Document Name:	Specification Air conditioners
Document No.:	NE-NT-SP0098
Version No.:	1.0

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Review Date:	

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1 SCOPE

This specification covers the requirements for air conditioner to be used by Broadband Infraco for its sites where Broadband Infraco will be installing Telecommunication equipment.

2 REFERENCE DOCUMENTATION

a) SANS 10142-1 – Wiring of premises

b) NE-NT-SP0008 - Containers

c) NE-NT-SP0058 – Air conditioners

3 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

3.1 Abbreviations and acronyms

Acronym	Description
AC	Alternating Current
BTU	British thermal unit
DB	Distribution Board
EAS	Environmental Alarm system
EER	Energy Efficiency ratio measured in (BTU/h)/Input power (in Watts)
e.g.	exempli gratiā, meaning “for example”
Hz	Hertz
V	Voltage
W	Watts
VA	Volt-Ampere

4 BACKGROUND

This specification covers the requirements for air conditioner to be used at Broadband Infraco network sites, where telecommunication equipment (usually SDH-, DWDM and other IP- and monitoring equipment) are installed, to maintain the equipment at a client determine temperature of approximately 21-22 degrees Celsius. Most of Broadband Infraco long distance equipment, which is spread over the whole country, is installed in containers which various from a 3m x 3m to 3m x 6m containers in size. These air conditioners are also required to be installed in rooms which have been converted to a Telecommunication room for Broad band Infraco. Air conditioners will be installed in an N+1 configuration (usually 1+1 or 2+1) and will be controlled by an on-site alarm system.

The intention of this specification is to cover for new installation, where air conditioners are required, but also for replacement of existing air conditioners which have reached end of life.

New installations in containers will require split unit type air conditioners whereas replacement unit will depends on the installed air conditioner which can be either a split unit or a window unit.

Refer to the container specification, NE-NT-SP0008, and planning document, NE-NT-SP0058, for Broadband Infraco requirements for various installation methods and practices.

5 AIR CONDITIONERS

5.1 Technology

5.1.1 Air conditioner should comply with the electrical requirement and interface as per table below i.e. 220V 50Hz single phase or 380V 50Hz three phase, with an EER of greater than 10.

5.1.2 Power factor in all cases should be better than 0.95.

5.1.3 Technology/design of the air conditioners should be such that the inrush current during switch on should not exceed its maximum running current (as per below table) to prevent oversizing of onsite generators. Thus typical technology should be typical of "inverter" type or equivalent technology.

Type	Capacity	Power interface	EER	Start-up and maximum running power
Split/Window Unit	12 000 BTU	Nominal 220V 50Hz single phase	≥10	1200W / 6A
Split/Window Unit	18 000 BTU	Nominal 220V 50Hz single phase	≥10	1800W / 9A
Split/Window Unit	24 000 BTU	Nominal 220V 50Hz single phase	≥10	2400W / 11A
Split unit (may differ depending on site conditions)	32 000 BTU-36 000 BTU	Nominal 380V 50Hz three phase	≥10	3600W / 7A (3ph)

Ratings of 5% variance of above mentioned values may be considered

Table 5-1: Standard air conditioners sizes and electrical requirements

5.2 Features of air conditioners

The air conditioner should have the following features as standard on the supplied air conditioners:

5.2.1 The air conditioners should have air flow direction control for the following directions

- Horizontal (manual or auto) and
- Vertical (auto).

5.2.2 The air conditioner should be able to auto restart. When there is electricity failure the system shuts off. After restoration of the power, unit will start in the same set conditions prior to the power failure.

5.2.3 The air conditioner should have an onboard memory so that after mains restoration after mains failure the condition of on / off condition, operating mode (cooling/heating), set temperature and fan speed must be remembered.

5.2.4 The air conditioner should be able to be controlled by an EAS as per paragraph 5.4.

5.2.5 The air conditioner should have a manual override/forced operation in case when the user needs the air conditioner to be switched on.

5.2.6 The air conditioner should be able to go in a sleep mode and be switched on again when the required signal has been received from the controller.

5.2.7 The air conditioners should be able to dehumidification and or remove moisture from the air inside the required room and or container.

5.2.8 The air conditioner should be able to operate in the following ambient temperature range

- Minimum - 5 degrees Celsius;
- Maximum 45 degrees Celsius.

5.2.9 Auto defrosting feature should be available on the air conditioner by for example reducing outdoor fan speed when such an incident occurred.

5.2.10 Easy access and filter removal should be possible to enhance routine maintenance.

5.2.11 Piping length between the indoor and outdoor unit should be able to operate with a distance of at least 10m.

5.2.12 Temperature control – Air conditioners should be able to regulate the temperature in a room to a user selectable set value between 18 and 30 degrees Celsius.

5.2.13 Wireless remote control should be supplied with the air conditioner.

5.2.14 Environment friendly refrigerant should be used. i.e R410A.

5.2.15 The air conditioners should have the following operations: Cooling- and fan functions. The requested air conditioner doesn't require heating function.

5.2.16 Air conditioner should be equipped of anti-corrosion fins for the outdoor units.

5.2.17 Air conditioner should have an auto cleaning function.

5.2.18 The window units should include a slide-out chassis for easy wall mounting.

5.3 Dimensions

5.3.1 The typical maximum dimensions of the air conditioners indoor units should be as follows (width x height x depth):

a. Split unit 12 000BTU: 1000mm x 300mm x 200mm

b. Split unit 18 000BTU: 1110mm x300mm x 200mm

c. Split unit 24 000BTU: 1110mm x 300mm x 200mm

d. Window unit 12 000BTU: 600mm x 380mm x 570mm

e. Window unit 18 000BTU: 660mm x 428mm x 675mm

f. Window unit 24 000BTU: 660mm x 428mm x 770mm

g. Split unit 32 000 BTU: 1250mm x 350mm x 220mm

h. Split unit 36 000 BTU: 1250mm x 350mm x 220mm

5.3.2 Please note that all physical dimensions (indoor and outdoor) for the air conditioners should be confirmed with Broadband Infraco, prior ordering to take place. Air conditioners units may be installed in space constraints areas where specific dimensions may be required especially where replacement units are required. In general air conditioners are installed in Broadband Infraco standard container design where up to three units are being installed.

5.4 EAS Controller

All air conditioners shall be able to be controlled by the EAS air conditioning control unit and shall be able to automatic start and switch-off after the appropriate signals, $220V_{ac}$ single phase for 12 to 36000 BTU/hr, from the EAS has been received (which is either when the temperature inside the container has reached a certain threshold value or when the mains power of the site has been interrupted and been restored). Currently Broadband Infraco has an extensive installed base of the SAM 2 controller.

5.5 Alarms/Indicator

The air conditioner should have a self-diagnostic feature and be able to detect what is faulty with the air conditioners and indicate the required error code and or message accordingly.

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5.6 Service intervals

5.6.1 The service intervals of the air conditioners shall be made available (in running hours and maximum months/years).

5.6.2 Part of the service interval schedule, the supplier shall indicate the service components and items to be serviced at various service intervals as well.

5.6.3 The supplier of the air conditioners shall indicate the various approved companies who can assist Broadband Infraco in servicing the air conditioner at the required interval, the required service components it will require and the maintenance the air conditioner in case of breakdown.

5.7 Support

5.7.1 The air conditioner and spares must be locally available in South Africa and must be supported by any local company.

5.7.2 The supplier of the equipment should also be prepared to do services on the air conditioner when the need arises.

5.8 Warrantee

5.8.1 Warrantee of minimum 24 months is required for the air conditioner and 3 years for the compressor under normal operations.

5.9 Training

5.9.1 The supplier shall offer training to Infraco on request covering aspects like installation, maintenance and or fault finding.

5.10 Deliverables

5.10.1 The air conditioner must come with all relevant manuals, including technical drawings and product specifications, supplied.

5.11 Maintenance

5.11.1 All maintenance items must be easily accessible.

END

APPENDIX E: SCHEDULE OF COMPLIANCE / NON-COMPLIANCE / INFORMATION

Suppliers are required to complete this schedule and must take note of the following:

1. A detailed statement of compliance or non-compliance, accompanied by reasons (if any) for every requirement called for in the specification, must be submitted. The detailed statements must be in the format as provided in Schedule. Where needed, further notes may also be appended to the schedule.

2. It must be clearly stated whether the equipment offered, for each of the specified requirements, is:
   - **Fully Compliant**, or
   - **Non-compliant**

3. In all cases the relevant brochures of the offered equipment/items shall be submitted with the bid/ tender and reference to the specific and relevant paragraph to proof compliance sheet shall be made.

4. Phrases such as "**noted**" must only be used against paragraphs that are for information only and carry no contractual commitment.

5. Phrases such as "**noting**", "**will comply**" and "**comply, except**", in a paragraph that requires a compliance or non-compliance statement will be read as non-compliance.
6. The letter appended at the end of each paragraph in the specification requires the following type of response:

   [H] Heading

Specification			
Specification	**Key**	**Fully Compliant / Non-compliant / Noted**	**Comments (if applicable)**
5.1 Technology	H		
5.1.1			
5.1.2			
5.1.3			
12 000BTU			
18 000BTU			
24 000BTU			
32 000-36 000BTU			
5.2 Feature	H		

5.2.1			
5.2.2			
5.2.3			
5.2.4			
5.2.5			
5.2.6			
5.2.7			
5.2.8			
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5.2.15			
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5.2.3			
5.3 Dimensions	H		
5.3.1			
5.3.1.a			
5.3.1.b			
5.3.1.c			
5.3.1.d			
5.3.1.e			
5.3.1.f			
5.3.1.g			
5.3.1.h			
5.3.2			
5.4 Controller	H		
5.4.1			
5.5 Alarms/ Indicator	H		
5.5.1			
5.6 Service intervals	H		
5.6.1			
5.6.2			
5.6.3			
5.7 Support	H		
5.7.1			
5.7.2			
5.8 Warrantee	H		

5.8.1			
5.8.2			
5.9 Training	H		
5.9.1			
5.10 Deliverables	H		
5.10.1			
5.10.2			
5.10.3			
5.11 Maintenance	H		
5. 11.1			