True Modular UPS System – Modular topology providing secure power with high availability and efficiency
Modular Power Protection Concept

- Modular Power Protection Concept Key Features

1. Modularity
2. Availability
3. Scability
4. Managebility
5. Environmentably Friendly
6. Servicability
ABB UPS Concepts
Modularity
Modular Technology
What is your definition of Modular?
Modular Architectures

Parallel System Architectures are designed to increase **Power Protection Availability**, which cannot be achieved by single UPS's.

Parallel Architectures available today:

- Central Parallel Architecture (CPA)
- Decentralized Parallel Architecture (DPA™)

These 2 architectures differ by the level of decentralization of their building blocks.
Modular Architectures
Centralized Parallel Architecture (CPA)

In a Centralized Parallel Architectures the system is composed of common system building blocks:

- CPU
- Control Panel
- Static Bypass Switch
- Battery

The only Decentralized Parts are the Power Units.
Decentralized Parallel Architecture (DPA)™ distributes the entire UPS Hardware and Software into each module.

A DPA system includes distributed/decentralized:

- CPU;
- Control Panel;
- Static Bypass Switch;
- Power Unit and
- Separate Battery
ABB UPS Concepts
True Modularity

Each Module is a complete UPS!
ABB UPS Designs
Modularity Design

Integration power components

Power Board

Control Logic

100% continuous duty static switch

Redundant Power supplies

High Frequency IGBT/PWM Inverter
Modular Technology
Safe Swap
Modular Technology
Safe Swap – added value

- Safe Swap
  - Easy maintenance (MTTR)
  - No risks for the load
  - No dangers for the technician
  - Increase number of modules with no supply interruptions
ABB UPS Concepts
Decentralized Parallel Architecture (DPA)

- True system redundancy
- No single point of failure
  (increased availability)
- Enhanced serviceability
- High level of flexibility
- Reduced Total Cost of Ownership (TCO)
- Low weight of modules
- Low footprint
- Safe swap
Why do we parallel UPS units?

- **Reliability**
  The answer to superior reliability requirements for business-critical applications is true redundancy, where all parallel modules share the load equally. If one module fails the remaining modules will continue to provide power protection.

- **Power Upgrade**
  To meet the power requirements of growing datacenters and telecommunication systems it is possible to easily reconfigure an existing UPS power system by simply adding one or more modules.
Parallel Systems

Parallelism is observed also in standalone products
Parallel Systems
Modular Technology

100kVA N+1

150kVA N+1

200kVA N+1

450kVA N+1

700kVA N+1

UPGRADE PATH
Parallel Systems
Modular Technology

600 kVA Capacity
550 kVA N+1 Redundancy

650 kVA Capacity
600 kVA N+1 Redundancy

700 kVA Capacity
650 kVA N+1 Redundancy

750 kVA Capacity
700 kVA N+1 Redundancy

800 kVA Capacity
750 kVA N+1 Redundancy

850 kVA Capacity
800 kVA N+1 Redundancy

900 kVA Capacity
850 kVA N+1 Redundancy

950 kVA Capacity
900 kVA N+1 Redundancy

1000 kVA Capacity
950 kVA N+1 Redundancy
Modular Power Protection Concept
Scalability

The modular (safe-swap) design allows easy upgrading of power by just adding modules into the Rack. The addition of modules is achieved without the need to transfer the load to bypass and therefore exposing it to unreliable raw mains power supply. This feature allows the step-by-step growth of the power protection depending on the growing computer power.
Modular Power Protection Concepts
Flexibility

Data Centre with changing needs

Aisle 1

Aisle 2

++++OVERLOAD++++
Case Study
Customer with critical load = 360 kVA

Each UPS equally sharing the load = 180 kVA
Each UPS percentage of full load = 180 kVA / 400 kVA = 45%
Case Study
Customer with critical load = 360 kVA

- Each UPS equally sharing the load = 120 kVA
- Each UPS percentage of full load = 120 kVA / 200 kVA = 60%
Case Study
Space & Weight consideration

**Traditional UPS configuration**
2 x 400 kVA UPS

- Footprint = 4.31 m²
- Total Weight = 6,120 kg

**ABB UPS Proposal**
3 x 200 kVA UPS

- Footprint = 2.70 m²
- Total Weight = 1,920 kg
ABB Modular UPS
Our Value

1) High Availability
   - Highest classification (IEC 62040-3 class: VFI-SS-111)
     UPS topology: double-conversion – designed to handle all types of power failures
   - Latest IGBT technology with DSP controls → High MTBF
   - Parallel redundant configurations with Distributed Parallel Architecture (DPA) → Very High MTBF
   - Fast and efficient repair due to modularity with safe swap feature → Low MTTR

2) Low TCO
   - Low initial investment, top of the line performance allows smaller upstream sizing, less cooling capacity, smallest footprint
   - Low operating costs, efficiency in double conversion mode 96%, in ECO mode >99%, savings in electricity costs, less cooling costs
   - Modularity allow for cost efficient scalability and concurrent maintenance

3) Sustainability and green values
   - Efficiency → lower carbon emissions
   - Green (energy saving) manufacturing, recycling, (ISO 14001) → low carbon footprint, no waste/pollution
   - High quality → long life cycle with minimum waste
   - Low size and weight → savings in footprint
ABB Modular UPS
Our Value

- Minimize interruptions (Availability)
- Respect requirements of an enterprise in expansion (Flexibility)
- Continuous growth of energy consumption lowering the costs (Efficiency)
- Reliability respecting the performance (Service)
Availability
- New service concept
Product Families

- Overview

**Single-phase standalone systems**
- 1 – 30 kVA
- Best-in-class compactness
- Outstanding cost-effectiveness

**Three-phase standalone systems**
- 10 kVA – 5 MVA
- High efficiency
- Output PF 1.0 (kW=kVA)
- Minimum TCO
- Parallelable up to 10 units
- Small footprint
- High power density

**Three-phase modular systems**
- 10 kVA – 1.5 MVA
- DPA with intelligent power modules
- Easy to replace safe-swap modules
- Low TCO
- Simple installation and service
- Optimal scalability of the UPS systems
Power and productivity for a better world™