-stated efficiency up to 99.96%; water level monitoring, flow regulation, dry-run and tank overflow protection.
- No battery required; simple installation and maintenance; soft start limits water hammer.
- Overvoltage, overload, undervoltage and low irradiance protection.
- RS485 PC monitoring and optional GPRS remote monitoring.

Parameter	220 V class	380 V class
AC input	1/3 phase 220 V -15% to 240 V +10%	3 phase 380 V -15% to 480 V +10%
AC output	1/3 phase, 0 to 220/230/240 V	3 phase, 0 to 380/480 V
Maximum DC input	450 V	780 V
Recommended open circuit voltage	380 V < Voc < 450 V	660 V < Voc < 780 V
Recommended MPP voltage	>310 V	>540 V
Output frequency	0-300 Hz	0-300 Hz
MPPT efficiency	99.96% (source stated)	99.96% (source stated)
Ambient temperature	-10 to +50 C	-10 to +50 C
Altitude	Below 1000 m	Below 1000 m
Cooling / enclosure	Forced air / IP20	Forced air / IP20

The source specifies more than 30 protective functions, including overcurrent, overvoltage, undervoltage, overheating, phase loss, overload and short circuit. Solar pumping protection includes sensor loss, full tank, dry run and low sunlight. Fault recording and automatic reset are supported.

Model	Motor kW	Motor HP	Rated kW	Output A	Recommended Voc (V)
1 phase 220-240 V (-15% / +10%), 50/60 Hz					
PV300-2SS1.5G	1.5	2	1.5	10	380-450
PV300-2SS2.2G	2.2	3	2.2	14	380-450
PV300-2SS3.7G	3.7	5	3.7	18	380-450
PV300-2SS5.5G	5.5	7.5	5.5	25	380-450
3 phase 380-480 V (-15% / +10%), 50/60 Hz					
PV300-4T0.75G	0.75	1	0.75	2.1	660-780
PV300-4T1.5G	1.5	2	1.5	3.8	660-780
PV300-4T2.2G	2.2	3	2.2	5.1	660-780
PV300-4T3.7G	3.7	5	3.7	9	660-780
PV300-4T5.5G	5.5	7.5	5.5	13	660-780
PV300-4T7.5G	7.5	10	7.5	17	660-780
PV300-4T11G	11	15	11	25	660-780
PV300-4T15G	15	20	15	32	660-780
PV300-4T18.5G	18.5	25	18.5	37	660-780
PV300-4T22G	22	30	22	45	660-780
PV300-4T30G	30	40	30	60	660-780
PV300-4T37G	37	50	37	75	660-780
PV300-4T45G	45	60	45	91	660-780
PV300-4T55G	55	75	55	112	660-780
PV300-4T75G	75	100	75	150	660-780
PV300-4T90G	90	125	90	176	660-780
PV300-4T110G	110	150	110	210	660-780
PV300-4T132G	132	180	132	253	660-780
PV300-4T160G	160	220	160	304	660-780
PV300-4T185G	185	250	185	340	660-780
PV300-4T200G	200	270	200	377	660-780
PV300-4T220G	220	300	220	426	660-780

How the system works

The system comprises the photovoltaic array, solar pump inverter, AC pump and water storage. The array converts sunlight into DC power. The inverter converts DC to AC, regulates output voltage and frequency as irradiance changes, and tracks maximum available PV power.

Mains power can provide backup when sunlight is insufficient. Applications include domestic supply, agriculture, desert management, livestock, forestry, wastewater treatment, landscaping and fountains. The concept reduces fossil energy consumption and supports remote areas with limited water or electricity infrastructure.

System characteristics

- Supports different PV modules and single / three phase AC pumps.
- Source system operating temperature statement: -25 to +60 C; distinguish this system claim from the inverter ambient limits.
- GPRS monitoring, real-time status, remote start and stop.
- Source claims 5% higher water delivery than comparable systems in cloudy weather; verify under project conditions.
- Automatic unattended operation and comprehensive protection.
- Reference installations: Dubai 10 kW, United Arab Emirates 5.5 kW and Saudi Arabia 11 kW solar pump systems.

Solar aeration

- Landscape water treatment in parks, wetlands and lakes.
- River and lake surface water treatment.
- Fish and shrimp aquaculture.
- Cable-free solar supply; automatic light dependent control adjusts aeration power without routine manual operation.
- Avoids mains voltage exposure associated with traditional aeration arrangements.
- Aluminium alloy and stainless steel parts provide corrosion resistance and durability.
- The source describes year-round day and night operation; energy storage and irradiance assumptions must be confirmed for an actual project.



Intelligent solar irrigation

The system combines photovoltaic pumping, drip or sprinkler irrigation, filtration, fertiliser dosing, pressure and flow control, solenoid valves, distribution mains, environmental monitoring and intelligent control. Renewable energy drive and control can integrate with networked irrigation management.

Automatic control covers water lifting, filtration, delivery, storage, distribution and fertilisation. Remote monitoring and operation support crop stage and moisture management. Networked systems can rotate irrigation between zones and elevations. Water treatment can be integrated to improve water quality and crop performance.

Mains or diesel backup permits coordinated switching and continuous service where required.

Source project example: Chad, 0.5 MW

The source describes a photovoltaic and diesel hybrid water supply project intended to serve 300,000 residents and part of the agricultural irrigation demand. In October 2020, a technical team reportedly completed installation support and integration within 15 days. The source claims diesel savings of 2,000 litres per day. This is a reference from the original portfolio, not a claim of a SKY MATRIX project.

Application and operating principles

The S520 power supply controls magnetisation and demagnetisation equipment for magnetic material production. Compared with traditional thyristor and high voltage capacitor arrangements, high frequency IGBTs, fast Hall current feedback and a high speed DSP improve current regulation and switching response.

The source describes high stability, comprehensive functions and output current fluctuation of +/-0.1 A. One supply can independently control two coils. Built-in braking is described across the range; cabinet installation is used above 110 kW.

- 150% overload for 1 minute; 180% for 10 seconds.
- Protection for overcurrent, overvoltage, earth short circuit, IGBT faults and interturn coil short circuit.
- Protective coating and sealed components support reliability.
- Permitted three phase voltage imbalance no greater than 3%; frequency variation +/-5%.
- Current rise from 0 A to rated current stated as below 100 ms, shortening magnetisation / demagnetisation cycles.
- Standard Modbus communication for PLC integration.

Model	Motor kW	Motor HP	Rated power	Rated output current (A)	Recommended open circuit V
3 phase 380-480 V (-15% / +10%), 50/60 Hz					
S520-4T 0.4GB	0.4	0.75	1.0	2.4	1.2
S520-4T 0.75GB	0.75	1	1.5	3.4	2.1
S520-4T 1.5GB	1.5	2	3	5	3.8
S520-4T 2.2GB	2.2	3	4	5.8	5.1
S520-4T 4.0GB	4.0	5.33	6.0	13.5	9.5
S520-4T 5.5G/PB	5.5	7.5	8.9	14.6	13
S520-4T 7.5G/PB	7.5	10	11	20.5	17
S520-4T 11G/PB	11	15	17	26	25
S520-4T 15GB	15	20	21	35	32
S520-4T 18.5GB	18.5	25	24	38.5	37
S520-4T 22GB	22	30	30	46.5	45
S520-4T 30G	30	40	40	62.5	60
S520-4T 37G	37	50	57	76.0	75
S520-4T 45G	45	60	69	92.0	91
S520-4T 55G	55	75	85	113	112
S520-4T 75G	75	100	114	157	150
S520-4T 90G	90	125	134	180	176
S520-4T 110G	110	150	160	214	210
S520-4T 132G	132	200	192	256	253
S520-4T 160G	160	250	231	307	304
S520-4T 185G	185	275	242	350	340
S520-4T 200G	200	300	250	385	377
S520-4T 220G	220	300	280	430	426
S520-4T 250G	250	400	355	468	465
S520-4T 280G	280	370	396	525	520
S520-4T 315G	315	500	445	590	585
S520-4T 350G	350	420	500	665	650
S520-4T 400G	400	530	565	785	725

Source column headings and values are retained; the last two columns appear inconsistent. Obtain a verified S520 datasheet before equipment selection.

Block forming machine: master / follower control

The source compares direct motor and hydraulic drives with VFD operation. Frequent direct starting (3-4 starts per minute) creates starting current of 5-7 times rated current, motor heating, bearing and mechanical stress, and starting difficulty during supply dips. Hydraulic arrangements add conversion losses, service requirements, noise and vibration.

A VFD arrangement offers one-to-two or one-to-four coordinated motor control, dynamic braking with an external resistor, smooth starting and reduced mechanical shock. The source opening paragraph duplicates the S520 description; it is not used as a block machine design requirement.

QT6 block machine	Before retrofit	After retrofit
Block dimensions	240 x 115 x 90	240 x 115 x 90
8 hour production	1600	2200
Starting current	155 A	45 A
Motor surface temperature	75 C	50 C
Vibration frequency	50 Hz	60 Hz
Block surface	Rough	Smooth

Source drive designation: S500-4T22KWGB/30KWPB. The motor line states two 75 kW motors, which conflicts with the drive designation; confirm equipment ratings.

Rolling mill retrofit

The source describes 26 machines with a 75 kW induction motor and belt transmission. Fourteen belts transmit power between pulleys of 240 mm and 860 mm, giving an approximate ratio of 3.6. Belt wear and loosening require periodic replacement, stated as about once per quarter.

The retrofit comprises a frequency converter, improved transmission and permanent magnet synchronous motor. For 75 kW and larger motors, the source claims PMSM rated efficiency 2-4 percentage points above the induction motor; in the 60-120% torque range, induction efficiency varies 3-5% versus 1-2% for PMSM.

An S500 drive adjusts PMSM speed to production demand, with source-stated potential energy savings of 5-10%. Torque and overload requirements must be retained.

The existing belt transmission is replaced with a planetary gearbox and coupling after verifying the final roll shaft speed (source designation FR124). The source claims planetary transmission efficiency 5-10% above the belt arrangement, with more stable operation and simpler maintenance.

low speed high torque drives and constant pressure control SUPPLY

Oilfield pumping units

Reciprocating pumping units lift oil through cyclic pressure changes and check valve action. Conventional systems combine induction motors, belts, reduction gearboxes and control equipment. Their principal requirements are smooth speed control, reliability, energy efficiency and manageable maintenance.

The source describes motors typically around 30, 37 and 45 kW, with some 55 and 75 kW units, and mentions more than two million kW of installed capacity in its reference market. Conventional belt maintenance may require replacement twice per year.

An S500 drive with a low speed high torque motor can replace belt and gearbox stages. Features include application macros, commissioning functions, RTU compatibility, compact assembly and direct drive operation.

Source example: 2000 Nm, 37 kW, 60 rpm direct drive motor with a 45 kW VFD. Metered energy savings are described as approximately 25%, varying with equipment and operating conditions.

Constant pressure water supply

A VFD regulates pump speed from pressure feedback to maintain the required supply pressure. Correct system design, drive selection, installation, commissioning and maintenance are essential.

- Energy saving: reduce pump speed and power demand as water use falls.
- Accurate pressure control protects the network against excessive and insufficient pressure.
- Fewer starts and stops extend pump life and reduce cycling.
- Automatic response maintains pressure when system demand changes.
- Real-time status supports local display and remote monitoring.
- Drip irrigation: constant pressure, reduced water hammer, automated control and overload / overvoltage / overcurrent / phase loss protection.
- Compact integrated equipment lowers installation labour and supports outdoor service when the selected enclosure and temperature rating permit it.

Spindle control and integrated VFD installation

INTEGRATION

Machine tool spindle control

An electric spindle integrates the spindle and spindle motor, enabling direct high speed drive. S500 high speed DSP and flux control support machine tool applications.

- Wide speed range; the application page states a maximum frequency of 1000 Hz. This is application specific and requires confirmation against the chosen model.
- High low speed torque: source states 150% rated torque at 0.5 Hz.
- Fast response; acceleration and deceleration of 0.5 s are stated for the example.
- Selectable open loop vector or V/f control.
- Source application claims 180% current for 3 s under transient load.
- Reduced operating cost and energy use.

Application example: the source lists 5 kW and 11 kW S500 drives with a 7.5 kW three phase induction spindle motor. The 5 kW entry is inconsistent with normal series ratings; verify the intended drive size and overload duty.

Cabinet integration

The source describes wall mounted drives commonly used from 0.4 to 200 kW and floor standing cabinets at higher powers. An integrated mounting arrangement is described for 11-200 kW equipment.

Wall mounted inside cabinet	Integrated mounting
More complex and less orderly wiring	Simpler wiring and shorter connections
Drive heat can affect PLCs, touch panels and other components	Heatsink at the rear separates drive heat from control electronics
Higher wiring cost and material waste	Lower wiring cost
Less compact visual arrangement	Improved cabinet layout

Engineering design must preserve ventilation, access, creepage and clearance, ingress protection, earthing and electrical safety. Select mounting details for the actual drive frame.

Low voltage soft starters

Soft starting reduces motor inrush, supply voltage dips, mechanical stress and water hammer. Suitable loads include fans, pumps, conveyors and compressors. The source lists 220 / 380 / 440 / 1140 V supply options.

- Built-in bypass contactor; six starting modes.
- Selectable forward / reverse operation and three stopping modes: coast, soft stop or DC braking.
- Starting selections include torque and ramp modes; two independent programmable output relays.
- LCD HMI with English / Russian display; Modbus RTU via RS485.
- Protection and actual motor power adjustment functions.

Rated power (kW)	Current (A)	Motor (kW)
15	30	15
18.5	37	18.5
22	44	22
30	60	30
37	74	37
45	90	45
55	110	55
75	150	75
90	180	90
115	230	115
132	264	132
160	320	160
185	370	185
200	400	200
220	440	220
250	500	250
320	640	320

High voltage soft starters: 6-10 kV

Designed for high voltage induction and synchronous AC motors, reducing inrush, supply dips, motor heating, mechanical shock and electromagnetic disturbance. Applications include steel, petroleum, chemical, aluminium, fire systems, mining, water treatment, power generation, pumps, fans, compressors, crushers, mixers and belt conveyors.

Parameter	Specification
Supply / frequency	6-10 kV AC; 50/60 Hz +/-2 Hz
Phase sequence	Any phase sequence permitted by parameter setting
Bypass / control supply	Contactor with direct start circuit; 220 VAC +/-15%
Surge / starts	DV/DT protection; 1-6 starts per hour
Environment	-20 to +50 C; RH 5-95% non-condensing; altitude below 1500 m
Display / records	Three phase supply voltage and current; last 100 faults
Communication	Modbus RTU; source describes connection of 32 units
Protection	Supply phase loss, overcurrent, current imbalance, overload, underload, start timeout, overvoltage, undervoltage, phase sequence and earth fault
Overcurrent / imbalance	Overcurrent: 100-500% Ie; current imbalance: 20-100%
Overload / underload	Overload levels 10A, 10, 20, 30; underload 50-100%, delay 0-10 s
Start / voltage limits	Start timeout 10-120 s; overvoltage above 120%; undervoltage below 70% of nominal

ACCESSORIES | EMC FILTERS & REACTORS

Input and output accessories for industrial drive systems

SKY MATRIX

PTE. LTD. | SINGAPORE

EMC filters reduce interference from drives to electrical and digital equipment. Applications include VFDs, servo systems, textile and packaging machinery, HVAC, welding and industrial electronics. Rated voltage: 250/380/440 V; 50/60 Hz; operating temperature -25 to +85 C; insulation resistance at least 30 Mohm; test voltage P-E 2000 VDC / P-P 1500 VDC.

Input filter	Output filter	Drive (kW)	Current (A)
NFI-5A-S	NFO-5A-S	0.75-1.5	5
NFI-10A-S	NFO-10A-S	4	10
NFI-20A-S	NFO-20A-S	5.5-7.5	20
NFI-30A-S	NFO-30A-S	11-14	30
NFI-40A-S	NFO-40A-S	15-18.5	40
NFI-50A-S	NFO-50A-S	18.5-22	50
NFI-60A-S	NFO-60A-S	22-30	60
NFI-80A-S	NFO-80A-S	30-37	80
NFI-100A-S	NFO-100A-S	37-45	100
NFI-120A-S	NFO-120A-S	45-55	120
NFI-150A-S	NFO-150A-S	75	150
NFI-200A-S	NFO-200A-S	90	200
NFI-250A-T	NFO-250A-T	110	250
NFI-300A-T	NFO-300A-T	132-150	300
NFI-420A-T	NFO-420A-T	160-200	420
NFI-550A-T	NFO-550A-T	220	550
NFI-650A-T	NFO-650A-T	260	650
NFI-800A-T	NFO-800A-T	300	800

Filter table voltage: 380/440 V. Model identifiers retain the NFI/NFO type designation. Confirm current range: the source description says 5-650 A, while the table includes an 800 A model.

Input reactors reduce supply current disturbances and improve power quality. Output reactors compensate cable capacitance, reduce dv/dt and leakage current, and support motor cables of 50-200 m as described in the source.

ACL/OCL suffix	Drive kW	Current A	ACL mH	OCL mH
5(8)	0.75(1.5)	8	.7	.6
10	2.2	10	.6	.45
10	3.7(4)	10	.6	.45
15	5.5	15	.24	.22
20	7.5	20	.22	.2
30	11	30	.18	.16
40	15	40	.16	.15
50	18.5	50	.14	.1
60	22	60	.12	.86
80	30	80	.05	.065
110	37	110	.06	.048
125	45	125	.05	.048
150	55	150	.037	.037
200	75	200	.04	.026
250	90	250	.03	.02
280	110	280	.028	.019
300	132	300	.026	.017
400	160	400	.024	.0135
450	187	450	.023	.0125
500	200(220)	500	.019	.01
600	250	600	.018	.007

ACL = input reactor; OCL = output reactor. Original values are retained, including the unusual OCL-60 inductance of 0.86 mH. The OCL-250 source motor entry is 90(93) kW.

Braking units dissipate regenerated motor energy in an external resistor. Typical applications include lifts, cranes, presses, hoists and centrifuges. Select the braking unit and resistor using the drive power, DC voltage, peak current, braking duty and thermal cycle.

Model designation

Code	Meaning
BU	Braking unit
2X	220 V AC drive class
4X	380 V AC drive class
6X	690 V AC drive class
XX	Matching drive power
G / H	Source designation suffix; confirm execution

The table retains the original BU product identifiers without the former company prefix. Source duty values, average / peak currents, matching drive powers and minimum resistor values are reproduced.

Model	Duty	Average A	Peak A	Drive kW	Min. ohm
BU-2022S	15%	8	46	22	8.2
BU-2037S	15%	12	70	37	5.5
BU-2045S	15%	15	90	45	4.2
BU-4045S	15%	8	75	45	13
BU-4075S	15%	15	100	75	10
BU-4110S	15%	22	150	110	8
BU-4160S	15%	30	200	160	5
BU-4220S	15%	45	300	220	4
BU-4030N	25%	10	40	30	18
BU-4045N	25%	12	50	45	14
BU-4075N	25%	25	100	75	10
BU-4110N	30%	45	150	110	8
BU-4160N	30%	85	200	160	5
BU-4220N	30%	120	300	220	3
BU-4315N	30%	160	450	315	2
BU-6110N	40%	24	100	110	15
BU-6160N	40%	44	150	160	10
BU-6220N	40%	60	200	220	8
BU-6300N	30%	80	300	300	6
BU-6600N	30%	120	400	600	3

VFD and constant pressure cabinets

Constant pressure cabinets use an S500 drive with integrated PID and feedback to regulate network pressure. Applications include water supply, circulation, cooling towers, domestic hot water, heating, ventilation, irrigation, fire systems, drainage and industrial / agricultural services.

The source claims 30-60% energy savings compared with traditional water supply methods; actual savings depend on demand, pump curves and system design. Compact construction, flexible configuration and automation reduce installation work. Lower average speed reduces mechanical wear, while soft starting and stopping limit water hammer.

VFD cabinets provide analogue reference and feedback inputs, PID, pump changeover, communication, application macros, multi-step speed and PLC / computer integration. Functions include fast response, low noise, wide stepless speed range, diagnostics, fault indication, current limiting and slip compensation.

Soft starter cabinets

Cabinets support current limiting, voltage ramp, kick start, current ramp and closed loop starting modes; coast or timed soft stopping; panel, terminal and remote control; Modbus RTU over RS485. Protection covers overheating, input / output phase loss, current imbalance, overload and short circuit.

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USD account	0105176095
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Technical enquiry: provide motor nameplate data, application duty, supply details, control interface, installation conditions and required accessories.

This English edition is adapted from the supplied 2025 product catalogue. Product series and component model identifiers are retained for traceability. Source inconsistencies are identified where they affect selection.