ONLINE UPS · DOUBLE CONVERSION

IST7

60–200 kVA

Three-phase online UPS with three-level inverter, digital DSP control and unity output power factor. Two cabinet sizes cover 60 to 200 kVA; selected models are upgraded on site from the touch screen.



IST7-60…120 · IST7-160…200

96.5%
AC/AC efficiency (peak) in double conversion · 99% in ECO mode

PF 1
Output power factor: kVA = kW

Touch screen
Colour display for status, records and settings

≤3%
Input current THDi at full load, input PF ≥ 0.99

WHY IST7

Key features
IST7 60–200 kVA

Each figure is taken from the IST7 user manual; next to it, what it means on site.

96.5%

Efficiency that lowers losses

Peak AC/AC efficiency in online double conversion; up to 99% in ECO mode, with automatic return to the inverter when the bypass leaves tolerance.

kVA = kW

Full rating as active power

Unity output power factor: a 120 kVA unit delivers 120 kW. Output PF can also be set to 0.9.

80 → 120

Power that follows the load

IST7-80 is upgraded to 100 or 120 kVA, IST7-100 to 120 kVA, IST7-160 to 200 kVA, by setting the capacity from the display. Same hardware, same footprint.

0.38 m²

Up to 120 kVA in 400 mm

The 60–120 kVA cabinet stands on 400 × 960 mm of floor; IST7-160 and IST7-200 need 600 × 1000 mm.

300%

A bypass that clears faults

The static bypass carries 300% for 100 ms and 200% for 1 s, so inrush and fault-clearing currents downstream are handled.

100%

Unbalanced load accepted

The three output phases accept a 100% unbalanced load, with an output phase error of no more than 1°.

OPERATING COST

What efficiency means at 100 kW

Losses are the energy the UPS turns into heat: you pay for it once at the meter and again in the room cooling.

		ENERGY LOST / YEAR	COST / YEAR
Online double conversion · 96.5 %	3.6 kW	31,800 kWh	≈ € 6,350
ECO mode · 99 %	1.0 kW	8,850 kWh	≈ € 1,770

100 kW load, 24/7 operation, € 0.20/kWh, calculated at peak efficiency. Losses = P × (1/η − 1). Indicative values.

DESIGNED FOR

- Network & IT rooms
- Telecommunications
- Finance & insurance
- Transport
- Energy & industry
- Public sector & education

ARCHITECTURE

Cabinet layout
IST7 60–200 kVA



160–200 kVA · 2 power units



60–120 kVA · 1 power unit

1 Power unit
PFC rectifier, three-level inverter and battery booster in one unit, with RUN / ALARM / FAULT LEDs and a limit switch that puts the unit in or out of service.

2 Bypass and control unit
Static bypass, system control card, communication ports and the battery cold-start button.

3 Switchgear
Mains input, bypass input and output switches, accessible behind the lockable door.

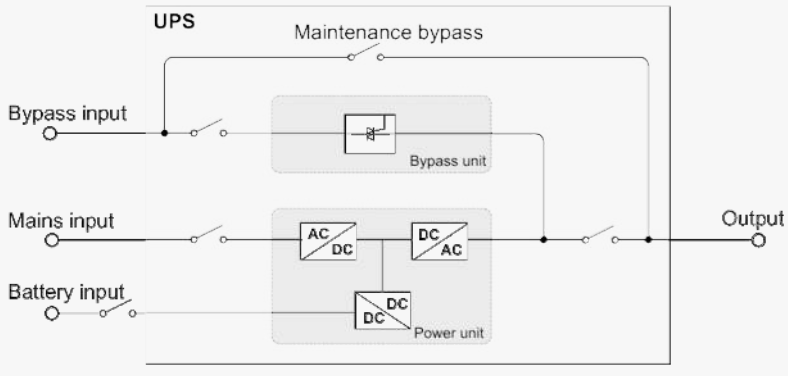
4 Maintenance bypass
Manual bypass switch: the load stays supplied while the UPS is de-energised for service.

5 Surge protection (option)
Class C SPD with its own disconnect switch, for sites exposed to lightning.

How power flows

The rectifier feeds the DC bus and the inverter rebuilds a clean sine wave for the load; each operating state is shown on p. 88.

- Mains input to the rectifier
- Separate bypass input to the static bypass
- Battery input to the DC bus
- One output to the load



Work principle, user manual Fig. 2-2

80 → 100 → 120 kVA · 160 → 200 kVA

IST7-80 uses the same hardware as IST7-100 and is upgraded to 100 or 120 kVA, IST7-100 to 120 kVA, IST7-160 to 200 kVA: the rated capacity is set from the display at engineering level, so the UPS grows with the load inside the same footprint.

Dimensions and installation
IST7 60–200 kVA



FRONT REAR

1 Operation panel
Touch screen, status LEDs and light bar: see p. 85.

2 Perforated front door
Lockable. Cooling air enters from the front.

3 Perforated rear panel
Hot-air outlet: keep the openings on the front and rear free.

4 Cable entry
Input, output, battery and PE cables: from below on all models.

60–120 kVA cabinet
Same layout, 400 mm wide



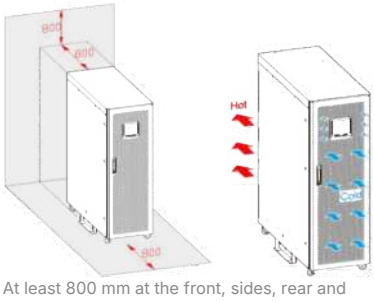
Dimensions and weight

Model	Size W × D × H (mm)	Weight
IST7-60	400 × 960 × 1193	153 kg
IST7-80	400 × 960 × 1193	163 kg
IST7-100	400 × 960 × 1193	165 kg
IST7-120	400 × 960 × 1193	167 kg
IST7-160	600 × 1000 × 1600	294 kg
IST7-200	600 × 1000 × 1600	296 kg

Installation

- Indoor, IP20, forced-air cooling
- Operating temperature −5 … 40 °C, humidity 0–95%
- Noise < 65 dB at 1 m from the front
- 60–120 kVA: castors for positioning, then anchored to the floor; 160–200 kVA: bolted to the floor

Free space



At least 800 mm at the front, sides, rear and above (Fig. 3-2); air in at the front, out at the rear (Fig. 3-3).

DID YOU KNOW?
EMC category C3 means a UPS for commercial and industrial sites: the IST7 is not for residential use without additional measures to prevent electromagnetic disturbances.

Technology
IST7 60–200 kVA

Three voltage levels, one clean sine wave

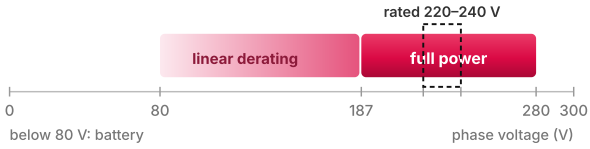
The inverter switches between +Vdc, 0 and −Vdc instead of two levels. Smaller voltage steps give lower switching losses and a cleaner output. A DSP controls inversion, synchronisation and current sharing between parallel units.



Output info screen: phase voltages, current, frequency, energy.

Grid-friendly input

PFC rectifier: input PF ≥ 0.99 and THDi ≤ 3% at full load, 40–70 Hz. Full power down to 187 V phase voltage; from 186 V down to 80 V the rated power decreases linearly. Outside the window the batteries take over.



≤1%
Output THDv with linear load (≤4% non-linear)

≤5%
Voltage transient for a 0–100–0% load step

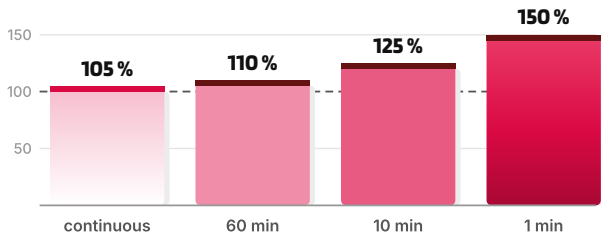
±0.1 Hz
Output frequency accuracy in battery mode

±6 Hz
Bypass synchronisation range around 50 / 60 Hz

Overload capacity

Time the UPS keeps supplying the load before transferring or protecting.

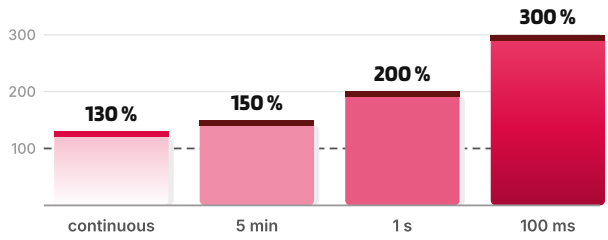
Inverter, linear load



> 150 % · immediate protection

IST7-120: above 125% immediate protection.

Static bypass



> 300 % · immediate protection

Protections

LOAD AND UNITS

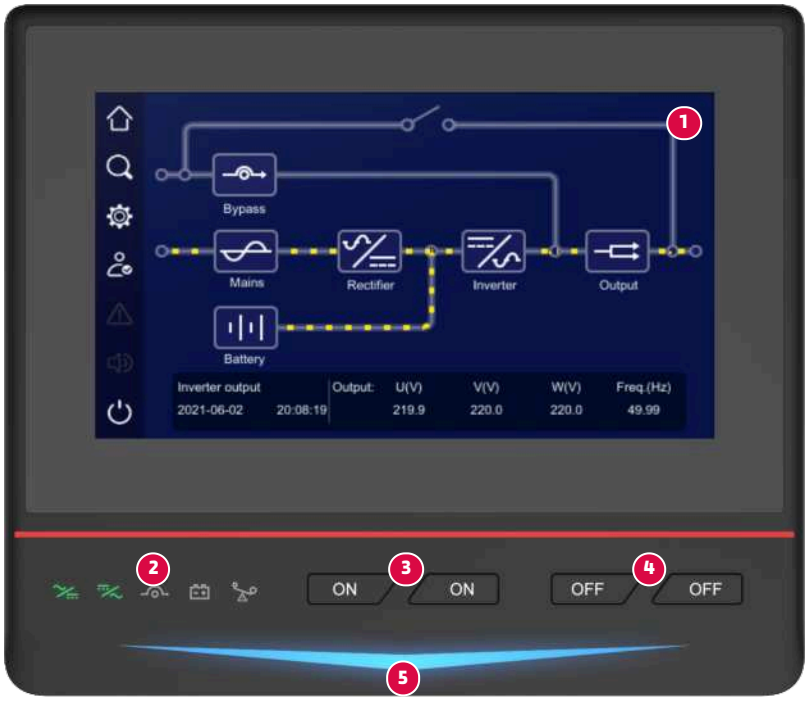
- Output short-circuit, over- and under-voltage
- Overload and over-temperature
- Communication fault between parallel units
- Emergency power off: EPO and EPO2 (NC) inputs

BATTERY AND SITE

- Battery under-voltage, two levels
- Battery grounding abnormal input (dry contact)
- Class C surge protection with its own switch (option)
- EMC to IEC 62040-2:2016

OPERATOR PANEL

Operator panel
IST7 60–200 kVA



1. **Colour touch screen**
   Live single-line diagram, measurements, settings and records.
2. **Five status LEDs**
   AC/DC, DC/AC, bypass, battery, overload: green when active or normal, red when abnormal.
3. **ON keys**
   Press both keys for 3 s to power on. Two keys: no accidental switching.
4. **OFF keys**
   Press both keys for 3 s: the inverter stops and the load moves to bypass.
5. **Ambient light bar**
   Shows the UPS state in colour, also when the display backlight is off.

Ambient light bar

Four states, one colour each: the operator knows how the UPS is doing before reaching the screen.



Blue
Normal operation



Blue, flashing
Battery mode



Yellow
Abnormal, load still supplied



Red
Abnormal, output off

Status LEDs

LED	Green	Red
AC/DC	Rectifier normal	Rectifier abnormal
DC/AC	Inverter normal	Inverter abnormal
BYP.	Bypass output	Bypass abnormal
BATT. LOW	Battery mode	Battery low voltage
OVERLOAD	Output normal	Output overload

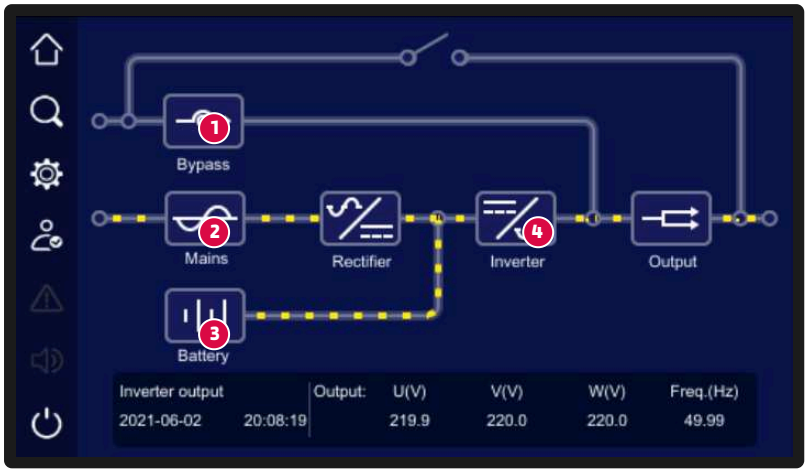
Screen settings



- Ambient light on / off
- Backlight time 1–999 min (default 5)
- Brightness, language, date and time

TOUCH SCREEN

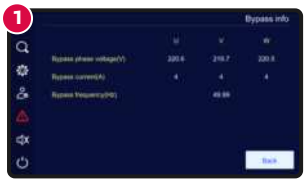
Touch screen display
IST7 60–200 kVA



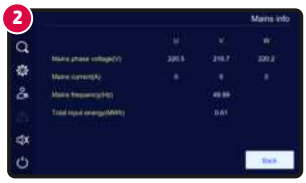
Live single-line diagram

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

Touch a block to open its page: the four pages below are marked 1–4 on the diagram.



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



Mains info
Phase voltage, current and frequency of the mains input



Battery info
Positive and negative battery voltage, charge and discharge current, status



Inverter info
Output phase voltage, current and frequency of the inverter

Menus



Information menu
Running info, history, user log, smart records, device info, wave capture



Settings menu
Cabinet, battery, battery test, output, smart mode, dry contacts, screen, password, communication, records



Running info
Three tabs: UPS info, parameter match, UPS status



Device info
Hardware, software and series version of each unit

3
access levels: user, engineer and factory

6
touch blocks: bypass, mains, battery, rectifier, inverter, output

MWh
total input energy, shown in Running info

Match
tab listing any setting that differs between parallel units

RECORDS

Event records and export
IST7 60–200 kVA



10,000

events in the history record: fault and alarm information of the system and of each unit, newest first.

10,000

entries in the user log. When a record is full, the oldest entry is overwritten.



User log

Every setting change, with date and time.



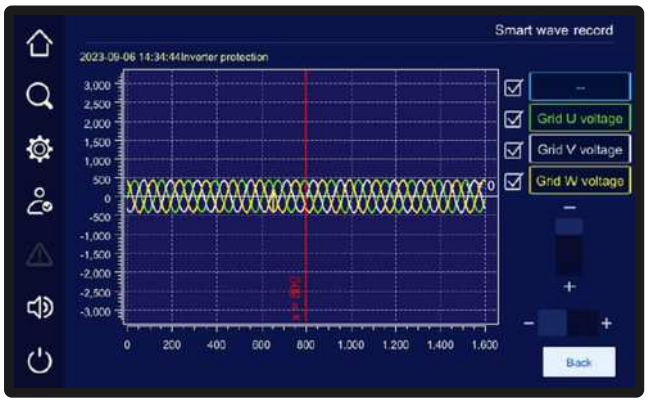
Current alarms

Open from the alarm icon on the home page: active faults, time-stamped.



Smart records

Records linked to the smart-mode settings, such as redundancy.



Smart wave capture

When an abnormal event occurs, the UPS stores the waveforms around it, with date, time and the abnormal information.

- Three sources: rectifier, inverter, system card (total abnormal record)
- Example: record of an inverter protection, grid U, V and W voltages around the event (red cursor)
- Open a record and choose the parameters shown on the four channels
- Export the capture to USB for the service report

Download to USB

Plug a USB stick (FAT32) into the touch screen and export each record from the record manage page.



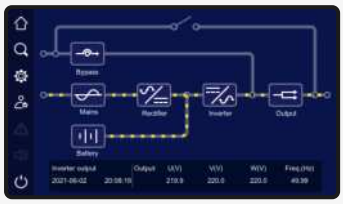
- History record, user log, smart records
- Smart wave capture
- Battery discharge record

Firmware is updated the same way, from a USB stick.

OPERATION

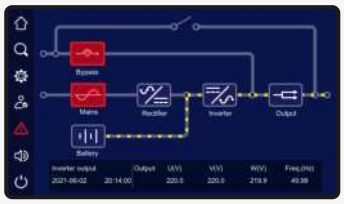
Operating modes
IST7 60–200 kVA

Real screens of the IST7: the yellow dots trace the active power path.



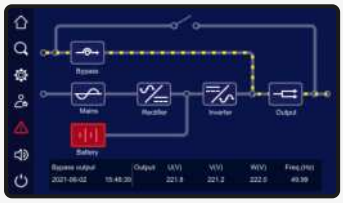
Online double conversion

Mains → rectifier → inverter → load. Batteries kept charged. Load isolated from mains disturbances.



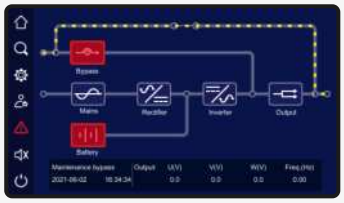
Battery mode

Mains out of limits: the batteries feed the inverter through the booster, with no break at the output.



Static bypass

Overload or inverter fault: the load moves to the bypass and returns to the inverter when the cause is cleared.



Maintenance bypass

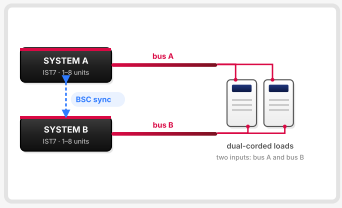
Manual switch: the load is fed directly while the UPS is de-energised for service.





ECO · up to 99%

Load on bypass while the mains is within the window (default ±15% V, ±2% f). The output mode page selects Standard ECO or W-ECO.



Dual bus (BSC)

Two independent UPS systems kept in step, for dual-corded loads on bus A and bus B. Set in Mode manage, p. 90.



Common battery

Common battery setting On: the units of a parallel system share one battery bank. Details on p. 90.

Transfers between states

0 ms
Mains → battery: the DC bus is fed by the booster without interruption

<1 ms
Inverter ↔ bypass, synchronised (<15 ms not synchronised)

Auto
Return from bypass to inverter once overload or fault is cleared

3×
Restart attempts after an output short circuit, then protection

TYPICAL USE

Online
Data centres, healthcare, industry: the load never sees the mains.

ECO
Stable mains and tolerant loads, when the lowest losses matter most.

Dual bus
Dual-corded IT loads: each power input is fed by its own UPS system.

Common battery
Parallel systems where floor space for battery cabinets is limited.

SMART FUNCTIONS

Advanced features and functions
IST7 60–200 kVA

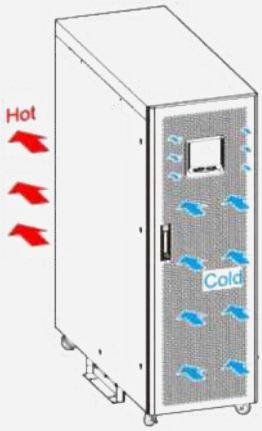
Set from the Smart mode pages of the touch screen: real screens of the IST7.

SELF-CLEANING

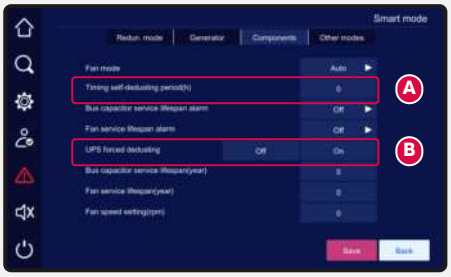
The air path cleans itself

Cooling air enters at the front and leaves at the rear. A timed self-dedusting function keeps the path clear between service visits.

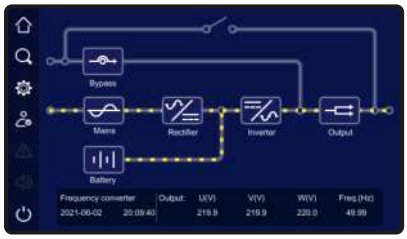
- **Timed:** default every 360 h, period settable
- **Forced:** started on demand from the screen
- **Logged:** “Fan dedusting” event in the records



Airflow, user manual Fig. 3-3



A Timing self-dedusting period (h) · **B** UPS forced dedusting On / Off. Also: fan mode, fan and bus capacitor service-life alarms.



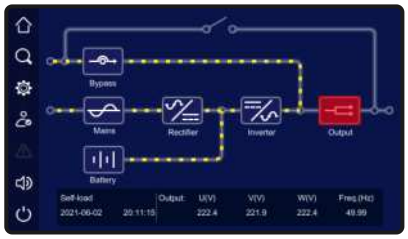
Frequency converter

Supplies 60 Hz loads from a 50 Hz grid or the other way round, e.g. marine, test benches or imported machinery.



Generator mode

Start mode manual or by dry contact from the ATS; generator rated power and charge-power derating set on screen, so the genset is not overloaded.



Self-load test

Output switch open: the power circulates back to the input. Load 1–100%, time 1–1440 h; burn-in without a load bank.

360 h
self-dedusting period, default

10 years
default service life for fan and capacitor alarms

20–200 ms
output short-circuit protection time, default 20 ms

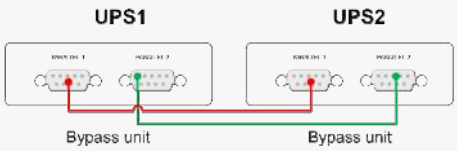
±10 V
output voltage fine-tuning

MORE SETTINGS FOR THE SITE

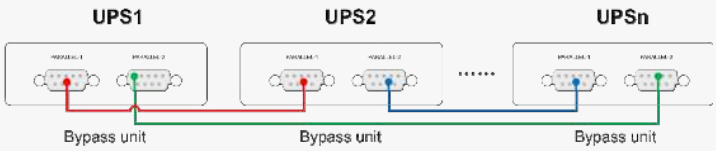
- Fan speed follows the load: quieter at partial load, longer fan life
- Automatic start when the mains returns
- Cold start from the battery, without mains
- Bypass window +10/15/20%, −10/15/20%; frequency range 2–20%

Parallel operation and redundancy
IST7 60–200 kVA

Parallel ports of the bypass units connected in a ring, as in the user manual.



Two UPS, Fig. 2-21



Multiple UPS, Fig. 2-22

One battery bank for the whole system

With the common-battery setting, the units of a parallel system share the same battery bank: fewer cabinets, less floor space and one string to maintain. Each unit can also keep its own batteries.

Up to 8 units on one load bus

Parallel address 1–8 from the display. Units are linked by parallel cables in a ring: N units, N cables, so each unit always has two connections.

Mode manage

Single or parallel mode, parallel address and BSC address.



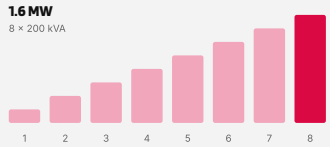
Capacity or N+X redundancy

Basic quantity and redundancy quantity of the parallel system.



Power grows by adding units

Output power with 1 to 8 IST7-200 units.



BSC: two systems, one rhythm

The synchronous BSC output of the dual bus control synchronises the outputs of two independent UPS systems in frequency and phase, so that dual-corded loads and static switches can move between bus A and bus B.

System functions

- Current sharing between units ≤ 5%
- Parameter match page: shows any setting that differs between units
- One command copies the settings to all units
- Staggered start of the units to limit inrush on the source
- Optional EPO linkage: one stop button for all units
- Parallel kit PAR-IST7-60/200

Battery management
IST7 60–200 kVA

Charging in stages

Current-limited charge, equalising, float, then an optional sleep phase that pauses charging and wakes up on voltage or time: less float time, longer battery life.





Battery setting pages: type, capacity, cells, common battery, BMS; float-to-sleep function.

30 A

max. charge current, 60–120 kVA

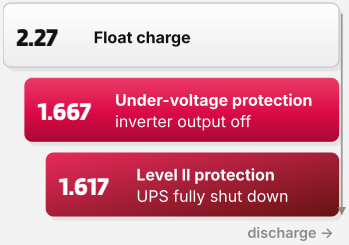
60 A

max. charge current, 160–200 kVA

- Charge current limit 0.2 C lead-acid, 0.5 C lithium (default)
- Optional timed equalising (default interval 720 h)
- Capacity setting 1–2000 Ah
- String 28–48 × 12 V blocks

End-of-discharge protection

Two levels in V/cell, plus a maximum discharge time (default 960 min) and an optional pre-alarm.



Battery test

Standard test (10 min) or deep test to the low-voltage alarm, started from the screen. Runs only when:

- mains is normal
- batteries are fully charged
- UPS has no fault
- load is at least 10%

Temperature

With the optional probe, charge voltage is compensated (default 3 mV/°C/cell) and alarms trip at 50 °C and 0 °C (defaults).

20–30 °C

best battery temperature: below 20 °C autonomy drops, above 30 °C battery life shortens.

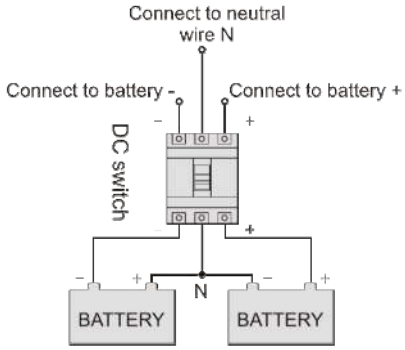
Lithium ready

See p. 92.

Three-pole battery string

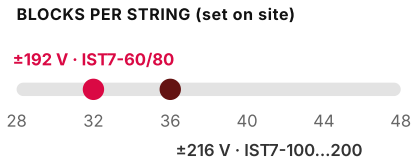
The string is split into two equal halves with the neutral at the midpoint: the UPS gets a positive and a negative DC bus from one set of 12 V blocks. Battery breaker with three poles (+, N, –).

Battery wiring, user manual Fig. 3-32.



Set on site

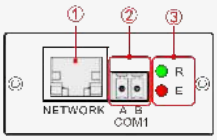
Blocks per string, capacity in Ah and battery type are set from the display at commissioning.



Matching AEC cabinets: next page.

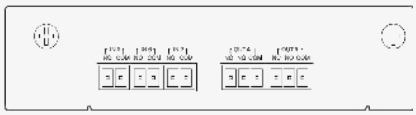
CONNECTIVITY

Communication and connectivity
IST7 60–200 kVA



SNMP card · option

Network port and COM1 (RS485) for a temperature and humidity sensor; web monitoring. Fig. 2-16.



Dry contact expansion card · option

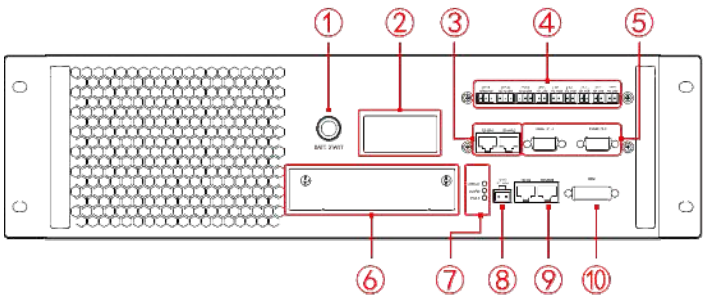
+3 inputs (IN.5–IN.7) and +2 outputs (OUT.4–OUT.5). Fig. 2-18.



BMS expansion card · option

BMS port for lithium batteries, charge- and discharge-disable inputs. Fig. 2-19.

Bypass and control unit: all ports in one place



Bypass unit, user manual Fig. 2-10.

1. Battery cold start
2. SNMP card slot
3. RS485 parallel monitoring
4. Dry contacts, EPO, battery temp.
5. Parallel ports
6. Expansion slot
7. Control card LEDs
8. EPO2 input (NC)
9. Modbus RTU and RS232
10. Touch-screen port

4 inputs · 10 functions

Each input is assigned from the display.

- Battery abnormal
- Battery grounding abnormal
- Battery switch open
- Bypass switch open
- Output switch open
- Battery discharge disable
- Battery charge disable
- Generator mode
- SPD abnormal
- Maintenance bypass start

3 changeover outputs · 18 functions

NO / NC contacts, each assigned from the display. * on request.

- Inverter output
- Bypass output
- Battery trip
- On battery
- Battery low alarm
- Battery low protection
- Overload
- UPS abnormal
- Bypass abnormal
- Mains abnormal
- Start generator
- ECO output
- Inverter abnormal
- Single bypass feedback*
- Parallel bypass feedback*
- UPS on
- Fan abnormal
- UPS alarm

Options

SNMP card
Ethernet, web pages, temp./humidity sensor port

Dry-contact expansion
+3 inputs, +2 outputs

Battery cabinets
BB5–BB8, empty or with batteries

Parallel kit
PAR-IST7-60/200

Battery temperature kit
probe and extension cable

Surge protection
class C SPD with switch

Battery release control
24 Vdc for shunt / UV release

Lithium cabinets
on request

TECHNICAL DATA

IST7 60–200 kVA

Model	IST7-60	IST7-80	IST7-100	IST7-120	IST7-160	IST7-200
Rated power (kVA / kW)	60	80	100	120	160	200
Capacity upgrade	—	→ 100 / 120	→ 120	—	→ 200	—
INPUT						
Connection	3 phases + N + PE					
Rated voltage	220 / 230 / 240 V phase (380 / 400 / 415 V line)					
Voltage range	187–280 V phase at full power · 80–186 V with linear derating					
Frequency · power factor · THDi	40–70 Hz · ≥ 0.99 · ≤ 3% at full load					
Bypass synchronisation range	50 / 60 Hz ± 6 Hz					
BATTERY						
Nominal DC voltage (default)	± 192 V	± 192 V	± 216 V	± 216 V	± 216 V	± 216 V
String length	28 – 48 × 12 V blocks, set on site · VRLA or lithium (BMS card)					
Max. charge current	30 A				60 A	
OUTPUT						
Voltage · frequency	220 / 230 / 240 V phase · 50 / 60 Hz (± 0.1 Hz on battery)					
Power factor · THDv	1 (settable 0.9) · ≤ 1% linear, ≤ 4% non-linear load					
Transient · unbalance · phase error	≤ 5% for 0–100–0% step · 100% unbalanced load · ≤ 1°					
Transfer time inverter ↔ bypass	< 1 ms synchronised · < 15 ms not synchronised					
Inverter overload	≤ 105% continuous · ≤ 110% 60 min · ≤ 125% 10 min · ≤ 150% 1 min (IST7-120: > 125% immediate)					
Bypass overload	≤ 130% continuous · ≤ 150% 5 min · ≤ 200% 1 s · ≤ 300% 100 ms					
SYSTEM						
Efficiency AC/AC	up to 96.5% double conversion · 99% ECO mode					
Parallel	Up to 8 units, capacity or N+X · BSC dual-bus synchronisation					
Communication	RS485 · Modbus RTU · RS232 · 4 IN / 3 OUT dry contacts · EPO · SNMP slot · expansion slot					
Display	Colour touch screen, 5 status LEDs, ambient light bar, 10,000 events and 10,000 user-log entries					
Environment	−5 … 40 °C · 0–95% RH · IP20 · < 65 dB at 1 m · forced-air cooling					
Cable entry	bottom				bottom	
EMC	IEC 62040-2:2016 · category C3 (not for residential use without additional measures)					
Dimensions W × D × H	400 × 960 × 1193 mm				600 × 1000 × 1600 mm	
Weight	153 kg	163 kg	165 kg	167 kg	294 kg	296 kg

Specifications are subject to change without notice.

Ordering codes

Code	Description	Code	Description
IST7-60	60 kVA / 60 kW	**IST7-160**	160 kVA, upgradable to 200 kVA
IST7-80	80 kVA, upgradable to 100 or 120 kVA	**IST7-200**	200 kVA / 200 kW
IST7-100	100 kVA, upgradable to 120 kVA	**PAR-IST7-60/200**	Parallel kit
IST7-120	120 kVA / 120 kW	**IST7-[kVA]-[n]X[Ah]**	UPS with battery cabinet, n × 12 V [Ah]

Two frames

Front and side views in mm, user manual Fig. 3-9 and 3-16.

