AEC

MODULAR ONLINE UPS · DOUBLE CONVERSION

IST6

120 kVA

Start with one 30 kVA power module, grow to 120 kVA in the same cabinet, and add a fifth module in the redundancy slot for N+1. Every power module is hot-swappable from the front.





30 kVA POWER MODULE · 2U · HOT-SWAP

30→120
kVA in 30 kVA steps, in one cabinet

N+1
fifth slot reserved for a redundant module

97%
efficiency in double conversion, 30 kVA module

Hot-swap
Modular technology: power modules replaced online

WHY IST6

Key features
IST6 30–120 kVA

Efficiency, flexibility and continuity in one cabinet, 600 mm wide.

30→120

Pay as you grow

Buy the power you need today. Add 30 kVA modules in the same cabinet when the load grows, with no new footprint.

N+1

Redundancy built in

Room for one module more than the load needs, backed by a centralised, removable bypass module.

Hot-swap

Service without shutdown

Power modules slide in and out from the front while the UPS keeps running: no shutdown for service.

ECO

Efficiency that pays back

ECO mode and redundancy sleep cut losses at light load, both set from the screen. See the operating cost below.

Lead · Li

Battery choice

Lead-acid or lithium with the BMS card; in a parallel system one battery group can be shared.

7"

Easy to run

Colour touch screen with live power-flow topology, module-by-module data and 10,000 event records.

OPERATING COST

What efficiency means at 96 kW

Losses become heat: you pay for them at the meter and again in the room cooling.

		ENERGY LOST / YEAR	COST / YEAR
Online double conversion · 97 %	2.97 kW	26,010 kWh	≈ € 5,200
ECO mode · 99 %	0.97 kW	8,490 kWh	≈ € 1,700

IST6 120 kVA at 80% load (96 kW), 8,760 h/year, € 0.20/kWh, cooling excluded; 97% in double conversion, 99% in ECO mode. Losses = P × (1/η − 1). Indicative values.

DESIGNED FOR

Data centres · Telecom · Banking & finance · Networks & IT rooms · Transport · Public buildings

SCALABILITY

Scalability
IST6 30–120 kVA

The cabinet is the same from the first module to the last: power is added by sliding a 30 kVA module into a free slot.





Add 30 kVA power modules (2U) in the free slots of the same cabinet. Left: IST6-120 with the door open, modules slide in from the front.

Redundancy N+1

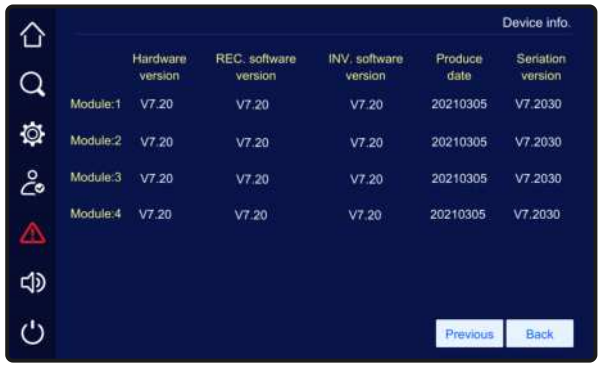
Install one module more than the load needs: if a module stops, the others carry the load without transfer to bypass.

Load up to	Modules (N)	Modules for N+1
30 kVA	1	2
60 kVA	2	3
90 kVA	3	4
120 kVA	4	4 + redundancy slot

The fifth slot, at the top, is the redundancy slot.

Every module identified

Slots are numbered 1 to 5 from bottom to top. Device info lists each installed power module with its hardware and software versions.



Device info page with four power modules installed.

CODE
IST6-120
Modular cabinet for up to 4 × 30 kVA power modules, supplied without modules.

CODE
IST6-30-J
30 kVA / 30 kW power module, 2U, hot-swappable. Order as many as the load needs.

CODE
PAR - IST6
Parallel kit for cabinets in parallel.

SCALE AND SLEEP

Load-based module management
IST6 30–120 kVA

Add 30 kVA modules or whole cabinets as the site grows; set redundancy and redundancy sleep from the screen.

30 kVA

Step size

One 2U module at a time, added online in a free slot.

Cycle · h

Sleep cycle period

Spare modules sleep in rotation; the cycle period is set in hours on the smart mode page.

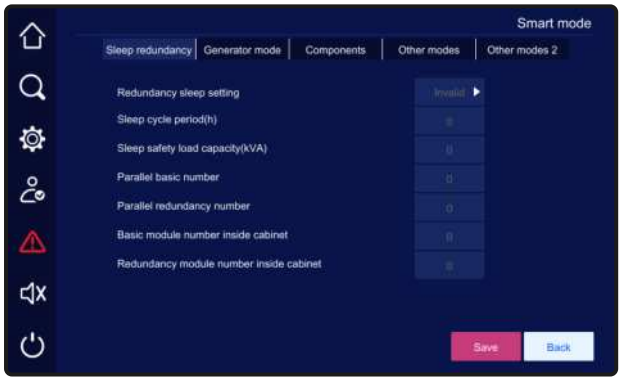
N+X

Two redundancy levels

Basic and redundant modules per cabinet and cabinets per system.

Redundancy sleep

Smart mode › Sleep redundancy: spare modules can sleep at light load, with a sleep cycle period and a sleep safety load capacity set on screen. An alarm warns if the load exceeds the safety load.

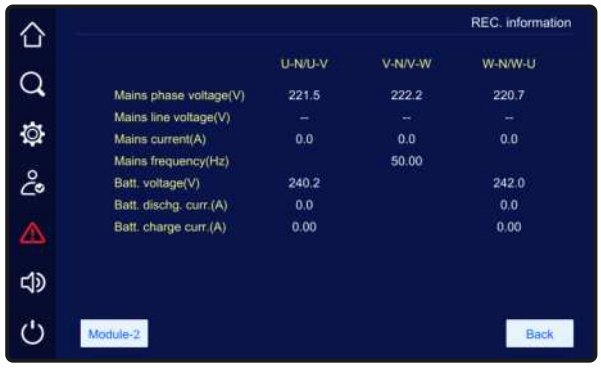


Settings: redundancy sleep on / off, sleep cycle period (h), sleep safety load capacity (kVA), basic and redundant cabinets, basic and redundant modules inside the cabinet.

Checked on screen

Run information shows the parameter match between cabinets and the state of both system cards; module data is shown module by module.





ALARMS

Redundancy watched

Dedicated alarms, shown on the screen:

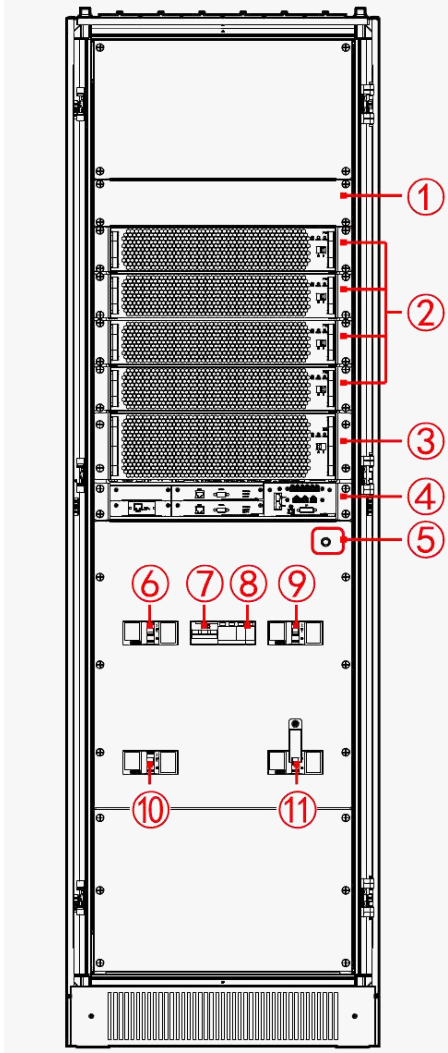
- Cabinet with no redundancy
- Cabinet redundancy insufficient
- System card with no redundancy
- Power module 1 … 5 offline

INSIDE THE CABINET

Cabinet layout
IST6 30–120 kVA



DOOR CLOSED



STRUCTURE LAYOUT · USER MANUAL FIG. 2-5

1. **Redundancy slot**
   Space for the N+1 module.
2. **Power modules 1–4**
   30 kVA each, 2U, hot-swap.
3. **Bypass module**
   Centralised static bypass, 3U, removable.
4. **System control box**
   Two control cards, monitor card, SNMP and expansion slots.
5. **Battery cold start**
6. **Mains switch**
7. **Surge protection switch**
   Optional.
8. **SPD**
   Optional surge protection device.
9. **Output switch**
10. **Bypass switch**
11. **Maintenance bypass switch**
    Manual bypass with no switching time.

POWER MODULE

30 kVA · 2U

86 × 500 × 700 mm (H × W × D, with handles), 24 kg. Rectifier, inverter and battery converter in each module.

BYPASS MODULE

Centralised · 3U

130 × 500 × 635.5 mm, 17 kg. Static bypass for the whole cabinet, with its own ready switch.

CABINET

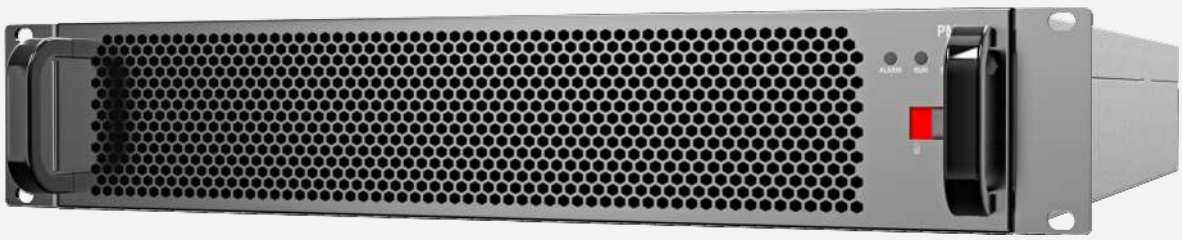
600 × 860 × 2000 mm

Four switches as standard (mains, bypass, output, maintenance bypass); SPD optional. IP20.

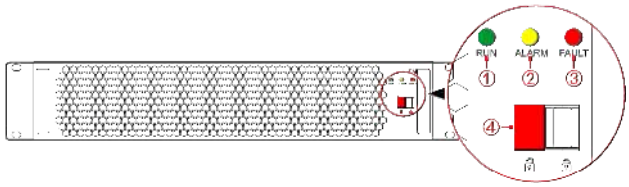
HOT-SWAP

Hot-swap modules
IST6 30–120 kVA

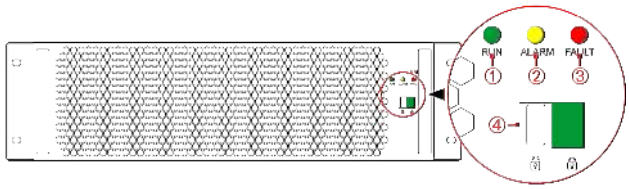
Every power module has a ready switch and three status LEDs: power modules are replaced without shutting down the UPS.



30 kVA power module, front: ventilation grille, RUN / ALARM / FAULT LEDs, ready switch and handles.



Power module, Fig. 2-6: ① RUN ② ALARM ③ FAULT ④ ready switch



Bypass module, Fig. 2-7: same LEDs and ready switch

LED

RUN · ALARM · FAULT

Green: inverter on (flashing: standby). Yellow: input voltage, fan or overload alarm. Red: module fault.

SELF-PROTECTION

A faulty module steps aside

A faulty power module is isolated automatically; normally the system continues on the other modules, with reduced redundancy.

DESIGN

No master, no slave

Modules share the load equally under digital control: any module can be removed or added online.

0

UPS shutdowns to add or replace a power module

Unlock · Lock

ready switch: green, the module can be removed; red, it is locked in

≧ 10 min

wait after removal before opening a module

Replacement by AEC or authorised personnel.

SMART ENERGY

Energy-saving functions
IST6 30–120 kVA

ECO mode

The load runs on the bypass while it is within the set window; outside it, the inverter takes over. Efficiency up to 99%.

Fans follow the load

Fan speed follows the load to extend fan life and reduce noise.



Output set page: bypass range and ECO window, set from the screen.

GENERATOR

Generator mode

Battery charging can be disabled while the UPS runs on generator; the generator is started before the UPS.

BYPASS RANGE

Bypass window on screen

Maximum and minimum bypass voltage and the bypass frequency range are set in Output set (example screen: +10%, −10%, ±10%).

Smart settings from the screen

Page	Setting	What it does
Smart mode	Redundancy sleep · cycle period · safety load	Sleep function for redundant modules
Output set	ECO voltage and frequency range	Window in which the load stays on bypass
Output set	Timing ECO	ECO mode by schedule
Dry contact	Start generator · mains abnormal	Generator start and status signals
Home page	Grid-tied aging	Load test state for commissioning, with its own alarms (self-load switch, time-out)

±5% / ±4%
ECO voltage / frequency window (example screen)

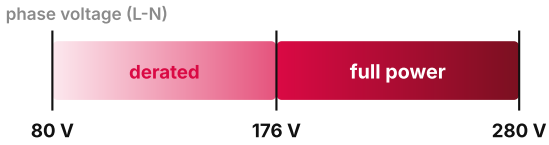
Dedusting
fan dedusting alarm on the screen

PERFORMANCE

Input and output performance
IST6 30–120 kVA

Wide input window

Full power from 176 to 280 V phase voltage; down to 80 V the UPS keeps working from the mains with derated power.



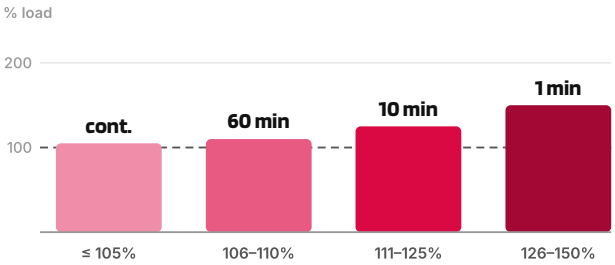
Frequency 40–70 Hz. Linear load: rated power decreases below 176 V, down to 80 V.

Output quality

Voltage	**220 / 230 / 240 V L-N · 380 / 400 / 415 V L-L**
THDv	**≤ 1% linear · ≤ 4% non-linear**
Phase error	**≤ 1° balanced load**
Frequency, no mains	**50 / 60 Hz ± 0.2%**
Load step 0↔100%	**voltage change < 5%**
Unbalanced load	**100%**
Transfer	**0 ms synchronised · < 15 ms not synchronised**

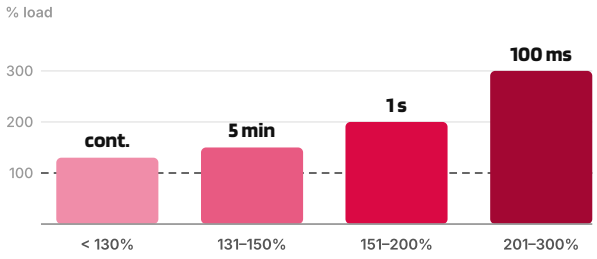
Overload capacity

Inverter · linear load, PF 1

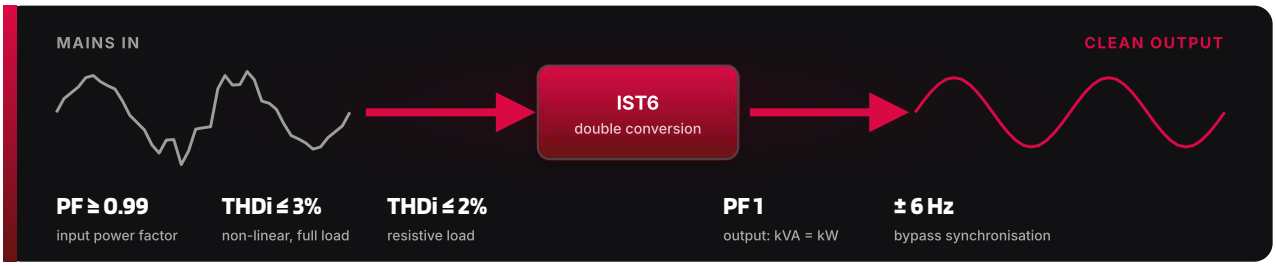


Above 151%: transfer to bypass at once. PF 0.9: 106–110% 60 min, above 110% to bypass at once; PF 0.8: above 105% to bypass.

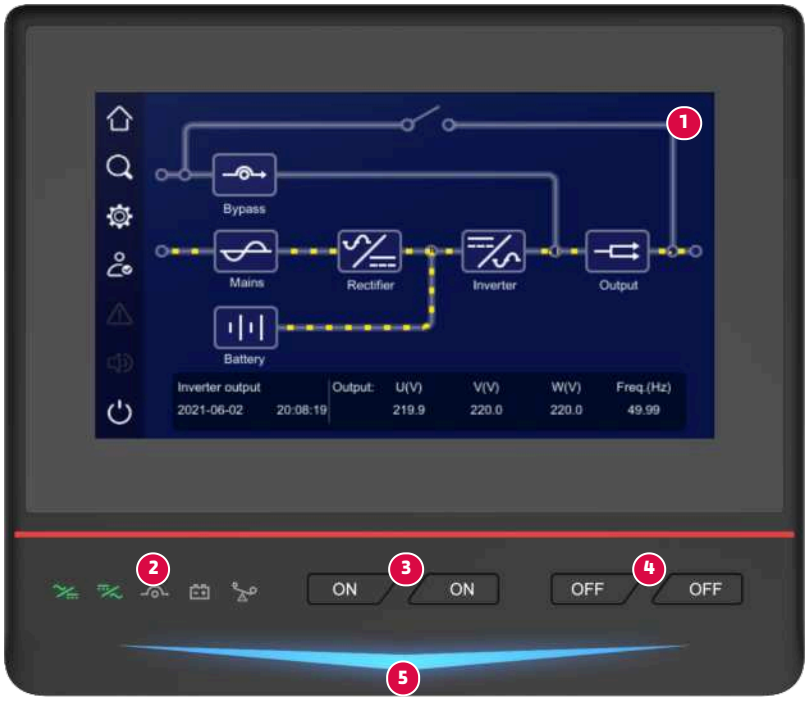
Bypass



Above 300%: immediate protection.



Operator panel
IST6 30–120 kVA



1. **Colour touch screen**
   Seven inches: live power flow, measurements, settings and records.
2. **Five status LEDs**
   AC/DC, DC/AC, bypass, battery, load: green when normal or active, red when abnormal.
3. **ON keys**
   Press both keys for 3 s to power on: no accidental switching.
4. **OFF keys**
   Press both keys for 3 s to power off.
5. **Status light bar**
   Shows the UPS state in colour, also from across the room.

Status light bar

Four states, one colour each: the operator knows how the UPS is doing before reaching the screen. Alarms also light the yellow or red ambient lamp.



Blue
Normal operation



Blue, flashing
Battery mode



Yellow
Abnormal, UPS still running



Red
Abnormal, UPS stopped

Status LEDs

LED	Green	Red
AC/DC	Rectifier normal	Rectifier abnormal
DC/AC	Inverter normal	Inverter abnormal
Bypass	Bypass output	Bypass abnormal
Battery	Battery output	Battery low voltage
Load	Output normal	Output overload

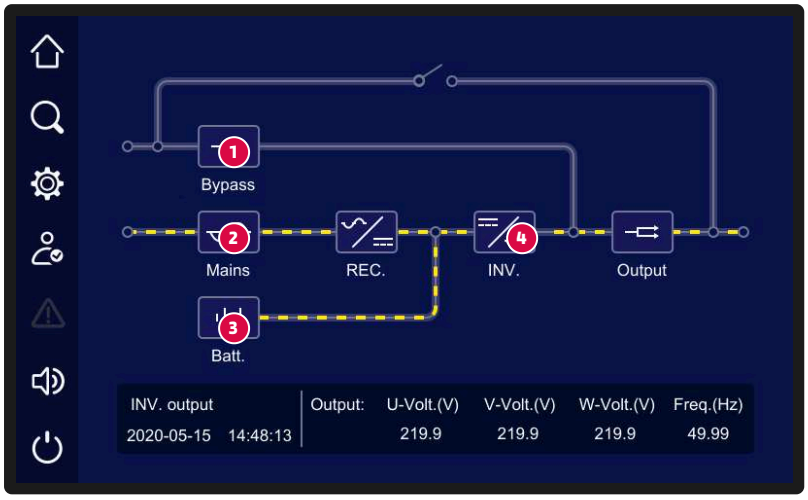
Screen settings



- Date and time
- Backlight time
- Language
- Brightness

TOUCH SCREEN

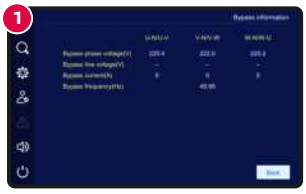
Touch screen display
IST6 30–120 kVA



Live single-line diagram

The home page draws the UPS as it runs: yellow dots trace the active power path, abnormal blocks turn red, and the bottom line shows output voltage and frequency.

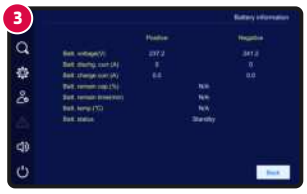
Touch a block (bypass, mains, battery, rectifier, inverter, output) to open its page.



Bypass info
Phase and line voltage, current and frequency of the bypass input.



Mains info
Phase and line voltage, current, frequency and input energy.



Battery info
Voltage, charge and discharge current, remaining capacity and time, temperature, state.



Inverter info
Output voltage, current, power and load of each module.

Menus



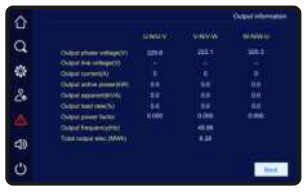
Information menu
Run info, history record, user log, smart record, device info, smart wave record.



Settings menu
Cabinet, battery, battery test, output, smart mode, dry contact, HMI, password, communication, records.



Run information
System info, parameter match, system status, system cards 1 and 2.



Output info
Voltage, current, active and apparent power, load, PF, frequency and output energy.

Settings pages



Cabinet set
System voltage and frequency, output PF.



Battery set
Type, capacity, cells, common battery, BMS.

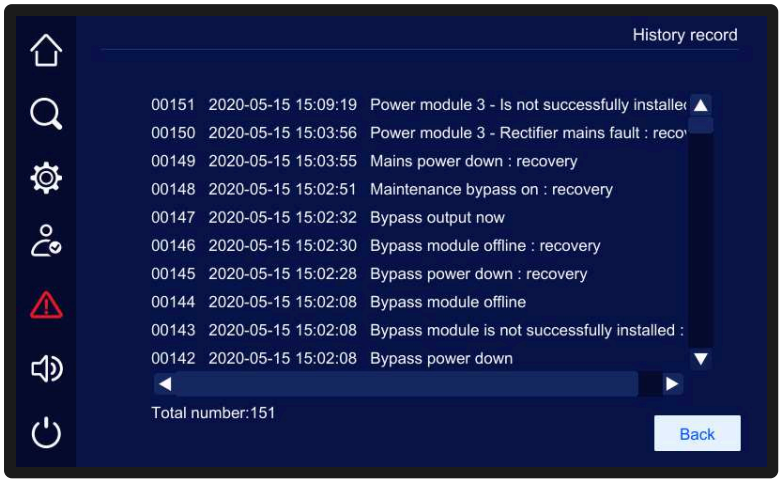


Battery parameters
Cell voltages, charge current, test time.



Dry contact
Inputs 1–7, each assigned to a function.

Event records
IST6 30–120 kVA



10,000

records in the history, newest first. When the record is full, the earliest entry is overwritten.

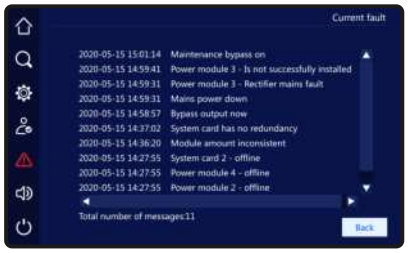
MWh

total input and output energy on the information pages.



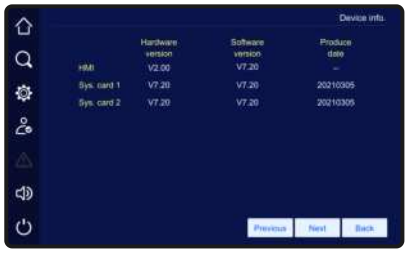
Run information

Parameter match between cabinets and state of both system cards.



Current fault

Active faults, time-stamped, from the alarm icon of the menu bar.



Device info

Hardware and software versions of screen and system cards.



Record management

History record, user log, smart record and smart wave record are kept in the UPS and saved or cleared from the record manage page.

- User log: parameter changes with date and time
- Smart wave record: waveforms of abnormal events



Battery test



Communication set

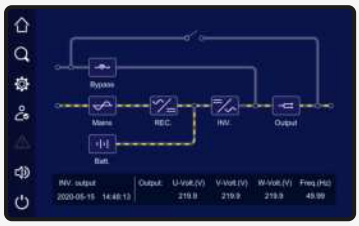


HMI set

OPERATION

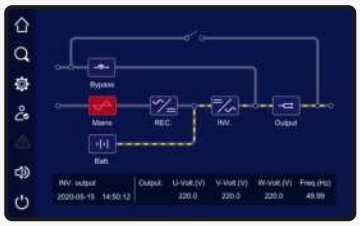
Operating modes
IST6 30–120 kVA

Real screens of the IST6: the yellow dotted line traces the active power path.



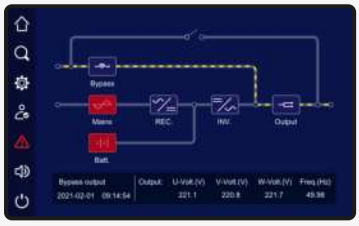
Mains inverter

Normal operation: mains → rectifier → inverter → load, battery charging.



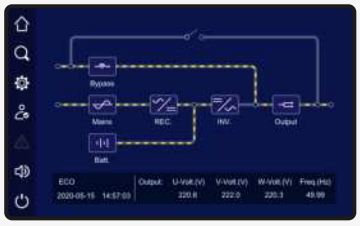
Battery inverter

Mains abnormal: the battery feeds the inverter with no break.



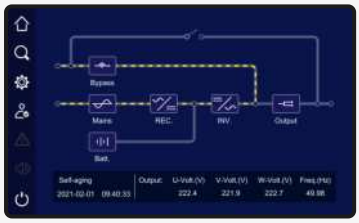
Bypass

Load on the bypass module, e.g. on overload or inverter fault.



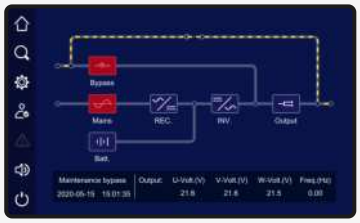
ECO

Load on the bypass within the ECO window; the rectifier keeps the battery charged.



Grid-tied aging

Test state shown live, with its own alarms.



Maintenance bypass

Load on the manual bypass, modules ready for service.

Transfers

No break
mains → battery: the modules move to the battery input

0 ms
inverter ↔ bypass, synchronised

< 15 ms
inverter ↔ bypass, not synchronised

Converter
inverter output in frequency-converter mode

Start from battery

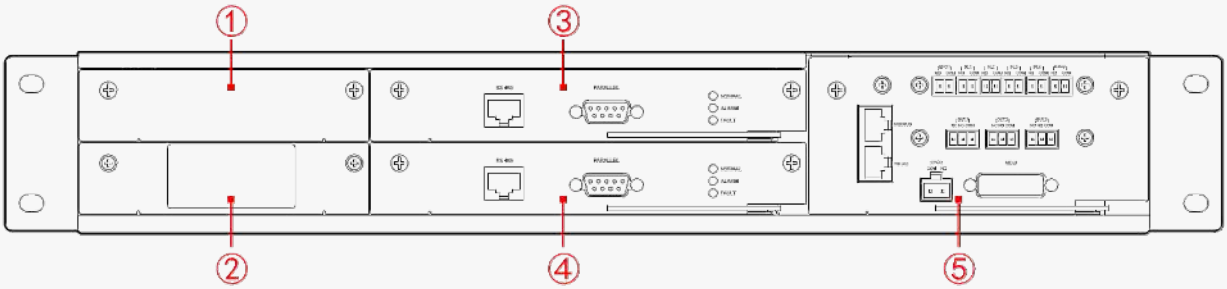
With no mains and no bypass, the battery cold start button starts the UPS from the battery.

Mains outside range

The UPS starts from the mains between 80 and 280 V; outside this range it starts from the battery.

DID YOU KNOW?
After an output short circuit, the IST6 tries to restart up to three times; only then does it stay in fault protection.

Communication and connectivity
IST6 30–120 kVA



System control box, user manual Fig. 2-8: ① expansion card position (optional) ② SNMP card position (optional) ③ control card 1 ④ control card 2 ⑤ system monitor card.

4 inputs (NO) · standard

Each assigned from the screen:

- Battery abnormal
- Battery grounding fault
- Battery switch disconnected
- Bypass switch disconnected
- Mains abnormal (generator start)
- Input SPD abnormal

3 outputs (NO / NC) · standard

Each assigned from the screen:

- Inverter output
- Bypass output
- Battery output
- Battery trip
- Battery under-voltage alarm
- Battery under-voltage protection
- Output overload
- UPS fault
- Bypass abnormal
- Mains abnormal
- Start generator

STANDARD

Modbus

RJ45 port on the monitor card for building management (station number, baud rate from the screen).

STANDARD

RS232 · RS485

RS232 for an external SNMP card; RS485 links the displays of a parallel system.

STANDARD

EPO

EPO1 normally open and EPO2 normally closed inputs.

STANDARD

Battery temperature

B-Temp input for the optional battery temperature sensor.

Options



SNMP card
network; T/H sensor port



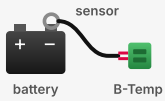
Dry contact expansion
+3 inputs, +2 outputs



BMS expansion card
BMS port, charge / discharge disable



Class C SPD
with surge protection switch



Battery temperature
sensor for charge compensation



Battery tripper
24 V DC trip for the DC breaker

4 + 3
dry-contact inputs + outputs, standard

7 + 5
with the expansion card

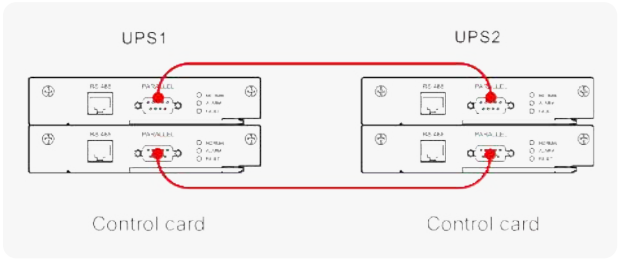
Modbus
RS232 · RS485 · SNMP

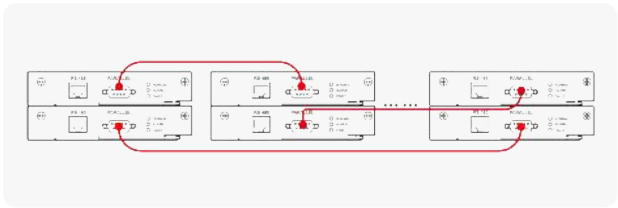
2
EPO inputs (NO and NC)

Parallel and dual-bus systems
IST6 30–120 kVA

Cabinets in parallel

Parallel cables connect the control cards in a ring: N UPS need N cables, at least two per UPS, which improves parallel reliability.





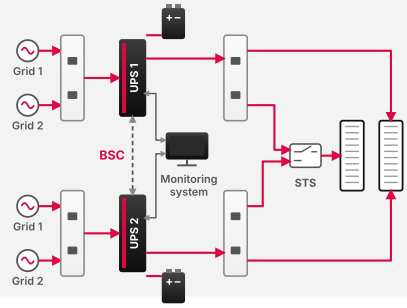
Parallel ports, user manual Fig. 2-21 / 2-22.

Dual bus with BSC

Two independent systems feed dual-input loads; the BSC keeps their outputs synchronised in frequency and phase.

BSC output

The synchronous BSC output of the dual bus control is used in a dual bus system to synchronise the outputs of the two buses in frequency and phase, so that the loads can switch between them.



BATTERY

Common battery group

All cabinets can share one battery group; the UPS checks that battery parameters match.

SAFETY

EPO linkage

With EPO linkage enabled, the EPO of any cabinet stops the whole system; disabled, it stops only that cabinet. The system EPO always stops all cabinets.

INPUTS

Separate mains and bypass

Mains and bypass can come from different sources: the link bars are removed at installation.

Parallel commissioning

< 5 V
phase-voltage difference between UPS before paralleling

± 2 V · ± 0.1 Hz
output of each UPS against its setting

Same
wiring and phase sequence on every cabinet

Ring
parallel cable topology

BSC
dual bus synchronisation

1
shared battery group possible

RS485
one display monitors all UPS

TECHNICAL DATA

IST6 120 kVA

Model	IST6-120 with IST6-30-J power modules
Rated power	30 to 120 kVA / kW in 30 kVA steps (1–4 modules) + 1 redundancy slot
Topology	online double conversion, modular, hot-swap power modules, removable bypass module
INPUT	
Connection · voltage	3 ph + N + PE · 220 / 230 / 240 V L-N
Voltage range	176–280 V full power · 80–176 V derated (linear load)
Frequency · power factor · THDi	40–70 Hz · ≥ 0.99 · ≤ 2% resistive, ≤ 3% non-linear full load
Bypass	220 / 230 / 240 V L-N; synchronisation 50 / 60 Hz ± 6 Hz
BATTERY	
Voltage · blocks	+168 … +276 V DC · ±14 … ±23 × 12 V (default ±16; below ±16 load 80%)
Charging current	10 A × number of modules (max.)
Functions	cold start · standard / deep test · common battery · lithium with BMS card
OUTPUT	
Connection · voltage	3 ph + N + PE · 220 / 230 / 240 V L-N, 380 / 400 / 415 V L-L
Power factor · THDv	1 · ≤ 1% linear, ≤ 4% non-linear
Frequency · phase error	tracks the bypass; 50 / 60 Hz ± 0.2% without mains · ≤ 1° (balanced load)
Transfer · dynamic response	0 ms synchronised, < 15 ms not synchronised · < 5% for 0↔100% step
Inverter overload (PF 1)	≤ 105% continuous · 106–110% 60 min · 111–125% 10 min · 126–150% 1 min · > 151% to bypass
Bypass overload	< 130% continuous · 131–150% 5 min · 151–200% 1 s · 201–300% 100 ms
Unbalanced load	100%
SYSTEM	
Efficiency	97% double conversion · up to 99% ECO
Display · records	7" colour touch screen · 10,000 events · 5 LEDs · EPO button
Communication	Modbus · RS232 · RS485 · 4 dry-contact inputs, 3 outputs · options: SNMP, dry-contact expansion, BMS card
Parallel	with parallel kit, ring cables; BSC dual bus
Environment	−5 … 40 °C · 0–95% RH · ≤ 2000 m · IP20 · < 65 dB · EMC class C3
Dimensions W × D × H	600 × 860 × 2000 mm · cable entry bottom (top with accessory)
Weight	cabinet without modules 180 kg · power module 24 kg · bypass module 17 kg

Data from the IST6 120 kVA user manual. Specifications are subject to change without notice.

Ordering codes

Code	Description
IST6-120	Modular cabinet, max. 4 × 30 kVA power modules, supplied without modules
IST6-30-J	30 kVA / 30 kW power module
PAR - IST6	Parallel kit