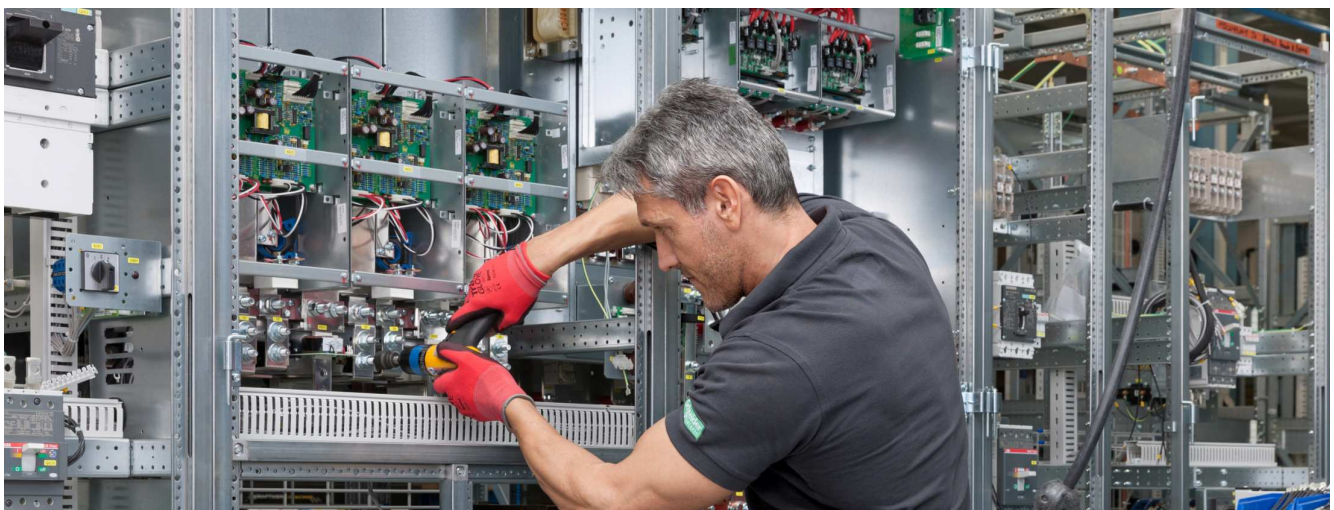


# AC-UPS Product Line

## Overview configurations Gutor UPS product line

Function	Single UPS	Par. Red. UPS	Dual UPS Independent	Dual UPS Synchronised
Upstream supply	1 - 2 feeders	1 - 3 feeders	1 - 4 feeders	1 - 3 feeders
Bypass	Single	Single	Dual	Single
„UPS“	Single	Parallel Redundant	Dual-Indp.	Dual-Synch.
Battery	Single	Redundant	Dual	Dual
UPS - Dist. (A/B)	Single	Single	Dual	Dual
Cabling	Single	Single	Dual	Dual
Downstream Dist.	Single	Single	Dual	Dual
C Distribution	N/A	N/A	N/A	STS - C. Dist.
Loads	Single	Single	Dual	Dual/Single
Maintenance	On Bypass	UPS power	UPS power	UPS power

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### UPS configuration

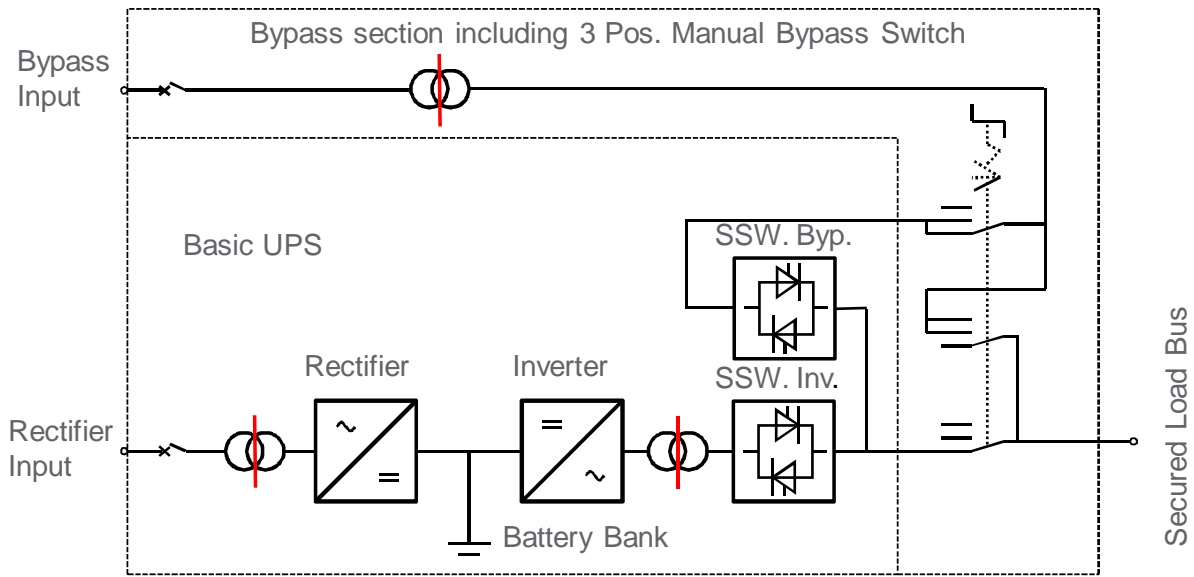
Basic units | All in one industrial solution UPS versus modular UPS



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# All in one Solution UPS

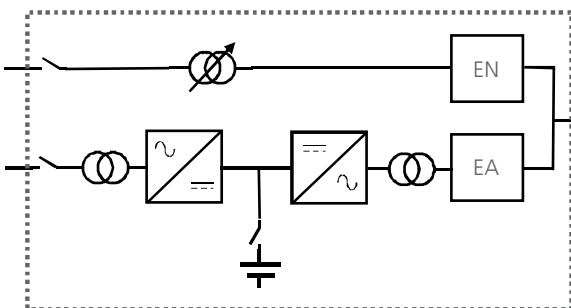


Basic UPS with 100% galvanic isolation (⚡) and bypass section.  
The basic UPS configuration will be used in all Gutor AC-UPS solutions.

# All in one Industrial Solution UPS versus Modular UPS

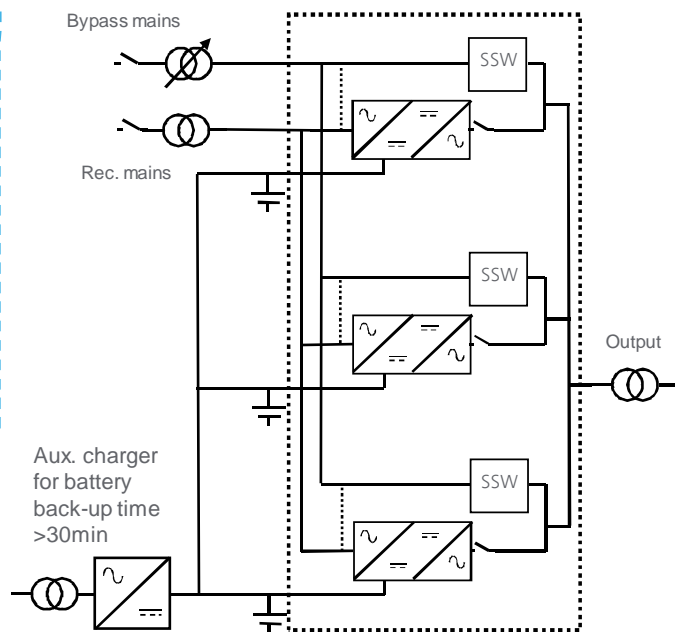
## All in one industrial solution

All parts included in monitoring and regulation circuit



3-Position Manual Bypass Switch can be included in the industrial solution.  
For the modular solution, it will typically be an external 2-Position Manual Bypass Switch.

## Modular solution



Integrated part of modular UPS solution, parts outside this box are typically not included in monitoring and regulation and could come from different suppliers.

## All in one Industrial Solution UPS versus Modular UPS

Topics	All in one Industrial Solution UPS	Modular UPS
Applications/Industries	Oil & Gas, Nuclear Power, Power Generation, Chemical, Mining, Transport, other industrial processes	Datacenters, banks, healthcare, telecom, hospital, airport, semiconductor
UPS Function	Prevent loss of control over critical processes, often involving human safety	<ul style="list-style-type: none"> <li>• Prevent data loss and costly server shutdowns</li> <li>• Provide continuous operation of mission critical facilities</li> </ul>
Electrical Environment	Unstable, « dirty » electrical supply (transients, surges, distortions), electro-magnetic interference	<ul style="list-style-type: none"> <li>• Stable and « clean » electrical supply (voltage, frequency, waveform)</li> <li>• little electro-magnetic interference</li> </ul>
Ambient conditions	<ul style="list-style-type: none"> <li>• Wide ranges in temperature (-10 - 55°C/14 - 131°F)</li> <li>• Humidity: (0-95%)</li> <li>• Vibrations (seismic, shock)</li> <li>• Presence of dust, gases, etc...</li> </ul>	<ul style="list-style-type: none"> <li>• Regulated temperature (20 - 30°C/68 - 86°F)</li> <li>• Humidity (10-55% non condensing)</li> <li>• Little or no vibration, dust, gases...</li> </ul>

## All in one Industrial Solution UPS versus Modular UPS

Topics	All in one Industrial Solution UPS	Modular UPS
Flexibility and customisation	<ul style="list-style-type: none"> <li>• Each system engineered according to customer needs</li> <li>• Project management approach</li> <li>• Full customisation, including testing and documentation</li> </ul>	<ul style="list-style-type: none"> <li>• Typically not required (off the shelf)</li> <li>• Limited selection of options may be offered</li> </ul>
Lifetime and services	<ul style="list-style-type: none"> <li>• Lifetime 20-30 years</li> <li>• Comprehensive service program during lifetime, including spare parts and maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Lifetime of 5-10 years (depending on market segment)</li> <li>• Retrofit rarely done</li> <li>• Life cycle monitoring program</li> </ul>

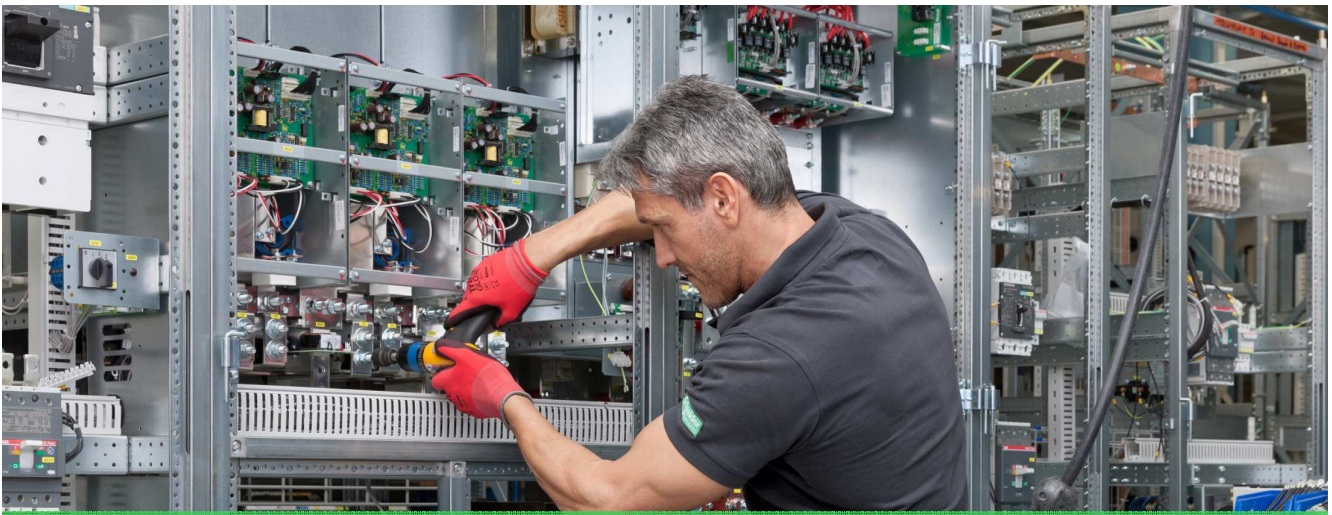
## All in one Industrial Solution UPS versus Modular UPS

Topics	All in one Industrial Solution UPS	Modular UPS
Galvanic isolation	Standard option as integrated part of system	<ul style="list-style-type: none"> <li>•Standard no galvanic isolation.</li> <li>•External transformers can be added, but not included in monitoring/regulation =&gt; Output tolerance +/- 3%</li> </ul>
Batteries	<ul style="list-style-type: none"> <li>•Different types of batteries used, including NiCd as well as both sealed (valve regulated) and vented lead-acid batteries</li> <li>•Battery choice tailored to customer specifications</li> <li>•Battery charging adapted to temperature - increases battery lifetime</li> </ul>	<ul style="list-style-type: none"> <li>•Generally sealed lead-acid technology</li> <li>•Batteries are standardised</li> <li>•Battery charging may not be temperature-adapted</li> </ul>
Battery back-up >30min.	Internal oversized rectifier to reduce recharge time	<ul style="list-style-type: none"> <li>•Not designed for long battery back-up time =&gt; Long recharge time or additional external charger will added, not included in overall HMI</li> </ul>

## All in one Industrial Solution UPS versus Modular UPS

Topics	All in one Industrial Solution UPS	Modular UPS
DC earth fault	Standard option as integrated part of the system	Typical not included even not as option.
Static transfer switch	100 % rated static transfer switch in inverter as well as in bypass	<ul style="list-style-type: none"> <li>•Integrated in each module</li> <li>•contactor in inverter output and static in bypass.</li> </ul>
Cooling	N+1 fans with internal RPM monitoring, as option 100% redundant fans	<ul style="list-style-type: none"> <li>•No redundant fans, typically with out internal RPM monitoring.</li> <li>•Redundancy secured by adding one module</li> </ul>
HMI	Monitoring of all main component included in the centralised HMI	<ul style="list-style-type: none"> <li>•Individual HMI on each module (all additional compon-ents are not included in HMI)</li> </ul>
Single phase output	Standard solution	<ul style="list-style-type: none"> <li>•Not available above 10KVA</li> <li>•May be realised by adding a transformer between two phases</li> </ul>





## UPS solutions in detail

AC and DC



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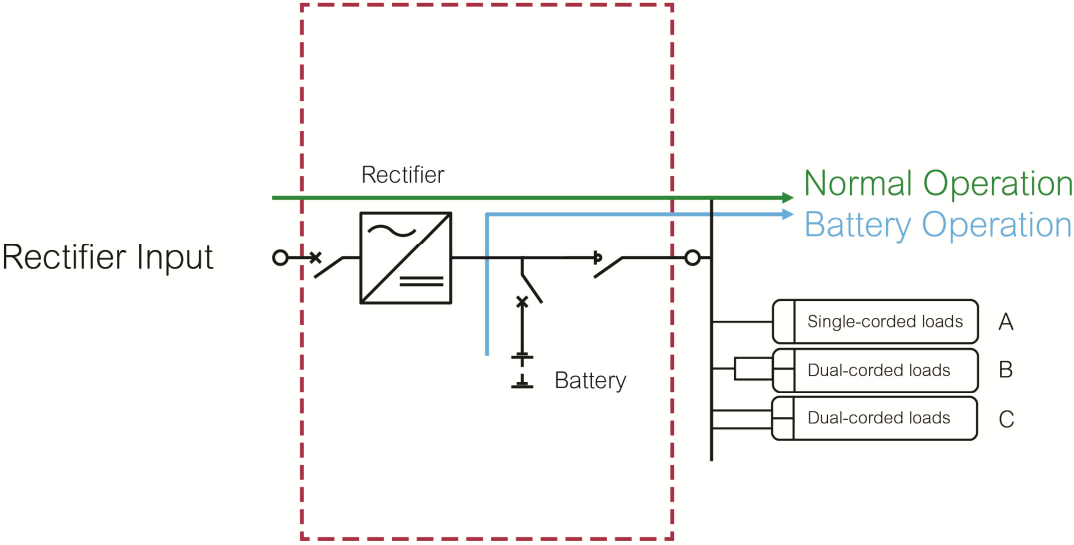
Schneider  
Electric

## UPS solutions in detail

- UPS technology all in one solution UPS
  - DC UPS systems
    - Single
    - Parallel Redundant
    - Dual
    - Detailed Single Line Wiring Diagram
  - AC UPS systems
    - Single
    - Parallel Redundant
    - Dual Independent
    - Dual Synchronised
    - Detailed Single Line Wiring Diagram
  - Construction Details

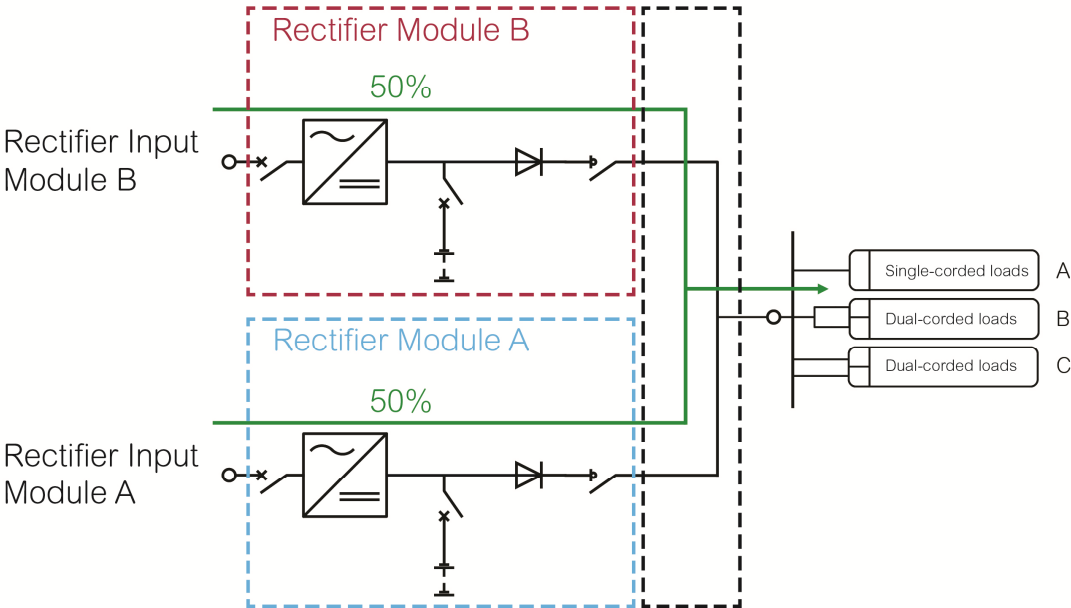
# AC-UPS Product Line

## DC Single UPS Configuration



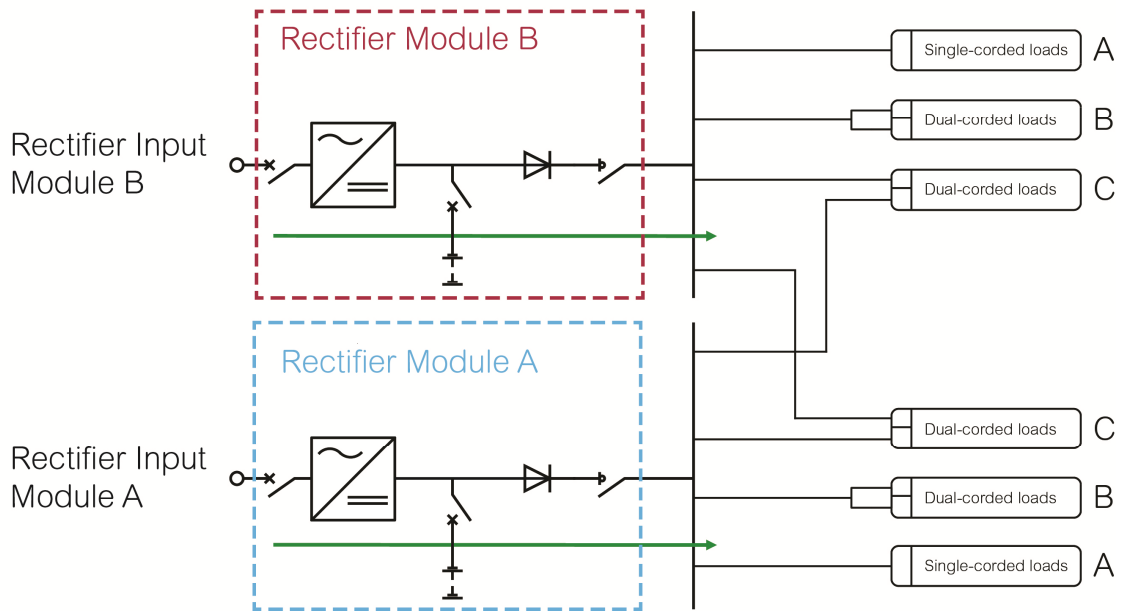
# AC-UPS Product Line

## DC Parallel Redundant UPS Configuration



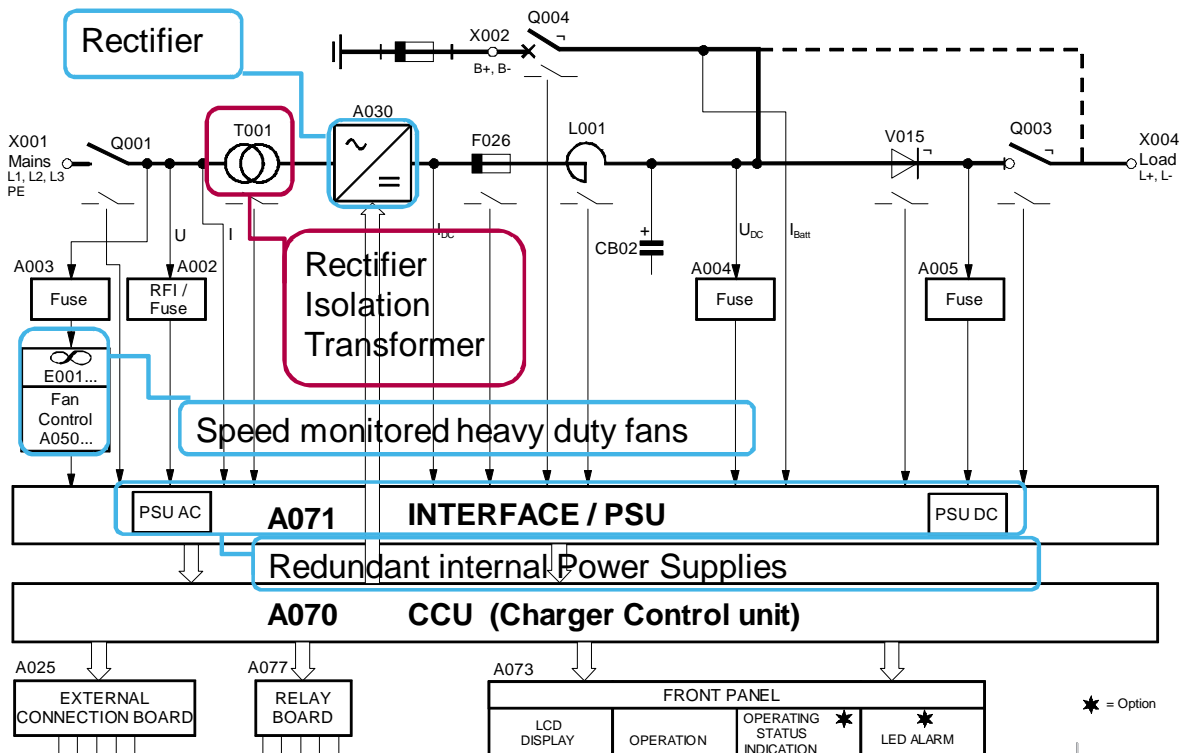
# AC-UPS Product Line

## DC Dual Independent UPS Configuration



# AC-UPS Product Line

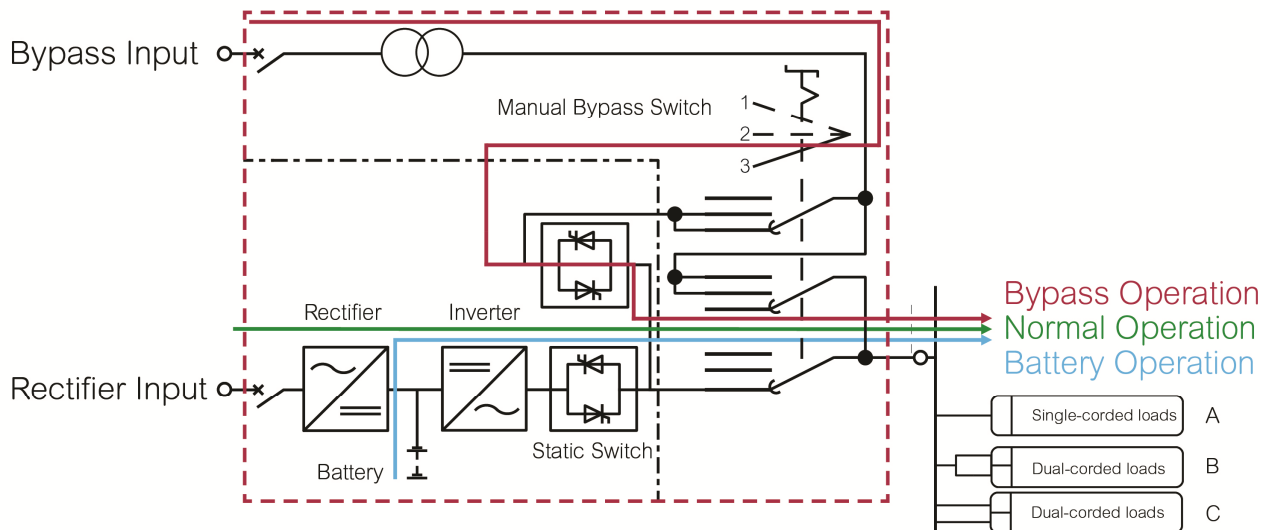
## DC detailed Single Line Wiring



# AC-UPS Product Line

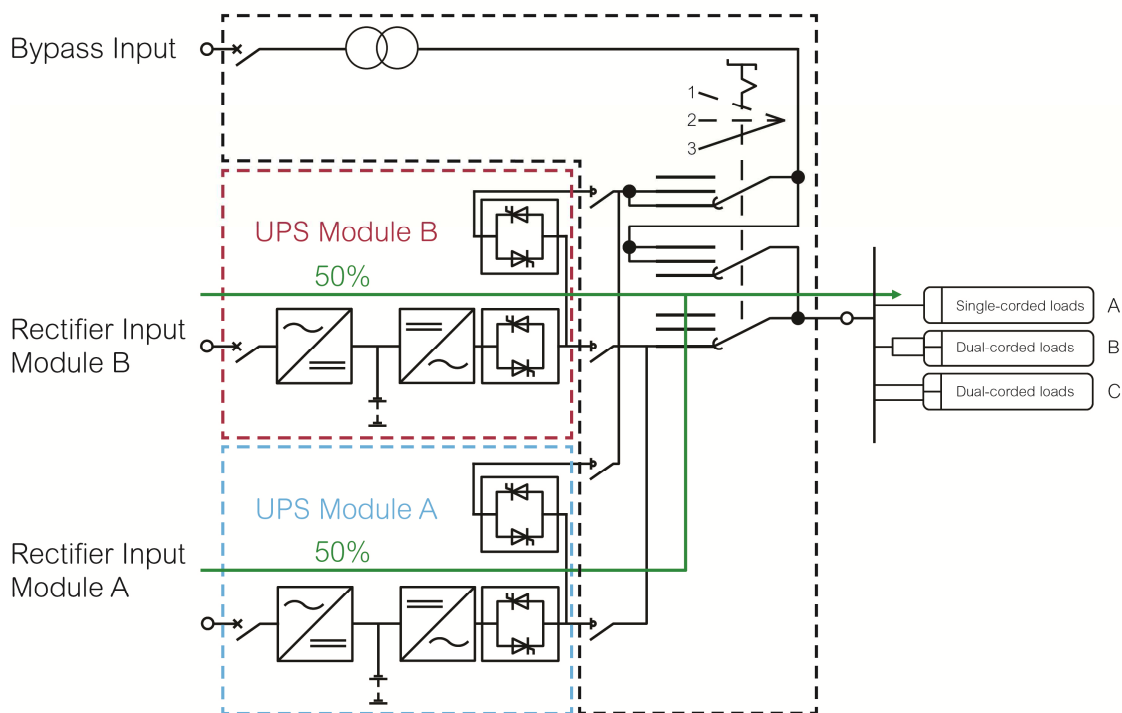
## AC Single UPS Configuration

Double Conversion UPS System with PWM Inverter



# AC-UPS Product Line

## AC Parallel Redundant UPS Configuration





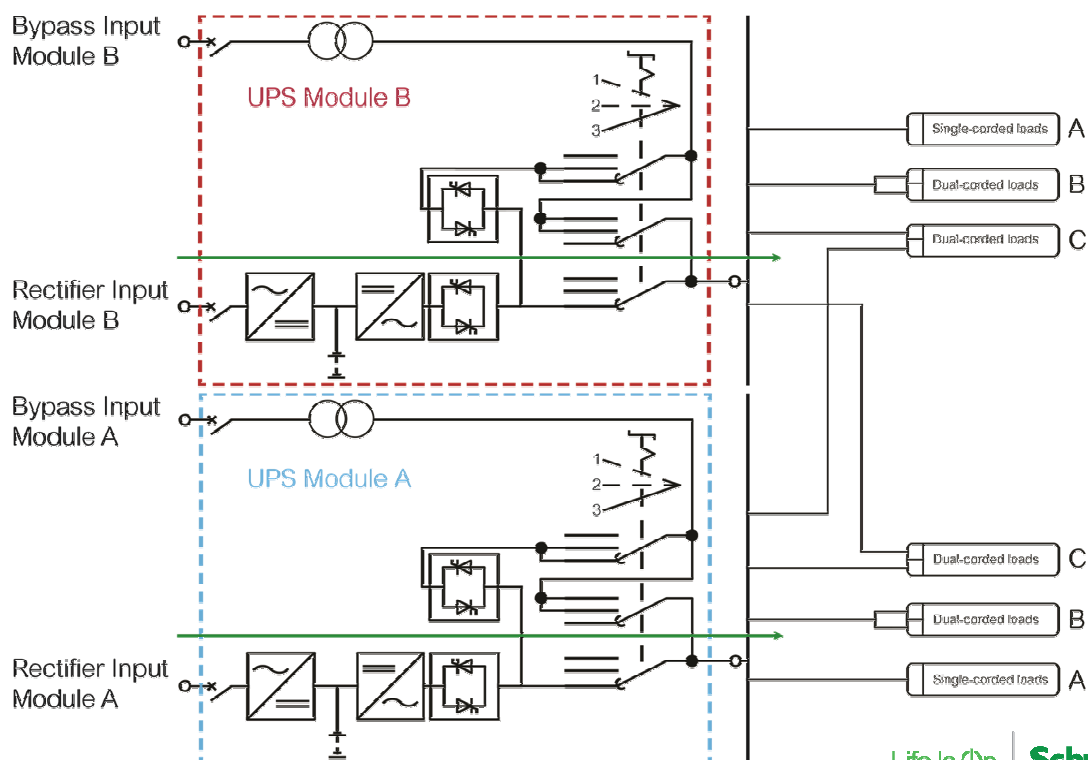
# AC-UPS Product Line

## Features & Benefits - Parallel / Redundant System

Features	Benefits
No master/slave system	All systems can work as masters. Possible to switch individual units OFF for service.
Bus system for communication	Two control cables between each unit
Priority control	The system will stay in the highest possible operational mode. The system will save battery capacity as long as enough energy can be taken from the mains.
Active load sharing	Each unit takes the same percentage of the actual load
Up to nine units can be switched in parallel	For redundancy or power increase
Masterlogic for parallel coordination	Disabling of parallel communication if one unit is disconnected / coupling switch open
Independent batteries for each unit	Avoids the danger of a single battery acting as a common failure point

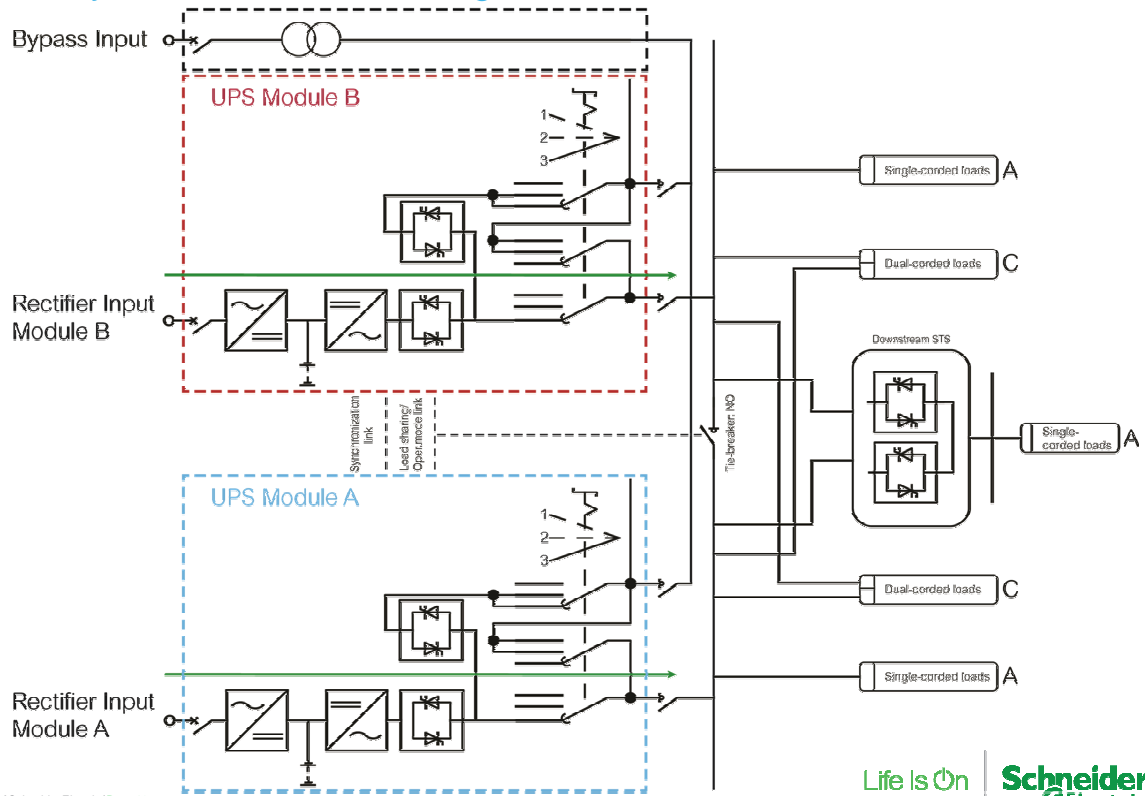
# AC-UPS Product Line

## AC Dual Independent UPS Configuration



# AC-UPS Product Line

## AC Dual Synchronized UPS Configuration

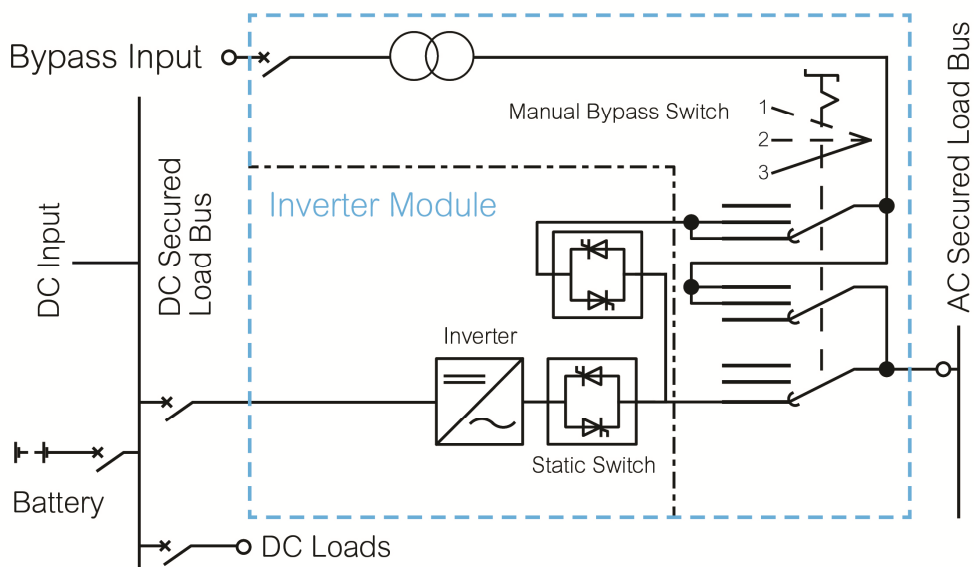


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# AC-UPS Product Line

## AC System with Stand-alone Inverter Configuration

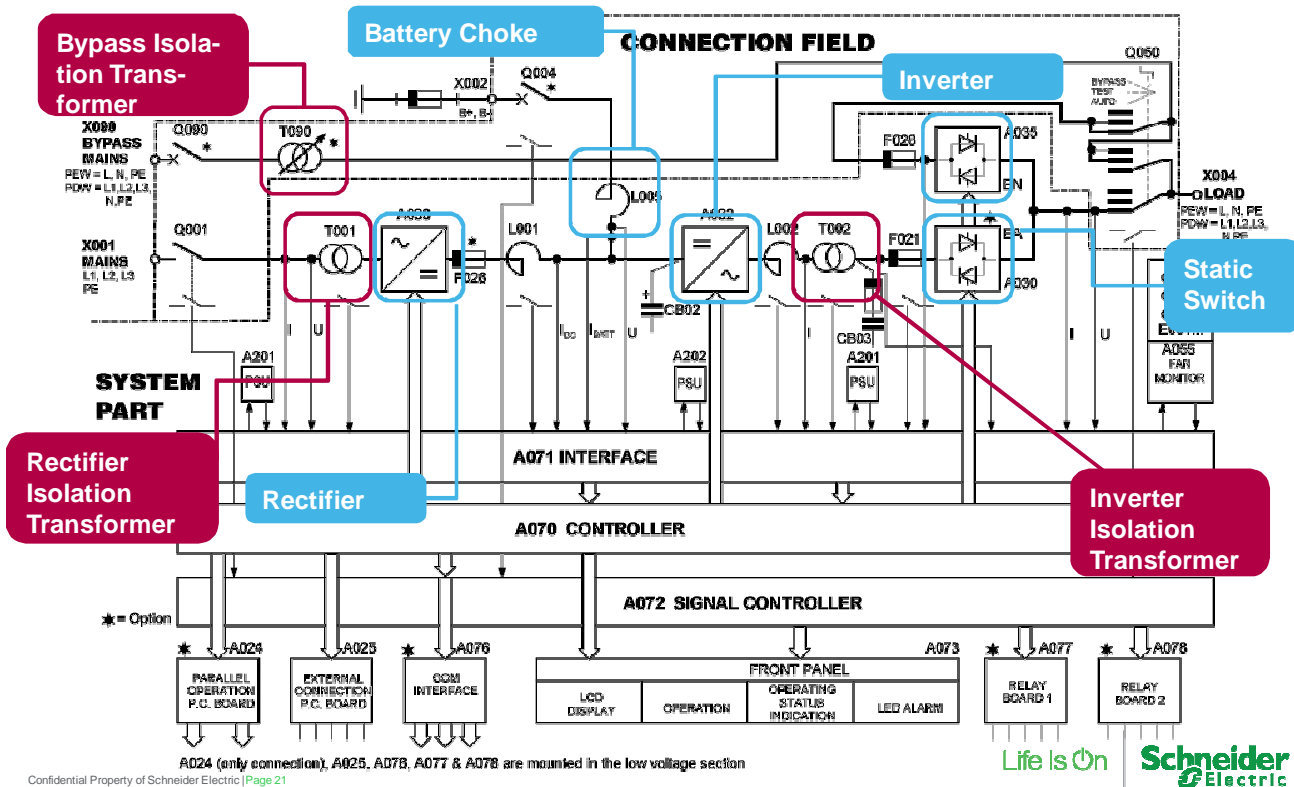


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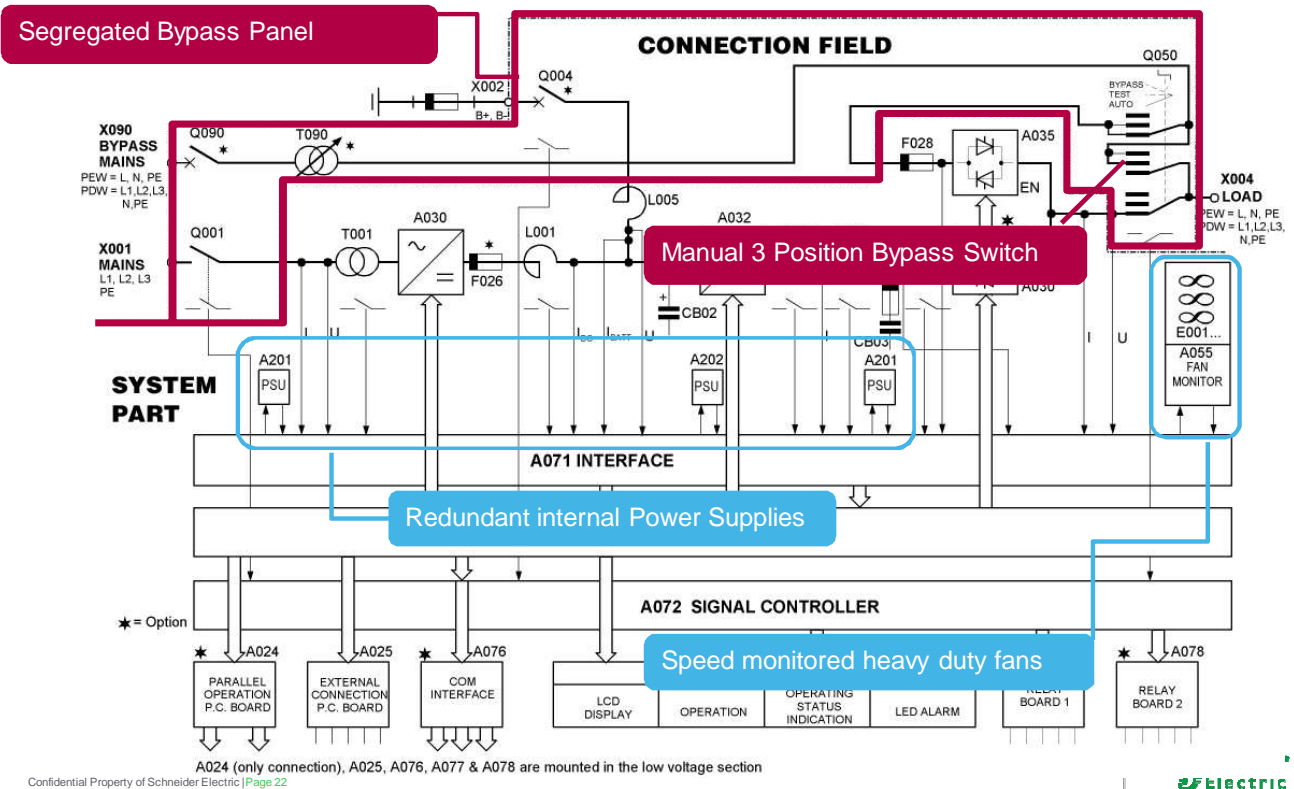
# AC-UPS Product Line

## AC detailed Single Line Wiring Diagram



# AC-UPS Product Line

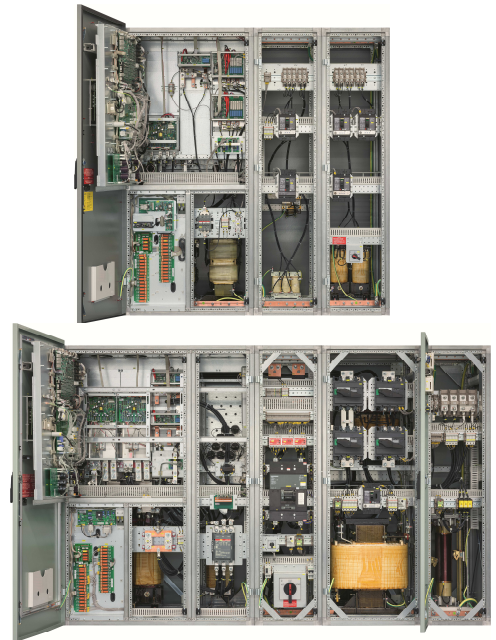
## AC detailed Single Line Wiring Diagram



# AC-UPS Product Line

## Constructional Details

- Control electronics on hinged panel
- Direct access to all power modules
- Individual component identification
- Fan replacement with system on
- Halogen free wiring and components
- Fully segregated manual bypass section
- Segregated incomer section



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Questions?

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