

Version 3.0b	Du 02/01/20
Auteur EHA	Control NRE

INDEX



. Safety.....	2
. Presentation.....	2
. Installation.....	5
. Start-Up of Air conditioner.....	8
. Common anomalies.....	11

Thank you for choosing our ISBC-e product, a Micro DataCenter that brings together all the functions of a real DataCenter in a single cabinet, quick and easy to install.

Depending on function and option selected, the component may differ (UPS, fire-fighting, Acces management, Monitoring etc), please refer to specific manual on www.ecus.fr/documentations-ecus

Important : télécharger la dernière version du manuel utilisateur :
http://www.ecus.fr/spec/ISB/ISBCe_Manuel_FR.pdf



Safety



This pictogram indicates special dangers during handling, use and / or operations.

Ecus is not responsible for material damage or personal injury due to the following:

- Incorrect use
- Failure to comply with safety instructions
- Non-reading or non-compliance with the instructions contained in this manual

For your safety, the system must be installed by a qualified electrician. If the ISBCe is equipped with an inverter, it has its own internal energy source (batteries). If the electrical network is absent, a voltage remains at the output terminals.

Make sure that the cabinet is properly grounded. Check that the cabinet input voltage corresponds to the appropriate voltage between phase and neutral and that the latter is of TT or TNS regime.



In order to get the most out of your product and to ensure safe use, we recommend that you read and keep this manual.

Presentation

The principle of the Micro-Data Center is to secure access and penetration of foreign bodies by a high protection index, and protection against heat by the integration of closed-loop air conditioning (recycled air).

The cabinet is divided into two distinct temperature zones;

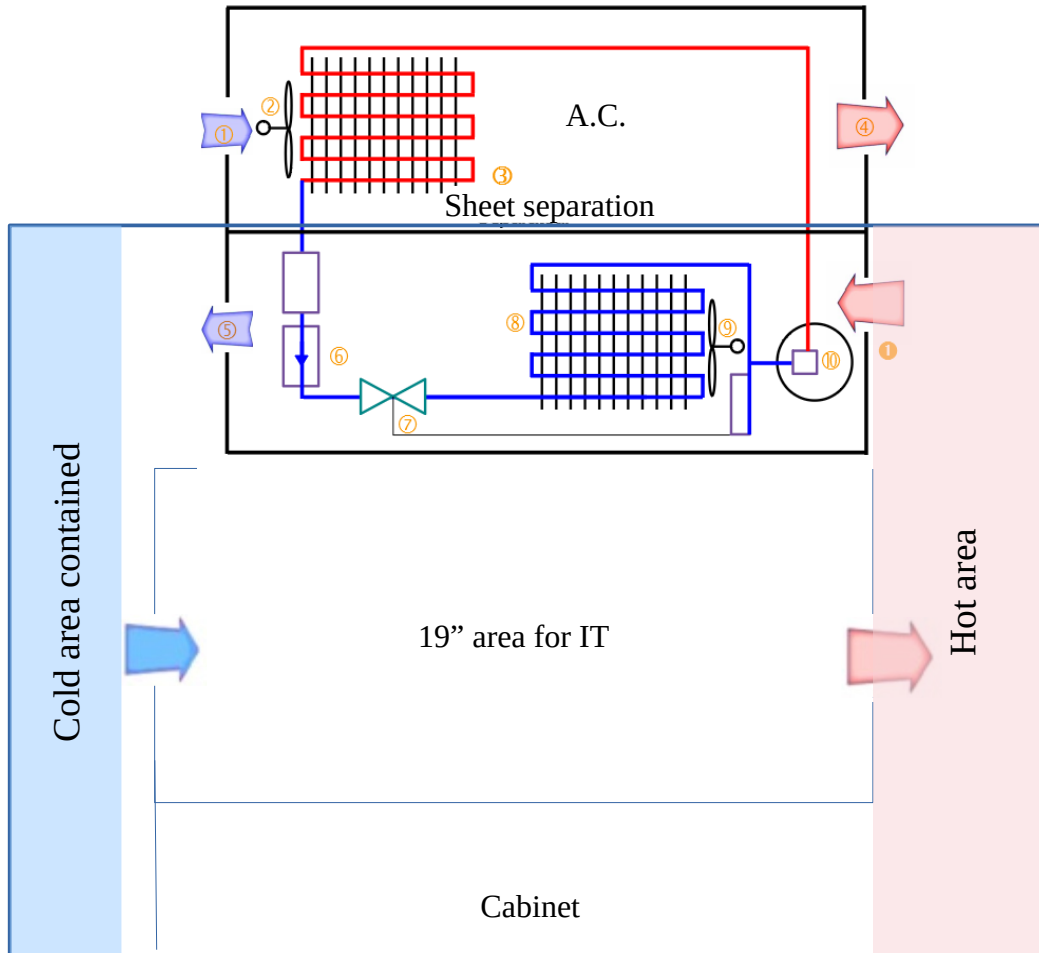
- the cold zone, located at the front of the bay, the front of the IT equipment.
- the hot zone at the rear of the rack, the rear of the IT equipment, or the calories produced by the equipment in operation are removed.

ISBCe is mainly a secured IT cabinet fitted with:

- Rugged structure with screws and welded frames
- A secured cabinet 19" fitted with safety glass door or metal, enabling an opening angle of 220 °, with two-point locking system and swing key handle (access control in option).
- Two sets of two 19-inch studs in the front and in the back with US standard square holes
- High/low and right/left containment to optimize air circulation to comply with the IT requirements.
- Until 44 U depending on options : 41U upright and 3 verticals 1U slots in the side skirt.
- IK8 impact resistance (resistant to 1.7Kgs weight falling from a 29.5 cm of height on the cabinet)
- IP20 to IP54 Protection degree (according to standard CEI 60529)
- Side cooler with capacity up to 8400W
- A power connection terminal block with proximity switch,
- Air flow duct organiser up/down
- Penetration of power cables through the floor, or through the baseboard via welded wire rope
- An UPS and its backup bypass (optional),
- Total weight of admissible equipment: 1300kgs.

Principle diagram (horizontal section)

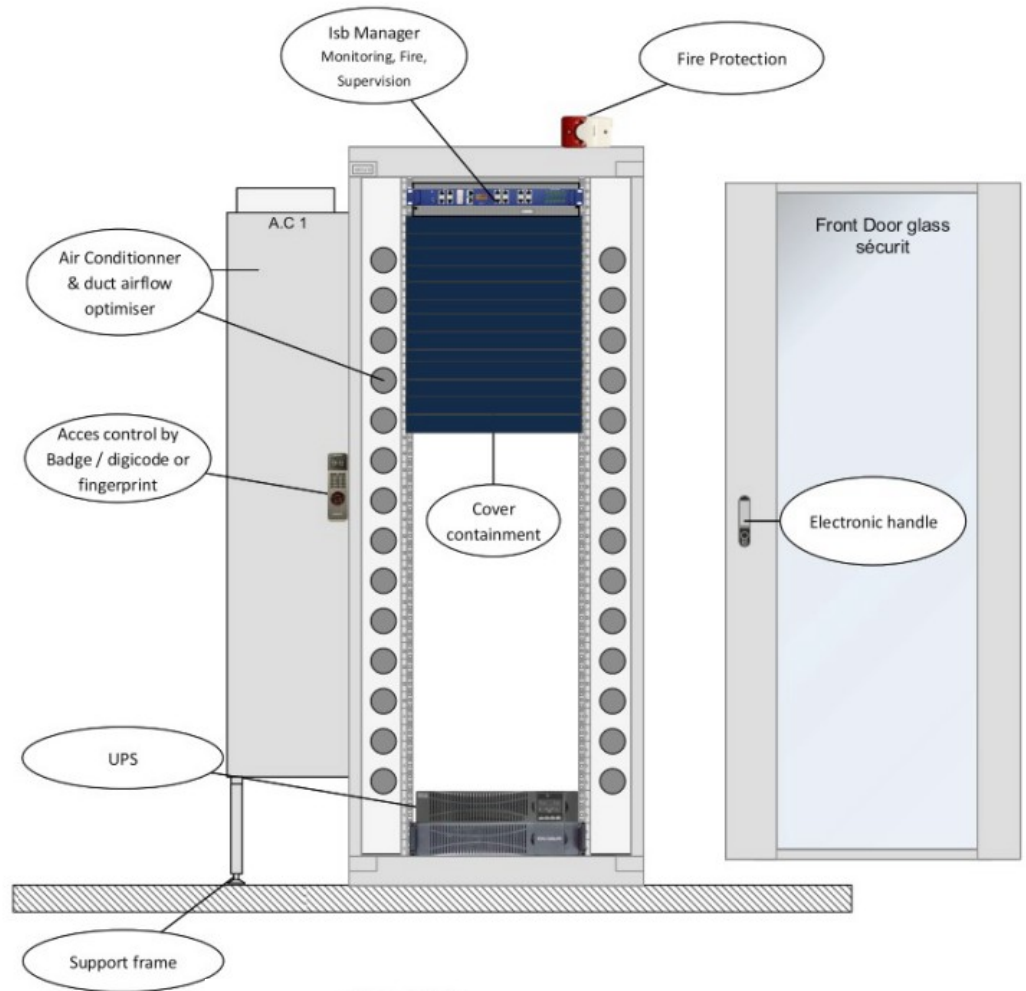
- | | |
|----------------------------------|---|
| ① Ambient air inlet | ⑦ Thermostatic expansion valve with equalizer |
| ② Condenser fan | ⑧ AC Evaporator direct expansion |
| ③ AC Condenser Radiator | ⑨ Evaporator fan |
| ④ Warmed ambient air outlet | ⑩ Hermetic compressor |
| ⑤ Cold air to computer equipment | ① Hot air from computer equipment |
| ⑥ Molecular sieve dehydrator | |



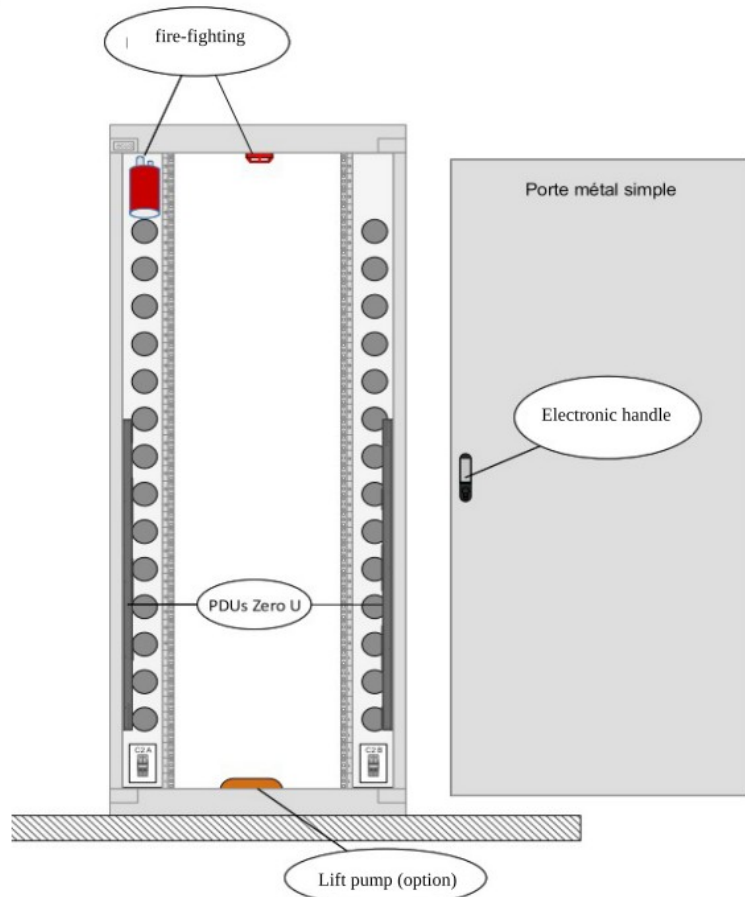
Model in the range ISBC-e

Model ISBCe	ISBCe10K	ISBCe15K	ISBCe20K	ISBCe30K	ISBCe40K
Nominal power	1200W	1600W	2200W	3500W	4200W
Weight (kgs)	244	245	252	279	281
Dimensions LxPxH en mm	1035 x 1200 x 2070	1050x1200x2070	1050x1200x2070	1150 x 1200 x 2070	
Dimensions Air Cond. LxPxH (mm)	400 x 255 x 1000	400x250x1200	400x250x1200	500 x 350 x 1550	
Volts	Monophase		Triphase		

Front view



Rear view



Installation

Delivery

The cabinet is delivered pre-assembled strapped on a pallet, filmed with protected angles. The air conditioner is delivered separately on a pallet. When unloading please check that no impact has damaged the product. If necessary note immediate reservations to the carrier or refuse the package. Carefully unpack the ISBC and check the minimum content:

- A cabinet width 800 x depth 1200mm with pre-drilled side panel
- The air conditioner generally delivered separately from the cabinet
- A binder containing this notice and the installation and use documents
- The options delivered pre-assembled: Supervision, fire, ups with standard autonomy, automatic door opening, etc.
- The options delivered separately: Long autonomy UPS battery, extension cabinet etc...

Choice of installation location



Always maintain the Vertical air conditioner during transport and handling. The air conditioner must always be installed in closed rooms protected from the weather.

Please check that the floor can support the weight of the ISBC (between 200 and 500kG, see technical characteristics) plus the weight of the material to be inserted.

The ISBC should be installed on a clean and perfectly flat floor. Provide space at the front and rear to open the doors. One side of the bay can be attached to a wall if it does not have an air conditioner.

At the front, reserve enough space to insert the IT equipment.

In all cases, the side of the air conditioner must be cleared to allow free entry of fresh air.



Caution : respect the distances to the walls for proper use and maintenance

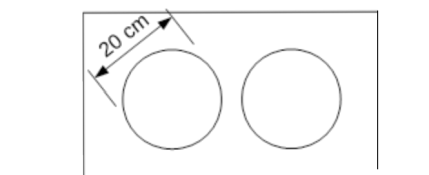
Type ISBC ^e	ISBC ^e 10K	ISBC ^e 15K	ISBC ^e 20K	ISBC ^e 30K	ISBC ^e 40K
Free space on rear mm	850mm (450mm with double door)				
Free space on front	900mm				
Free space on side of AC module	200mm				

Minimum room volume

In the case of reduced rooms, it is necessary to create an extraction of hot air, and a supply of fresh air in accordance with the table below.

Type ISBC [®]	ISBC [®] 10K	ISBC [®] 15K	ISBC [®] 20K	ISBC [®] 30K	ISBC [®] 40K
Ventilated room need minimum ⁽¹⁾	60 m ³	90 m ³	120 m ³	160 m ³	210 m ³
Local airtight, isolated or heated need a minimum	75 m ³	135 m ³	180 m ³	240 m ³	310 m ³
⁽¹⁾ For a room "at any wind", no restriction					
If the volume is lower, provide for renewal and extraction of air.					
Minimum air inlet	500cm ²	500cm ²	500cm ²	800cm ²	800cm ²
Minimum air outlet	500cm ²	500cm ²	500cm ²	800cm ²	800cm ²
Tubing air outlet	Two pipes of diameter 20cm For a distance greater than 3 meters, add a motorized extractor				

If the volumes are insufficient, it is possible to tub the hot air extraction, to connect one or two pipes of 20cm in diameter according to the model, on the exhaust hood and to direct it towards the outside, so that the ISBCe does not recycle its own hot air.



Pipe connection hood
Placed on top of Air Cond (option)



Caution: The fans are provided for a hose of maximum 3m in length, if beyond please add an extractor on the line.

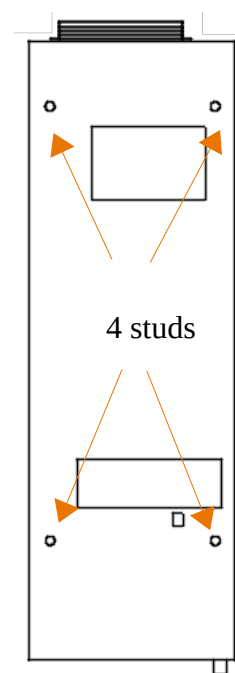
Assembly



The weight to be lifted can be significant and requires the presence of several people or an assistance machine.

The air conditioner is assembled by bolting the assembly to the side panel fitted with a seal, which guarantees the air tightness inside the cabinet:

- Check that the side panel is correctly screwed onto the cabinet, and that the pre-assembled seals are in place,
- Remove the air conditioner cover,
- Mount the air conditioner by aligning the holes on the 4 pending studs, and check the level using a spirit level,
- Tighten the 4 nuts and washers provided on the studs, until the joints are half crushed,
- For the ISBCe-30 and 40 models, mount the additional support feet (see below "Foot kit").
- Replace the air conditioning cover before starting.



A.C. to mount

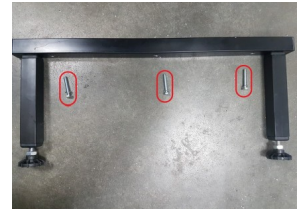
Floor tightness

It is imperative to check the air tightness on the ground between the plinths of the cabinet base and the ground to prevent the entry of air from the room, in order to stop any penetration of dust and stale air, and limit the formation of condensate. A joint provided is to be placed between the plinths and the floor.

Monting of accessory “foot kit”

The feet kit is intended for 30K and 40K model air conditioners in order to transfer the weight to the floor. It is delivered ready to screw under the air conditioner and offers a level adjustment.

- Remove the air conditioner cover
- Position the kit under the air conditioner by aligning the 3 holes,
- Tighten the 3 screws provided without forgetting the washers,
- Replace the air conditioner cover
- Adjust by unscrewing the feet until they rest on the ground, without modify le level.



Electrical connection



Caution : Please adjust to prevailing local standards

The supply lines must be protected by a circuit breaker recommended in the table below.

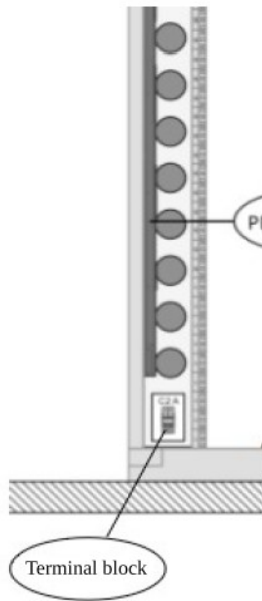
Type ISBC [®]	ISBC [®] 10K	ISBC [®] 15K	ISBC [®] 20K	ISBC [®] 30K	ISBC [®] 40K
AC Power supply	110V to 240V/60Hz 2 poles+PE			380V to 440V/60HZ Without neutral 3 Poles +PE	
Circuit breaker for AC	2 poles curve D			3 poles curve D	
	8A	10A	12A	6A	8A
Recommended power supply for IT equipment (via UPS & PDU)	2 ways of cable 2P+T 16A or 32A with plug IEC309 penetrating by top or bottom of cabinet				

The MicroDataCenter can be equipped with several power sources:

- Power supply of the air conditioner (s)
- Direct supply of the inverter (s) (generally on terminal block)
- Direct supply of the second channel PDU (option on socket)

Please refer to the prerequisite list provided when ordering.

On request the ISBCe can be supplied with IEC309 socket. In this case just connect the sockets and go to the next step. If it's not the case :



1. Remove the protective cover from the breaker box on the rear panel in order to access the terminal block (see rear panel plan).
2. Enter a flexible cable preferably and connect it to the terminal block, Earth to the Green /yellow terminal, neutral to the N terminal, phase 1 to the L1 terminal. For three-phase models phase 2 on terminal L2 and phase 3 on L3.

Start-Up of Air conditioner

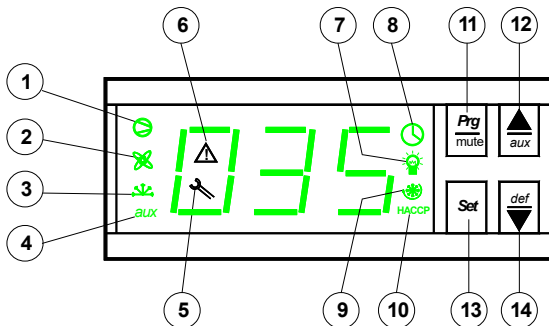


The A.C. must be kept in the vertical position at least 24 hours before the first start-up

1. In your power panel (source TD) close the power circuit breaker (set to ON).
2. In the connection box / terminal block in the ISBCe cabinet, there is a switch, check that you have the right voltage between neutral and phases and between phases and earth, between phases.
3. Close this switch (set to ON), the air conditioner begin to ventilate in the cabinet. As long as the temperature is below the set target, the A.C. compressor will not start. It will start automatically when the temperature at the rear of the rack reaches the set point (30 to 34 ° C as factory set).

Setting of air conditioner

The air conditioner has its own regulation with the various sensors ensuring good cooling of the rack, located in the screen/regulator.



Display

- 1 Light on: Compressor on or flashing when waiting' autorisation
- 2 Light on: Fan on or flashing when waiting' autorisation
- 3: Defrost (not use)
- 4: Speeded up dismissal of alarm
- 5: Eprom error
- 6: External alarm
- 7: Light (not use)
- 8: Clock (not use)
- 9: Speeded up uninterrupted cycle
- 10: HACCP alarm (not use)

Keyboard

- 11: Alarm stop/ Program
- 12: Inactivated by program
- 13: Display Setup value
- 14: Inactivated by program



To avoid manipulation by unauthorized persons, the keypad is locked by programming.

Principle of refrigeration regulation

The Micro-DataCentre is divided into two distinct temperature zones:

- the cold zone, located at the front of the bay, the front of the IT equipment.
- the hot zone at the rear of the bay, the rear of the IT equipment, or the calories generated by the equipment in operation are removed.

In order to guarantee efficient regulation, many parameters come into consideration, the main ones being:

- ST1 value (hot zone): value 30 (can be viewed directly on the display by briefly pressing the "SET" button on the regulator.)
- RD hysteresis value: 4K value

The regulation is based on the sensors in the hot zone, placed as close as possible to the equipment, making it possible to react very quickly to temperature increases by adjusting the refrigeration production.

When the set temperature is reached (30-34°C as factory set at the rear of the cabinet), the air conditioner starts and blows cold air on the front panel until reaching the target temperature (-10°C compared to the rear), i.e. 20 to 24 ° C at the front, then wait until reaching its hysteresis, and restart a cold cycle.

We have set a corrective factor in order to read the target temperature directly on the front of the cabinet in the cold zone directly on the display of regulator. (/ C1 = value -10K.).

In **normal mode**, this target temperature value is displayed on the controller (in degrees C).

In the event of an **alarm**, is displayed the alarm code alternated with the target temperature.

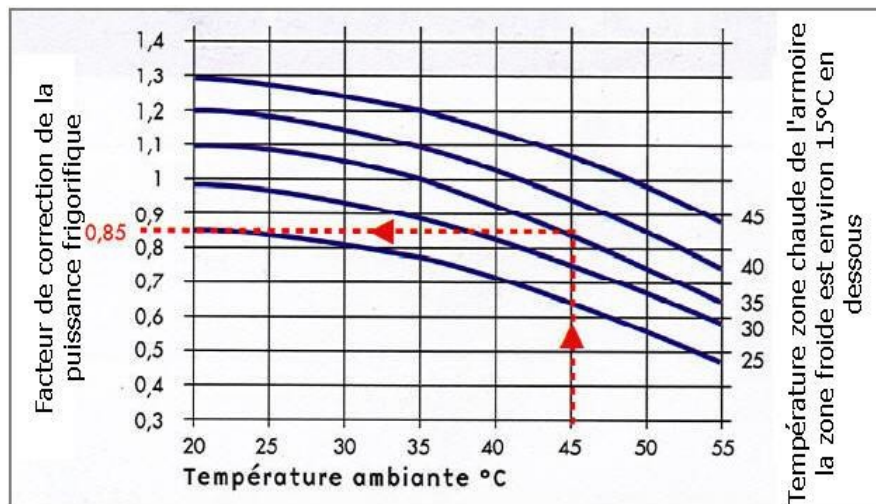
Recommended temperature

Since 2015, the ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers), which is an authority in this field, recommends temperature ranges as input from servers up to 27 ° C, with a humidity between 8 and 60 % **without compromising operation or continuity of service.**

For optimal economy and ecology, we advise you not to change the set temperatures as factory

Correction factor as a function of ambient temperature

Depending on the temperature in your room, the power available can vary depending on the factor below:



Common anomalies

The main anomalies encountered are listed below:

The A.C. does not get cold / does not start: The A.C. must suck in the hot zone at the back of the bay and blow in the cold zone at the front of the cabinet at all times. However, it is normal for the A.C. to start only when the temperature requires it (30-34°C at the back of the bay).

Condensate water: Condensate forms when humid air comes into contact with a cold wall. If water condensate appears on the glass or panel of the interior of the cabinet, it indicates a penetration of fresh air. Please correct the waterproofing at ground level and joints. If it is outside the cabinet, please lower the humidity of the room.

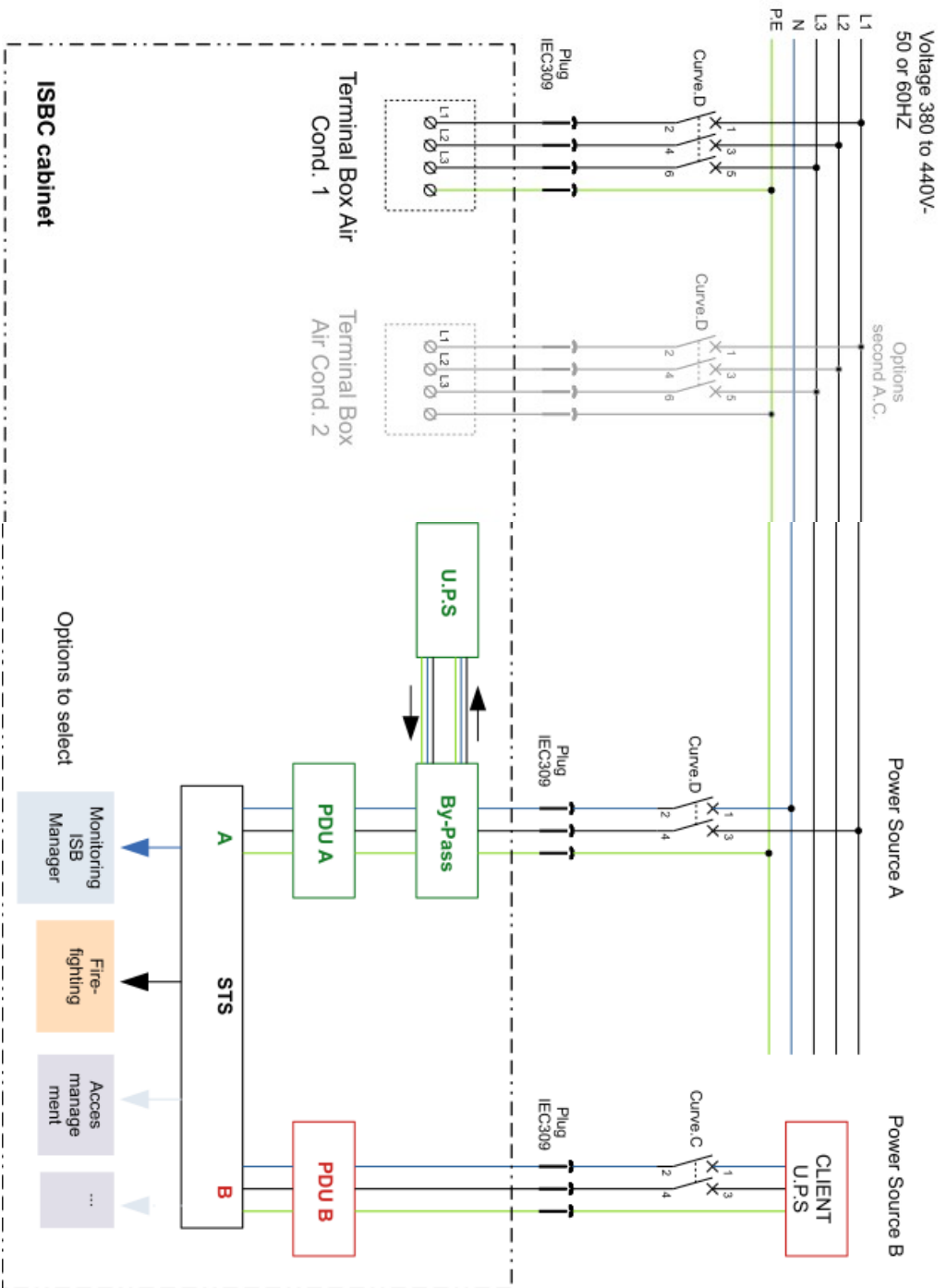
Heat at the back of the cabinet (hot area): it is quite normal for the temperature at the back of the cabinet, in hot areas, to be high. The temperature is considered normal up to 38 °C, and to be monitored up to 42 °C, abnormal above 42 °C.

Temperature variation: If the temperature on the front of the servers (in cold area) varies quickly between low and high temperature this is due to the lack of load, please add equipment in order to reach the nominal load (50 to 100% recommended) or call us to optimize the setting.

Main alarms on IR33 regulator

dA	Blinking	This function is postponed by a delay time and depends on an external agreement or is made impossible because of another on-going procedure.	Ex: Delay time to avoid short-cycles of the compressor.
RE, Ei	Blinking	Probe error RT (i+1)	- The probe is damaged: the sign of the probe is interrupted or in short circuit. - The probe is incompatible with the device.
AFr	Blinking	Anti frost alarm	- Check air circulation on evaporator. - Check ambient temperature.
dEF	Light on	Anti frost on	- There was a freeze
IA	Blinking	HP pressure switch, fan cooling condenser isotherm and compressor isotherm.- Check the closing of the contacts.	- Check the closing of the contacts.
LO	Blinking	Low temperature alarm, temperature lower than 20°C. (Factory set)	- Check if the door rack is open. - The alarm goes off automatically when the temperature reaches the selected limits.
HI	Blinking	High temperature alarm, temperature higher than 42°C. (Factory set)	- Check if the door rack is open - The alarm goes off automatically when the temperature reaches the selected limits.
OFF		Air conditioner in waiting mode.	door open, remote order triggered...

Typical wiring ISBC-e



Monitoring type (option)

ISB MANAGER (basic config)

- Monitoring environment**
- Timestamp of opening/closing doors
 - UPS condition
 - 6 spots temperatures in the rack
 - 2 spots humidity in the rack

- Alarmeres summary**
- Air conditioner 1
 - Pump lift
 - Air conditioner 2
 - Latches
 - Water leakage
 - Firefighting
 - Siren flash alarm

