



# SiEL ENERJi

UNINTERRUPTED ENERGY SOLUTIONS

*For Those Who Take Precautions Timely*



*Your Energy is Under Control*

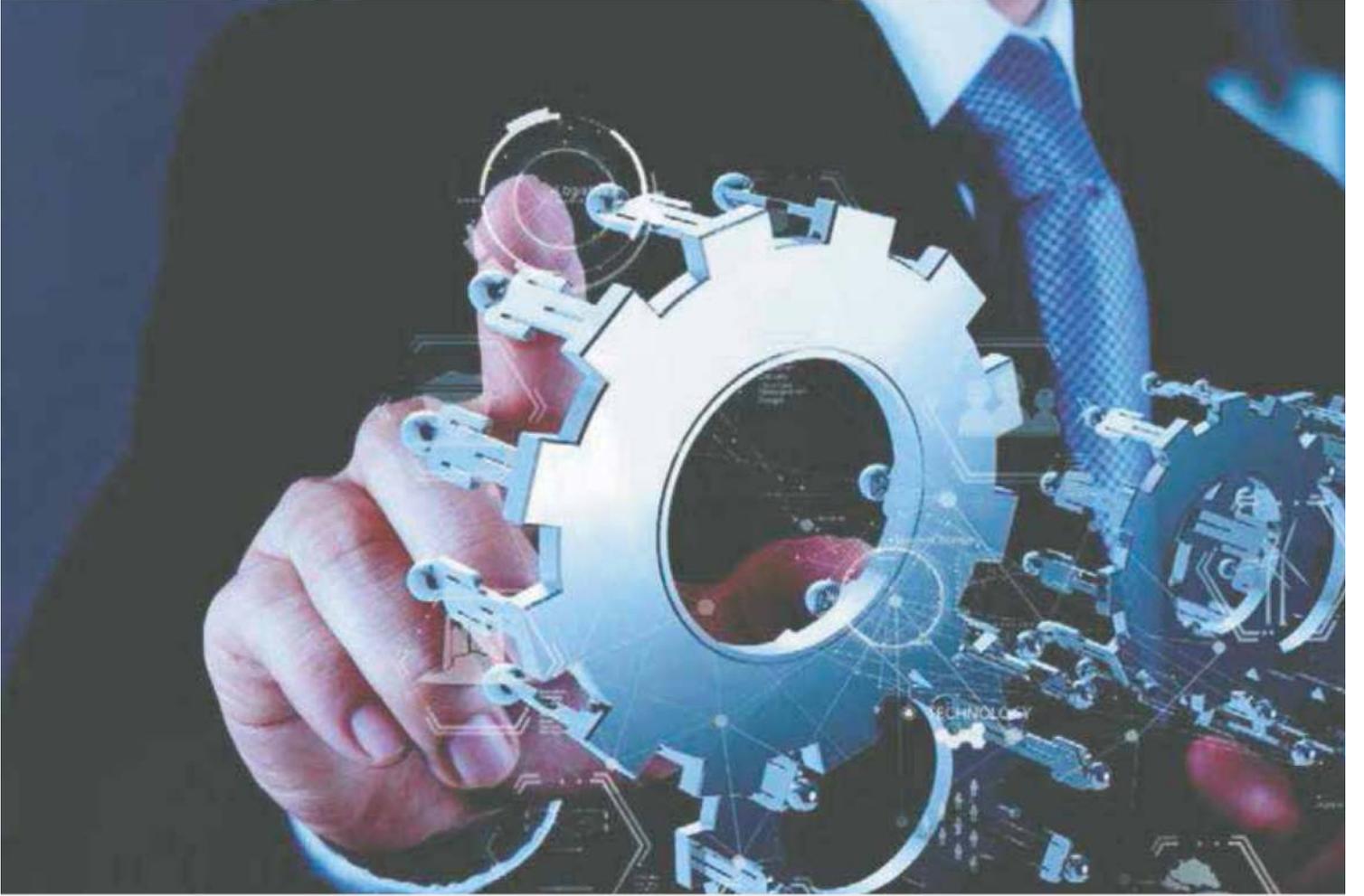
UPS • BATTERY • STABILIZERS • RECTIFIER • INVERTER • TRANSFORMERS • SOLAR SYSTEMS

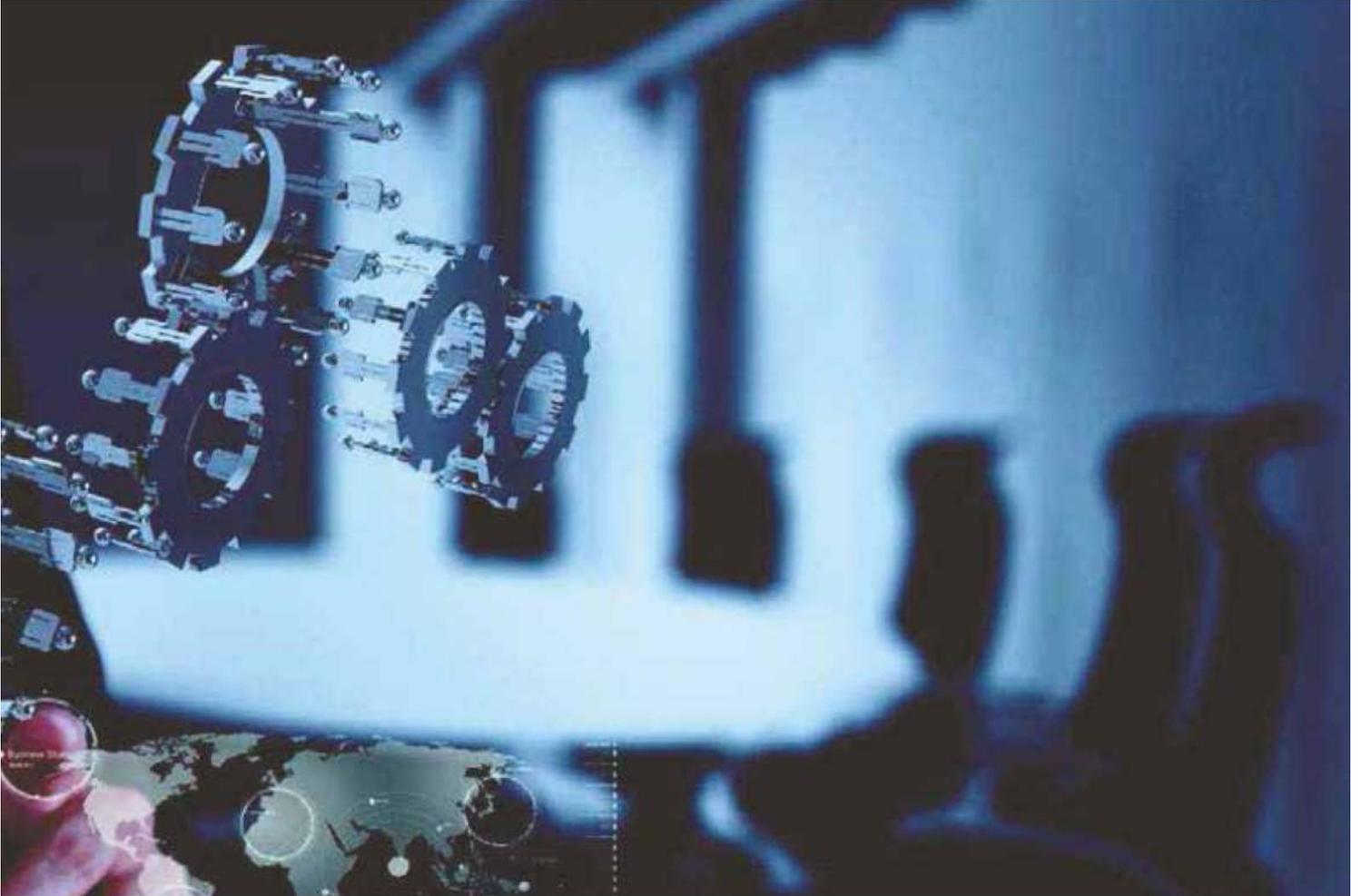
## Our Aim

*We keep up with the technology closely, as well as aiming to implement the solutions to facilitate our lives, we also aim to develop new solutions and project and implement them at international standards.*

*We perform our work as required, keep our promise and commitments and add value to our customers as a reliable engineering partner.*

*We aim to spread the corporate and social responsibility and aim to fulfill the requirements.*





## Our Target

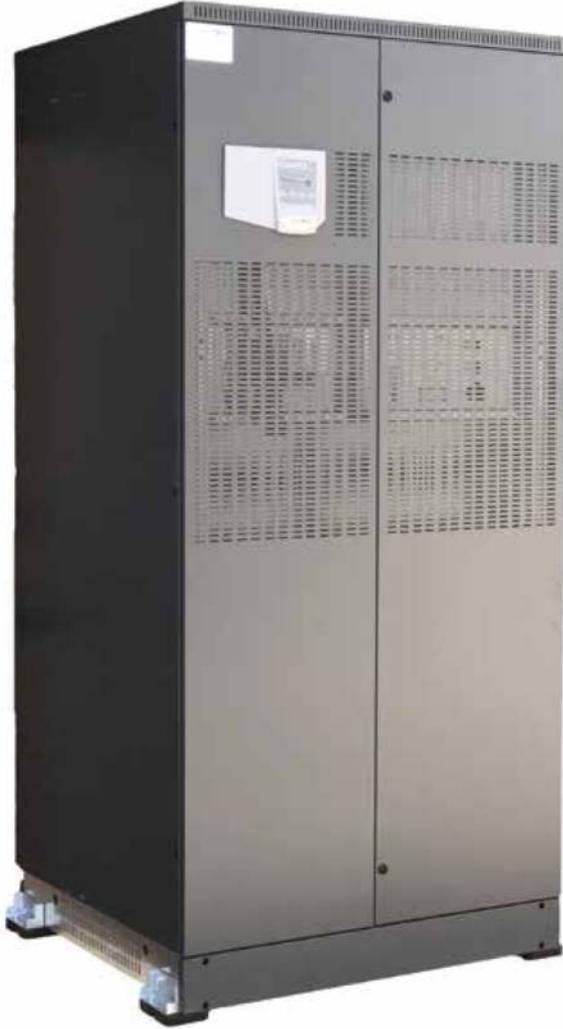
*Follow very closely the innovations in international markets, as opinion leaders to provide solutions that add value to our customers and develop pioneering projects.*

*Quality is protection of the environment and employee...*

*We optimize our energy and natural supplies and consider being sensitive to the environment as our privileged duty and see recycling as a part of our process.*

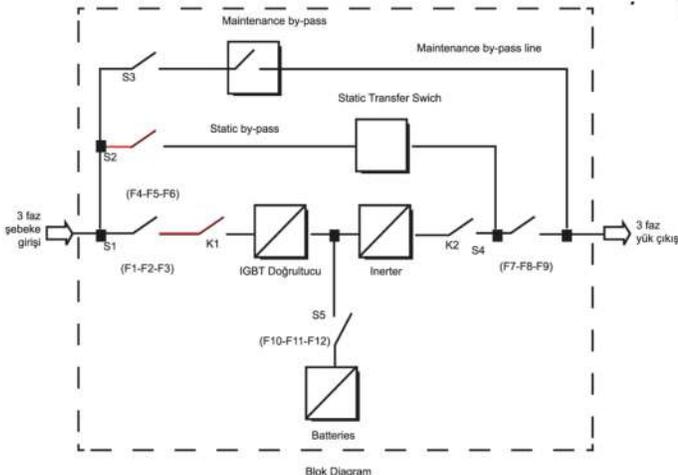
*We ensure safe conditions for work environments and security of all parties affected by our activities and services and reduces the risk of accident.*

*Quality means continuous improvement...*



SLD 33 series, 3-phase input, 3-phase output, IGBT rectifier, DSP controlled interrupted power supplies are the high-technology products designed to maximize MTBF times that featuring high efficiency and safe operation and minimizing input harmonics distortions input equipped with IPM (Intelligent power modules) input power factor of which reaches to 0,99. Since development of products is carried out by software control by means of DS, updating of the developments is easy.

- High input power factor 0,99
- Low input current harmonics distortion ( THDI)< 5%
- High efficiency up to 94%
- Feature of battery start up
- Static and service by-pass feature
- Overload and short-circuit protection system
- Emergency stop function
- 192 event sign-up (4500 alarms)
- Regenerative load feature
- Calendar and clock
- Advanced automatic battery test system
- Heat compensated battery charging system
- Modem setting for dial-up connection
- RS232 and dry contact interface for remote monitoring
- 3 DSP controlled modular construction
- Isolation transformer option at input and output by the application
- SNMP-compliant communication option
- MODBUS-compliant communication option
- Compliance with international standards ( EC directive; EN 62040)
- 2 year full warranty and 10-year spare part warranty
- Production with CE, TSE, ISO9001 and ISO14001 quality assurance system
- Digital control construction
- Minimum space occupying
- Economic operation(ECONOMODE)
- Minimum electronic component
- Output current limitation
- Advanced diagnostics
- Selectable input/output voltage and frequency
- Secondary voltage source input
- Output DC leakage protection
- Separate DSP use for inverter
- 3 stage battery protection
- High-charging capacity
- Charging / discharging current indicator
- Advanced remote monitoring options



## SLD 33 MODEL UPS (10-300 kVA) 3 Phase input/3 Phase output

SLD 33 SERIES 3 Phase Input - 3 Phase Output UPS

MODEL	SLD 33-10	SLD 33-15	SLD 33-20	SLD 33-30	SLD 33-40	SLD 33-60	SLD 33-80	SLD 33-100	SLD 33-120	SLD 33-160	SLD 33-200	SLD 33-250	SLD 33-300	
<b>POWER ( kVA )</b>	10	15	20	30	40	60	80	100	120	160	200	250	300	
<b>INPUT</b>														
Voltage Tolerance	220/380 VAC ( 230/400 VAC ) 3 Phase + N, +%20, -%25													
By-pass Voltage and Tolerance	220/380 VAC ( 230/400 VAC ) 3 Phase + N, +/-%10													
Power Factor	>0.98-0.99													
Input THDI ( Harmonic Distortion)	< %5													
Input Frequency and Tolerance	50 Hz / 60 Hz (adjustable) +/- %5													
<b>OUTPUT</b>														
Power ( kW )	8	12	16	24	32	48	64	80	96	128	160	200	240	
Power Factor	0.8													
Voltage and Tolerance	380-400 VAC 3 P , 4 N, +Earth, +/-1% (240/415 opsiyonel)													
Frequency	50Hz/60 Hz (Adjustable)													
Frequency Tolerance	Synchronous Network +/- 1% / Self Employment: +/- 0,2% (Adjustable)													
Efficiency ( %100 load )	up to %94													
Crest Factor	3:1													
Overload Protection	%100 - %125 load: 10 mins.													
	%125 - %150 load: 1 mins.													
	>%150 load: static by-pass.													
THD	< %3 linear load ( non linear load: < %5 )													
<b>BATTERY</b>														
Type	Full-closed Dry Type Maintenance Free													
Number of Batteries	2 x 30													
Charge Voltage	2 x 405 VDC													
End of Discharge Voltage	2 x 300 VDC													
Battery Operating Temperature	< 25 °C													
Battery Protection	Otomatik devre kesici													
Battery Test	Standart													
<b>GENERAL</b>														
Standard	EN62040-2													
User Interface	LCD Panel, Mimic led panel, 5 vektor buttons, Buzzer, Optional Graphical Color Touch Screen.													
Indicators	Phase -N Voltage, Phase-Phase Voltage, Current, Power, Crest Factor, Frequency, PF, Service Time													
Comunication	2xRS232 Serie Port, 4 standard and 8 optional dry alarm contact													
Inputs	EPO (kill switch) input, Interactive panel battery input, Generator Input													
Generator Kit	Standard (Adjustable)													
Software	Standard Siel Administrative UPS Software (3 user + 1 server management)													
Alarm Record	Standard: 192 Event Date and Time , (512 Event optional)													
Protection	Overheating protection Siel module , Over Current, high temperture alarm													
Operating Temperature Range	0 °C - 40 °C													
Protection Class	IP20													
Humidity (Condensing)	%0 - %90													
Operating Height	90% max (non condensed) <1000m above sea level													
Noise Level ( 1m. )	< 57 dBA						< 62 dBA			< 68 dBA				
Weight (without battery) ( kg )	100	114	116	122	180	202	253	285	405	522	570	735	750	
Dimension (L*W*H) (mm)	400 x 780 x 1070				570 x 900 x 1300		670 x 730 x 1630		850 x 780 x 1820	970 x 850 x 1950		1340 x 1080 x 1950		
<b>OPTIONS</b>														
Input	110/208 VAC													
Output	110/208 VAC													
Transformer	Galvanic isolation tranformer (input and output)													
Software	Siel Soft Admin Multi UPS monitoring, Siel Soft Server 50-100-200 User , DLOG log loader													
Adapters	SNMP, MODBUS, RS485, Remote Monitoring Panel													
Parallel Operating	N+1 (up to 4 pcs.)													



SL33 HIP Version through the dual evolution on-line technology and IGBT –DSP control provides high protection and efficiency. Producing in IT and industrial load high quality and reliable energy. This series has been designed using a new configuration that an IGBT sine wave input rectifier.

- High input power factor 0,99
- Low input current harmonics distortion ( THDI)< 3%
- Inverter output galvanic isolation transformer
- High efficiency up to 98,5%
- Feature of battery start up
- Static and service by-pass feature
- Overload and short-circuit protection system
- Regenerative load feature
- Calendar and clock
- Advanced automatic battery test system
- Heat compensated battery charging system
- Modem setting for dial-up connection
- RS232 and dry contact interface for remote monitoring
- 3 DSP controlled modular construction
- Isolation transformer option at input and output by the application
- SNMP-compliant communication option
- MODBUS-compliant communication option
- Compliance with international standards ( EC directive; EN 62040)
- 2 year full warranty and 10-year spare part warranty
- Production with CE, TSE, ISO9001 and ISO14001 quality assurance system
- Digital control construction
- Minimum space occupying
- Economic operation(ECOMODE)
- Minimum electronic component
- Output current limitation
- Advanced diagnostics
- Selectable input/output voltage and frequency
- Secondary voltage source input
- Output DC leakage protection
- Separate DSP use for inverter
- 3 stage battery protection
- High-charging capacity
- Charging / discharging current indicator
- Advanced remote monitoring options

## SL 33 HIP UPS (IGBT) 3 Phase input/3 Phase output

SL 33 HIP SERIES 3 PHASE INPUT - 3 PHASE OUTPUT UPS									
MODEL	SL 33 HIP - 100	SL 33 HIP - 120	SL 33 HIP - 160	SL 33 HIP - 200	SL 33 HIP - 250	SL 33 HIP - 300	SL 33 HIP - 400	SL 33 HIP - 500	SL 33 HIP - 600
POWER ( kVA )	100	120	160	200	250	300	400	500	600
<b>INPUT</b>									
Voltage tolerance	380 VAC ( 400 / 415 VAC adjustable) 3 Phase +N								
Voltage tolerance	+ %20 - %25								
Frequency	45 - 65 Hz								
Frequency tolerance	± 2% ( from ± 1% to ± 5%adjustable)								
Power factor	> 0.99								
Input	141	169	226	281	352	423	564	702	842
Input THDi (Current Harmonic Distortion)	< %3								
Soft Start	%0 load to %100 load 30 s ( adjustable)								
<b>OUTPUT</b>									
Power ( kW )	90	108	144	180	225	270	360	450	540
Power Factor	0.9								
Voltage	380 - 400 - 415 VAC 3 FAZ + N , ± %1								
Frequency	50 Hz / 60 Hz								
Frequency tolerance	Synchronous network +/- %1 ( Self-employment: +/- % 0.05 )								
Efficiency	> %95								
Crest factor	3:1								
Over load protection	%110 load for 60 mins. 110% for 60'; 125% for 10'; 150% for 1'								
	%125 load for 10 mins.								
	%150 load for 1 min.								
	%200 load for 7 sec.								
Vthd	Linear load< %1, non-Linear load: < %3								
<b>BATTERY</b>									
Type	Full closed dry type - maintenance free								
Number of Batteries	40								
Charge Voltage	540 VDC								
End of discharge voltage	400 VDC								
Operating temperature	< 25 °C								
<b>GENERAL</b>									
Interface	2x16 character LCD panel								
Communication	Dry contact and RS232								
Software	Compatible with Windows								
High Temperature Protection	Elektronik high temperature protection								
Operating temperature range	0-40 °C								
Protection class	IP20								
Security and Standards	EN 62040-1-1 (directive 2006/95/EC); EMC: EN 62040-2 (directive 2004/108/EC)								
Smart mode efficiency	> %98								
Humidity (Condensing)	%0 - %90								
Max Operating Height	< 1000 m								
Noise level	< 63 dBA			< 70 dBA			< 72 dBA		
Output transformer	Galvanic isolation transformer								
Parallel operating	3+1 system (N+1 redundant, redundant, simetrik parallel)								
Weight (non battery) ( kg )	656	700	800	910	1000	1400	1700	2100	2700
Dimension ( G x D x Y ) mm	800x850x1900		1000x850x1900			1500x1000x1900		2100x1000x1900	
<b>OPTIONS</b>									
Output power factor	1 (kva=kw)								
Parallel working	3+1 Sistem (N+1 redundant, paralel)								
Adaptors	SNMP, MODBUS, RS485, Uzaktan izleme paneli								



## DSP digital control technology

- Active power factor correction (APFC), input power factor up to 0.99
- Output power factor 0.9
- Cold start
- Dual input
- Wide input voltage range (190 V ~ 485 V)
- Auto sensing frequency
- 50 / 60 Hz frequency conversion mode
- Work efficiency up to 98% in ECO mode
- Auto control fan speed when loads varies
- Auto power ON/OFF according to the load capacity set by users
- Flexible battery configuration for using 14/16/18/20 pcs batteries
- Compact internal layout, miniaturized the complete unit for small footprint
- LCD+LED display, multi-functional keys operation, friendly human-machine interface
- Powerful background software for parameters configuration and online updating
- Doubling the battery charging speed, 90% capacity restored in 4 hours (standard model UPS)
- Linear derating in low voltage input, reducing battery discharging times, extending the service life of battery
- Advanced battery management (ABM), automatic floating / equalizing charge control, charger dormancy control
- Configurable switching time from battery mode to mains mode when mains power is restored, reducing the impact on power grid or generator
- Effective software and hardware protection function, powerful self-diagnostic function, abundant historical records
- Standard emergency power off (EPO)
- Standard maintenance bypass
- Standard RS232/USB communication port
- Optional RS485 / SNMP / AS400 communication port and SMS alarms
- Optional N+X redundancy parallel up to 6 units
- Optional battery temperature compensation, EMD environmental sensors

### Specifications

MODEL	SLDS3310	SLDS3315	SLDS3320	SLDS3330
Capacity	10 kVA / 9 kW	15 kVA / 13,5 kW	20 kVA / 18 kW	30 kVA / 27 kW

### INPUT

Rated voltage	360 / 380 / 400 / 415 Vac			
Voltage range	277 - 485 Vac (no derating); 190 - 277 Vac (linear derating between 50% and 100% load)			
Rated frequency	50 / 60 Hz (auto-sense)			
Frequency range	40 - 70 Hz			
Power factor	≥ 0,99			
Bypass voltage range	- 40% - + 15% (settable)			
Total harmonic distortion (THDi)	≤ 5%			

### OUTPUT

Rated Voltage	360 / 380 / 400 / 415 Vac (settable)			
Voltage regulation	± 1%			
Frequency	45 - 55 Hz or 55 - 65 Hz (synchronized range); 50 / 60 Hz ± 0.1 Hz (battery mode)			
Waveform	Sinusoidal			
Power Factor	0.9			
Total harmonic distortion (THDv)	≤ 2% (linear load), ≤ 5% (non-linear load)			
Crest factor	3:1			
Overload(Inverter)	102% - 125% tor 10 min, 125% - 150% tor 1 min, > 150% tor 0.5 s			
Overload Bypass	102% - 125% for 20 min 125% - 150% for 2 min > 150% for 1 s			

### BATTERIES

DC voltage	Standard model: 240 Vdc; Long time model: 192 Vdc (168 / 192 / 216 / 240V optional)			
Inbuilt battery of standard model	20 X 7 Ah	40 X 7 Ah	40 X 9 Ah	60 X 9 Ah
Charging current	Longtime model: 7A supplied (additional 7A is optional) Standard model: 1 A, 2 A, 3.5 A settable			
Recharge time	Standard model: 90% capacity restored in 4 hours; Long time model: depend on the capacity of battery			

### SYSTEM

Efficiency	≥ 93%, ECO mode 98%			
Transfer time	0 m s			
Max. number of parallel connections	6			
Protections	Short-circuit, overload, overtemperature, battery low voltage, overvoltage, undervoltage and fan failure			
Communications	RS232 / USB (standard), RS485 / dry contacts / SNMP (optional)			
Display	LCD+LED			
Standards	EN 62040-1, EN 62040-2, EN 61000-3-12, EN 61000-3-2, EN 61000-3-1 1, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, 1 EC 61000-4-6, IEC 61000-4-8, IEC 61000-4-1 1, IEC 61000-2-2			

### OTHERS

Operating temperature	0°C - 40°C			
Storage temperature	-25°C - 55°C(without batteries)			
Relative humidity	0 - 95% (non-condensing)			
Altitude	≤ 1000 m, derating 1% tor each additional 100 m			
iP rating	iP 20			
Noise level at 1 m	≤ 60 dB	≤ 65 dB		
Online thermal dissipation	3504 BTU/hr	5773 BTU/hr	8281 BTU/hr	9929 BTU/hr
Dimensions (W x D x H)(mm)	350 x 785 x 858(S)		350 x 655 x 732 (H)	
Packaged dimensions (W x D x H) (mm)	472 x 910 x 1050 (S)		472 x 910 x 1260(S)	
Net weight (kg)	55 (H), 115 (S)	60 (H), 155 (S)	61 (H), 175 (S)	65 (H), 235 (S)
Gross weight (kg)	65 (H), 125 (S)	70 (H), 170 (S)	71 (H), 190(S)	75 (H), 250 (S)

- Derate capacity to 90% when the output voltage is adjusted to 360 Vac.
- S means standard model, H means long time model.

- All specifications subject are to change without notice.
- Custom-made specifications are acceptable.



SLD 11 series uninterruptible power supplies (UPS) are produced with PWM and IGBT technology. SL11 series uninterruptible power supplies providing high-safety with micro-processor control are the online uninterruptible power supplies with 1-phase input 1-phase output cycles (double conversion, being user-friendly, clear large high-quality LCD display all values and operation diaphragms are displayed, ensuring power factor and energy efficiency, with full sine wave output and ensuring more power by means of high-output power factor.



- DSP-controlled Online UPS
- True sine wave output, Online UPS
- 176VAC-276 VAC wide input voltage
- Double loop (double conversion)
- N+ 1 redundant parallel function (6-10 KVA)
- CPU Control to maximum security
- PFC function (Power Factor Correction)
- Static Bypass feature
- Cold Start (from battery operation features)
- Communication via RS-232 port.
- Input power factor correction
- The overload and short-circuit-protected
- Automatic self-test feature
- High-efficiency, energy-saving
- SNMP support optional
- Changing fan speed according to the load (the smart fan)
- Additional battery Connect feature (optional)
- Input / Output / Load / Battery / Frequency showing the status of
- Large, clear LCD display and the LED display
- Advanced battery management (ABM)
- Compact, light weight, quiet structure EMI/RFI
- Free UPS management software(Turn Off and re-start-up)
- 2 years full warranty.
- CE, ISO 9001 certified
- 10 Years parts Warranty.



## SLD 11 UPS (1-10 kVA) 1 Phase input /1 Phase output

More powerful products, higher wattage value

<b>SLD 11 1kVA</b>	<b>900W</b>
<b>SLD 11 2kVA</b>	<b>1.800W</b>
<b>SLD 11 3kVA</b>	<b>2.700W</b>
<b>SLD 11 6kVA</b>	<b>5.400W</b>
<b>SLD 11 10kVA</b>	<b>9.000W</b>

MODEL	SLD 11	SLD 11	SLD 11	SLD 11	SLD 11
POWER	1KVA/900W	2KVA/1,8KW	3KVA/2,7KW	6KVA/5,4KW	10KVA/9 KW
<b>INPUT</b>					
Voltage	208V/220V/230V/240VAC				
Voltage range	half-load (115-295)±5VAC full-load (145-295)±5VAC		half-load (115-295)±5VAC full-load (165-295)±5VAC		
Frequency	45-55Hz±0.5% or 55-65Hz±0.5% (auto-detect)			40-70Hz±0.5% ( auto-detect)	
Power factor	i0.99				
<b>OUTPUT</b>					
Voltage	208V/220V/230V/240VAC Adjustable				
Voltage Regulation	±1%				
Frequency	Synchronous programme AC mode; 50/60±0.2 Hz battery mode				
Wave shape	True Sine.				
Crest Factor	3:1				
Harmonic distortion	83%(Linear load;95%(non- Linear load)			82%(Linear load;95%(non-Linear load)	
Transfer time	AC battery mode :0 ms Inverter model bypass mode:4 ms(Typical)			AC battery mode:0 ms Inverter model bypass mode:0 ms	
<b>BATTERY</b>					
DC voltage <i>j</i>	24V	48V	72V	192V	192V
Standard battery	2*9Ah	4*9Ah	6*9Ah	16*7Ah	16*9Ah
<b>ENVIRONMENTEL</b>					
Humidity	840 0 C				
Noice level	850dB (1m)			855dB (1m)	
<b>SOFTWARE</b>					
Standard RS-232 Optional USB	Support Windows 98/2000/2003/P/Vista/2008/7/8				
Optional SNMP	SNMP				
<b>PHYSICAL</b>					
Dimension (mm) W*D*H	144*410*215	190*452*341		262*514*735	
Net Weight (kg)	13	25	29	60	70



*SLD Modular UPS has been designed in two models.*

*·SLD UPS ST (Standard) Model, UPS and battery cabinet.*

*·SLD UPS RI (Rack) UPS Power Module, 19" rack cabinet and battery cabinet.*

- Smart, continuous power modules, module replacement.*
- Weight low power modules (10kw= 18,6Kg; 20kw = 21,5 Kg)*
- Easy to set up and technical service UPS is running change module*
- High input power factor*
- Input power factor, Pf>0,99*
- Input current harmonics, THDI <3%*
- Ac-ac efficiency 95,5%*
- Without transformer technology*
- Double evolution of online technology*
- Modular, parallel redundant operation*

## SLD 33 Modular UPS (10-120 kVA=kW) 3 phase input/3 phase output

SLD SERIES ON-LINE MODÜLER UPS						
MODEL	SLD 10	SLD 20	SLD 40	SLD 60	SLD 80	SLD 120
<b>PROPERTIES</b>						
POWER ( kVA )	10	20	40	60	80	120
UPS design technology	On-line, Digital microprocessor controlled system , double conversion					
UPS architecture	Independent modular, scalable, redundant Hot and Swap ( Changeable module while device operating)					
<b>INPUT</b>						
Input voltage ( VAC )	220VAC / 380 VAC					
Input voltage range ( VAC )	220VAC + %15 - %20 / 380VAC +%15 - %20					
Harmoni Distortion	< %3 T.H.D. linear load.					
Power factor	> 0.99					
Frequency ( Hz )	35 - 70 Hz					
<b>OUTPUT</b>						
Voltage ( VAC )	220VAC / 380 ± %1					
Frequency ( Hz )	50 / 60 Hz +/- %0.5 ( Automatic detect)					
Power factor	1					
POWER ( kW )	10	20	40	60	80	120
Output wave form	True Sine.					
Crest factor	3 : 1					
On-line Mod efficiency( %100 load )	> %95					
Eko Mod efficiency ( %100 load )	> %98					
Over load capacity	%125 load 2 mins., %150 load 30 sec					
<b>BATTERY</b>						
Run Time of battery	Selectable from battery time table					
Addable Battery group	Yes					
<b>GENERAL</b>						
By-pass	Each module can be by-passed independently as of static and electromecanical					
	Automatic					
	Manual By-pass ( maintenance By-pass)					
Göstergeler / Alarmlar	Large 4 line digital display screen fraceable of UPS status.					
	Acustic signals					
Communication Points	RS232 seri port					
	USB					
	Dry contact					
	SNMP adaptor nount					
Software	UPS communication software					
Protection	Electronic protection overload and short circuit and excessive battery dischage.					
	Then Suspension of UPS					
	Make the current limitation by swiching					
	EPO conract ( Emergency shutdown)					
Input / Output connection	Fuse and clip port					
Isolation transformer	Optional					
<b>PHYSICAL</b>						
Power Module Quantity / Power ( kW )	1 x 10	2 x 10	2x20	3 x 20	4 x 20	6 x 20
Battery cabinet	Selectable from battery table					
Net weight ( kg )	20	40	136	238	169	263
Dimension ( mm ) ( L x W x H )	448x310x565	448x487x735	550x1135x770	550x1975x770	550x1135x770	550x1975x770
<b>ENVIRONMENTAL</b>						
Operating temperature range ( °C )	0 - 40 °C					
Operating height ( m )	3500 m					
Humidity	%20 - %80 uncondensed					
Noice level 1 m ( dBA )	42 - 46 dBA					
<b>STANDARDS</b>						
Security	IEC/EN 62040-1.1 , IEC/EN 60950-1					
EMC	IEC/EN 62040-2, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-2-2					
Performances	IEC/EN 62040-1.1 , IEC/EN 60950-1					
Sertificate	CE					



High-performance full protection. Line-interactive model uninterruptible power supply is used at small and medium scaled work places and ensures full protection for advanced servers and pc users at high performance.

- Full digital micro-processor controlled
- Advanced voltage regulation (AVR) and indicator
- Battery replacement in active mode
- Fluctuation protection output for critical loads
- Overload, status indicators
- Thunder and fluctuation protection output
- Overload and short-circuit protection
- 50/60 Hz frequency
- EMI/RFI noise filter
- Cold start
- Automatic charging in off mode
- Battery status power status indicators.



## Line Interactive UPS (600-3000 VA) 1 faz giriş/1 faz çıkış

INTERACTIVE SERIES 1 PHASE INPUT - 1 PHASE OUTPUT ( LINE INTERACTIVE ) UPS						
MODEL	600	800	1000	1500	2000	3000
POWER ( VA )	600	800	1000	1500	2000	3000
<b>INPUT</b>						
Voltage	220 VAC + N +/- %20					
Frequency	50 / 60 Hz +/- %10 ( auto-detect )					
<b>OUTPUT</b>						
Voltage ( with battery )	220 VAC + N +/- %5 Square wave					
Frequency ( with battery )	50 / 60 Hz +/- %0.5					
Voltage regulation AVR	AVR, Input voltage nominal value -%9 with -%25 while the output voltage raise +%15. AVR, input voltage nominal value +%9 with +%25 while the output voltage decrease %15.					
Transfer süresi	2/4 msn. ( including detection time )					
<b>BATTERY</b>						
Type	Maintenance-free dty type battery					
Recharge time	5 hours ( %80 capacity )					
Protection	Automatic test oneself, discharge protection, battery replacement signal.					
<b>PROTECTION AND FILTERING</b>						
Extrem peak protection	320 joule, 2 msn.					
EMI/RFI sound filter	0.15 MHz 'de 10 dB, 30 MHz 'de 50 dB.					
Overload protection	overload 3 sec at %130 and 60 sec at %110 over shut-off					
Input unit	Overload fuse and shortcircuit protection.					
On base cable input	Network competable jack ( UTP, RJ 45 )					
Short circuit	Output cut-off of UPS or input fuse protection					
<b>BACKUP TIME</b>						
PC and 14" monitor	25 -35 mins	60 - 70 mins	65 - 75 mins	70 - 80 mins	85 - 95 mins	
<b>PHYSICAL</b>						
Weight ( kg )	6	13.3	15	15.8	26.2	
Dimension ( L x W x H ) mm	97 x 320 x 135	130 x 382 x 201			170 x 450 x 225	
<b>ALARM</b>						
Battery backup	Fast beep( about 0.47 Hz )					
Low battery	fast beep( about 1.824 Hz )					
Overload	Continuous beep					
<b>INTERFACE</b>						
RS232 interface	Bi-directional communication port and software					
<b>ENVIRONMENTAL</b>						
Environmental conditions	Max. 3500 m. height, %0 - 95 uncondensing humidity, 0 - 40 °C heat					
Noise level	< 45 dBA ( 1 m )					

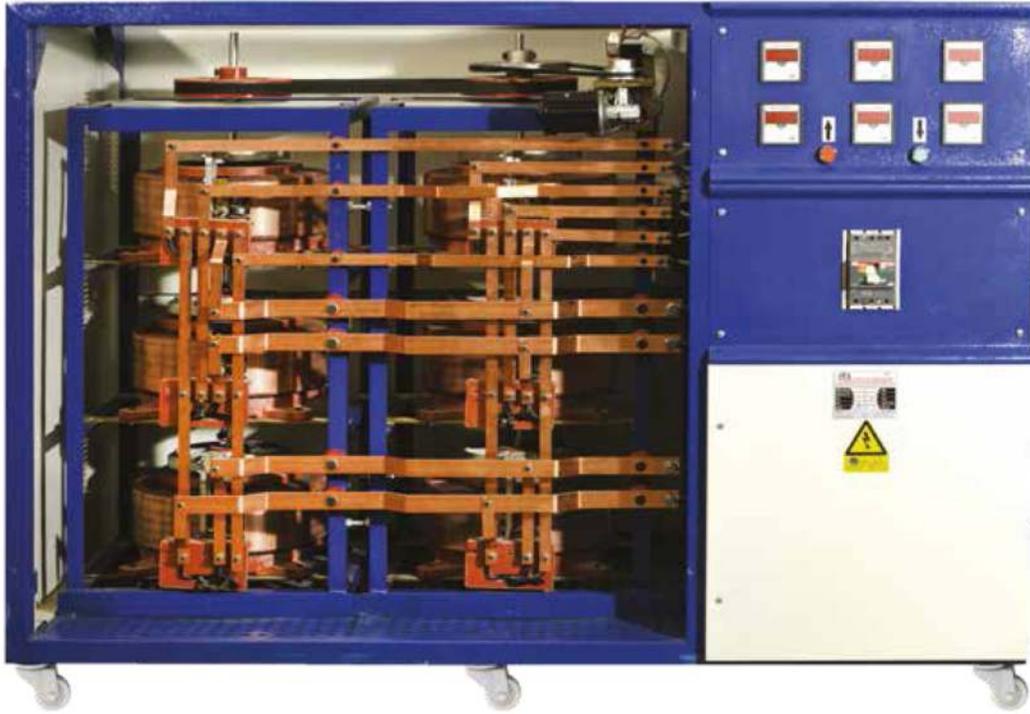
## 1-3200 kVA

www.siel.com.tr



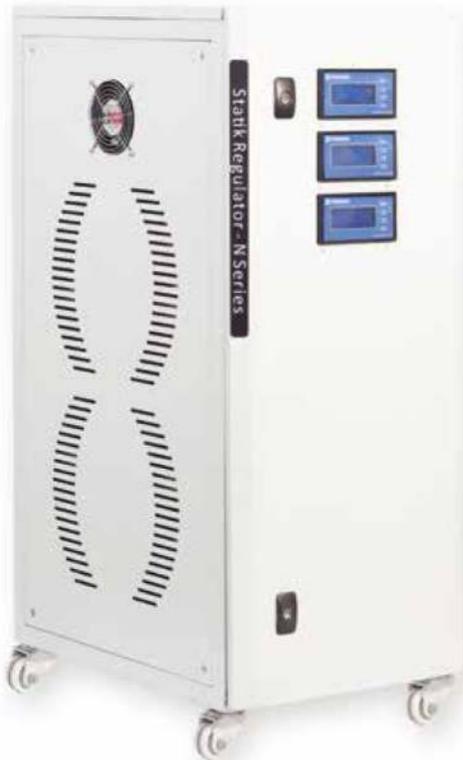
- Full automatic servo control
- 3 Piece (Digital) voltmeter
- Rectification (control) rates: 200VAC/sec.
- Input voltage range: Phase-neutral 150-250 VAC, phases 275- 450 VAC
- Output voltage range: phase-neutral 220 VAC, phases 380 VAC (230-400 VAC adjustable)
- Output voltage tolerance. 2%
- Efficiency: 97%
- Operating at -10 to +55 degrees
- 3-second operation at 150% capacity
- Overload, short-circuit, overheating and voltage protection unit.
- Glass fiber is wire transformer wrapping and resistant to 250 degrees
- High setting rate
- Sensitivity tolerance set in front panel
- Time adjusted fan cooling
- Failure signal (audible illuminated).
- Protection unit of the regulator steps with delay of 7 seconds. (adjustable) (To prevent damages in sudden voltage changes)
- 1-0-2 Mechanic by-pass switch. (1: network, 2: regulator)
- The unit is of 2 (two) years warranty for manufacturing defect.
- 10 Years spare part supply warranty.







- Thyristor control with PWM technology
- 3 LCD indicators. (voltage, current, tolerance and protection levels can be seen)
- Correction (control) rate: 20 msn. (5000 VAC / sec)
- Input voltage range: phase - neutral 150 - 250 VAC; phases 275 - 450 VAC.
- Output voltage range: phase - neutral 220 VAC; phases 380 VAC.
- Output voltage tolerance: 2%
- Efficiency: 96%
- Operation at - 10 to + 55 0C.
- Resistance to overload (500%) for 20 milliseconds.
- Overload, short-circuit, overheating and voltage protection unit.
- Glass fiber is wire transformer wound and resistant to 250 degrees
- EMI / RFI noise filter.
- Output voltage and sensitivity tolerance set in front panel
- Time adjusted fan cooling
- Failure signal (audible illuminated).
- Protection unit of the regulator steps with delay of 10 seconds.
- 1-0-2 Mechanic by-pass switch. (1: network, 2: regulator)
- The unit is of 2 (two) years warranty for manufacturing defect.
- 10 Years spare part supply warranty.
- No harmonics distortion



## StaticRegulator

### *Compact switch protection*

*It is of the feature of switching on/off on regulator panel. The unit is controlled automatically and output is cut in cases such as over current, overvoltage, low voltage and output short-circuit. Moreover compact switch is turned on as the mechanic bracket and extra safety is ensured.*

### *High start current*

*Static voltage regulators respond to loads requiring high start current by means of semi conductive elements resistant to sudden and high currents (thyristor). These semi-conductive elements resist to 10 times of nominal current for 20 milliseconds. For servo-motor voltage regulators, very high temperature will occur because of the contact resistance at the contact point of the brushes even if start demarrage of asynchronous motor and damage will occur on the surface of brush and transformer.*

### *Protection functions*

*Overvoltage- low voltage protection limits the highest and lowest voltage values to the receivers connected to the unit. The user can set these values and the time of cutting the voltage to the receiver if these values are exceed on the front panel and control them. Over current-output short-circuit protection; Protection is ensured if current-time graphic values are exceeded and nominal currents drawn by the loads of the unit are higher than current tolerance values set for the unit.*

### *LCD front panel*

*By means of mimic diaphragm on the front panel, information about the operating status of the unit can be provided. LCD display with different language options input and output values of the unit (voltage, current, frequency) can be read and calibrated. Lower and upper levels of input voltage and lower and upper levels of the regulated output volume, excessive lower and excessive high voltage cutting times negative and positive polarity settings for voltage calibration are the parameters offered to the user with password control.*

### *Main areas of use*

*Start up loads such as CNC controlled lathes, milling machines, erosions, processing centers, computerized wood machines, laser cutting, printing machines, electronic typesetting machines, industry robots, radio-TV transmitters, base stations, communication systems, hospitals, medical units, electric motors, air-conditioner, fan, pump, centrifuge loads, lighting systems, light and sound studios, home, office and buildings*

### *High safety*

*Static voltage regulators are micro-controller and thyristor controlled and operate with digital technology. It protects itself and the load it feeds in abnormal cases such as lower and higher value for network voltage as dangerous, over current, excessive temperature and output short-circuit. RFI and EMI filters are standard for all powers.*

### *Very high rectification rate*

*Static voltage regulators detect the change in the voltage at the first period of network and one period is in the range of 220V 2% for output voltage for 20 millisecond. For classic servo motor voltage regulators rectification of changing network voltage is ensured by setting output voltage of the variable transformers by the brushes driven by the motor. It responds slowly in abrasion rapid network voltage changes. Since rectification rate of output voltage is in seconds, it is considered as very slow for the contemporary electronic units fed.*



## CONTROL TRANSFORMERS

Control transformers are widely used in industrial applications such as electrical panels or PLC power supplies. Input and output voltages may vary up to 1000V and they possibly include voltage taps or shield windings. Power ratings of these transformers go up to 10kVA. The electrical connection is done via terminal blocks and special mounting for DIN rails is available on request.

## ISOLATION TRANSFORMERS

Isolation Transformers are designed to be used on one or three phase systems where galvanic isolation and voltage step-up or step-down required. Input and output voltages may vary up to 5000V and they possibly include voltage taps or shield windings. Power ratings of these transformers go up to 1600kVA. The electrical connection is done via terminal blocks or bars. Any vectoral connection type is available on request.

## AUTO TRANSFORMERS

Auto transformers are used to change the level of voltage without providing galvanic isolation. They are an economical alternative to isolating transformers. Input and output voltages may vary up to 3000V and they possibly include voltage taps or shielding windings. Power ratings of these transformers go up to 1600kVA. The electrical connection is done via terminal blocks or bars. Any vectoral connection type is available on request.



## INDUSTRIAL APPLICATIONS

*Siel Enerji control transformers are used in various countries and industries across the world. To mention a few:*

- *Lighting,*
- *Electric Automation,*
- *Steel,*
- *Machinery,*
- *Robotics,*
- *Ship Construction,*
- *Elevator,*
- *Motor Starting*
- *Voltage Regulation*
- *Energy saving circuits*

### MAIN FEATURES

*Siel enerji control transformers are used in various countries and industries accross the world. To mention a few:*

- *Highly permeable iron core*
- *High quality copper or aluminium windings*
- *Class 1 transformer*
- *Excellent voltage regulation*
- *High short time power*
- *Vacuum impregnated varnish to ensure silent and moisture-immune operation*
- *Manufactured under ISO 9001 quality management system*





### DC Systems 12, 24, 48, 110, 220.. VDC

The unit that converts AC alternative current into DC direct current is called rectifier. Output current and voltage of these units are controlled electronically. Units are microprocessor controlled and communication options and digital front panel is present. Rectifiers are generally used for charging battery systems, while battery is charged, limitation of charging current and not being above certain value is required. Moreover, maximum DC voltage applied to batteries should not be above a certain value.

Types of rectifiers by SIEL;

1 phase AC input up to 1000 amperes current capacity;

3-phase AC input up to 1000 amperes current capacity;

### Areas of Usage

**Battery charging**

**Energy generation and  
distributions stations,**

**Substations,**

**Telecom systems,**

**Petro-chemistry plants,**

**Docks and marine systems**

**Subway, trolley, railroad,**

**Satellite systems,**

**Forklifts**





Provision of electrical products used for installation of substation equipment and on the train in rail systems;

Traction power distribution units;

Traction power transformers: Generally used for AC power requirement of rectifiers meeting DC power requirement in rail system.

Traction power rectifiers: The Rail system rectifiers are produced to meet the DC energy requirement continuously in accordance with IEC standards.

DC cells: DC cells offer switching solutions at 750 V, 1500 V and 3600 Vdc voltage levels up to 10000 A. Cells produced in accordance with IEC standards in standard production can support different standards if requested.

#### DC Cell Comprise of 4 parts.

- AG part
- Fast circuit breaker (HSCB)
- Cable output part
- Bus
- Separator panels

Negative panels: Grounding of negative panels should be visible for providing safety during the service of negative system at railroad distribution centers. Negative panels comprise of Grounding separator, transducer and measuring units. Overvoltage protection relays are available in negative panels. The board where negative panel is integrated has overvoltage protection relays.

#### General Specifications

- Aesthetic appearance
- LCD display
- Silent operation
- Environmentally-friendly design
- Simple installation
- Simple program menu
- Chargeable batteries (dry, wet, gel) 24-hour operation
- Automatic activation in case of power failure
- Lower signal voltage error
- Upper signal voltage error
- Operation at different frequency (50 -60 Hz.)
- Maintenance- free
- Standard part
- Adjustable-normal-fast charging voltage

#### Optional Specifications

- Remote monitoring
- Battery reverse signal
- Signal for non-connected battery
- DC leakage error
- Audible error message
- PC connection
- Battery discharging unit
- Battery test unit
- Operation at different voltages
- Redundant operation
- Operation with external start
- Circuit feeding
- Double or more outputs
- Signal error of network is available/inot available
- Operation by different frequency
- Over temperature protection



SLD Series DC/AC Static inverters are the units with sinusoidal waveform output, real ON LINE, transfer (bypass) system at output and all necessary protection systems. With the optional bypass system uninterrupted and automatic selection between the network and voltage generated by the inverter with the input can be done.

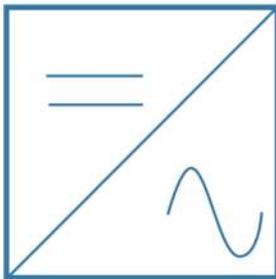
**Pure sinewave PV inverter with Output power factor = 1**  
**Selectable input voltage range for PC or home appliances**  
**Smart battery charging algorithm to optimize battery life**  
**Configurable AC/Solar input priority via LCD panel**  
**Compatible to mains or generators**  
**Auto restart while AC back and cold start function available**  
**Overload and short circuit protection**  
**Anti-Dust kits (optional) for harsh environment**

### Areas of Usage

**Solar and Wind Energy Systems**  
**Yachting and Dixy**  
**Telecommunication**  
**Marin Systems**

Inverters are produced in conformity with solar and wind energy. It is applied in telecommunication systems successfully. Input voltage may be 12, 24, 48, 110 and 220 VDC optionally.

- Single or three-phase output DSP control for the inverter
- Circuit breaker at input and output
- 1kVA / 2kVA / 3kVA / 5kVA / 10kVA power options
- Output isolation transformer
- 50 Hz / 60 Hz / 110 Hz / 400 Hz output options
- 50 Hz / 60 Hz authority for the same model
- Programmable output voltage
- Perfect dynamic response
- By-pass output and uninterrupted by-pass option
- Soft start
- Fit for high start current loads (compressor, motor)
- Short-circuit protection
- Scalability with parallel operation (option)
- 2x16 character LCD display output voltage and current
- DC input voltage and current monitoring
- Input low, input high, output low, output high,
- Over temperature, IGBT / Mosfet error alarm and signal
- 2/4 (when communication is not available) programmable dry contact relay output
- Modbus over RS232 or RS485 connection communication (ops.)
- very advanced PC control and monitoring program over PS232 connection (ops.)



Model Number	SLD 12VDC - 220VAC	SLD 24VDC - 220VAC	SLD 48VDC - 220VAC
Grid system	Single Phase, 230Vac	Single Phase, 230Vac	Single Phase, 230Vac
Rated power	<b>1000VA/ 1000W</b>	<b>3000VA/3000W</b>	<b>5000VA/5000W</b>
Parallel capability	No	No	No
Max. PV input power	<b>600W</b>	<b>1200W</b>	<b>2400W</b>
Max. PV voltage (OC)	<b>55Vdc</b>	<b>80Vdc</b>	<b>105Vdc</b>
Number of MPPT	No	No	No
<b>Input Characteristic</b>			
AC voltage	Single Phase, 230Vac	Single Phase, 230Vac	Single Phase, 230Vac
Selectable Voltage Range	170-280 Vac (For PC/ SPS applications) 90-280 Vac (For Home facilities)	170-280 Vac (For PC/ SPS applications) 90-280 Vac (For Home facilities)	170-280 Vac (For PC/ SPS applications) 90-280 Vac (For Home facilities)
Frequency range	50 Hz/ 60 Hz (Auto	50 Hz/ 60 Hz (Auto	50 Hz/ 60 Hz (Auto
<b>Output Characteristic</b>			
AC voltage regulation @ backup mode	230Vac ± 5%	230Vac ± 5%	230Vac ± 5%
Surge ability	2000VA	6000VA	10000VA
Transfer time	10 ms (For PC/ SPS) ; 20 ms (For home facilities)	10 ms (For PC/ SPS) ; 20 ms (For home facilities)	10 ms (For PC/ SPS) ; 20 ms (For home facilities)
Output waveform	Pure sinewave	Pure sinewave	Pure sinewave
Peak Efficiency	90 - 93%	90 - 93%	90 - 93%
<b>Charging Characteristic</b>			
Max. charging power	<b>600W</b>	<b>1680W</b>	<b>5280W</b>
Max. charging current	<b>50A</b>	<b>70A</b>	<b>110A</b>
Max. PV charging current	<b>50A</b>	<b>50A</b>	<b>50A</b>
Max. AC charging current	<b>20A</b>	<b>25A</b>	<b>60A</b>
Nominal Battery voltage	<b>12Vdc</b>	<b>24Vdc</b>	<b>48Vdc</b>
Over charge protection	<b>16Vdc</b>	<b>33Vdc</b>	<b>60Vdc</b>
Battery floating voltage	<b>13.5Vdc</b>	<b>27Vdc</b>	<b>54Vdc</b>
Rated backup time w/ 100Ah (min)	50	28	40
Standby power consumption	<2W	<2W	<2W
Operating ambient temp range	-10C-50C	-10C-50C	-10C-50C
Storage temp range			
Humidity	5 - 95% RH, non-condensing	5 - 95% RH, non-condensing	5 - 95% RH, non-condensing
Altitude	0 - 1000m*	0 - 1000m*	0 - 1000m*
Dimensions (W x H x D)	225 x 320 x 88 mm	285 x 334 x 100 mm	300 x 440 x 100 mm
Net weight	5.0kg	6.5kg	9.0kg
Protect function	Overload, short circuit, over voltage, high temperature	Overload, short circuit, over voltage, high temperature	Overload, short circuit, over voltage, high temperature
Cooling	Air forced	Air forced	Air forced
Enclosure environmental rating	IP20	IP20	IP20
<b>Interface</b>			
HMI	LCD display	LCD display	LCD display
Communication port	USB/ RS232	USB/ RS232	USB/ RS232
Dry contact port	NA	NA	NA
<b>Features</b>			
Monitoring software	Yes	Yes	Yes
Compliance	IEC 55022 Class A, IEC 60950	IEC 55022 Class A, IEC 60950	IEC 55022 Class A, IEC 60950
Certification	CE	CE	CE



*Areas of usage for dry type batteries*

- Alarm systems
- Control units
- Telephone switchboard
- Cable television
- Communication units
- Uninterrupted power supplies
- Fire safety systems
- Stand-by lighting systems
- Medical devices
- Control units
- Electronic scales
- Marine equipment
- Electronic cash registry
- Portable TV and videos
- Micro-processor office machines
- ATM
- Toys
- Sales machines
- Portable lights
- Solar energy systems
- Telecommunication systems
- Micro-processor textile machines
- Fully closed, maintenance-free type
- Operation at wide range of heat
- Equipped with special low pressure safety valves
- Dry batteries can operate at float charging or multi-cycle charging
- No gas leakage if working with oxygen recombination
- Internal resistance is low and losses at shelf are very low
- Batteries can be operated in vertical, horizontal position.
- It does not leak acid even reversed.
- Special calcium-alloy grills ensure long service life and high performance.
- Owing to "Glass mat" separator it contains max. Electrolyte ensures high performance.



### Photovoltaic Panels

These are the modules that converting solar energy into electric energy.

All energy supplies other than solar energy are dependent on the zone and physical area. One of the dependant energy supplies is wind energy.

### Charging Regulator

Regulates photovoltaic panel voltage and feeds the battery. It controls charging discharging status of the battery and extends the service life of the battery.

Electricity generation system with solar and wind energy is as follows.

#### \*Off Grid systems

#### \*On Grid systems

### Battery Group

Supplies the system by means of batteries when solar energy is not sufficient

Off grid systems are the electricity generation systems benefiting from solar energy to meet the requirement of electricity at farm house, country house, villa, building complex and agricultural land where mains electricity is not available or preferred. Photovoltaic panels, charging regulators, battery and inverter are used in these systems. The widespread application is on grid systems considering the use of photovoltaic systems in developed countries.

### Inverter

Inverter is the unit converting DC electric energy of solar panels into AC electric energy to operate the units in house conforming to the mains electricity.

On grid systems: these are the electricity generation systems benefiting from solar energy for meeting electricity requirement in all streets where mains electricity is available. Energy generated with photovoltaic panels installed on roof and surfaces of buildings is supplied to the mains with double-sided meter.

### Panels

It is distributed in the house from electricity fuses to the panel.

DC current generated in these systems should be converted into AC current and comply with the network. Photovoltaic panels can generate the whole, some of electricity or more than the requirement. In such systems, excessive electricity generated with photovoltaic system is sold to electricity grid. If sufficient energy is not generated, energy is supplied from the grid. On grid systems are the systems with and without batteries.

### Sayaç

double-sided meter is read electric energy drawn from the network when solar energy is not sufficient. When electric energy generated by solar energy is redundant, it is read separately and it shows the electricity supplied to the network.

Photovoltaic (PV) panels, charging regulators, battery group, inverter, board (fuse), meter and loads are available in on grid photovoltaic System.











# SIEL ENERJİ

UNINTERRUPTED ENERGY SOLUTIONS

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