

Industrial UPS PL Series



Industrial Uninterruptible Power Supply (UPS) is a critical component in various sectors, designed to provide reliable backup power and ensure the continuity of operations during power outages or fluctuations.

Industrial UPS systems are engineered to handle high power demands and are often equipped with advanced features such as real-time monitoring, battery management, and scalability to meet the growing needs of an operation. By stabilizing power supply and protecting sensitive equipment from voltage spikes or drops, industrial UPS units play a vital role in maintaining operational efficiency and safeguarding critical processes.

Industrial UPS PL SERIES



Benefits

Strengthened reliability:

- Streamlined cooling design for airflow optimization.
- Reduced operation temperature of critical components.

Improved maintainability:

- "True" front access to all replaceable components to reduce MTTR.
- Simplified design of major subassemblies to allow complete replacement in minutes.
- Easier maintenance of paralleled systems thanks to unique Hannibal Smart Parallel Switching function.

Increased availability:

- Multiplied redundancy with Hannibal Smart Parallel Switching function that dynamically controls paralleled systems.
- built- in static and manual bypass switch and LCD display.
- Remote support from experts to efficiently update settings as required.

Industrial grade inverters:

- Industrial grade inverters are based on transformer technology for robustness and endurance. The output isolation transformer protects the semiconductors against peak currents and distortion, supplying short circuit currents and filtering noise. Transformer based technologies offer therefore a longer service life and higher degree of protection.

Range Overview

Hannibal is a system range based on SCR/IGBT technology with proven digital control. It is available from 2.5 to 250 kVA in single-phase output version and from 5 to 500 kVA in three-phase output version. It is configurable with a set of industrial options such as custom protection devices, bypass transformer and/or stabilizer, various communication solutions, etc. Designed as an industrial system, it includes most frequently specified features as default, for example dual cooling channel, input and output transformers, conformal coating of all printed circuit boards, halogenfree flame retardant internal cables. The architecture of the system allows the segregation of different pre-defined functions that help to increase personnel safety on site as well as improve overall system availability. As part of Hannibal solution, we offer the calculation and set up of a system with various industrial style batteries (VRLA, sealed, NiCd, Li-Ion, Sodium) as well as low-voltage.



Applications

- Oil and Gas industries, offshore and onshore.
- Refining and petrochemical plants.
- Power generation plants.
- Rail transport.
- Process industries.



PL industrial UPS advantage: —

- Output Power factor 0.8 / 0.9.
- Inverter bridge with IGBT technology.
- Output galvanic separation transformer.
- No DC component can be present on the output.
- Designed based on industry requirement.
- Fault tolerant in control and power.
- Best price / Performance ratio.
- Highest reliability.
- Possibility of customization.

Front panel LED Standard: —

- Operation.
- Battery operation.
- General Alarm.
- Inverter failure.
- DC Voltage High.
- DC Voltage Low.
- High Temperature.
- Bypass out of limits.
- Output out of limits.



The above illustrations show some examples of finished systems. As each system is customized to specification, the internal layout might be different for different units.



Technical Data

Input	
Rectifier Bridge Topology	- Thyristor 6 Pulses - Standard - Thyristor 12 Pulses- Optional - IGBT - Optional
Input Voltage -Single Phase	110/120/200/220/240/277 V
Input Voltage -Three Phase	208/220/240/380/400/415/480 V
Voltage tolerance	+/- 15 %
Frequency	50 Hz (60 Hz)
Efficiency	90%
Power Factor	0.8
THD	<30% for 6 pulses Rectifier - <12% for 12 Pulses version
Inrush current	$\leq 10 \times I_n^{(4)}$
Float Voltage	- 2.17-2.27 V/cell VRLA - 1.4-1.42 V/cell Ni cd
Boost Voltage	- 2.25-2.4 V/cell VRLA - 1.55-1.65 V/cell Ni cd
Ripple	<5% 1Ph <2% 3Ph
Battery	
Type	Lead acid or nickel cadmium, vented or recombination
Autonomy	From few minutes to several hours, on request
Battery current limitation	1- 0.1 C (lead-acid battery) 2- 0.2 C (nickel-cadmium battery)

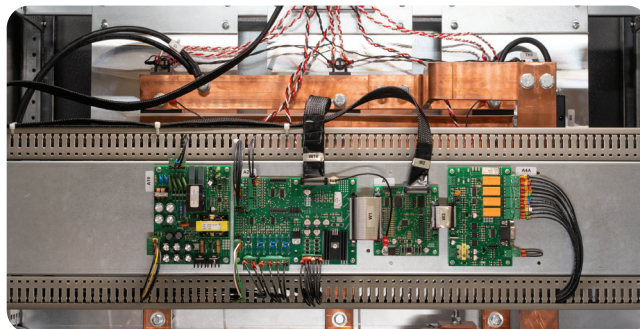
Output	
Inverter Bridge Topology	IGBT with output isolation Transformer
AC Voltage Single phase Three phase	1 x 230 V (220, 240) ; 1 x 110 V (115, 120) ⁽⁴⁾ 3 x 400 V (380, 415) ; 3 x 220 V (200, 208, 230) ⁽⁴⁾
AC Voltage Tolerance	1%
Frequency	50 Hz (60 Hz)
Frequency Tolerance	+/- 0.05 %
Inverter overload capability	
- 1 minute - 10 minutes	150 % of nominal power 125 % of nominal power
Short circuit clearance (in % of nominal current)	
- 1-ph output - 3-ph output Ph-N: - 3-ph output Ph-Ph:	250 % / 100ms - 175% / 5s 315 % / 100 ms - 220 % / 5s 190 % / 100 ms - 135 % / 5 s
Harmonic voltage distortion	
- With 100 % linear load - With 100 % non-linear load	<3 % <5%
Power Factor	0.8
Efficiency	90%
Allowable crest factor	up to 3/1
Static Transfer Switch	SCR Type
Static Bypass transfer Time	<4 ms
Maintenance Bypass switch	Isolator

General Data

Title	
Rectifier Bridge Topology	- Thyristor 6 Pulses - Standard - Thyristor 12 Pulses- Optional - IGBT - Optional
Operating temperature	0 to 40° C ⁽⁴⁾
Storage temperature	< 95 % non condensing
Operating altitude	1000 m max without derating ⁽⁴⁾
Cooling	Fan Forced, free cooling -Optional
MTBF	<150,000 h
External protection	IP 20 ⁽⁴⁾ according to IEC 60529
Internal protection	Protection against unintentional direct contacts as per IEC 60950-1/62477-1
Noise (at 1m in front of the unit)	60 – 75 dB according to rating
Cabinet colour	RAL 7035 ⁽⁴⁾
Touch Panel " HMI"	Standard
Communication	- RTU RS485-Standard - TCP/ IP - Optional
Conformity	
Low voltage directive	2006/95/EC and 2014/35/EU
EMC directive	2004/108/EC and 2014/30/EU
CE Mark	

Standards

Standards	
IEC62040-1:2017	Uninterruptible power systems (UPS) - Part 1: Safety requirements
IEC62040-2:2016	Uninterruptible power systems (UPS) – Part 2: Electromagnetic compatibility (EMC) requirements
IEC62040-3:2011	Uninterruptible power systems (UPS) - Part 3: Method of specifying the performance and test requirements
IEC61439-1:2011	Low voltage switchgear and controlgear assemblies - Part 1: General rules
IEC60529:1989 +AMD1:1999	Degrees of protection provided by enclosures (IP Code)
IEC60076-11:2004	Power transformers – Part 11: Dry type transformers



- 3-ph output only
(1) at power factor 0.8 lagging
(2) 1-ph output only

(3) Up to 250 kVA 1-ph output or up to 500kVA 3-ph output on request

(4) other available on request
(5) derating may apply

Options

Consult us for any other requirements, subject to feasibility

Rectifier charger

- . 12-pulse rectifier
- . IGBT Rectifier
- . Harmonic filter on 12P for THDi $\approx 5\%$ (+/- 1pt)
- . Other input voltage (3 x 190 to 3 x 690 VAC)
- . Surge and/or lightning protections
- . Rectifier output switch

Battery line

- . Battery reversed polarity detection
- . Battery low-voltage disconnection
- . DC earth fault detection
- . Battery black start
- . Battery room temperature sensor
- . Battery cabinet / rack

System

- . Dual distributed parallel configuration with one or two reserve lines
- . Input / output isolators
- . AC distribution
- . AC earth fault detection or monitoring
- . Internal cabinet lighting
- . Anti-condensation heater
- . UPS cabinet temperature monitor

Bypass line

- . Bypass isolator(s)
- . Bypass transformer (H class)
- . Bypass stabilizer (servo-controlled)
- . Backfeed protection
- . Surge and/or lightning protections

Communication

- . Front panel analogue meters (72x72, class 1.5)
- . Transducers 4-20mA
- . Additional volt-free contacts
- . Modbus / TCP
- . IEC61850 protocol
- . monitoring software
- . Mimic panel:
 - Passive mimic of the system
 - Active mimic with integrated LEDs Lamp indicator on front panel (22 mm diameter)

Mechanical

- . External ingress protection up to IP42
- . Top cable entry
- . Specified color of panels
- . Special feet height (200mm or 300mm)
- . Special keylock
- . Non-magnetic gland plate (brass or aluminum)
- . Specified cabinet identification (tag, nameplate)

