

ANNEX A: TERMS OF REFERENCE (ToR)

Introduction: The Office of the United Nations High Commissioner for Refugees (UNHCR) was established on December 14, 1950, by the United Nations General Assembly. The agency is mandated to lead and co-ordinate international action to protect refugees and resolve refugee problems worldwide. Its primary purpose is to safeguard the rights and well-being of refugees. It also has a mandate to help stateless people.

UNHCR Nigeria currently has offices in Ogoja, Takum, Adikpo and Calabar which are equipped with air conditioners to improve the comfort of UNHCR staffs. Just as other running equipment and machinery are, air conditioners need regular maintenance, as well as emergency services whenever there is an unexpected, to make them sustainable in the longest possible useful life. In view of this, the establishment of a country-wide contract with an approved/ accredited vendor for the repair, servicing / maintenance of Air conditioners, fridges, and water dispensers in UNHCR offices on and as when required basis is requested.

2. Objectives: The Objective of the frame agreement is to obtain services of a reputable, experienced and qualified contractor who can provide equipment curative and preventative maintenance support services to ensure optimal equipment functionality and minimize downtime that would occur in the event of equipment failure.

The vendor selected shall therefore, provide the required service of repair and maintenance of Air conditioners for:

- a. Takum - office and guest house
- b. Ogoja - office and guest house
- c. Calabar -Office
- d. Adikpo - office and guest house in Benue State.
- e. Makurdi - office
- f. Other locations - As may be determined based on emerging operational need.

3. Maintenance Overview: The requirement is the quarterly repair, servicing, and maintenance of the Air conditioners. The services are also extended to refrigeration equipment (Fridge, water cooler and cold room)

4. Scope of Work: The scope of work will entail timely maintenance (preventative and curative) and faulty resolution of the existing Air Conditioning Units at UNHCR offices in Nigeria (irrespective of brand) as outlined below:

a. Visual Inspections

To check for unusual noise, vibrations or leaks, dust, minor corrosion and exposed ductwork for damaged insulation and air leaks.

b. Start-up and Shutdown

To check that the units are functioning correctly

c. Condenser

To chemically clean or wash coils, check fan motor voltage and amps, lubricate moving parts, check fan blades, belts and pulleys and adjust, if necessary, check for corrosion and degradation.

d. Compressor

To check compressor oil levels and sight glass, to check voltage and amps, check mounting for cracks and vibrations, check head and suction pressure.

e. Evaporator

To wash or chemically clean the coils depending on the extent of fouling, clean blower wheels, check fan motor, voltage, and amps, lubricate moving parts, check belts and pulleys and adjust, if necessary, clean of cabinet.

f. Filters

To inspect and clean when necessary.

Kindly note that permission must be sought for the purchase of all items which do not fall under the maintenance and service contract prior to installation

g. Drains

To clean drain pan and flush drain lines

h. Electrical Connections

To check electrical connections, clean and tighten as necessary

i. Refrigerant lines and installation

To check refrigerant for exposed pipes, leaks, and insulation damage

j. Operation of Thermostat/Remote Controls

To check to see that the unit is functioning correctly and adjust as required

k. Refrigeration equipment

This contract also includes the refrigeration equipment. The successful contractor will be responsible for servicing all water coolers, fridges, freezers, ice machines, chillers packs and cold room where applicable. The frequency of maintenance will be as requested.

5. Repairs or Remedial work: Any equipment that needs repair must be clearly identified when presented for approval.

- i) Clearly state where it is to be done
- ii) Clearly identify what is to be done
- iii) Clearly state an estimated time to complete the Job
- iv) Provide a list of spare parts and indicative prices. The prices should be fixed for a period of the contract **OR** contractor should submit a list of requirements and quotation for repairs within a reasonable time frame for review as this is not included in the contract cost
- v) Used spare parts must be shown and /or given to UNHCR offices

vi) The materials /accessories used in the repair/ replace work must adhere with the **ISO 9001 standard specifications**. Faulty parts to be taken out of the office for repair in the workshop must be authorized by the supervisor staff. They will also be cleared when they are back for reinstallation. New spare parts for the replacement will be provided by the contractor based on the proposed unit cost prior to the award of the contract, the supplied spare parts will be confirmed and authorized by the supervisor staff upon physical inspection on site before installation. They can be purchased by the office or by the supplier of maintenance services. In this case a purchase order shall be issued to the supplier.

6. Preventive Maintenance:

- The service provider commits to ensure a support of the Air Conditioning installations by onsite maintenance in accordance with schedules adopted and agreed upon by both parties.
- The service tasks of the preventive maintenance include the following.
- A comprehensive quarterly preventive maintenance of all Air Conditioning Units,
- trouble shooting, repair and restoration of all the components of Air Conditioning Unit.
- Assistance and advice in the best practice administration relating to the Air Conditioning equipment Area.
- To check that the Units are functioning correctly.
- Check and optimize the oil and gas levels of Air Conditioning Units
- To check for unusual noise, vibration, or leaks, dust, minor corrosion and other exposed components.
- Tightening the electrical connections
- To chemically clean or wash coils, check fan motor voltage and amps (current),
- lubricate moving parts, check, check fan blades, belts and pulleys and adjust.
- Clean blower wheels.

7. Curative Maintenance: The service provider makes every effort to ensure that the breakdowns of the Air Conditioning installations because of normal use is immediately fixed once reported

The service provider should provide a list of necessary spare parts, and their respective unit costs, required for smooth functioning of Air Conditioning Units. Such prices shall be applicable throughout the contract period.

8. Workshop Inspection: The Vendor must give access to UNHCR personnel for compliance inspection when required.

9. Repair and maintenance: All parts and labor related to agreement must be guaranteed and include a warranty.

- a. The Contractor shall provide only replacement parts that are new and are of the same quality as that being replaced.
- b. The UNHCR shall be responsible to provide reasonable means of access to all equipment covered by this agreement and promptly notify the Contractor of any malfunction in the system(s).

- c. The Contractor shall do all the work and furnish all the materials, tools, equipment, and safety devices necessary to perform in the manner within the time specified.
- d. The Vendor shall bear all losses resulting to him or to the Owner on account of the amount or character of the work, or because of the nature of the area in or on which the work being done is different from what was estimated or expected, or account of the weather, elements, or other causes.

10. Special Equipment: The Contractor and /or his Staff must have available the necessary specialized diagnostic equipment to diagnose the faults of the Air Conditioning Units at the UNHCR offices in Nigeria.

11. Response: Ad – hoc repairs to be scheduled within 2 workings days after formal notification by UNHCR, which may include travelling.

(a) The contractor shall provide a 24/7 telephone number which should be responded to on 1st attempt with 3 maximum call attempts. This is needed for emergency support and repairs. All the standby phone numbers must be provided.

12. Transportation to Locations and Accommodation: UNHCR will not be responsible for the Vendor's transportation to locations and accommodation in any of the locations.

13. Security: The responsibility for the safety and security of the Contractor and its personnel and property, and of UNHCR property in the Contractor's custody, rests with the Contractor. The Contractor shall:

(a) Consider the security situation in the location where the services are being provided.

(b) Assume all risks and liabilities related to the Contractor's security.

(c) The contractor must hold record of their staff details. A list of the staff involved in performance of the work must be shared with the staff supervising the maintenance services. The contractor shall provide clear visible badge to their workers, showing the name and this should be worn at all times during the work

(d) The contractor shall not without the written approval from the staff supervising the maintenance services, take photograph of the whole or any part of UNHCR premises or of any UN agency. The contractor shall take all reasonable steps to prevent any person from taking, publishing or otherwise circulation of any of such photographs without permission

14. Vendor's Qualification: To meet the requirement for the contract, the Vendor must comply with the following criteria:

a. The Vendor shall be registered with relevant association. Proof of such accreditation must be provided prior to the award of contract.

b. Maintenance services shall be carried out by trained and accredited technical personnel in possession of Certificates of Competence (COC)

- c. UNHCR shall have the right to terminate the contract, if either the Vendor or their staff responsible for the execution of the services loses his/her accreditation.
- d. Competent companies must have a progressive working experience of minimum of (3) years in the field
- e. Companies must demonstrate the capacity to maintain the site by submitting team composition (of one technical manager, two qualified electronic engineers, two electricians) and work plan of the services
- f. Companies shall provide all 4 staffs CVs signed by holders and copies of notarized academic or professional certificates
- g. Each staff should hold at least A1 or equivalent professional certificate in (Electricity, Electronics, Electro – mechanics, Mechanical or any other related field) with minimum of 3 years of experience
- h. Provide at least three references of similar accomplished works and one live or running similar contracts with UN, International organizations or any other organization in Nigeria.
- i. The qualified company should have a workshop

15. Personnel: Contractor shall utilize only fully trained and qualified personnel to repair and service Air Conditioning Units at UNHCR offices in Nigeria.

- b. The Contractor must have a minimum number of 4 in-house staffs.

16. Record Keeping: Contractor shall provide Job sheet along with other supporting documents to process payment and provide timely report to UNHCR at the completion of maintenance service.

The contractor must provide a sticker on each Ac (Indoor/Outdoor) indicating the last date of service and the due date of service.

17. Reporting: The contractor should immediately provide a completed work report after completing the assignments on each site and should be verified and approved by the office staff supervising the maintenance service

- The report should be in form of a logbook, clearly indicating the site name, date, time in and out, status of equipment and problem cause, work done and other observations or comments, the company staff name, site's ICT/ Admin manager name, company staff name supervising the activities and signatures.

18. Evaluation of the Bid Proposals: The criteria to be used in the evaluation of the bid proposals is as follows:

- a. The ability of the bidder to meet the minimum specified requirements. Bidders are expected to ensure the provision of all the requirement of the tender e.g (Annex C and B).
- b. The overall costs of the proposal satisfying the requirements. Bidders are expected to provide each unit cost per line items mentioned in the Annex B – Financial offer form.

c. Bids will only be considered from Contractors that have a minimum of 3 years of successful experience providing fire Air Conditioners and refill services, repair parts and related supplies. The Vendor shall be required to demonstrate that they have successfully completed these type services for clients of the same size and magnitude for a minimum of three years. Failure to demonstrate this experience will be grounds for bid rejection.

d. The Contractor must have a minimum number of 4 in-house staffs. Failure of the bidder to demonstrate this capability will be grounds for bid rejection.

19. Warranties and Guarantees: The contractor will guarantee his work for a period of twelve (12) months from the date of official handover. Any items replaced or repaired will also carry twelve (12) months guarantee from the successful recommissioning of that item. Record of installation and repair dates of air conditioners must be held.

20. Payment: UNHCR terms of payment applies

21. Site Management:

(a) The contractor will always maintain a tidy site and will, daily, remove all rubble and redundant equipment to the appropriate areas. The contractor will account for all equipment and waste material removed from a site during this contract.

Standard Operational Procedures(SOP) Maintenance of Air Conditioning Units – Sub Office Ogoja

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1. Aim and scope

The objective of this operational procedure is to specify methods, frequency and responsibilities related to maintenance of air conditioning units at UNHCR Ogoja and its affiliate Field Offices as required.

The SOP is addressed to all work performed by a contractor in connection to Air Conditioning Maintenance or installation of new units for UNHCR.

2. Importance of Aircon Maintenance

Having proper and regular **Maintenance** ensures that you keep your aircon and cooling system running at optimal condition, lower electricity bill and prolong the lifespan of the AC.

The aircon filters, fan coils, fins and the other moving parts require regular care and servicing to ensure that the unit runs smoothly and efficiently, saving money in terms of a lower energy bill. Failure to do so will result in:

- Further damage to the aircon cooling system which may require a major repair
- Need for a Chemical Overhaul which is costly
- Shortening the lifespan of the air-conditioning system
- Getting unhealthy and putrid foul-smelling air
- Higher energy bill will rise because of decline in optimal performance of the air-conditioner.

For your **Air-Conditioners**, following areas need regular servicing and checks:

- Air Conditioner Filters
- Air Conditioner Fan Coils
- Coil Fins
- Condensate Drains
- Window & Door Seals

3. Terms and Definitions

CMO Compound Management Officer

SPO Supply Officer

CMP Contractor's Maintenance Personnel

ADM Administration Officer

EMS Environmental Management System

SOP Standard Operating Procedure

4. Responsibilities

UNHCR Responsible Officer (CMO)

- Annually defines the Air-conditioning Preventive Maintenance plan
- Updates AC list as and when required
- Shall receive by email all malfunction concerns from staff or otherwise and relay the information and dispatch the CMP for corrective measures.
- Shall keep custody and record any faulty part in exchange with a new part to the CMP for replacement
- Shall Manage the AC spare parts store and will only approve the issuance of a spare part with the supporting document of the complainant's email.
- Certify the air conditioning Log Sheet
- Keeps all relevant records for 5 years

Contractor's Responsible Officer (CMP)

- Informs CMO about any discrepancies in the information of the installed units at a specific location
- Notifies CMO of any irregularities in the list
- Verify the Air-Conditioning Log Sheet
- Identify and justify the replacement of an AC spare part
- Keeps records as per SOP
- Act in accordance with this procedure and any other related operative instructions

5. Frequency

The SOP will be reviewed every twelve (12) months or when the need arises

6. Detailed Procedural Rules

General Aircon Service is usually carried out at regular intervals of around 3 months. The objective is to prevent aircon blockage, fungi growth, air-conditioner leaking water and other serious problems. In the long run, AC service will help extend the lifespan of the air-conditioner system and reduce aircon energy usage.

Regular AC service is a preventive measure, and one should not wait until there are serious aircon problems such as foul air emitting, water leaking, constricted air flow and stuffy air.

Compared to the more involved process of Chemical Overhaul, **General Aircon Service** is carried out onsite and can be completed in under 30 minutes or less for each fan coil unit. The fan coil cover is removed, and general vacuuming and cleaning of the exposed surfaces will suffice. The air filter screen is cleaned with water only. No chemicals are used in general AC service.

Under normal usage and circumstances, a general aircon service will suffice

6.1 Preventive maintenance of air conditioning units

Preventive maintenance shall be carried out by the CMP. This shall include, but is not limited to:

Normal Service

- Remove fan coil unit cover

- Brushing & vacuuming of the cooling unit
- Removed drainage tray
- Clean & clear the drainage tray
- Cleaning/renewal of the filters
- Cleaning of evaporator.
- Checking the efficiency of the unit.
- Checking the refrigerant charge
- Brush the blower wheel
- Vacuum the drainage pipe
- Test run
- Check any faulty parts
- Check cooling system
- Checks for leaks, the condition of all copper pipe work, insulation material, drain pipe and the general state of the indoor and outdoor units.
- If any faults/abnormalities are encountered during the preventive maintenance, corrective actions must be carried out accordingly as indicated below.
- The preventive maintenance should be recorded by the CMP on Air-conditioning Log Sheet.

**** 60 days warranty on workmanship exclude parts for normal service ****

6.1.1 Cleaning/renewal of air filters

- Air filters should be taken off the indoor unit and washed with clean water.
- Before re-fitting into indoor unit, the air filters should be dry.
- If any filters are damaged, these should be renewed.

6.1.2 Cleaning of evaporator

- The evaporator should be cleaned using an evaporator cleaner with antibacterial properties found in aerosol spray packaging, which crumbles and emulsifies any dirt present.

6.1.3 Checking the efficiency of the unit

The temperature meter is used, indicating the room temperature and the indoor unit's air flow temperature. Unit is checked to ensure superheat is per parameters (5°C -10°C).

6.1.4 R22 Refrigerant

As from 1st January 2015, no R22 gas can be used to service air-conditioning units. If leaks are detected in any air-conditioning unit that is still in service and it contains R22 gas, all the R22 gas is to be extracted and the possible solutions should be considered:

- Drop-in refrigerant replacement
- Replacement of the unit

Record of any R22 extracted from the UNHCR AC units is to be kept in the Air-conditioning Log Sheet. The reclaimed R22 gas is to be disposed of in a permitted waste management facility as per Waste Management Procedure for Contractors.

6.1.5 Checking the refrigerant charge

The air conditioning unit is set to 'cool' and with the lowest temperature possible.

The low-pressure side (blue) of the pressure gauge manifold is connected to the suction line (larger tube) of the outdoor unit.

The pressure gauge should read the corresponding average pressure of the respective refrigerant at room temperature.

If refrigerant top-up is needed, the middle hose (yellow) of the pressure gauge manifold is connected to the appropriate refrigerant cylinder and the unit is charged accordingly, taking note of the amount of refrigerant charged by weighing the refrigerant cylinder before and after the charge. A calibrated electronic weighing scale is used.

6.1.5.1 Chemical Overhaul include the following.

- Dismantle fan coil and (wall mounted and cassette type)
- Chemical wash cooling coil
- Chemical wash blower wheel
- Chemical wash drainage tray
- Chemical wash cover
- Chemical wash air filter
- Chemical wash fan coil body
- Vacuum drainage pipe
- Test run
- Check any faulty part
- Check cooling system

**** 60 days warranty on workmanship exclude parts for Chemical Overhaul ****

6.1.6 Checking against leaks and the condition of all copper pipe work, insulation material, drain pipe and the general state of the indoor and outdoor units

- Refrigerant leaks are checked using an appropriate and calibrated gas leak detector. Calibration of the instrument is performed during every maintenance procedure (3kg and over) and calibration records are to be available by the contractor to UNHCR on demand
- All hardware checking is done visually.
- Any damaged material should be replaced.

6.2 Maintenance, repairs or disassembling of part/all the refrigerant circuit of a unit

The CMP should do the pump-down of the refrigerant from the air conditioning unit using a refrigerant recovery unit as the first step before starting any maintenance, repairs or disassembling which affects the refrigerant circuitry.

If the unit is repaired and the refrigerant circuit is once again complete, the CMP should then vacuum the system before this is re-charged with the proper refrigerant. The charging amount is specified on the manufacturer's label found on the outdoor unit.

6.3 Leak testing for air conditioning units with a rated refrigerant capacity of 3 kg or more

Leak test on any air conditioning unit with the rated total capacity of refrigerant being 3 kg or more as per manufacturer's specifications shall be carried out once per year by the CMP in line with the yearly preventive maintenance plan established by the CMO.

Together with the yearly preventive maintenance, any amount of refrigerant recovered from or charged into such an air conditioning unit should be quantified and recorded on the Air-conditioning Log Sheet by the CMP. Leakages, maintenance and follow-up actions of these units should also be reported on this Log Sheet.

6.4 Reporting

Air-conditioning Log Sheet should be filled in by the CMP for any maintenance work done on the units. This is verified by the CMO. These are stored in a database and are to be made available to the Admin/Supply Officers upon request.

An updated list of all the Air conditioning units at all UNHCR Sub Office Ogoja and the affiliate Field Offices should be kept by the CMO and any required changes to be highlighted by the CMO.

7.0 Additional Information

7.1 AIRCON INSTALLATION

It is important to hire a **professional aircon installation company** when installing a new aircon system or replacement unit. A trained and experienced aircon installation service engineer plays an important role:

- To ensure proper aircon installation procedures are carried out
- To ensure compliance to air-conditioning installation regulatory requirements

7.1.2 PROPER AIRCON INSTALLATION

- Only qualified and experienced personnel are involved in the installation of the air-conditioner system.
- Proper installation follows strict guidelines and specifications as given by the manufacturer.
- Quality approved and long-lasting materials are used in the entire installation process.
- Proper refrigerant level charging (aircon gas) is introduced to ensure optimal cooling efficiency.
- Test the entire system, including pressure test before sealing up.

- Ensure all electrical wires are proper run and secured and protected from the elements and rodent attacks.
- The indoor as well as the outdoor units are secured properly and level to facilitate proper drainage Ideally, the units should be away from mainstream dusty and greasy areas.
- The outdoor unit should be away from foliage and falling leaves

7.1.3 AIRCON TYPES AND SIZES

Multi-Split System

The 3 most common air-conditioner types are:

- Room Air-Conditioners
- Central Air-Conditioners
- Ductless, Mini-Split Air-Conditioners (also commonly known as the Multi-Split System)

There is another category of air-conditioners known as **portable-aircons**. These are mobile self-contained air-conditioning units. It draws the exhaust heat through a portable hose or duct which is usually emptied through the window.

7.1.4 CHOOSING AIR-CONDITIONERS

- COOLING CAPACITY / BTU
- NON-INVERTER & INVERTER AIR-CONDITIONING SYSTEMS
- REFRIGERANT

7.1.5 BRANDS

When deciding which air-con brands to buy, the following selection criteria are normally taken into consideration:

- Price
- Length of Guarantee
- After Sales Service
- Cooling Capacity / BTU and other Energy Saving Ratings
- Types of Refrigerants (such as Ozone Friendly R410A vs the Ozone Depleting R22)
- Inverter vs Non-Inverter Type
- Quiet Operation

Another factor to take into consideration is **Reliability and Market Rating** which is subjective and usually based on sample market Survey & Review. Most people tend to go for the more **popular brands** which known for their consistent quality, reliability and commitment.

7.1.6 AIRCON SERVICING CONTRACT

A **Contract** should cover the following:

- Test for aircon gas (refrigerant) leaks using a leak detector
- Check for aircon gas top up, if necessary
- Capture any aircon gas that must be purged from the system (instead on illegally releasing it to the environment)
- Check for window and door seals leakage
- Pressure test for system / duct leakage in central air-conditioning systems
- Measure airflow through the AC evaporator coil
- Check / inspect electric contact points and terminals, clean, tighten and apply a non-conductive coating (to prevent contact point corrosion) if necessary
- Lubricate motors and other moving parts
- Check belts for tension and wear
- Check for thermostat accuracy

7.1.7 AIRCON REPAIR

Common Air-Conditioning Problems

Aircon Repair is also known as **AC Repair**. To avoid costly & time-consuming aircon repair, one must be aware of the various contributory factors that lead to aircon problems and malfunction. **Improper operation** is one example. If the aircon is turned on, please ensure that all doors and windows are shut. In the case of running a room air-conditioner, remember to isolate this room from the other adjoining or connected rooms. This will avoid straining the air-conditioner.

Another aircon problem is existing **inherent faulty installation** which include:

- System mismatch
- Improper aircon gas (refrigerant in the system)
- Works carried out by unqualified personnel where the installation is not carried out in accordance to strict manufacturer specifications and guidelines.

This will lead to poor drainage, leaky aircon ducts, restricted air flow and the resultant below optimal operation.

7.1.8 SERIOUS AIRCON CHALLENGES

The following are some of the more serious aircon problems that require an AC Repair Service by a qualified aircon service and repair company:

- Refrigerant Leaks & Undercharged
- Inadequate Maintenance
- Electric Control Failure

- Sensor Problems
- Drainage Problems
- Broken/cracked propeller blades
- Noise

8.0 External Audits

The CMO should keep all the necessary records required for external audits readily available to the ADMN/SPO upon request. Any queries should be discussed and tackled within the required timeframe. Audits are normally carried out annually at an agreed time usually before the start of the next financial.

9.0. Reference Documents

9.1 Air-conditioning Log Sheet

9.2 Air-conditioning Preventive Maintenance Plan (to be drawn after the comprehensive inspection of all Ac's in the operation.

9.3 Air-conditioning units list (to be compiled from all offices detailing the brand and BTU's capacity)

9.1 AIR CONDITIONING LOG SHEET

General Information			
Registration No./Barcode No.			
Unit Location			
Room			
Unit Make:		Unit Type:	
Year Of Installation:		Capacity (Btu's):	
Refrigerant Type:		Refrigerant Weight (g)	
Maintenance Work			
Date	Responsible person	Maintenance Details	Changes & Replacements of Components
Refrigerant Additions			
Date	Responsible person	Amount Added (g)	Reason for Addition
Refrigerant Removals			
Date	Responsible person	Amount Removed	Reason For Removal
Leak Tests(Applicable for units with rated refrigerant capacity of 3kg or more)			
Date	Responsible Person	Test Result	Follow up action Recommended

Verified by:

Signature: _____

Name: _____

Date: _____

9.1.2 AFTER SERVICE LOG

Follow Up Actions			
Date	Responsible Person	Related Test	Follow Up Action Taken
Decommissioning Of Unit			
Date	Responsible Person		Reason for Decommission and Action Taken
Employee Details			

Verified by:

Signature: _____

Name: _____

Date: _____

**LIST OF SPARE PARTS FOR AIRCONCONDITIONERS
(OUTDOOR AIRCONCONDITIONERS)**

S/N	NAME OF SPARE PARTS
1	Compressor
2	Connector
3	Capacitor
4	Overload
5	Fan
6	Motor Fan
7	Condenser
8	Nozzle
9	Refrigerants
10	Charging Hose

**LIST OF SPARE PARTS FOR AIRCONCONDITIONERS
(INDOOR AIRCONDITIONERS)**

S/N	NAME OF SPARE PARTS
1	Motor Fan
2	Fan
3	Relay
4	Panel
5	Condenser
6	Timer
7	Sensor
8	Thermostat
9	Air filter
10	Contactator
11	Transformer
12	4-Way Reversing Valve

LIST OF SPARE PARTS FOR REFERIGERATORS

S/N	NAME OF SPARE PARTS
1	Overload
2	Thermostat
3	Relay
4	Condenser
5	Compressor
6	Fan
7	Inbuilt Panel
8	Refrigerants

LIST OF SPARE PARTS FOR WATER DISPENSERS

S/N	NAME OF SPARE PARTS
1	Heater
2	Panel
3	Overload
4	Condenser
5	Compressor
6	Fan
7	Thermostat
8	Relay
9	Refrigerants

AC, Spare Parts, Fridge Spares

PARTS NAME	BLAND	SPLIT TYPE	MODEL/PARTS NO	MANUFACTURED BY	CAPACITY	QTY	ATTACHED PICTURE
1 COMPRESSOR	LG	ROTARY		KOREA	12000BTU	10PCS	 <p>LG Rotary Compressor QP 407 - HVACR Wholesale Dealer ... kindly noted that item one and two is the same size but difference is mounting.</p>
2 COMPRESSOR	LG	ROTARY	QK222JBA	KOREA	12000BTU	100PCS	 <p>https://www.alimranuae.com/product/lg-rotary-compressor-qk-222/</p>
3 COMPRESSOR	LG	ROTARY	QP407PFC	KOREA	18,000BTU	10PCS	 <p>https://www.alibaba.com/product-detail/LG-Original-Brand-New-Air-conditioner_60837826880.html</p>
4 PC BOARD	LG	HIGWALL	6871A20572H	KOREA	12000BTU	25PCS	 <p>https://servair.com/parts/pcb-circuit-boards/6871a20572g.html</p>
5 PC BOARD	LG	HIGWALL MOUNTING	6871A90572H	KOREA	18,000BTU	15PCS	 <p>https://servair.com/parts/pcb-circuit-boards/6871a20572g.html</p>
6 INDOOR MOTOR	LG	HIGHWALL MOUNTING		KOREA	12000BTU	20PCS	
7 AVS	SOLLATEK	SINGLE PHASE	AVS	ENGLAND	15AMPS	316PCS	 <p>https://320technologies.co.ke/energy-efficiency-products/</p>
8 CAPACITOR	D&L	THREE PIN	CBB65 MKP SH		35/1.5UF	150PCS	

9	KLIXON 36474*/MRA2771380 MARS OVERLOAD FOR 22111 ROTARY ... (PART LINK)					160PCS		
10	AIR CONDITIONER	r410a	HIGHWALL MOUNTING			12000BTU	50 UNITS	
	<p>kindly noted. Availability of the spare parts should in the local marketing, e.g compressor,pc board, capacitor,indoor fan motor, outdoor fan motor. specification,fast cooling,low noisy, durable,and long term to serve and it spare parts to be continued for the five years coming.</p> <p>example ; https://whiteiswhite.com.ng/product/lg-2t .</p>							
11	AIR CONDITIONER	r410a	HIGHWALL MOUNTING			18000BTU	15units	
	<p>kindly noted ;the machine must be it spare parts available in the local marketing e.g compressor,pc board, capacitor,indoor fan motor, outdoor fan motor specification,fast cooling,low noisy, durable, long term to serve and it spare parts to be continued for the five years coming.</p> <p>example; https://whiteiswhite.com.ng/product/lg-2hp-gencool-inverter-split-unit-air-conditioner/</p>							
12	INSULATED PIPING		ROLL	5M	INDIA	1/4 ,1/3	20PCS	
	<p>3/4 X30m Pre Insulated Copper Tube for Central Air ...</p>							
13	INSULATED PIPING KIT		ROLL	5M	INDIA	1/4,1/2	5PCS	
	<p>3/4 X30m Pre Insulated Copper Tube for Central Air ...</p>							
14	INSULATING TAPE LINK		PVC			https://www.egretmfg.com/tape/pvc-tape-for-air-conditioner	100PCS	
15	remote control LINK	lg	HIGHWALL		LG KOREA		50PCS	
	<p>A/C Air Conditioner Remote Control For LG AKB73315601 ...</p>							



FRIDGE SPARE PARTS 2023_OGOJA

PRODUCT	BLAND	TYPE	SIZE	SPECIFICATION	ATTACHED PICTURE	QTY
COMPRESSOR http://www.searspartsdirect.com/part-number/2521C-A7256/0046/795.html	LG	DOUBLE DOOR	MA72LCEG9(1/4)			12PCS
COMPRESSOR https://www.alibaba.com/product-detail/LG-Brand-1-5hp-refrigeration-compressor_60639298255.html	LG	MEDIUM DOUBLE DOOR	MA69LCEG(1/5)			20PCS
COMPRESSOER http://www.appliancespares.co.za/11868/lg%20fridge%20compressor.aspx	LG	BIG SINGLE DOOR	MA53LAEG(1/8)			15PCS
COMPRESSOR https://www.ice-loong.com/refrigerator-compressor/56449959.html	LG	SMALL SINGLE DOOR	MSA43LBEG			10PCS
DRAINAGE HEATER https://www.indiamart.com/proddetail/refrigerator-drain-heater-14497622697.html	LG	BIG DOUBLE DOOR	860(W)*733(D)*1794(H)	220-2240		10PCS
filter drier https://www.retekool.com/Welded-Copper-Filter-Drier-For-Refrigerator-pd6834501.html	lg	little giant				20PCS

COMPRESSOR OIL	M-KARATE	FRIDGES	20PCS
https://shopee.ph/Emkarate-1L-Refrigeration-Lubricant-%28RL32H-RL68H-RL100H%29-Compressor-Oil-Em-Karate-M-i.115495824.10747150046			
			
timer	friges	double door 860(w)*733(d)*1794(h)	15PCS
https://www.allfixelectrical.com.au/products/lg-westinghouse-fridge-defrost-timer-6hour-35minutes-part-tmde706sc			
			
pc board	fridge	double door EAN36439801 (BAOC) MDL;GR-M652YVQ	5PCS
			
REFRIGERANT GAS	HARP	13.3KG	5 CYLINDERS
https://shingchem.coowor.com/shop/product-detail/201805041352373047FB36J.htm			
			







