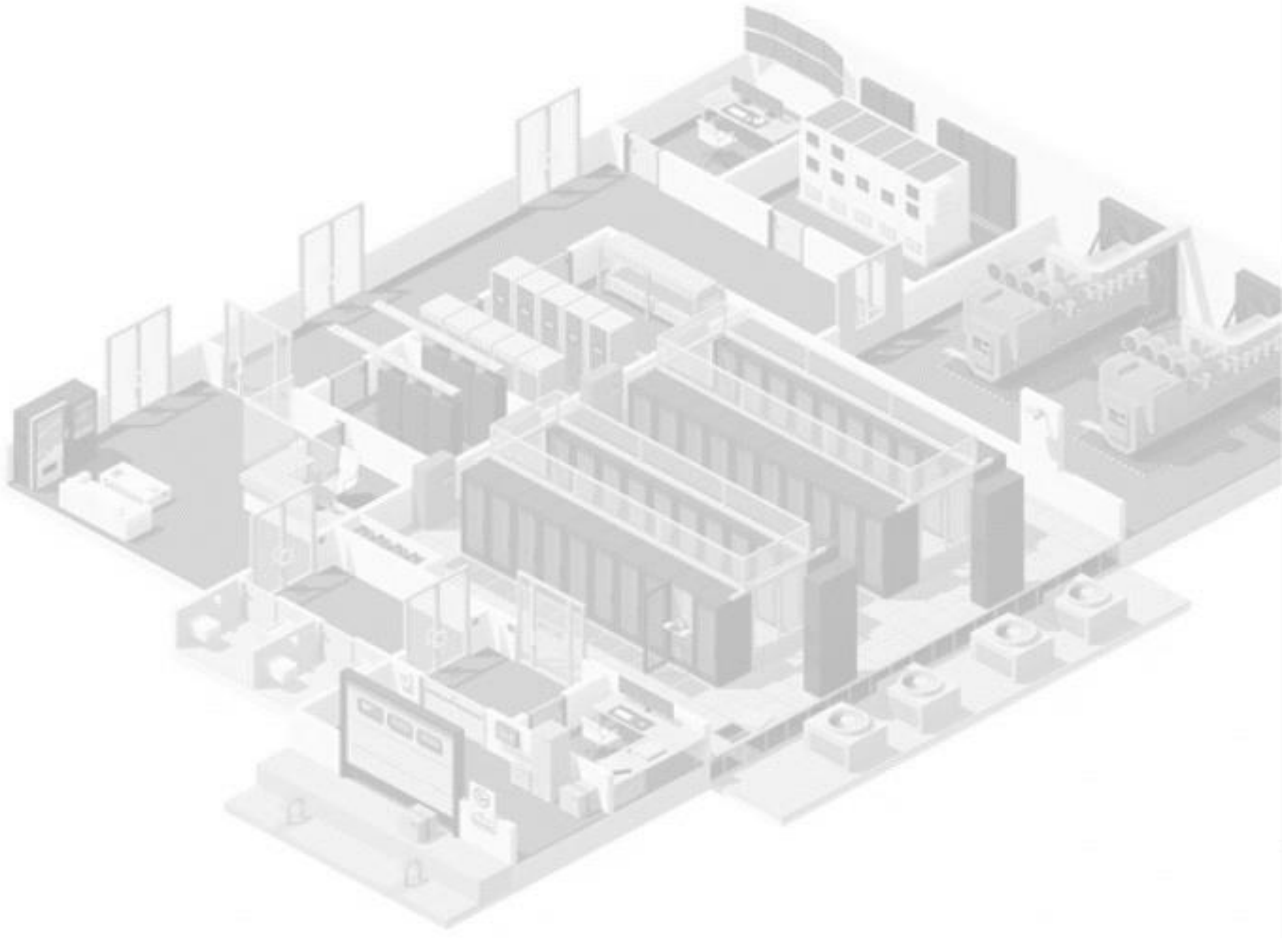
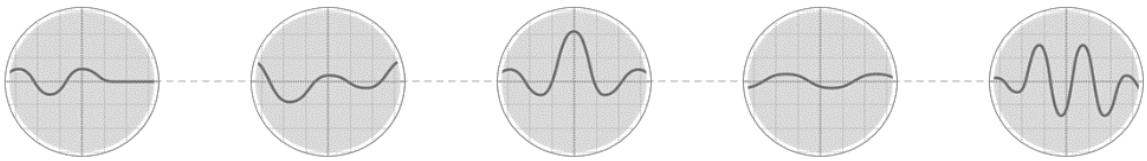
MODULAR ENERGY



Data Center & Control Center Solution

WWW.MODULARENERGY.ID

Power issues affecting your facility?



AC BLACKOUT

A total loss of utility power occurring for more than 2 cycle.

POWER SAG

Short-term low voltage caused by starting inrush current of large equipment, utility switching, or a temporary overload.

VOLTAGE SURGE

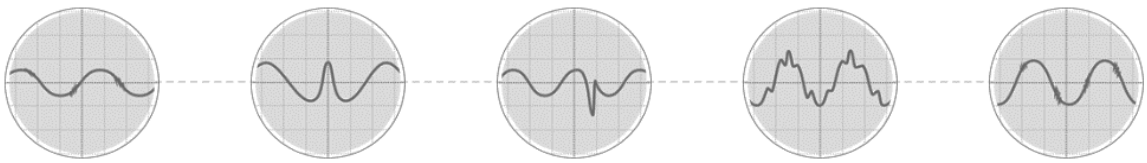
Short-term high voltage above 110% of nominal for several cycles.

BROWNOUT

Long-term reduced line voltage for an extended period of a few minutes to a few days.

OVERVOLTAGE

Extended periods of increased line voltage ranging from a few minutes to a few days.



NORMAL MODE NOISE

High frequency electrical waveform between line (L) and neutral (N) caused by RFI or EMI interference.

FREQUENCY VARIATION

Frequency change from nominal 60Hz or 50Hz. Operation from engine generators can produce frequency variations.

SWITCHING TRANSIENT

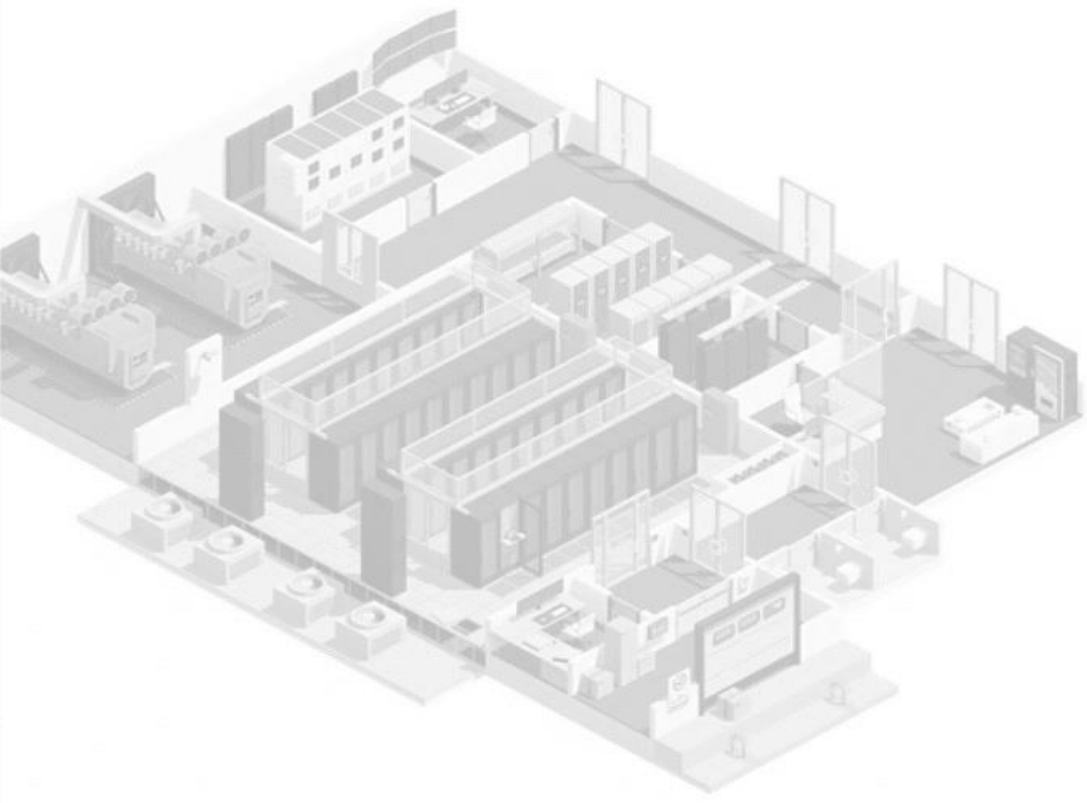
Fast high voltage spike with very short duration time.

HARMONIC DISTORTION

Distortion of the normal waveform generally caused by nonlinear loads such as rectifiers, switch mode power supplies, and variable frequency drives.

COMMON MODE NOISE

Electrical Interference that is measured between ground and either neutral (N) or line (L) of a typical AC power line.



Data Center Solution

MODULAR ENERGY

Uninterruptible Power & Backup Quality

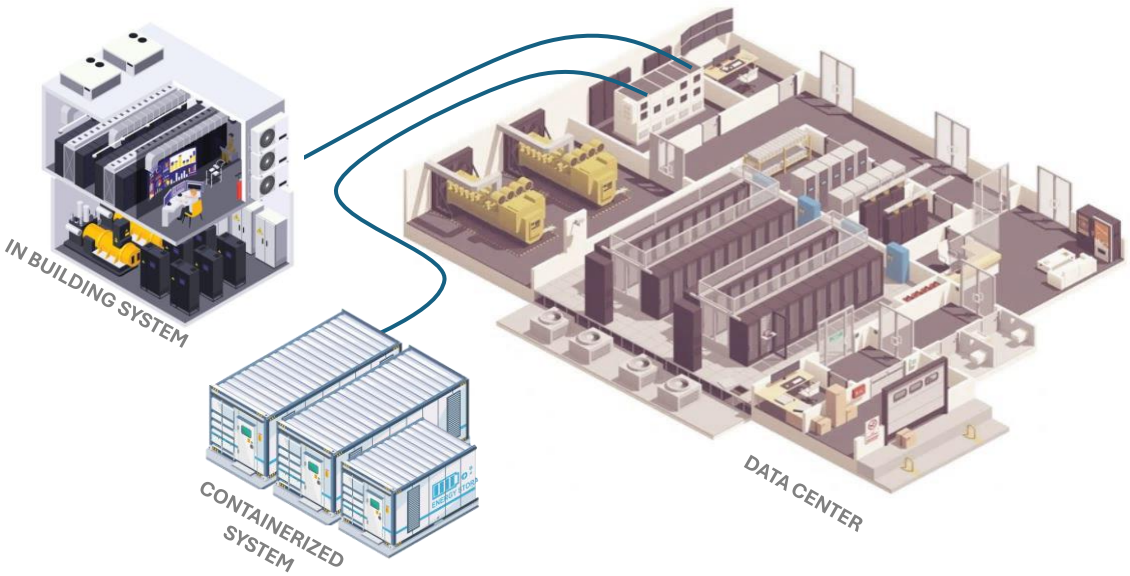
Power Conditioning System (PCS) in a data center safeguards sensitive equipment from issues with the incoming electrical supply. Integration with Battery Energy Storage (BESS), allows greater enhancement, more resistance to even deep power disturbance, brownout, or blackout. Integration of PCS+BESS forms Advanced UPS functionality

Cost Saving

- Load Shifting. PCS can control BESS to store energy in cheaper low demand and use it during peak demand higher cost period. Saving Opex
- Peak shaving. PCS + BESS can act as buffering for onsite genset and DRUPS. Allowing engineering to size them down for average demand calculation instead of peak demand. SavingCapex

Integration with Onsite Renewable

BESS & PCS can intelligently manage intermittency of onsite renewable generation e.g Solar PV or Wind, allowing low cost & green energy and improving carbon footprint.



Powered by RENOZ ENERGY

SINEXCEL

XTREME Power Conversion

Product Range
Data Center Solution

MODULAR ENERGY

CONTAINERIZED SYSTEM



POWER RACK SYSTEM

Bi-directional storage inverter
Offgrid & Interactive mode
30kW - 1.7MW Scalable blocks
150-1500VDC
380/400VAC 3Ph+N
SCADA/DER controlled & EMS

Hybrid inverter
45kW - 1.7MW Scalable blocks
250-830VDC MPPT Input
380/400VAC 3Ph+N Output
SCADA/DER controlled & EMS

Advanced UPS
40kW - 1.2MW Modular System
220 / 380 / 400VAC 1Ph / 3Ph+N Input/Output
Static Transfer Switch
SCADA/DER controlled & EMS
Load Shifting Function

ADVANCED UPS /PCS MODULAR SYSTEM

Bi-directional inverter
30kW/45kVA
150-750V Charging
700-830V DC bus
400±15V AC
RS485 communication

Intelligent Transfer Switch
100kVA
- 1ph 220/230VAC
- 3ph 380/400/480VAC

TN-C-S, TN-S, TT, TN-C Grid
SCADA/DER controlled & EMS

PV charger module
45kW (summable)
250-830V PV side
700-830V DC Bus
MPPT *3

Hybrid UPS module
5 – 10 kWh / block
24 – 48V batteries /DC bus
220(1ph) / 380(3ph) AC input-output
40 – 500 V DC MPPT PV input
CAN/RS485 communication

Small Power Rectifier/Inverter
2000-6000W / block
12 - 72 V DC input-output (DC mode)
220(1ph) - 380(3ph) V AC input
40 - 500 V DC MPPT*2 PV mode
SNMP/CAN/RS485 communication

Static VAR Generator
30 – 120 kVAr
400 – 690 V
50 / 60Hz (auto sensing)

Active Harmonic Filter
Capacity 5 - 300A
228 – 456 V
IEEE519

BATTERY RACK SYSTEM (BESS)

Indoor LV Rack System
5 - 30 kWh / block
12 - 72 V DC mode
Natural / forced air

HV Rack System
30 - 50 kWh / block
240 - 584 VDC
Forced air / natural cooling

Specialty System
Outdoor IP55/IP56/IP65
Air Conditioning / Liquid cooling
Fire suppression

Advanced UPS / PCS Features

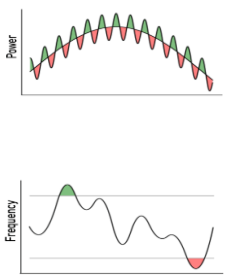
Flexible Modularized Design

- UPS power module
- Hybrid inverter module
- Bi-directional inverter module
- Rectifier module
- PDU module
- Transfer Switch (STS/ATS)
- Solar PV MPPT Input
- Transformer

Persistent Power Quality

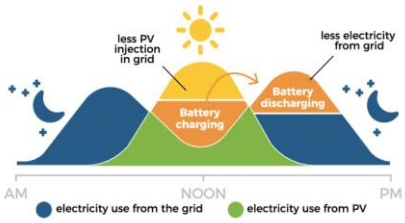
Rapid Response to Fluctuations: PCS can react rapidly to fluctuations from the grid. This real-time response capability helps to maintain a stable power, voltage sags/swells and dips.

Frequency Regulation: PCS can act as a fast-acting frequency regulator by absorbing or injecting energy as needed. This helps to maintain the system frequency within precision range.



Onsite Power Generation

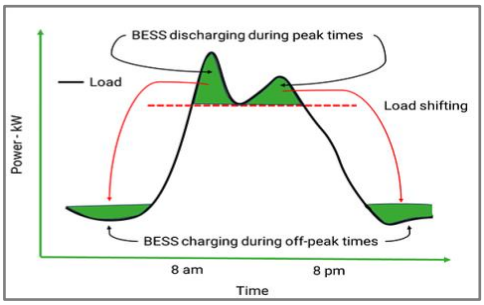
While renewable energy sources such as solar and wind power offer compelling possibility of **virtually free energy,** their inherent variability and intermittency can pose challenges for critical system. BESS can function as large-scale storage of surplus electricity generated during periods of sunny days or high-wind hours and allows for the later utilization of this clean energy.



Features integrated with BESS

Load Shifting Cost Saving

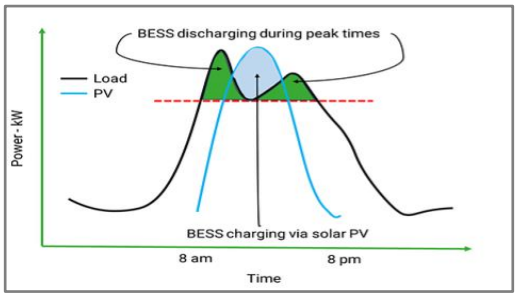
This strategy leverages the ability of BESS to store electrical energy. Absorbing the energy from Grid during low-rate hours, and then discharge them during peak hours, when demand and electricity prices are at their highest. **reduce overall electricity costs**



Peak Shaving cost reduction

Business & utilities can avoid **unnecessary expensive investments** by sizing down generator capacity to meet **realistic average demand,** instead of following peak demand.

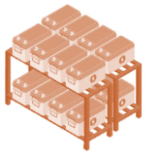
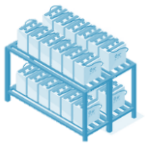
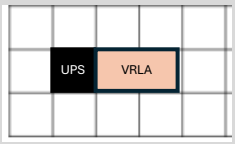
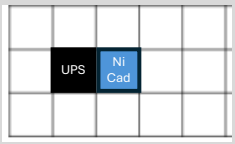
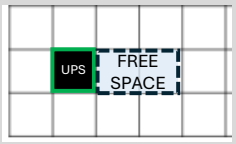
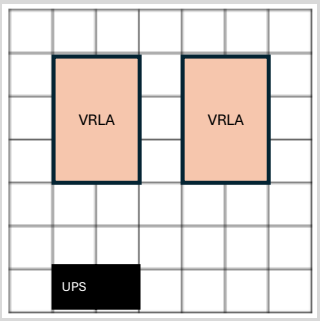
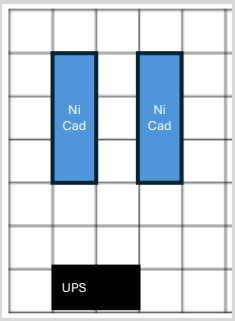
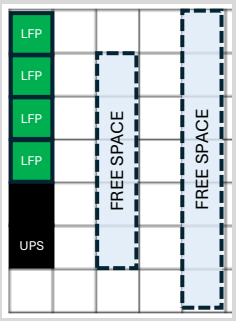
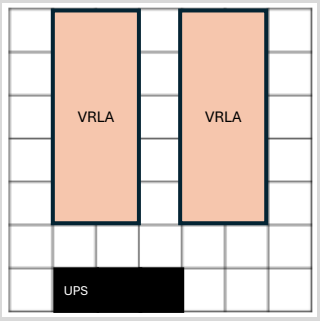
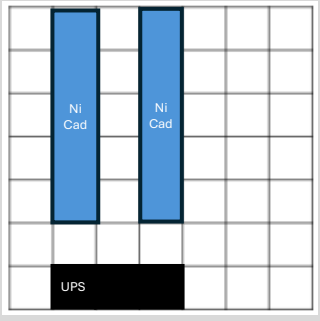
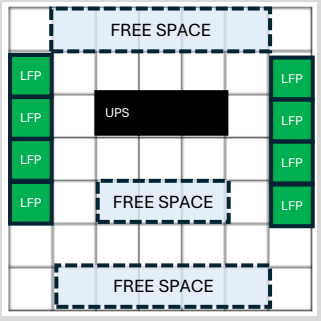
BESS also reduces the need for traditional power plants to **frequent ramp up and down** to meet fluctuating demand. This minimizes wear and tear, and improves their overall efficiency, leading to **cost savings and reduce emissions.**



Space optimization
with Battery Energy Storage System

Footprint comparison VRLA & NiCad battery rack VS LFP BESS

Space optimization benefit can have trickle down effect to other support system such as HVAC, lighting, fire system, etc

	Traditional VRLA Battery Rack	Conventional NiCad Battery Rack	LFP BESS Cabinet
UPS & batteries in typical footprints *Example configuration			
10-60kVA UPS Branch Site Server rack 10 min backup*			
			*UPS+LFP battery in the same cabinet
90-600kVA UPS Edge data center 8 min backup*			
			*LFP cabinet do not need front-rear access
0.8-1.2MVA UPS Tier-1 data center 6 min backup*			
			*LFP cabinet do not need front-rear access

*footprint multiplication will increase significantly with higher Tier system
*dimension in multiplication of 0.8 x 0.8 m square

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