

S5K Modular Series On-Line Uninterruptible Power Systems (UPS)

This easily upgraded and flexible UPS provides the protection you want, when you need it.

The 5K Modular is scalable from 4 to 20 kVA, offering many flexible options by adding a few standard modules. Designed to be fully configured, tested and shipped in the configuration you need, the 5K Modular also has the ability to be easily upgraded in the field to either higher VA ratings (up to 20 kVA maximum), longer back-ups or to add N+x parallel redundancy. Configurations can be cost-effectively upgraded keeping your 5K Modular current without a large reinvestment in a new system.

The optional N+x redundancy provides a fault-tolerant group of power modules and controls. The modular design is easy to upgrade so the UPS can grow with the needs of the system that is being protected.

Each of the modular components, including 4 kVA power modules, battery modules and system control modules, can be hot-swapped making it easy to increase power, extend your back-up or add redundancy while still providing power protection to the load.

This fault-tolerant system uses intelligent power and battery modules which take themselves off-line if there is a problem without interrupting power to the load. Self-diagnostic capabilities simplify maintenance and troubleshooting. Each unit incorporates an internal automatic bypass.

Applications

- Network Servers
- Enterprise Telecommunications Systems
- LAN gateways, Bridges and Routers
- Mini-computers, Superservers and Server Clusters
- Clusters of PCs or Workstations and Peripherals
- RAID arrays and other large-scale Data Handling Systems



Features

- Scalable for capacity, redundancy, or battery back-up offering unbelievable flexibility.
- Built-in intelligence is provided for each individual module using microprocessor controls, increasing functionality, communications and reliability.
- N+x parallel redundancy is easily achieved by adding extra control, power and battery modules.
- Any failed module will automatically take itself off-line while the other modules continue to support the connected equipment.
- Multiple and simultaneous communication ports
- Variable input voltage range minimizes battery operation to increase battery life.
- An automatic internal bypass for maximum availability of output power.
- Continuous sinewave output
- Power factor corrected input reduces reflected distortion and optimizes utility power.
- Limited two-year warranty (Includes factory start up), See the Extended Warranty at the end of this section for details.

Chassis Options

The S5K Modular has three chassis available to build on:

- The “A” chassis can accommodate up to 8 modules.
- The “B” chassis can accommodate up to 12 modules and supplies 16 kVA of power, with N+1 redundancy.
- The “C” chassis can accommodate up to 12 modules and supplies a full 20 kVA of power, with N+1 redundancy.

System control modules are not included in module count. All chassis can accommodate up to two system control modules. Select the proper chassis based on your futures need for expansion or redundancy. In most standard (non-redundant) applications, the “A” chassis is the most popular.

Selection Steps

1. Determine the maximum kVA you will need for future expansion.
2. Determine the kVA and run time value for your immediate need.
3. Determine if you need redundancy. If the exact run time is the critical need, use the fully redundant option (see Selection Charts on the following pages).
4. Select the unit that meets both your immediate requirements, and is expandable to your future needs in the “Maximum Upgrade” column in the selection table. The Maximum Upgrade column shows the highest kVA expansion that particular configuration is capable of without removing any of the battery modules from the original configuration.

Specifications

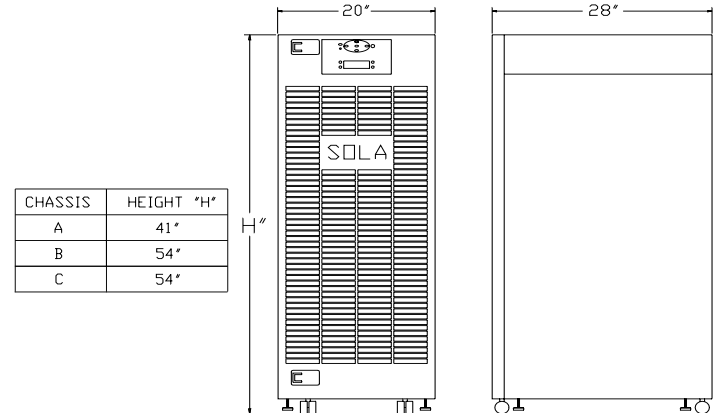
Capacity (VA/Watts)	4 kVA / 2.8 kW to 20 kVA / 14 kW in 4 kVA / 2.8 kW increments
Dimensions – inches	
Unit (H x W x D)	8 module capacity “A” Chassis 41” x 20” x 28” 12 module capacity “B” or “C” Chassis 54” x 20” x 28”
Shipping (H x W x D)	56 in x 32 in x 42 in
Input AC Parameters	
Voltage Range (typical)	170-276 Vac Low line limit variable with load 170 Vac from 80 to 100% load 144 Vac from 20 to 90% load 127 Vac from 20 to 70% load 100 Vac at less than 30% load
Voltage Configuration and Connection	Single phase, 2-wire plus ground (L1-L2-G)
Frequency	60 Hz nominal 40 - 70 Hz range without operating from battery
Input Connector	Hardwired only
Power Factor	.98 typical
Output AC Parameters	
Voltage	240, 208, 240/120 (120-0-120) or 208/120 (120-0-88)
Receptacles	Optional with use of external Maintenance Bypass
Voltage Regulation	±3 %
Voltage Distortion	Maximum 3% THD for linear loads, maximum 7% THD for full non-linear loads.
Transient Response	< 7% for 100% step load; recovery within 96 ms.
Frequency	60 Hz
Frequency Slew Rate	Selectable up to 5 Hz/sec
Frequency Sync Range	Selectable up to ±5 Hz
Overload	100 to 110% for 10 minutes minimum 111 to 150% 10 seconds 151 to 200% for 2 Cycles
Battery Parameters	
Battery Type	Sealed, lead acid
Recharge Rate	3 to 5 Hrs to 90% capacity
Battery Back-up	See Battery Selection Tables for specific configurations Autonomy time is 6 minutes with an equal number of battery & power modules in a non-redundant configuration at full load
Battery Voltage	120 Vdc Nominal
Maximum charge current (full load)	3A
Environmental	
Operating Temperature	+32°F to +104°F (0°C to +40°C)
Storage Temperature	+5°F to +122°F (-15°C to +50°C)
Relative Humidity	0% to 95%, non-condensing
Operating Elevation	Up to 10,000 ft. (3000m) at 104°C (40°C) without derating
Storage Elevation	15,000m (50,000 ft.) maximum
Heat Dissipation	1062 BTU / Hour per fully loaded power module (4kVA / 2.8kW)
Audible Noise	< 62 dBA @ 1 meter
Agency	
Safety	UL 1778 listed; c-UL
Compliant Immunity Standards	ANSI C62.41, Class A & B
Routine Maintenance	Keep the UPS clean and cool to enhance system reliability. Occasionally clean or replace the fan intake filters and ensure proper airflow. Do not use liquid or aerosol cleaning fluids. Periodically review the UPS alarm logs

Recommended Part Numbers

(See selection charts for other options)

kVA / kW	Catalog Number		Back-up (Min@FL/HL)
	Standard	Redundant	
4/2.8	S5KA4N1A6	S5KA4R1A6	7/18
8/5.6	S5KA8N2A6	S5KA8R2A6	7/18
12/8.4	S5KA12N3A6	S5KA12R3A6	7/18
16/11.2	S5KA16N4A6	S5KB16R4A6	7/18
20/14	S5KC20N5A6	S5KC20R5A6	7/18

Mechanical Diagram



Part Number Configuration

The S5K modular is available in many combination. Use the part number template below to identify the description of any given part number.

Series Designation	Chassis Size	kVA Rating	Unit Type	Number of Battery Modules	Output Voltage	Frequency
	A = 8 Module, 16 kVA Capacity	4, 8, 12, 16 or 20 kVA 00 = External Battery	N = Standard (Not Redundant)	* Must be at least one per 4 kVA of capacity	A = 208/120	6 = 60 Hz
	B = 12 Module, 16 kVA Capacity		R = Redundant Power & Control			
	C = 12 Module, 20 kVA Capacity		X = Redundant Power, Battery & Control			
	D = External Battery Cabinet		B = Battery Cabinet			
Example: 4 kVA Load, Future Expandable to 16 kVA with 7 minutes of Back-up. What is the part number?						
S5K	A	4	N	1	A	6
Resulting catalog number is "S5KA4N1A6"						

Chassis A: 8 Module, 4 kVA Enclosure Selection Chart

System Model Number	Qty of Power Modules Included	Qty of Battery Modules Included	Qty of System Control Modules Included	Unit Weight (lbs)	Back-up Full/Half Load (minutes)	Maximum Upgrade ²
4 kVA / 2.8kW						
S5KA4N1A6	1	1	1	441	7/18	16kVA
S5KA4N2A6	1	2	1	506	19/42	16kVA
S5KA4N3A6	1	3	1	571	30/61	16kVA
S5KA4N4A6	1	4	1	636	42/82	16kVA
S5KA4N5A6	1	5	1	701	52/98	12kVA
S5KA4N6A6	1	6	1	766	62/110	8kVA
S5KA4N7A6	1	7	1	831	75/140	N/A
Redundant (power & control only)						
S5KA4R1A6	2	1	2	472	7/18	12kVA
S5KA4R2A6	2	2	2	537	19/42	12kVA
S5KA4R3A6	2	3	2	602	30/61	12kVA
S5KA4R4A6	2	4	2	667	42/82	12kVA
S5KA4R5A6	2	5	2	732	52/98	8kVA
S5KA4R6A6	2	6	2	797	62/110	N/A
Full Redundant (battery, power & control)¹						
S5KA4X2A6	2	2	2	537	7/18	12kVA
S5KA4X3A6	2	3	2	602	19/42	12kVA
S5KA4X4A6	2	4	2	667	30/61	8kVA
S5KA4X5A6	2	5	2	732	42/82	N/A
S5KA4X6A6	2	6	2	797	52/98	N/A

Notes:

1. Full redundant units include one redundant battery module. Back-up given does not include this extra module, so actual achieved Back-up will be longer than published.
2. The S5K modulars are easily upgraded by adding extra battery and/or power modules as long as the number of modules (battery plus power) does not exceed the number of modules the enclosure is designed to contain.
 - Control modules do not count toward the 8 module max. (2 max control modules per system).
 - There must be at least one battery module per power module installed.

Chassis A: 8 Module Enclosure Selection Chart

System Model Number	Qty of Power Modules Included	Qty of Battery Modules Included	Qty of System Control Modules Included	Unit Weight (lbs)	Back-up Full/Half Load (minutes)	Maximum Upgrade ²
8 kVA / 5.6kW						
S5KA8N2A6	2	2	1	532	7 / 19	16kVA
S5KA8N3A6	2	3	1	597	13 / 30	16kVA
S5KA8N4A6	2	4	1	662	19 / 42	16kVA
S5KA8N5A6	2	5	1	727	25 / 52	12kVA
S5KA8N6A6	2	6	1	792	30 / 62	N/A
Redundant (power & control only)						
S5KA8R2A6	3	2	2	563	7 / 19	12kVA
S5KA8R3A6	3	3	2	628	13 / 30	12kVA
S5KA8R4A6	3	4	2	693	19 / 42	12kVA
S5KA8R5A6	3	5	2	758	25 / 52	N/A
Full Redundant (battery, power & control)¹						
S5KA8X3A6	3	3	2	628	7 / 19	12kVA
S5KA8X4A6	3	4	2	693	13 / 30	N/A
S5KA8X5A6	3	5	2	758	19 / 42	N/A
12 kVA / 8.4kW						
S5KA12N3A6	3	3	1	623	7 / 19	16kVA
S5KA12N4A6	3	4	1	688	11 / 27	16kVA
S5KA12N5A6	3	5	1	753	15 / 34	N/A
Redundant (power & control only)						
S5KA12R3A6	4	3	2	654	7 / 19	N/A
S5KA12R4A6	4	4	2	719	11 / 27	N/A
Full Redundant (battery, power & control)¹						
S5KA12X4A6	4	4	2	719	7 / 19	N/A
16 kVA / 11.2kW						
S5KA16N4A6	4	4	1	714	7 / 19	N/A

Notes:

- Full redundant units include one redundant battery module. Back-up given does not include this extra module, so actual achieved Back-up will be longer than published.
- The S5K modulars are easily upgraded by adding extra battery and/or power modules as long as the number of modules (battery plus power) does not exceed the number of modules the enclosure is designed to contain.
 - Control modules do not count toward the 8 module max. (2 max control modules per system).
 - There must be at least one battery module per power module installed.

Chassis B: 12 Module, 4 kVA Enclosure Selection Chart

System Model Number	Qty of Power Modules Included	Qty of Battery Modules Included	Qty of System Control Modules Included	Unit Weight (lbs)	Back-up Full/Half Load (minutes)	Maximum Upgrade ²
4 kVA / 2.8 kW						
S5KB4N1A6	1	1	1	496	7 / 18	16 kVA
S5KB4N2A6	1	2	1	561	19 / 42	16 kVA
S5KB4N3A6	1	3	1	626	30 / 61	16 kVA
S5KB4N4A6	1	4	1	691	42 / 82	16 kVA
S5KB4N5A6	1	5	1	756	52 / 98	16 kVA
S5KB4N6A6	1	6	1	821	62 / 110	16 kVA
S5KB4N7A6	1	7	1	886	75 / 140	16 kVA
S5KB4N8A6	1	8	1	951	92 / 170	16 kVA
S5KB4N9A6	1	9	1	1016	100 / 190	12 kVA
S5KB4N10A6	1	10	1	1081	110 / 220	8 kVA
S5KB4N11A6	1	11	1	1146	120 / 250	N/A
Redundant (power & control only)						
S5KB4R1A6	2	1	2	527	7 / 18	16 kVA
S5KB4R2A6	2	2	2	592	19 / 42	16 kVA
S5KB4R3A6	2	3	2	657	30 / 61	16 kVA
S5KB4R4A6	2	4	2	722	42 / 82	16 kVA
S5KB4R5A6	2	5	2	787	52 / 98	16 kVA
S5KB4R6A6	2	6	2	852	62 / 110	16 kVA
S5KB4R7A6	2	7	1	917	75 / 140	16 kVA
S5KB4R8A6	2	8	1	982	92 / 170	12 kVA
S5KB4R9A6	2	9	1	1047	100 / 190	8 kVA
S5KB4R10A6	2	10	1	1112	110 / 220	N/A
Full Redundant (battery, power & control)¹						
S5KB4X2A6	2	2	2	592	7 / 18	16 kVA
S5KB4X3A6	2	3	2	657	19 / 42	16 kVA
S5KB4X4A6	2	4	2	722	30 / 61	16 kVA
S5KB4X5A6	2	5	2	787	42 / 82	16 kVA
S5KB4X6A6	2	6	2	852	52 / 98	16 kVA
S5KB4X7A6	2	7	2	917	62 / 110	16 kVA
S5KB4X8A6	2	8	2	982	75 / 140	12 kVA
S5KB4X9A6	2	9	2	1047	92 / 170	8 kVA
S5KB4X10A6	2	10	2	1112	100 / 190	N/A

Notes:

1. Full redundant units include one redundant battery module. Back-up given does not include this extra module, so actual achieved Back-up will be longer than published.
2. The S5K modulars are easily upgraded by adding extra battery and/or power modules as long as the number of modules (battery plus power) does not exceed the number of modules the enclosure is designed to contain.
 - Control modules do not count toward the 8 module max. (2 max control modules per system).
 - There must be at least one battery module per power module installed.

Chassis B: 12 Module, 8 kVA Enclosure Selection Chart

System Model Number	Qty of Power Modules Included	Qty of Battery Modules Included	Qty of System Control Modules Included	Unit Weight (lbs)	Back-up Full/Half Load (minutes)	Maximum Upgrade ²
8 kVA / 5.6kW						
S5KB8N2A6	2	2	1	587	7 / 19	16kVA
S5KB8N3A6	2	3	1	652	13 / 30	16kVA
S5KB8N4A6	2	4	1	717	19 / 42	16kVA
S5KB8N5A6	2	5	1	782	25 / 52	16kVA
S5KB8N6A6	2	6	1	847	30 / 62	16kVA
S5KB8N7A6	2	7	1	912	38 / 75	16kVA
S5KB8N8A6	2	8	1	977	43 / 92	16kVA
S5KB8N9A6	2	9	1	1042	47 / 100	12kVA
S5KB8N10A6	2	10	1	1107	54 / 110	N/A
Redundant (power & control only)						
S5KB8R2A6	3	2	2	618	7 / 19	16kVA
S5KB8R3A6	3	3	2	683	13 / 30	16kVA
S5KB8R4A6	3	4	2	748	19 / 42	16kVA
S5KB8R5A6	3	5	2	813	25 / 52	16kVA
S5KB8R6A6	3	6	2	878	30 / 62	16kVA
S5KB8R7A6	3	7	2	943	38 / 75	16kVA
S5KB8R8A6	3	8	2	1008	43 / 92	12kVA
S5KB8R9A6	3	9	2	1073	47 / 100	N/A
Full Redundant (battery, power & control)¹						
S5KB8X3A6	3	3	2	628	7 / 19	16kVA
S5KB8X4A6	3	4	2	693	13 / 30	16kVA
S5KB8X5A6	3	5	2	758	19 / 42	16kVA
S5KB8X6A6	3	6	2	823	25 / 52	16kVA
S5KB8X7A6	3	7	2	888	30 / 62	16kVA
S5KB8X8A6	3	8	2	953	38 / 75	12kVA
S5KB8X9A6	3	9	2	1018	43 / 92	N/A

Notes: (Apply to all 12 Module Tables)

1. Full redundant units include one redundant battery module. Back-up given does not include this extra module, so actual achieved Back-up will be longer than published.
2. The S5K modulars are easily upgraded by adding extra battery and/or power modules as long as the number of modules (battery plus power) does not exceed the number of modules the enclosure is designed to contain.
 - Control modules do not count toward the 8 module max. (2 max control modules per system).
 - There must be at least one battery module per power module installed.

Chassis B: 12 Module, 12 and 16 kVA Enclosure Selection Chart

System Model Number	Qty of Power Modules Included	Qty of Battery Modules Included	Qty of System Control Modules Included	Unit Weight (lbs)	Back-up Full/Half Load (minutes)	Maximum Upgrade ²
12 kVA / 8.4kW						
S5KB12N3A6	3	3	1	678	7 / 19	16kVA
S5KB12N4A6	3	4	1	743	11 / 27	16kVA
S5KB12N5A6	3	5	1	808	15 / 34	16kVA
S5KB12N6A6	3	6	1	873	18 / 41	16kVA
S5KB12N7A6	3	7	1	938	24 / 50	16kVA
S5KB12N8A6	3	8	1	1003	27 / 58	16kVA
S5KB12N9A6	3	9	1	1068	29 / 63	N/A
Redundant (power & control only)						
S5KB12R3A6	4	3	2	709	7 / 19	16kVA
S5KB12R4A6	4	4	2	774	11 / 27	16kVA
S5KB12R5A6	4	5	2	839	15 / 34	16kVA
S5KB12R6A6	4	6	2	904	18 / 41	16kVA
S5KB12R7A6	4	7	2	969	24 / 50	16kVA
S5KB12R8A6	4	8	2	1034	27 / 58	N/A
Full Redundant (battery, power & control)¹						
S5KB12X4A6	4	4	2	719	7 / 19	16kVA
S5KB12X5A6	4	5	2	839	11 / 27	16kVA
S5KB12X6A6	4	6	2	904	15 / 34	16kVA
S5KB12X7A6	4	7	2	969	18 / 41	16kVA
S5KB12X8A6	4	8	2	1034	24 / 50	N/A
16 kVA / 11.2kW						
S5KB16N4A6	4	4	1	769	7 / 19	N/A
S5KB16N5A6	4	5	1	834	11 / 27	N/A
S5KB16N6A6	4	6	1	899	15 / 34	N/A
S5KB16N7A6	4	7	1	964	16 / 38	N/A
S5KB16N8A6	4	8	1	1029	19 / 43	N/A
Redundant (power & control only)						
S5KB16R4A6	5	4	2	800	7 / 19	N/A
S5KB16R5A6	5	5	2	865	10 / 25	N/A
S5KB16R6A6	5	6	2	930	12 / 30	N/A
S5KB16R7A6	5	7	2	995	16 / 38	N/A
Full Redundant (battery, power & control)¹						
S5KB16X5A6	5	5	2	865	7 / 19	N/A
S5KB16X6A6	5	6	2	930	10 / 25	N/A
S5KB16X7A6	5	7	2	995	12 / 30	N/A

Note: See previous page.

Chassis C: 12 Module, 12, 16 and 20 kVA Enclosure Selection Chart

System Model Number	Qty of Power Modules Included	Qty of Battery Modules Included	Qty of System Control Modules Included	Unit Weight (lbs)	Back-up Full/Half Load (minutes)	Maximum Upgrade ²
12 kVA / 8.4 kW						
S5KC12N3A6	3	3	1	744	7 / 19	20 kVA
S5KC12N4A6	3	4	1	809	12 / 24	20 kVA
S5KC12N5A6	3	5	1	874	16 / 36	20 kVA
S5KC12N6A6	3	6	1	939	20 / 43	20 kVA
S5KC12N7A6	3	7	1	1004	24 / 51	20 kVA
S5KC12N8A6	3	8	1	1069	28 / 60	16 kVA
S5KC12N9A6	3	9	1	1134	32 / 68	N/A
Redundant (power & control only)						
S5KC12R3A6	4	3	2	775	7 / 19	20 kVA
S5KC12R4A6	4	4	2	846	12 / 24	20 kVA
S5KC12R5A6	4	5	2	905	16 / 36	20 kVA
S5KC12R6A6	4	6	2	970	20 / 43	20 kVA
S5KC12R7A6	4	7	2	1035	24 / 51	16 kVA
S5KC12R8A6	4	8	2	1100	28 / 60	N/A
Full Redundant (battery, power & control)¹						
S5KC12X4A6	4	4	2	840	7 / 19	20 kVA
S5KC12X5A6	4	5	2	905	12 / 24	20 kVA
S5KC12X6A6	4	6	2	970	16 / 36	20 kVA
S5KC12X7A6	4	7	2	1035	20 / 43	16 kVA
S5KC12X8A6	4	8	2	1100	24 / 51	N/A
16 kVA / 11.2 kW						
S5KC16N4A6	4	4	1	835	7 / 19	20 kVA
S5KC16N5A6	4	5	1	900	9 / 25	20 kVA
S5KC16N6A6	4	6	1	965	13 / 31	20 kVA
S5KC16N7A6	4	7	1	1030	17 / 37	20 kVA
S5KC16N8A6	4	8	1	1095	19 / 43	N/A
Redundant (power & control only)						
S5KC16R4A6	5	4	2	866	7 / 19	20 kVA
S5KC16R5A6	5	5	2	931	9 / 25	20 kVA
S5KC16R6A6	5	6	2	996	13 / 31	20 kVA
S5KC16R7A6	5	7	2	1061	17 / 37	N/A
Full Redundant (battery, power & control)¹						
S5KC16X5A6	5	5	2	931	7 / 19	20 kVA
S5KC16X6A6	5	6	2	996	9 / 25	20 kVA
S5KC16X7A6	5	7	2	1061	13 / 31	N/A
20 kVA / 13 kW						
S5KC20N5A6	5	5	1	926	7 / 19	N/A
S5KC20N6A6	5	6	1	991	9 / 24	N/A
S5KC20N7A6	5	7	1	1056	12 / 29	N/A
Redundant (power & control only)						
S5KC20R5A6	6	5	2	957	7 / 19	N/A
S5KC20R6A6	6	6	2	1033	9 / 24	N/A
Full Redundant (battery, power & control)¹						
S5KC20X6A6	6	6	2	1022	7 / 19	N/A

Note: See previous page.