National Research Foundation | SAASTA South African Agency for Science and Technology Advancement

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REQUEST FOR QUOTATION (RFQ) NUMBER:	**RFQ-187-2025-2026 (Please use this number as reference when sending quotations and supporting documentation)**
DESCRIPTION	**The National Research Foundation- SAASTA (NRF-SAASTA) wishes to appoint a suitable CIDB Grade 2 ME (or higher) service provider for the supply, delivery and installation of new air-conditioners and removal of old units in the Didacta building**
RFQ ISSUED DATE	**09 February 2026**
RFQ VALIDITY PERIOD	60 days from the closing date.
CLOSING DATE	**23 February 2026**
CLOSING TIME	**11:00am**
EXPECTED DATE SERVICES IS REQUIRED	**March 2026**
COMPULSORY BRIEFING SESSION/ SITE VISIT/SITE INSPECTION	**Date:** Monday 16 February 2026 **Time:** 10:00 AM **Venue:** Didacta Building, 211 Nana Sita Street Pretoria Central,SAASTA
DELIVERY ADDRESS OF GOODS/SERVICES	**211 Nana Sita Street, Didacta Building, Pretoria Central**
RFQ RESPONSES MUST BE EMAILED TO:	All quotations should be emailed to **quotes2@saasta.nrf.ac.za** Failure to follow these instructions will result in your quote not being considered.
ENQUIRIES REGARDING THIS RFQ SHOULD BE SUBMITTED VIA E-MAIL TO	Enquires can be directed at this e-mail address

	S.suke@saasta.nrf.ac.za , you may contact Silence Suke on 012 392 9380

Important Notes to this RFQ:

- **Service providers/suppliers should ensure that RFQ responses are emailed to the correct email address, (quotes2@saasta.nrf.ac.za)**
- **If the quotation is late, it shall not be accepted for consideration.**
- **The NRF-SAASTA reception is generally accessible 8 hours a day (07h45 to 16h00); 5 days a week (Monday to Friday) for delivery of goods.**
- **Supplier to complete and sign all Annexures to this document (Standard Bidding Documents and Mandatary Requirements);**
- **Supplier must provide a CSD no (MAAA…….)**
- **Supplier must provide a original or copy of certified of SANAS accredited BBBEE Certificate or Sworn Affidavit;**

Prohibition of Gifts & Hospitality:

"Except for the specific goods or service procured by the NRF-SAASTA, service providers/suppliers are required not to offer any gift, hospitality or other benefit to any NRF-SAASTA official. To avoid doubt, branded marketing material is considered to be a gift.

CONTENTS

SERVICE PROVIDER/SUPPLIER: .....

REGISTRATION NUMBER: .....

CSD REGISTRATION NUMBER: .....

ADDRESS: .....

CONTACT PERSON: .....

TEL: .....

1. NRF-SAASTA's standard conditions of purchase shall apply.
2. Late submissions will not be accepted.
3. The recommended service provider will be required to complete and sign all Standard Bidding Documents (SBDs) and Annexures. Please duly complete and sign the **SBD 1, 4**, **SBD 6.1 forms** respectively.
4. All service providers/suppliers must adhere to the General Conditions of Contract as prescribed by National Treasury.
5. Any service provider/supplier who has reasons to believe that the RFQ specification is based on a specific brand must inform the NRF-SAASTA before the RFQ closing date and time.
6. It is the responsibility of the service provider/supplier to ensure that the NRF-SAASTA is in possession of the valid Tax Clearance Certificate (TCC). The onus is on the service provider/supplier to ensure that the NRF-SAASTA receives a valid TCC as soon as the validity of the said certificate expires.
7. No goods or services shall be delivered before the issuing of an official authorised NRF-SAASTA Award Letter or Purchase Order (PO) signed by the authorised NRF-SAASTA official. The NRF-SAASTA reserves the right not to make payment or accept the goods or services should the goods or services be delivered to the NRF-SAASTA before the NRF-SAASTA Award Letter or PO is issued. (An official authorised NRF-SAASTA PO should have the Supply Chain Management (SCM): Manager signature or such other official duly authorised in terms of the NRF-SAASTA's Delegations of Authority and Approval Framework),Description of the item, Quantity of items purchased, Date of delivery of the item, Total amount of the items purchased inclusive of Vat where applicable.
8. This RFQ will be evaluated based on the 80/20 preference point system applicable to bids with a Rand value of R2 000 up to a rand value of R1 000 000 000. 00. (all applicable taxes included).
9. Please note that RFQ responses should be sent to email address mentioned on the cover page of the RFQ document, failure to do so, it shall not be accepted for consideration.
10. Service providers/suppliers are required to be registered on the Central Supplier Database (CSD).
11. After 14 days of closing date of Request for Quotation (RFQ) without receiving a signed purchase order by a properly delegated official, please consider your Quotation unsuccessful.
12. Append/Submit your correct banking details on your quotation and should be in the correct payee name as per CSD verification.
13. Banking details on the invoice must correspond with those verified on CSD
14. By responding to this RFQ you agree to all terms and conditions of the **Government Procurement: General Conditions of contract, July 2010.** You can log on www.saasta.ac.za/procurement/openbids to access this document.

*[1] Which is referred to as tenders in the PPPFA and Preferential Procurement Regulations, 2022 include advertised competitive bids, written price quotations or proposal.

*[2] It should be noted that written price quotation / RFQ bidding method is applicable to written price quotations up to the rand value of less than R 1 000 000. 00. (Vat inclusive).

I, the undersigned (NAME)……certify that:

I have read and understood the conditions of this RFQ;

I have supplied the required information and the information submitted as part of this RFQ is true and correct.

Signature: _____ **Date: _____**

Capacity: _____

https://www.saasta.ac.za/procurement/guidelines/

https://www.nrf.ac.za/sites/default/files/documents/General%20Conditions%20of%20Contract.pdf

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Annex C : RFQ SPECIFICATION

1. BACKGROUND TO THE NATIONAL RESEARCH FOUNDATION|SOUTH AFRICAN AGENCY FOR SCIENCE AND TECHNOLOGY ADVANCEMENT

South African Agency for Science and Technology Advancement (NRF-SAASTA) is a business unit of the NRF and its primary function is to advance public awareness, appreciation, and engagement of science, engineering, and technology (SET) in southern Africa.

2. BACKGROUND OF THE PROJECT

The National Research Foundation- SAASTA (NRF-SAASTA) wishes to appoint a suitable CIDB Grade 2 ME (or higher) service provider for the supply, delivery and installation of new air-conditioners and removal of old units in the Didacta building

The current VRV unit in the Auditorium is loud and whenever there is a meeting it must be shut down as people can't even hear each other. The other aircon units in offices are obsolete and needs to be replaced.

3. DETAILED SPECIFICATION

BRIEF DESCRIPTION OF ITEM(S)/SERVICE(S) REQUIRED	UNIT OF MEASURE	QUANTITY OF ITEM(S)
3.1. Removal of the current **Alliance MAC-150HDINX (6) VRF** system including the indoor units and stored in the building basement area	Each	1
3.2. Supply, deliver and install **4 x FXSQ125A FXSQ-A - Concealed ceiling unit with medium ESP** or equivalent, complete with **1 x RXYQ20U - RXYQ-U (VRV IV Non-Continuous Heating)** or equivalent outdoor unit, KHRQ22M29T9 x 1 & KHRQ22M64T x 4 Refnet branch piping kits, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation.	Each	1

3.3. Supply, deliver and install split unit of 9000BTU Inverter R410A Split unit complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation. Flash Streamer filter, 2- area motion detection sensor, practically inaudible not more than 25dBA – Office 115	Each	1
3.4. Supply, deliver and install split unit of 12000BTU Inverter R410A Split unit complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation. Flash Streamer filter, 2- area motion detection sensor, practically inaudible not more than 25dBA – Office 228	Each	1
3.5. Supply, deliver and install split unit of 18000BTU Inverter R410A Split unit complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation. Flash Streamer filter, 2- area motion detection sensor, practically inaudible not more than 25dBA – office 023 & office 233	Each	2
3.6. Supply, deliver and install split unit of 18000BTU Inverter R410A Split unit complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation. Flash Streamer filter, 2- area motion detection sensor, practically inaudible not more than 25dBA – office 127	Each	1
3.7. Supply, deliver and install Round Flow Cassette of 18000BTU Inverter R410A Round flow cassettes complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation. Units must have self-cleaning decoration panel, standard built-in drain pump kit. motion sensor – office 208	Each	1
3.8. Servicing Current Air Conditioners - Split units/Round Flow/Under Ceilings Clean & wash filters; Check condition of condenser & evaporator coils; Check unit & fan operation; Check heating & cooling operation; Clean intake screen; Check fan motor; Check compressor mountings & piping; Pressure clean condenser & evaporator coils; Clean drip pan and of ensure drain pipes are not leaking; Test for refrigerant leaks and top up if necessary; Check electrical connections; Status report of each air con and recommendations; office 105, 129, 202, 204, 223, 235 and security desk	Each	7
3.9. Service and repair of a Cassette unit in office 203 including reflaring the pipe, changing the flare nut and regas the system/unit	Each	1
3.10. Removal of Old units removed units to be removed and stored in the basement	Each	6

Provide detailed requirements to evaluate the bidder's ability to deliver on the bid.

- The bidder is to be registered with CIDB Grade 2 ME or higher
- The bidder to have a professional indemnity and public liability insurance of not less than R1

000 000

- The bidder to supply proof of COIDA letter of good standing
- The bidder to supply proof of the technician's South African Trade Refrigeration Certificate(s)
- The bidder to supply proof of F-Gas registration number of technician. (South African Qualification and Certification Committee (SAQCC) Gas Practitioner Card)
- Bidder must provide three Service, Supply and Installation of air-conditioning projects written references, with contact details for those customers for whom the bidder has completed work within the last 36 months similar to the scale and nature of the project and has indicated their willingness to take NRF representatives on such site visits to such client premises. These references meet the minimum threshold of "Meets requirements".
- The bidder to supply proof of training of air-conditioning installation from manufacturer for the technician on the product offered/quoted
- Quotation on a company letterhead with detailed description of the items quoted meeting the minimum specification

Standards and Compliance

All work must be carried out in accordance with, but not limited to, the following:

- **SANS 10147:** Code of practice for refrigeration systems, particularly regarding the handling of refrigerants, leak detection, and maintenance of systems with over 20kW capacity
- **SANS 10142**: Wiring code, requiring that electrical connections are made by a qualified electrician.
- **SANS 10400-O:** National Building Regulations regarding ventilation and air conditioning.
- **Occupational Health and Safety (OHS) Act 85 of 1993:** All installations must comply with this Act, including the management of safety files on-site, risk assessment, and proper PPE.

Installation and Replacement Standards

- **Installation Procedure:** Installations must follow manufacturer guidelines, including proper placement of indoor/outdoor units, secure mounting to prevent vibration, and correct pipe lengths.
- **Structural Integrity:** Core drilling on walls/slabs must not compromise the building structure; holes must be sealed, filled, and painted.
- **Electrical Safety:** Lockout/tagout procedures, proper grounding, and appropriate wire gauges are mandatory to avoid fire hazards.
- **Drainage:** Condensate drainpipes must be installed with a proper slope to ensure effective water drainage.
- **Noise Control:** Installations should not increase ambient noise levels by more than 3 dB(A) on the site boundary, aiming for an NC 30 rating in offices.

Installation and configuration service

- ✓ The bidder is to remove the old equipment and replace with new equipment (old equipment remains the property of SAASTA)
- ✓ The bidder is to ensure all installed equipment is in working order and SAASTA representatives are trained on how to use them
- ✓ Bidder to supply the original equipment manufacture's manuals
- ✓ All refrigeration piping and respective piping installation, cabling and drains, following same route of existing and connecting to same drain points as the old units where possible
- ✓ Rigging of the existing outdoor units including from the roof and hoisting new AC units to the same positions as the old once whilst observing all safety controls and requirements as per the OHS Act and associated regulations.
- ✓ Installation to include all components that come with the unit including remotes and wall panels
- ✓ Bidder to supply certificate of compliance on completion of installation

Support service

- ✓ The bidder is to be available within 24 hours after installation whenever there are problems with the equipment or installations for the duration of the workmanship guarantee of one year
- ✓ The bidder to provide a one-year workmanship guarantee

- **Occupational Health and Safety when working on NRF sites;**
  - ✓ All personnel performing work on SAASTA site/s as part of this contract are responsible to obtain safety induction.
  - ✓ Over and above the obligations provided by the Occupational Health and Safety Act (OHS Act No 85 of 1993 and its Regulations, known as 'the Act'), the appointed bidder meets with all relevant health and safety instructions as given to them by site safety personnel, where relevant. Personal protection equipment including closed safety shoes, hard hats, height safety equipment, and high visibility vests are worn at all times while on the work site. All personnel are to obey the relevant instructions, including signage, related to restricted access and speed limits on all sites.
  - ✓ The appointed bidder, once signing the contract (SBD 7 and the NRF's Section 37.2 agreement), is responsible for itself, its employees, and those people affected by its operations in terms of the Act the regulations promulgated in terms thereof. The appointed bidder performs all work and uses equipment on site complying with the provisions of the Act.
  - ✓ To this end, the appointed bidder shall make available to SAASTA on the valid Letter of Good Standing in terms of the COID Act and ensures its validity does not expire while executing this bid, where applicable. The appointed bidder furnishes its registration number with the office of the Compensation Commissioner.
  - ✓ The appointed bidder maintains a health and safety plan complying with the requirements of The Act at the work site during the period that contracted work takes place on the site.
  - ✓ SAASTA manages the appointed bidder in his/her capacity for the execution of this contract to meet the provisions of the said Act and the regulations promulgated in terms thereof. The appointed bidder accepts liability for any contraventions to the Act. Each member of the appointed bidder's team (including sub-contracted personnel), submit a

signed indemnity form prior to entering the work site and kept in the appointed bidder's health and safety file.

SYSTEM FEATURES FOR THE HEAT PUMP

1.1 General

The Heat Pump system will control flow of refrigerant through the indoor units, by means of an electronic expansion valve fitted in each indoor unit. It will have the following features:

1) The Heat Pump system will have inverter-controlled fan motors to allow the system to accurately respond to head pressure control requirements.
2) The system must be able to vary evaporating and condensing temperatures based on ambient temperatures and/or load to ensure optimum seasonal efficiency and comfort. Or alternatively fix the evaporating temperature for continual very high off coil temperatures.
3) Part load conditions must be met by a combination of change of compressor speed and change in refrigerant temperature at a suitable reaction speed which is set at the condenser on commissioning.
4) The Heat Pump systems will have a minimum of 50 step inverter fan control to allow the system to accurately respond to head pressure control requirements.
5) The compressor shall respond to control frequencies from 60 to 402Hz to provide stepless capacity control.
6) All condenser fans must be capable of at least 78 Pascal's of external static pressure.
7) The refrigerant must be distributed by the use of a refrigerant networking system (Refnet) to ensure low pipe pressure losses as well as keeping the require pipe work installation space and material used to a minimum compared to other parallel pipe work systems.
8) The system will have the ability to sustain refrigerant piping lengths of up to 165m (equivalent piping length has to be at least 190 meters) with a level difference of 90m between fan coil units and condensing unit, providing connection ratios are suitable. The system shall be capable of having up to 1000m of refrigerant pipe work installed. The system shall be capable of having up to 90m from the first refnet to the furthest indoor unit, providing manufacturer system design guidelines are used. The elevation between the highest and lowest indoor units must be able to be extended up to 30 meters.
9) The system must be able to adjust capacity depending on the load requirements and outside temperature to ensure that the efficiency is optimised and responsiveness maintained.
10) The system must be able to operate a continuous heating during defrost system on single as well as multi-unit installations resulting in no cold air dumping.
11) The system has to smoothly operate at ambient temperatures ranging at least from -5°CDB to +43°CDB in cooling and down to -20°CWB and up to +15,5°CWB in heating. The system operation must be possible outside above-mentioned limits, unless safety devices are activated.
12) The system will operate with Refrigerant R410A, being a zeotropic blend constituted of a maximum of two different refrigerants providing a maximum temperature glide of less than 0.17K to avoid fractionation problems.
13) The system will have the capability to automatically charge the correct volume of refrigerant during commissioning and, if automatic charging has been utilised, the system must also have the ability to self-diagnose refrigerant containment for maintenance and service purposes. The unit shall be capable of carrying out automatically the calculated required additional refrigerant charge necessary to operate the system within its optimum efficiency. This cycle shall be completely automatic and provide a warning to the service technician to indicate when charging has been completed or the charging cylinder is empty. The refrigerant cycle shall not rely upon float valves, level switches or weighed input of the refrigerant. The calculated refrigerant charge shall be retained within the memory of the outdoor PCB as a reference for a refrigerant containment check which can be carried out as required to verify the correct refrigerant charge remains within the system. The automatic refrigerant charging and containment check facilities shall be capable of being used at any time during the life of the system for any alterations or service operations which may be required.

14) In the event of compressor failure, the system will allow emergency operation of its other compressors in order to maintain 8 hours of interim capacity whist spares are sourced.
15) Systems containing multiple outdoor units shall sequentially cycle its start-up sequence to ensure equalised compressor operation to extend operating life and reduce lifecycle cost.
16) In the outdoors units it is preferable to have a 7-segment decimal display, displaying detailed error codes, stage of the start-up procedure as well as function and operating data of the system. For the commissioning of a system and in order to properly set all necessary data and values for the optimum operation of it, it is recommended for the starting-up the use of special software provided by the manufacturer of the system. The establishing of the values and the programming should be possible even offline.
17) The system shall have the capability to monitor and log data in a critical memory which will store and provide 5 minutes of real time operational data prior to any system failure. This information provides the system with "Black Box" data recording capability which can be used by a qualified service technician to perform efficient and precise interrogation.

1.2 Equipment manufacturer

The equipment manufacturer must be fully certified and registered to comply in the areas of CE, Eurovent, ISO9001 and ISO14001 and also must possess the BES 6001 certificate to demonstrate responsible sourcing throughout the supply chain by proving product stewardship against social, economic and environmental sustainability criteria. The equipment manufacturer shall be responsible for the manufacture of the compressor, refrigerant oil and refrigerant used within the system to maintain integrity of design and optimise efficiency and reliability of equipment.

1.3 Testing and certification.

All equipment shall be run tested in accordance with the following procedures prior to leaving place of manufacture:

1) A choke test carried out on the refrigerant piping to detect obstacles.
2) The pipework shall be tested to 38bar.
3) Electronic leak testing shall be carried out to ensure maximum system refrigerant containment.
4) System vacuum test to 2 Torr
5) Refrigerant test to within 0.3%
6) Electrical tests shall include flash testing at 1440V AC to ensure that current leaks above 5mA are detected, megger test at 500V DC to ensure resistance levels are above 10 mega Ohm and earth continuity tests.

2. SYSTEM COMPONENTS FEATURES

2.1 Outdoor unit features

2.1.1 Outdoor unit physical appearance

The outdoor unit must be suitable for outdoor installation. The shell/casing of the unit will have to be made of enamelled stainless-steel sheet, with polyester thermal powder coating (minimum 70µ) for high protection in environment near the seaside. The units shall be air-cooled type incorporating heat exchanger coils manufactured from copper tubes and aluminium fins. The air-cooled heat exchanger of the outdoor unit will have to have undergone appropriate treatment for protection and long-life efficient operation against atmospheric corrosion. Specifically, the aluminium fins will be coated with a layer of acrylic resin and on top covered with a hydrophilic film or any other material

which will provide minimum 5 to 6 times greater resistance to acid rain and salt corrosion. The bottom of the unit will have a sheet of stainless steel for protection against oxidation.

2.1.2 Outdoor unit mechanical features and components

The outdoor units will be able to deliver cooling capacities ranging from 8HP (22,4kW) and up to 20HP (56,0kW) in a single shell/housing. A combination of two or three outdoor units will be possible to have systems with cooling capacity reaching 54 HP (150,0 kW). No limitations on possible combinations will be accepted while the most appropriate one will be decided primarily for operating at the best possible seasonal efficiency. Aforementioned cooling capacities will have to be clearly mentioned in the manufacturer's official technical documentation and literature and will have to be calculated, based on the following conditions:

- Indoor room air temperature: 27oCDB / 19oCWB.
- Ambient air temperature: 35oCDB.
- Equivalent piping length: 5,0m.
- Height difference: 0m.

2.1.2.1 Compressors

In the outdoor unit there will be either one or two compressors in separate shells, so in case one fails it will not be necessary to replace both. The outdoor units will have axial fan(s) DC inverter driven, air-cooled heat exchanger, piping, wiring and automation, factory-installed electronic expansion valves, oil separator, accumulator at the suction side of the compressor, high & low pressure sensors, protection thermostats, fuses, protection against overcurrent, protection for overloading of the inverter, liquid and gas stop valves and solenoid valves, timers and all the necessary sensors and protection equipment to ensure continuous, safe and smooth operation.

The outdoor unit - and consequently the whole system - will keep on operating even if one compressor is turned off (emergency operation). In case of a multi-outdoor unit system it will be possible to isolate one module, while the rest of the system will continue to operate even if delivering reduced capacity. This ensures continuous air conditioning of the premises, until the cause of the issue seizes to exist.

Outdoor units should have a specific function and appropriate devices to prevent refrigerant in liquid phase to return to the compressor. This ensures the specified density of the oil and therefore the adequate lubrication of the compressor. This function increases the efficiency of the system and extends the lifespan of the compressor.

Compressors will have to be hermetically closed scroll type with integrated motor and sound absorbing jacket. They will have a DC inverter driven motor and be able to continuously change the frequency, resulting in a change to the volumetric refrigerant flow from the compressor, in order to accurately and fast respond to the required load. The change in frequency should be done incrementally, but in enough steps so the change of delivered capacity can be approximated as linear. The minimum number of capacity steps will have to be no less than 100.

The compressors shall be equipped with the technology, providing the minimization or elimination of refrigerant backflow within the scroll structure al low load conditions, thus minimizing the losses and improving the overall seasonal efficiency. This shall be done by means of refrigerant bypass port, which allows high pressure refrigerant to go partially to pressure equalization chamber on the back side of movable scroll, thus compensating the scroll compressing force loss at low load conditions.

The motor windings will have to be specially constructed, in order to achieve the safe and smooth operation to avoid hazards due to the continuously changing of frequency and voltage. The

compressors will be protected by an electrical crankcase heater to prevent oil condensation at low ambient temperatures.

The oil supply in the compressor will have to be on the high pressure side, ensuring optimum lubrication of all moving parts. Therefor a separate lubrication system will not be required for the moving parts of the compressor, since the oil in the centre of the crankshaft will be transported across the surface of the rotating parts from the centre to the perimeter. This optimizes the performance of the compressor and minimizes stress and wear, extending its lifetime. The compressors' motors will have a cooling system using compressed gas, to avoid sudden changes in temperature resulting in significant stresses on winding and bearings.

Compressors will alter the rotation speed linearly and consume energy in accordance with cooling and heating loads, ensuring operational autonomy and independent temperature control in each room. The two DC inverter compressors will vary their speed separately controlling the volumetric flow more accurately, with lower power consumption, resulting in higher efficiencies at all loads and connection ratios.

For protecting the compressor from frequent start-stops, there will be an appropriate timer.

2.1.2.2 Oil recovery system

The oil recovery from the piping network and the indoor units has to be achieved by the use of a microprocessor. The oil will be recovered at least once every eight hours, via a special oil recovery function, ensuring smooth operation of compressors.

2.1.2.3 Fans

The fan motor(s) of the outdoor unit will have to be DC inverter to further increase energy savings, to more accurately adjust the fan speed and reduce noise. The setting of the fan speed will result in precise control of system's performance in accordance with the requirements of indoor and ambient conditions. The DC inverter fan motors will automatically adjust the rotation speed - thus the air flow - and have at least 120 different steps. Each fan will be separately controlled in order to further increase the accuracy of system control.

The impeller will be made of plastic and with a special configuration to achieve greater air flow with low noise level. Outdoor units will have a protective cover over the fan to guard against accidents and to avoid foreign objects entering the units. It will be special design and construction to minimize the external static pressure drop of the fan.

Fans will have a high external static pressure setting in order to reach at least 78 Pa. This will allow the installation / connection of duct(s) for greater flexibility during installation. In case of an outdoor unit with two fans, then each fan will have the ability to be separately ducted.

2.1.2.4 System control and functions

All indoor units to be connected to a system must be independently controlled depending on the requirements of each room. The indoor units will be connected to the outdoor unit via the wiring and refrigeration piping network. The wiring cables are not required to be shielded, but the installer will have to ensure that it will not be closer than 5cm to power cables.

The system's operation has to be based on pressure sensors and thermostats, which via a specially designed integrated circuit will control the frequency of the compressor motor (inverter) by varying the compressor's speed resulting in changes to the refrigerant's volume and temperature. The result,

combined with ambient temperature and building's load requirements, will always deliver the necessary capacity while maintaining optimum efficiency.

The system will have the ability to perform capacity control from down to 9% and up to 100% of the nominal capacity. The capacity delivered by the system should match the building's load. This way the system will consume the minimum required energy, at the highest possible efficiency.

The room temperature for each room must be controlled by a microprocessor, where processing of the various parameters and the corrective settings are proportional and according to the integral - differential method of regulation.

- Parameters: set temperature and return air temperature for the differential control, gas and liquid refrigerant temperatures for controlling the superheat
- Corrective settings; opening of the expansion valve, fan speed

Variable Refrigerant Temperature

The system has to automatically adjust the evaporating and the condensing temperature in order to always deliver the exact capacity for the building's load, with the highest possible efficiency. In parallel, it must be possible to also set a target refrigerant temperature. This way the delivered capacity will be ambient temperature dependant thus having very high seasonal efficiency. In addition, it has to be possible to operate the system with at least three different set refrigerant temperatures. Higher evaporating temperatures will result in less dehumidification indoors, while the system will deliver mostly or even only sensible capacity. The adjustment of the evaporating and the condensing temperature will have to be easily field set, without any optional accessories prior or after the commissioning of the system.

Ambient temperature dependant variation of the refrigerant temperature – evaporating and/or condensing is required, and results in even greater energy savings and optimal seasonal efficiencies, as per latest directives of the European Union.

It should also be possible to fix the evaporating temperature at different values in order to have the system operate with different Sensible Heat Factors. This way and depending on the indoor relative humidity the supply air temperature can vary (e.g. higher), thus increasing comfort levels through less cold air supplied in the rooms. At the same time relative humidity levels can be maintained within the comfort zone according to international standards and guidelines.

Continuous Heating During defrost

The VRV units should incorporate a function that guarantees continuous comfort during defrost cycles as defrost takes place regularly in order to increase efficiency of the system and protect the outdoor units from heat exchanger breaking down.

In order to avoid cold drafts and also the absorption of heat from the rooms, the indoors will not be used as the evaporator during defrost. The outdoor unit must have a special heat exchanger that will act as the evaporator during defrost. In case of multi-outdoor systems, the defrost of the outdoor heat exchanger will take place in a consecutive way, by means of defrosting completely each heat exchanger one after the other.

For single-module systems the most preferred technology for the special heat exchanger will be the one of using a phase changing material. This material will provide the necessary heat for the defrost cycle, while ensuring that any residual capacity of the unit will be provided in the indoor units for continuous heating.

Please refer to enclosed schedules for equipment details.

CONCEALED CEILING UNITS

1. FUNCTION AND TYPE

The indoor units shall be concealed ceiling ducted type, to be installed hidden into ceiling space. They must have sufficient ESP to overcome the resistance of ducts and return and discharge grilles according to the project design.

2. DESCRIPTION AND MECHANICAL FEATURES

The unit casing shall be manufactured from galvanised steel plate and shall be fully insulated. The use of a polystyrene only construction for the outer casing will not be acceptable. Facility shall be provided for duct connection for introduction of fresh air to the unit and branch ductwork from the unit. The return air to the unit shall be through the back of the unit as standard. A facility shall be provided for alternative return air position through the underside of the unit. The heat exchanger coils will be manufactured from copper tubes and aluminium fins. It shall have electronic expansion valve to control refrigerant flow rate in response to the load variation in the conditioned space. The expansion valve shall be controlled by an integral computerised PID control system to maintain correct room temperature. The fan shall be DC to comply with LOT 11 and dual suction multi blade type, statically and dynamically balanced to ensure low noise and vibration free operation. Supply and return air grilles, properly sized for minimum pressure drop at rated air volume, should be supplied by others. The return air should be ducted back to the indoor unit in insulated galvanised sheet steel ductwork. Return air path will be possible from either the bottom or the rear of the unit. The condensate shall be drained from the unit using suitable tube and run directly to a main drainage point. A condensate lift pump shall be provided within the unit and shall be capable of discharging 625 mm above the bottom plate of the unit. The air filter must be included with the units and must be removable and washable and have a mould proof coating.

3. KEY CHARACTERISCTICS

The units shall be no more than 245 mm in height. The units must have ESP at least 150 Pa for the whole line-up to enable operation with sufficiently long ducts. The units must have sound pressure level of no more than 34 dBA for biggest models.

4. FUNCTIONS

The units must be able to be operated by wired or wireless remote controllers (by designer choice), available wired controllers must be available in 2 types at least (simplified and fully functional) to allow the design flexibility. The units must have automatic restart function and multi-tenant ability.
The units must have the ability to alter the External Static Pressure (ESP) from the controller during commissioning and automatically at installer's choice, to avoid the insufficient air flow if the real installed ducting differs from the designed one.

5. ADDITIONAL OPTIONS

Adapters for remote control and monitoring must be available as options to allow integration with other types of engineering equipment. Remote temperature sensor must be also available as an option to allow the correct temperature control if installation situation does not allow using the built-in sensor or remote controller sensor.

Annex D : EVALUATION CRITERIA

The evaluation criteria will be based on the following requirements:

1. **Sage 1:** Technical Evaluation

No.	Criterion	Grading scheme	Minimum required grade
1.	The bidder is to be registered with CIDB Grade 2 ME or higher	Go/No Go	Go
2.	The bidder to have a professional indemnity and public liability insurance of not less than R1 000 000	Go/No Go	Go
3.	The bidder to supply proof of COIDA letter of good standing	Go/No Go	Go
4.	The bidder to supply proof of the technician's South African Trade Refrigeration Certificate(s)	Go/No Go	Go
5.	The bidder to supply proof of F-Gas registration number of technician. (South African Qualification and Certification Committee (SAQCC) Gas Practitioner Card)	Go/No Go	Go
6.	Bidder must provide three Service, Supply and Installation of air-conditioning projects written references, with contact details for those customers for whom the bidder has completed work within the last 36 months similar to the scale and nature of the project and has indicated their willingness to take NRF representatives on such site visits to such client premises. These references meet the minimum threshold of "Meets requirements".	Go/No Go	Go
7.	The bidder to supply proof of training of air-conditioning installation from manufacturer for the technician on the product offered/quoted	Go/No Go	Go
8.	Bidder to submit quotation on a company letterhead with detailed description of the items quoted meeting the minimum specification	Go/No Go	Go

Bidders **must** meet all the mandatory requirements listed above. Failure to comply with any of these requirements will result in automatic disqualification at the technical evaluation stage.

2. Stage 2: Evaluation for Price and NRF-SAASTA specific goals based on the 80/20 PPPFA principle.

Evaluation: Price and NRF-SAASTA specific goals:

This RFQ will be evaluated based on the 80/20 preference point system applicable to bids with a rand value of up to R1 000 000. 00. (All applicable taxes included).

Annex E : COST BREAK DOWN

1. The service provider/supplier is required to provide a full cost breakdown for each item required on an official company letterhead;
2. The service provider/supplier is required to list all additional costs associated with the services listed above, with the conditions of when such costs will apply;
3. All prices must be VAT inclusive (if VAT registered) and must be quoted in South African Rand (ZAR);
4. No price changes will be accepted after official Purchase Order (PO) is issued.

NB: Price calculation Guide to be aligned to the quotation

No	Description	Unit of Measure	Quantity	Unit Price	Total VAT inclusive
1.	Removal of the current **Alliance MAC-150HDINX (6) VRF** system including the indoor units and stored in the building basement area	Each	1		
2.	Supply, deliver and install **4 x FXSQ125A FXSQ-A - Concealed ceiling unit with medium ESP** or equivalent, complete with **1 x RXYQ20U - RXYQ-U (VRV IV Non-Continuous Heating)** or equivalent outdoor unit, KHRQ22M29T9 x 1 & KHRQ22M64T x 4 Refnet branch piping kits, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation.	Each	1		
3.	Supply, deliver and install split unit of 9000BTU Inverter R410A Split unit complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation. Flash Streamer filter, 2- area motion detection sensor, practically inaudible not more than 25dBA – Office 115	Each	1		
4.	Supply, deliver and install split unit of 12000BTU Inverter R410A Split unit complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the	Each	1		

	installation. Flash Streamer filter, 2- area motion detection sensor, practically inaudible not more than 25dBA – Office 228				
5.	Supply, deliver and install split unit of 18000BTU Inverter R410A Split unit complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation. Flash Streamer filter, 2- area motion detection sensor, practically inaudible not more than 25dBA – office 023 & office 233	Each	2		
6.	Supply, deliver and install split unit of 18000BTU Inverter R410A Split unit complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation. Flash Streamer filter, 2- area motion detection sensor, practically inaudible not more than 25dBA – office 127	Each	1		
7.	Supply, deliver and install Round Flow Cassette of 18000BTU Inverter R410A Round flow cassettes complete with Outdoor unit, all electrical connections to isolators, electrical control wiring, brackets, support and all necessary accessories to complete the installation. Units must have self-cleaning decoration panel, standard built-in drain pump kit. motion sensor – office 208	Each	1		
8.	Servicing Current Air Conditioners - Split units/Round Flow/Under Ceilings Clean & wash filters; Check condition of condenser & evaporator coils; Check unit & fan operation; Check heating & cooling operation; Clean intake screen; Check fan motor; Check compressor mountings & piping; Pressure clean condenser & evaporator coils; Clean drip pan and of ensure drain pipes are not leaking; Test for refrigerant leaks and top up if necessary; Check electrical connections; Status report of each air con and recommendations; office 105, 129, 202, 204, 223, 235 and security desk	Each	7		

9.	Service and repair of a Cassette unit in office 203 including reflaring the pipe, changing the flare nut and regas the system/unit	Each	1		
10.	Removal of Old units removed units to be removed and stored in the basement	Each	6		
11	Scaffolding for auditorium	Each	1		
Total VAT inclusive					

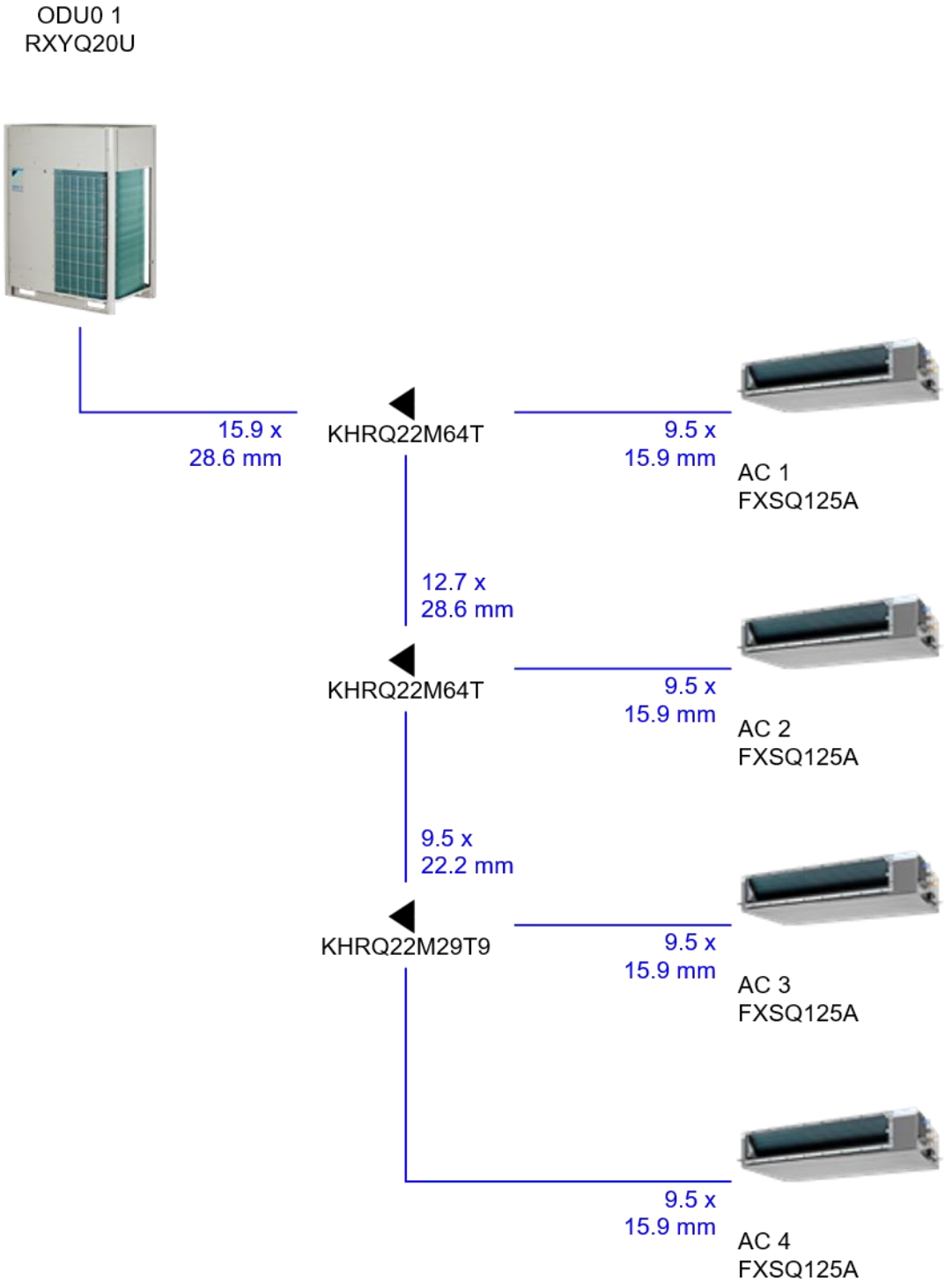
Annex F : STANDARD BIDDING DOCUMENTS

SCM-Bid documents SBD 1

SCM-Bid documents SBD 4

SBD 6.1 in terms of PPR 2022

The Following picture is for illustration purposes for Piping of specification 3.2



The Following picture is for illustration purposes for Wiring of Specification number 3.2