

The ESIM3™
Three Phase Modular
ESI Series

E24™

P303E



**Modular Energy Storage Inverter for Three Phase
Applications from 20 to 200KW**

The ESIM3™ Series is the latest generation of Energy Storage Inverters from E24. Focused on delivering a features-rich, versatile three phase uninterrupted Energy Storage, the ESIM3 Series is available in modules from 20 to 200 KW that can be set in parallel to reach up to 1200KW of Power.

The ESIM3™ Series

The ESIM3™ Modular Decentralised Inverter Series is built in modules of 20KW to 200KW each allowing to reach a maximal total power capacity of 1200 KW (6 x 200KW) in three phase output. The ESIM3™ is highly compact and efficient allowing substantial savings in space energy.

The ESIM3™ exceptional design meets all modern requirements of buildings and ideal to power environmentally friendly homes, buildings, business and industrial applications. The ESIM3™ Modular Decentralised Inverter Series employs transform less double conversion Inverter topology.

The E24 ESIM3™ Series is designed with the flexibility to accommodate an increase in power, reliability level, runtime or renewable energy capacity by simply adding modules.

Easy installation and maintenance was at the base of the design for this Modular Inverter system with easy access to electrical connections and fully serviceable components.



- Flexible 3 or 1Phase input (20KW unit only)
- N+X Paralell Redundancy (up to 6 units)
- Up to 96.5% system efficiency
- True double Conversion with DSP Control
- Up to >=99% efficiency in Eco-mode
- Rated Output Power Factor 1.0
- Near-unity Power factor at partial and full loads
- Wide Input Voltage/Frequency Range
- High Battery Charging Power
- Configurable Battery Voltage (30 to 50 blocks)
- Automatic Battery Test setable from LCD
- Superior Overload Capability
- Back feed Protection
- De-rating Operation Available
- Common Battery
- Dual Input Feed
- Frequency Converter Mode Is Selectable

The ESIM3™ Unmatched Performance

The ESIM3™ Modular Decentralised Inverter Series is engineered to adapt to almost any existing energy source in a manner to optimise energy costs and minimize generator operation while offering outstanding power quality.

Multi-input power selection:

When used as part of a turnkey E24 Energy Storage Solution, the ESIM3™ Modular inverter may connect to a three phase or a single phase input (20KW unit only), DC coupled renewable energy inputs (PV or Wind) and/or AC coupled renewable energy input (PV or Wind).

With or without renewable energy sources:

The ESIM3™ system may be used without renewable energy inputs. Under such a case the ESIM3™ will only store the energy of the grid / or the generator into the batteries and keep the load operational without any interruption.

Generator Friendly

The ESIM3™ accepts a wide range of input variations with voltage per phase ranging from 120V to 276V per phase and frequency variations from 40Hz to 70 Hz.

100% isolated from the grid:

The ESIM3 continuously feeds the load from the batteries while refilling them with the exact same energy discharged (100% on-line double conversion topology). This means that the load is constantly being powered by a freshly synthesized sine wave of the purest quality in order to be 100% isolated from any grid disturbance, surge, brownout or harmonics.

On-Line or Off-Line operation

The ESIM3 includes the option to deactivate the double conversion topology and may be operated in green function mode to further save energy.

Three Phase load balancing technology

It is common to trip the main utility or the generator breaker due to one of the phases being overloaded. If the ESIM3 is used with three phase input, it includes the technology to equally distribute the load on the three input phases equally in a manner to delay or avoid the tripping of utility of generator breaker until the three phases reach simultaneously their maximum allowed threshold. This function is extremely valuable for customers with limited available utility breakers or under-sized generators.

Power Factor Correction

Diesel generators consume fuel in proportion to the KVA loads rather than KW. Correcting the load to unity power factor may decrease fuel consumption by up to 50%.

The ESIM3™ includes DSP technology allowing to correct for the input power factor in a manner to substantially save on both the utility and generator bill.

Seamless, easy operation:

The ESIM3™ is engineered to operate without any user intervention. There is no need to push any buttons or understand how it works. It simply does.

Touch Screen LCD:

The ESIM3™ Modular Decentralised inverter series include a touch screen LCD display with an intuitive menu displaying detailed data about the system.

Besides its unmatched performance and flexibility, the ESIM3™ offers a number of further features:**N+X parallel redundancy**

Up to 6 modules can be connected in parallel redundancy mode to reach up to 1200KW of power in Three phase and 120KW in Single Phase.

This means that if any power module fail, the system will continue to operate normally (after sounding an alarm) with the only consequence of a decrease in maximum power equal to the number of modules which failed. The likeliness of 2 modules failing at the same time being extremely low, the reliability of the overall system is the highest in the industry.

DSP Technology

The ESIM3™ Modular Decentralised Inverter is built on advance Digital Signal Processing technology in order to provide high performance steady and accurate operation over its lifetime while offering outstanding efficiency (up to 96% in online mode and more than 99% under green function topology).

Intelligent Battery Management

The ESIM3™ Modular Decentralised Inverter includes an intelligent battery charger that includes a float/boost charger and a dynamic cut-off level that reduces battery maintenance and improves battery life.

Battery Discharge Time Prediction

The ESIM3™ Modular Decentralised Inverter is capable of predicting the remaining time on battery under a current load level allowing you to make accurate decision making.

Flexible Battery Configuration

The ESIM3™ Modular Decentralised Inverter is programmable to operate on a variable number of batteries. This means that in case one or more batteries are damaged, the ESIM3™ can be programmed to operate on less batteries until the damaged battery is replaced avoiding any downtime.

Easy Swappable Power Modules

In the event of a power module being damaged, it is possible to replace the damaged module with a new one with limited down-time.

Strong Overload Capability

The ESIM3™ Modular Decentralised Inverter is capable of handling overloads of 110% / 125% / 150% for 60min / 10min / 1 min respectively.

Power Walk In

Power Walk In function allows the rectifier of each unit to be turned on progressively and in sequences in order to avoid the sudden load on generators.

Comprehensive Communication Options

Communications options include: RS232, RS485, Modbus (option), SNMP adaptor (Option), Dry Contacts.

Low input current total harmonic distortion (THDi)

The ESIM3™ Modular Inverter Series actively manages the input current total harmonic distortion (THDi) at a low level (2 percent at 100 percent load). E24's unique technology neutralizes the emission of harmonics at the input of the Modular Inverter system, providing greater reliability of operations for circuit breakers and extending the overall service life of the equipment. Low harmonic distortion saves unnecessary over sizing of gensets, cabling and circuit breakers, avoids extra heating of input transformers and extends the overall service life of all components.

Truly Modular and Evolutive

The ESIMD3™ Modular Decentralised Inverter Series is built into mobile units allowing to increase power capacity or reliability.

More power modules can be added in order to configure the ESIM3™ to the required capacity or level of reliability:

If for example a system is configured with 3 power modules of 20KW each, the maximum power of the Inverter will be $3 \times 20\text{KW} = 60\text{KW}$. If the load is constantly under 40KW, and one module fails, the Inverter will sound an alarm and the load will be automatically transferred to the 2 remaining power modules without any load interruption.



Upgrade as you Grow

The ESIM3™ can be upgraded by adding modules. You may start with a single ESIM3™ unit and decide later that you wish to upgrade.

Simply add one module to increase output and charging power (check with your dealer validate compatibility with your existing battery bank).

Easy to Service

The advantage of a modular system is that it allows to replace one module in case of a damaged part.

The ESIM3™ allows to detect easily which module is faulty. It is then easy to swap the faulty module with a new one. Simply remove the faulty module and replace it with the new module and the system is operational again.

Customers who own multiple ESIM3™ units may keep one module as a common spare part for all racks allowing to minimize downtime.

Technical Specifications

MODEL	ESIM31-20KI	ESIM3-20KI	ESIM3-30KI	ESIM3-40KI	ESIM3-60KI	ESIM3-80KI
Capacity (VA/Watts)	20K / 18K	20K / 18K	30K / 30K	40K / 40K	60K / 60K	80K / 80K
INPUT						
Nominal Voltage	380/400/415Vac,(3Ph+N+PE)					
Operating Voltage Range	208~478Vac					
Operating Frequency Range	45-55Hz at 50Hz/54-66Hz (auto sensing)					
Power Factor	≥0.99					
Harmonic Distortion (THDi)	≤2% (100% non-linear load)					
Bypass Voltage Range	220Vac Max. Voltage: +25% (optional +10%, +15%, +20%) 230Vac Max. Voltage: +20% (optional +10%, +15%) 240Vac Max. Voltage: +15% (optional +10%) Min. Volatge: -45% (optional -20%, -30%) Frequency Synchronize Tracing Range: ±10%					
Generator Input	Support					
BATTERY						
Possible Configurations	20K and 30K units operate on 16,18,20 x 12V blocks, units> 40K operate on 30 to 50 blocks					
Maximum Charging (A)	10A for 20K and 30K units, 20A for 40,60K, 40A for 80K					
OUTPUT						
Output Voltage	380/400/415Vac (3Ph+N+PE)					
Voltage Regulation	±1%					
Power Factor	0.9					
Output Frequency	Line Mode: Synchronize with Input; when Input Frequency>±10%(±1%/ ±2%/ ±4%/ ±5% Optional), Output (50/60 ±0.1)Hz, Battery Mode: (50/60 ±0.1)Hz					
Crest Factor	3:1					
Harmonic Distortion (THD)	≤2% with Linear Load, ≤5% with Non Linear Load					
Efficiency	≥93.5%		≥94.5%			
SYSTEM FEATURES						
Transfer Time	Utility to Battery: 0ms; Utility to bypass: 0ms					
Overload	Line Mode	Load≤110%: Last 60min, ≤125%:Last 10min, ≤150% Last 1min, ≥150% to bypass				
	Bat. Mode	Load≤110%: Last 10min, ≤125%: Last 1min, ≤150%: Last10s, ≥150% shutdown UPS immediately				
Alarm	Overload, Utility Abnormal, UPS Fault, Battery Low, etc.					
Protection	Short Circuit, Overload, Over Temperature, Battery Low, Fan Fault Alarm					
Communication	USB, RS485, Parallel Port, Coupler Dry Contact, Intelligent Slot, SNMP Card (optional), Relay Card (optional)					
ENVIRONMENTAL						
Operating Temperature	0°C~40°C					
Storage Temperature	-25°C~55°C (no battery)					
Humidity Range	0~95% (non condensing)					
Altitude	<1500m. De-rating when >1500m					
Noise Level	<55dB		<58dB			
STANDARDS						
Safety	IEC/EN62040-1, IEC/EN60950-1					
EMC	IEC/EN62040-2, IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8					

The ESIM3™ Modular ESI Series

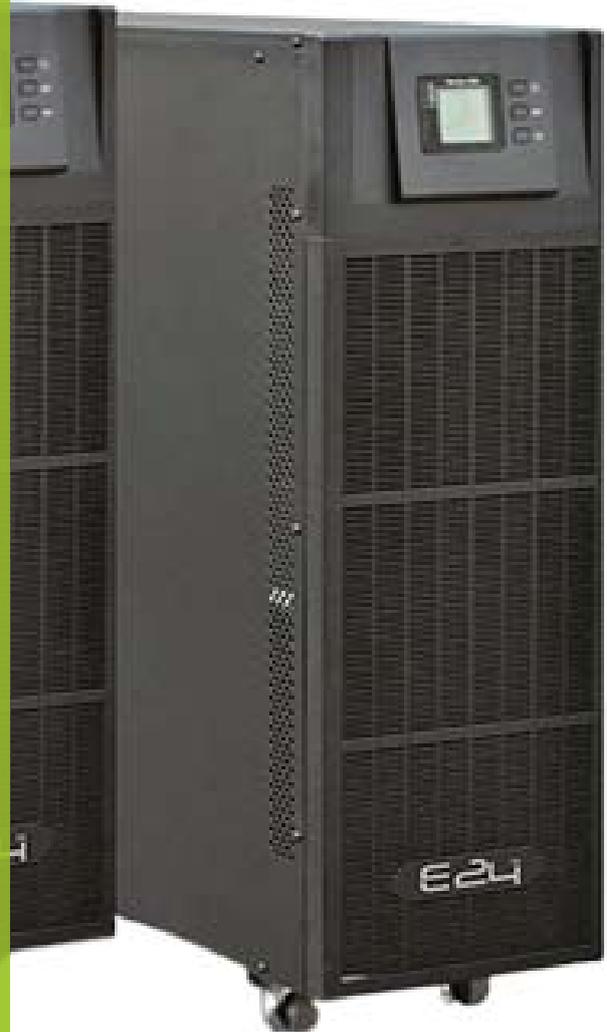
MODEL	ESIM3-100KI	ESIM3-120KI	ESIM3-150KI	ESIM3-180KI	ESIM3-200KI	
Capacity (VA/Watts)	100K / 100K	120K / 120K	150K / 150K	180K / 180K	200K / 200K	
INPUT						
Nominal Voltage	380/400/415Vac,(3Ph+N+PE)					
Operating Voltage Range	208~478Vac					
Operating Frequency Range	45-55Hz at 50Hz/54-66Hz (auto sensing)					
Power Factor	≥0.99					
Harmonic Distortion (THDi)	≤2% (100% non-linear load)					
Bypass Voltage Range	220Vac Max. Voltage: +25% (optional +10%, +15%, +20%) 230Vac Max. Voltage: +20% (optional +10%, +15%) 240Vac Max. Voltage: +15% (optional +10%) Min. Volatge: -45% (optional -20%, -30%) Frequency Synchronize Tracing Range: ±10%					
Generator Input	Support					
BATTERY						
Possible Configurations	30 to 50 blocks					
Maximum Charging (A)	40A for 100K, 120K units, 60A for 150K, 180K, 200K units					
OUTPUT						
Output Voltage	380/400/415Vac (3Ph+N+PE)					
Voltage Regulation	±1%					
Power Factor	0.9					
Output Frequency	Line Mode: Synchronize with Input; when Input Frequency>±10%(±1%/ ±2%/ ±4%/ ±5% Optional), Output (50/60 ±0.1)Hz, Battery Mode: (50/60 ±0.1)Hz					
Crest Factor	3:1					
Harmonic Distortion (THD)	≤2% with Linear Load, ≤5% with Non Linear Load					
Efficiency	≥93.5%		≥94.5%			
SYSTEM FEATURES						
Transfer Time	Utility to Battery: 0ms; Utility to bypass: 0ms					
Overload	Line Mode	Load≤110%: Last 60min, ≤125%:Last 10min, ≤150% Last 1min, ≥150% to bypass				
	Bat. Mode	Load≤110%: Last 10min, ≤125%: Last 1min, ≤150%: Last10s, ≥150% shutdown UPS immediately				
Alarm	Overload, Utility Abnormal, UPS Fault, Battery Low, etc.					
Protection	Short Circuit, Overload, Over Temperature, Battery Low, Fan Fault Alarm					
Communication	USB, RS485, Parallel Port, Coupler Dry Contact, Intelligent Slot, SNMP Card (optional), Relay Card (optional)					
ENVIRONMENTAL						
Operating Temperature	0°C~40°C					
Storage Temperature	-25°C~55°C (no battery)					
Humidity Range	0~95% (non condensing)					
Altitude	<1500m. De-rating when >1500m					
Noise Level	<55dB		<58dB			
STANDARDS						
Safety	IEC/EN62040-1, IEC/EN60950-1					
EMC	IEC/EN62040-2, IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8					



E24 Modular Range Of Products For Building Easy, Flexible & Evolutive Solutions

E24 products dynamically evolve with the lifestyle and work style of its customers while easing the installation process.

E24 products are conceived in modules allowing for an easy upgrade to adjust with the needs of the customers. Being modular and easy to connect E24 products allow installers to easily configure the required modules for an optimal solution while offering easy upgrade options.



Ordering Information

Ref Number	Description
ESIM31-20KI	Modular Energy Storage Inverter, N+X, 1 or 3 Phases input, 1 phase output, +/-120Vdc, 18KW, 220Vac, 50/60Hz
ESIM3-20KI	Modular Energy Storage Inverter, N+X, 3 Phases Input/output, +/-120Vdc, 18KW, 380/220Vac, 50/60Hz
ESIM3-30KI	Modular Energy Storage Inverter, N+X, 3 Phases Input/output, +/-120Vdc, 27KW, 380/220Vac, 50/60Hz
ESIM3-40KI	Modular Energy Storage Inverter, N+X, 3 Phases Input/output, +/-240Vdc, 36KW, 380/220Vac, 50/60Hz
ESIM3-60KI	Modular Energy Storage Inverter, N+X, 3 Phases Input/output, +/-240Vdc, 36KW, 380/220Vac, 50/60Hz
ESIM3-80KI	Modular Energy Storage Inverter, N+X, 3 Phases Input/output, +/-240Vdc, 36KW, 380/220Vac, 50/60Hz
ESIM3-100KI	Modular Energy Storage Inverter, N+X, 3 Phases Input/output, +/-240Vdc, 36KW, 380/220Vac, 50/60Hz
ESIM3-120KI	Modular Energy Storage Inverter, N+X, 3 Phases Input/output, +/-240Vdc, 36KW, 380/220Vac, 50/60Hz
ESIM3-150KI	Modular Energy Storage Inverter, N+X, 3 Phases Input/output, +/-240Vdc, 36KW, 380/220Vac, 50/60Hz
ESIM3-200KI	Modular Energy Storage Inverter, N+X, 3 Phases Input/output, +/-240Vdc, 36KW, 380/220Vac, 50/60Hz

E24[®]

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ISO 9001:2015



QUALITY STANDARD

