**NATIONAL AEROSPACE SCIENCE AND TECHNOLOGY PARK**

**(NASTP) KARACHI**

###### BIDDING DOCUMENTS FOR INVITATION OF BIDS

### Tender No. NASTP/001/2024/HVAC

**HIRING OF OPERATION & MAINTENANCE SERVICES FOR HVAC**

**& FIRE FIGHTING EQUIPMEN AT NASTP KARACHI**

**Duration of contract is Oct-2024 to Oct-2025**

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**TIME-LINE DATA SHEET**

|  |  |
| --- | --- |
| **Description** | **Date / Remarks** |
| Tender No | NASTP/Silicon 001/2024 / HVAC O&M |
| Date of tender publication in 01 English and 01 Urdu daily newspapers followed by uploading on PPRA website | **05 Sep, 2024** |
| Collection of bidding documents, technical evaluation criteria and scope of work | **05 Sep to 18 Sep, 2024** |
| visit of site / facility / plant at NASTP Silicon by interested bidders and discussions on queries | **06 Sep to 18 Sep, 2024** |
| Submission of technical & financial proposals | **19 Sep, 2024 (1000 hrs)** |
| Opening of technical proposal | **19 Sep, 2024 (1200 hrs)** |
| Acceptance / Rejection to be intimated to bidders through calls followed by official letter with reasons | **21 / 22 Sep, 2024** |
| Opening of commercial proposal | **23 Sep, 2024** |
| Bid security deposit by bidders | Bank draft of Rs **5,00,000**/ (five hundred thousand only) will be deposited by bidder in favour of GW Alpha Tech Pvt Ltd Islamabad as bid security deposit along with technical proposal |
| Preparation and processing of part case for approval of CFA | **24 Sep, 2024** |
| Tentative date of approval | **28 Sep, 2024** |
| Contract signing (D day) | **30 Sep, 2024** |
| Contract enforcement | **01 Oct, 2024 to 30 Sep, 2025** |

**DFA**

**INVITATION TO BID FOR O&M SERVICES OF HVAC & FIREFIGHTING EQUIPMENT FOR 2024-2025 AT NASTP, KARACHI**

**INTRODUCTION**

National Aerospace Science and Technology Park (NASTP) Silicon 1 Karachi, is requires firms to provide O&M Services of HVAC and Firefighting Equipment in **03 shifts** for **24/7** operations inclusive of Gazzetted / Non-Gazetted holidays during the year.

**INSTRUCTIONS TO BIDDERS**

**General Instructions: -**

1. According to PPRA Rule 36(b) Single Stage Two Envelopes bidding procedure shall be adopted.

2. The bidders are hereby invited to submit a technical and financial proposal for Outsourcing the abovementioned services. The envelopes shall be marked as “**FINANCIAL PROPOSAL**” and “**TECHNICAL PROPOSAL**” in bold and legible letter to avoid confusion.

3. Initially, only the envelope marked “**TECHNICAL PROPOSAL**” shall be opened at a time, date and venue announced and communicated to the bidders in advance.

4. The envelope marked as “**FINANCIAL PROPOSAL**” shall be retained in the custody of the procuring agency without being opened.

5. The procuring agency shall evaluate the technical proposal in a manner prescribed in advance, without reference to the price and reject any proposal which do not confirm to the specified requirements.

6. During the technical evaluation no amendments in the technical proposal shall be permitted.

7. After the technical evaluation and approval of the technical proposal the procuring agency, shall at a time within the bid validity period, open the financial proposals of the technically accepted bids only at a time, date and venue announced and communicated to the bidders in advance. The financial proposal of bids found technically non-responsive shall be returned un-opened to the respective bidders.

8. A complete set of original Bidding Documents shall be obtained from NASTP, Silicon 1 Karachi after publishing of advertisement submitting bank draft / pay order of Rs 5000/- (**non-refundable**) in favour of “GW Alpha Tech Pvt Ltd.”

9. In preparing the technical proposal, the bidders are expected to examine all terms and instructions included in the documents. Failure to provide all requested information shall be at bidder’s risk and may result in rejection of the proposal.

10. Bids submitted by consortium or joint venture will be rejected.

11. Last date and time of submission of Both Technical & Financial proposal is **on 19 Sep, 2024 (1000 hrs).** The technical proposals shall be opened **on 19 Sep, 2024   
(1200 hrs)** in the presence of bidders or their authorized representatives. Bidder’s Representatives shall have a signed authority letter from the bidder to be present in the bid opening.

12. Financial proposals of only the technically qualified bidders will be opened after due notification and procedure as laid down by the pertaining PPRA rules.

13. **Eligibility Criteria :-**

14. Bidders shall meet the following eligibility criteria:

1. Be a registered Firm or a Company in Pakistan in required HVAC & Fire System development / installation / operations domain since at least Ten year. Experience certificate to be produced of working as O&M company.
2. Must have Valid Pak Engineering Council Certification (**at least C4 CATEGORY**)

(c) Have a track record of working with public and private sectors organization, institution / Multinational companies/big Malls.

(d) Ability to provide details of all technical equipment, machinery and tools.

(e) Bidder must provide experience certificate for mechanized related equipment from any reputed institutions / Organizations where they provided similar Services.

15. **Clarification on bidding Documents**

Bidder(s) requiring any clarification on this bidding document may seek clarification by contacting undersigned during Monday to Friday from 09:30 am to 5:00 pm.

16. **The Technical Proposals should contain:**

(a) Covering Letter on Company Letter-Head

(b) Company profile (including status, services offered, projects (along with certificates), equipment owned, equipment rented, and proof of all points in the “**Eligibility**” criteria.

(c) Copy of work orders granted in last Ten years

(d) Business Registration Certificate, Incorporation Certificate (In case of SECP & Registrar of the firms), copy of Partnership Deed along with NTN (In case of AOP), NTN.

(e) Copy of National Tax Number and GST registration Certificate.

(f) Evidence of appearance in ATL with FBR and Sindh Sales Tax Department.

(g) Financial statements signed by CFO and verified by concerned bank.

(h) Non-Blacklisting with any Government department/agencies/ authorities. An affidavit of “non-blacklisting” from authorized signatory on judicial stamp paper to the effect that the bidder is not black-listed.

(j) Minimum 10 years of proven experience in the field of abovementioned services in organizations.

(k) Details of available machinery, tools and equipment.

(l) Experience letters along with contact details for existing/ previous Clients.

(m) Detailed Plan of **Operation & Maintenance** including work procedures, Standards, Schedules and number of workforces.

(n) Provide measures / plan for safety of equipment.

(p) The total points allocated for the Technical and Financial organizational strength component of the Bid is 100.

(q) Those bids scoring less than **70%** will not be considered for financial opening and will be declared “not technically qualified” .

17. **The Financial Proposal should contain: -**

(a) Covering letter on Company letter-head

(b) Break-down of taxes paid in last 03 years.

(c) Bid Security of Rs.500,000 (Five Hundred Thousand) in the form of a Pay Order / Demand Draft / Call deposit Receipt bid in the favor Silicon techno park Karachi as bid security.

(d) The offer must be valid for **120** days from last date of submission of bids.

(e) The quoted prices shall be treated as firm and final till the duration of the contract.

(f) Financial proposal should be prepared using the tables as per formats:

(g) Firm has to provide quotation for salary of **12** personnel as per following Criteria: -

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Description** | **No** | **Qualification** | **Experience** | **Basic Salary** | **EOBI** | **SESSI** | **Total Salary** |
| Operation Maintenance In charge | 1 | Bsc / BE (Mech) | 7-10 Years |  |  |  |  |
| Associate Engineer | 1 | BS (Tech) | 7-10 Years |  |  |  |  |
| Chiller Operator | 3 | D.A. E (HVAC) | 7-10 Years |  |  |  |  |
| AC Technician | 2 | D.A. E | 3-5 Years |  |  |  |  |
| AC Technician/General Fitter | 1 | Matriculation | 3-5 Years |  |  |  |  |
| General Fitter | 1 | Matriculation | 3-5 Years |  |  |  |  |
| Electrician | 1 | Matriculation | 3-5 Years |  |  |  |  |
| Handy Man | 2 | Matriculation | 3-5 Years |  |  |  |  |
| Service Charges |  |  |  |  |  |  |  |
| Applicable Taxes |  |  |  |  |  |  |  |
| **Total** | **12** |  |  |  |  |  | 2,100,000 |

SST 15% 315,000

Grand Total 2,415,000

(h) Quoted rates must adhere govt wages rules / labour laws.

(j) Services charges be mentioned separately.

(k) Income tax will be applicable and deducted as per FBR rules.

(l) Prove of SESSI/EOBI Payment will be proved to NASTP Silicon on demand.

(m) Qualification certificate /Verified degree/Experience of personnel will be provided to NASTP Silicon.

(n) Contract will be awarded and “**low quoted salary**” basis inclusive of low quoted service charges.

(p) Service charges must include cost of machinery, tools, equipment, uniform / shoes / safety gears of personnel and profit of the firm.

(q) Lubes or anything required for schedule / unforeseen maintenance, will be provided by NASTP.

(r) Any part / item / equipment required for replacement or repair will also be provided by NASTP.

18. **Safety / Security of Men & Material: -**

(a) Firm will remain responsible for safety and security of men and material during period of contract.

(b) In case of any injury, accident or fatal incident (excluding natural disaster) of any personnel, firm is responsible to provide compensation.

(c) In case of loss / damage to plant, chiller, or any part of plant / chiller because of non-adherence of safe / professional practices by deployed manpower, firm is responsible to bear the loss.

19. **TECHNICAL EVALUATION CRITERIA**

(a) Total marks –**100**

(b) Qualifying marks – Minimum **70**

**Particulars of the Company**

**Year of establishment of the Pvt. Ltd. firm/Company along with the certificate incorporation, Office address, Telephone, Fax, E-mail & website.**

**(Marks Allocated – 10)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | 1-3 Years | 05 |  |
| ii | 4-6 Years | 07 |  |
| iii | 7-9 Years | 08 |  |
| iv | 10 and above Years | 10 |  |

**Work shop, Tools & Plants and Experienced employees.**

**(Marks Allocated – 15)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | Work shop | 05 |  |
| ii | Trained employees and their experience not be less than 5 years) | 05 |  |
| iii | List of Tools and Plants | 05 |  |

**Operation / Maintenance contracts of HVAC & Mechanical Equipment’s Executed /O&M In hand (under one roof) along with satisfactory completion certificate from Client as one contract cost not below Rs.3.33 million per year.**

**(Marks Allocated –20)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | 05 Years | 10 |  |
| ii | 08 & above | 15 |  |
| iii | 12 and above | 20 |  |

**List of Engineers / Technical staff, their qualification and experience along with documentary proof presently available on payroll (Providing 12 Staff)**

**(Marks Allocated – 10)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | 5-10 | 06 |  |
| ii | 10-20 | 08 |  |
| iii | 20-25 | 10 |  |

**Valid registration certificate with Pakistan Engineering Council in the field of specialization code (ME01 - ME06) minimum having category C4**

**(Marks Allocated – 10)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | C4 | 07 |  |
| ii | C3 & C2 | 09 |  |
| iii | C1 & CA | 10 |  |

**Litigation History of the Firm.**

**(Marks Allocated – 05)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | No Litigation (at Present) | 05 |  |
| ii | Black Listed | 00 | **Not Eligible** |

**Financial Standing / Status Of Firm**

**Income tax paid during the last 05 years (Attached -audited income Tax. Statement/balance sheet / receipted Tax Challans.**

**(Marks Allocated – 10)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | Income Tax paid under Rs.3.0 million per Year | 05 |  |
| ii | 3 – 5 million per year | 07 |  |
| iii | 5 – 7 million | 08 |  |
| iv | Above 7 Million | 10 |  |

**Average annual turnover (for the last five years)**

**(Marks Allocated – 10)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | Annual turnover Rs.12.0 million and above | 10 |  |
| ii | Annual turnover Rs.5.0 to 11.0 million | 08 |  |
| iii | Annual turnover up to Rs.5.0 million | 5 |  |

**Financial standing of the firm / Company**

**(Marks Allocated – 05)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | Last 03 years bank statement (duly certified by bank). Current balance 15 Million | 05 |  |
| ii | Last 03 years bank statement (duly certified by bank). Current balance 10 Million | 03 |  |

**Valid Registration certificate in-respect of GST, SST + Income Tax etc**

**(Marks Allocated – 05)**

|  |  |  |  |
| --- | --- | --- | --- |
| i | Yes | 05 |  |
| ii | No | 00 |  |

### 20. SCOPE OF WORK AND INSPECTION SCHEDULE

The **FIRM** shall responsible for operations and maintenance of following HVAC / Fire emergency equipment along with given inspection schedule: -

**LIST OF HVAC & Fire Fighting EQUIPMENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Equipment to be Operated & Maintained** | **Qty** | **Make** | **Capacity** |
| Chiller | 02 | York | 750 Tr each |
| Chilled water pump | 03 | Wilo | 110 Kw each |
| Condenser Water pump | 03 | Wilo | 45 Kw each |
| Cooling Tower | 02 | Nihon | 45 Kw each |
| Air handling unit | 107 | Haier / Gree / Daikin / Mekar |  |
| Fan Coil units | 85 | Haier / Gree / Daikin / Mekar |  |
| Fresh air fans | 6 | SASA |  |
| Air Conditioning Units | 41 | Gree / Haier | 1 / 1.5 / 2 & 4 Tr |
| Exhaust fans | 12 | SASA |  |
| Fire Pump | 01 | Sffeco | 132 Kw |
| Jockey Pump | 01 |
| Engine Driven Pump | 01 |
| Water Transfer Pump | 06 | Grundfos |  |
| Fire Extinguishers | 33 | DCP | 04 Kg |
| 33 | CO2 | 05 Kg |
| Fire Hose Reel | 26 |  |  |

**CHILLER UNIT SERVICE INSTRUCTION**

|  |  |
| --- | --- |
| 1. **DAILY INSPECTION** | |
| i | Check Chiller for fault codes |
| ii | Inspect and clean condenser coil |
| iii | Ensure the refrigerant is properly charged |
| iv | Check for debris, fouling or scaling in the condenser water loops |
| v | Check for refrigerant or air leak |
| vi | Check tubes for fouling |
| vii | Check for excessive condensation |

|  |  |
| --- | --- |
| 1. **WEEKLY INSPECTION** | |
| i | Check the pump shaft for any minor damage or discoloration |
| ii | Lubricate the pump seal to prevent dryness |
| iii | Check and clean your chiller’s air intake vents |
| iv | Check that no fluids are leaking or seeping from the chiller |

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| 1. **MONTHLY INSPECTION** | |
| i | Check your cooling towers for debris |
| ii | Check all fixing and fastenings |

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| 1. **QUARTERLY INSPECTION** | |
| i | Check the air handing unit for a buildup of dust mould |
| ii | Conduct an oil analysis to check for metallic content and acidity |
| iii | Check your pumps for any leakages, damage, or corrosion |
| iv | Reprogram your thermostat |

|  |  |
| --- | --- |
| 1. **YEARLY INSPECTION** | |
| i | Check the integrity of your heat exchanger’s tubers with an eddy current test |
| ii | Ensure there’s no scale in the heat exchanger tubes |
| iii | Check refrigerant charge levels and identify any contaminants (rust, sludge or harmful acids) |
| iv | Have your oil filters changed by a professional |
| v | Implement a water treatment program to minimize solids in the tower’s water system |
| vi | Perform a vibration analysis to identify issues with bearings |

**CHILLER WATER PUMP UNIT SERVICE INSTRUCTION**

|  |  |
| --- | --- |
| 1. **DAILY INSPECTION** | |
| i | Check pump exterior for any leaks |
| ii | Clean pump and nearby region to remove any debris |
| iii | Check for excessive pump vibration or unusual noises |
| iv | Check for foaming or oil discoloration |
| v | Check bearing temperature for overheating |
| vi | Inspect all gaskets to ensure there are no oil leaks |
| vii | Inspect self-flush pump is applicable |
| viii | Check pump cooling system |
| ix | Clean bearing covers if needed |

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| 1. **MONTHLY INSPECTION** | |
| i | Top up oil to bearing serveries if needed |
| ii | Clean oil bulbs and level windows |
| iii | Clear out dirt and debris from bearing and grease them |
| iv | Check the pump guards and replace then if needed |
| v | If applicable, check that the hydraulic governors are working properly |
| vi | Check overall pump system for leaks and clean the pimping system surroundings |

|  |  |
| --- | --- |
| 1. **QUARTERLY INSPECTION** | |
| i | Check pumps and motor for any vibration damage |
| ii | Change the oil in bearing systems |
| iii | Grease bearing as per need |
| iv | Check suction, discharge and head pressure |
| v | Check all hold down bolts for tightness to reduce vibration |
| vi | If needed, inspect shaft pump alignment |
| vii | Apply rust preventive coat to prevent corrosion |

|  |  |
| --- | --- |
| 1. **ANNUALLY INSPECTION** | |
| i | Check axial float of the pump along with the driver shaft |
| ii | Remove mechanical cover and inspect the entire pump arrangement |
| iii | Check disc couplings for damage |
| iv | Inspect coupling alignment |
| v | Inspect seal chamber for scoring and pitting |
| vi | Check oil levels and refill as per need |
| vii | Inspect impeller for erosion and replace if needed |

**CONDENSER WATER PUMP UNIT SERVICE INSTRUCTION**

|  |  |
| --- | --- |
| **CONDENSER WATER PUMP MAINTENANCE CHECK LIST** | |
| i | Check that mounting points are secure |
| ii | Inspect the mechanical seal and packing |
| iii | Inspect the pump flanges for leaks |
| iv | Inspect the couplings |
| v | Inspect and clean filters |
| vi | Check that all terminators are tight |
| vii | Inspect motor vents and winding for dust / dirt build up and clean according to manufacturer’s guild lines |
| viii | Inspect starter / contractor for arcing, overheating, etc. |
| ix | Use a megohmmeter on the windings to check for insulation failure |

**COOLING TOWER SERVICE INSTRUCTION**

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| --- | --- |
| 1. **MONTHLY INSPECTION** | |
| i | Inspect the tower exterior |
| ii | Inspect the water level |
| iii | Monitor water level |
| iv | Check fan operation |
| v | Walk the perimeter of the tower to inspect balance in rain zone |

|  |  |
| --- | --- |
| 1. **QUARTERLY INSPECTION** | |
| i | Inspect the tower exterior, include structure integrity and fan blade |
| ii | Check and clean water strainer or Filter. |
| iii | Monitor water level |
| iv | Inspect and lubricate fan motor bearing and gear box oil level. |
| v | Test the water quality parameter such as PH, conductivity and TDS |

|  |  |
| --- | --- |
| 1. **SEMI ANNUALLY INSPECTION** | |
| i | Conduct comprehensive inspection of the water distribution system, including pipes, valve and fitting. |
| ii | Inspect fill material for any sign of damage or fouling. |
| iii | Verify alignment coupling in the fan system. |
| iv | Clean or replace any clogged or damaged spray nozzles. |

|  |  |
| --- | --- |
| 1. **ANNUALLY INSPECTION** | |
| i | Performed a detailed inspection of the entire cooling tower system. |
| ii | Check fan blades for cracks, balance and alignment. |
| iii | Weight selected fill block from lower level and record weight to measure fouling. |
| iv | Inspect and clean water basin and sumps. |
| v | Check and adjust the water treatment system, include chemical feeder and control system. |
| vi | Conduct throughout inspection of water piping and associated equipment. |

**AIR HANDLING UNIT SERVICE INSTRUCTION**

|  |  |
| --- | --- |
| **AIR HANDLING UNIT MAINTENANCE CHECKLIST** | |
| i | Change filter |
| ii | Clean cooling coil |
| iii | Examine cooling coil |
| iv | Inspect blower assembly |
| v | Lubricating motor and blower bearing |
| vi | Drain and clean condensation pan |
| vii | Inspect and clean filters |
| viii | Inspect refrigerant levels |
| ix | Inspect the condensate drain pan |
| x | Check for unusual noise and vibration |
| xi | Check pressure |
| xii | Checking your belt |
| xiii | Inspect and clean burners |
| xiv | Inspect for rust and leaks |
| xv | Inspect the thermostat operation and programming |
| xvi | Inspect venting system |
| xvii | Lubricate or grease all fittings |
| xviii | Straighten coils with fine comb |
| xix | Tighten electrical |

**FRESH AIR HANDLING UNIT SERVICE INSTRUCTION**

|  |  |
| --- | --- |
| 1. **MONTHLY INSPECTION** | |
| i | Removal of washable aluminum filters (wash & clean) & refix properly |
| ii | Wash & clean Evaporator coil with karchar pump |
| iii | Condensate drain pan wash and clean with karchar pump. |
| iv | Condensate drain trap wash and clean |
| v | Air handler Fan / Fan motor clean properly. |
| vi | AHU body to be clean from internal & external area properly. |
| vii | Check drive belt condition if required change with new |
| viii | Measure Ampere before service & after service. |
| ix | AHU room clean properly from dust & dirty |

|  |  |
| --- | --- |
| 1. **QUARTERLY INSPECTION** | |
| i | Removal of washable aluminum filters (wash & clean) & refix properly |
| ii | Wash & clean Evaporator coil with karchar pump |
| iii | Condensate drain pan wash and clean with karchar pump. |
| iv | Condensate drain trap wash and clean |
| v | Air handler Fan / Fan motor clean properly. |
| vi | AHU body to be clean from internal & external area properly. |
| vii | Check drive belt condition if required change with new |
| viii | Measure ampere before service & after service. |
| ix | Cleaning of AHU shaft with kerosene oil and apply grease if necessary |
| x | Fan blower bearings clean with grease gun. |
| xi | Electric Motor ball bearing grease if required |
| xii | Check alignment of motor / fan if necessary align |
| xiii | Fan belt change if required |

|  |  |
| --- | --- |
| 1. **SEMI ANNUAL INSPECTION** | |
| i | Removal of washable aluminum filters (wash & clean) & refix properly |
| ii | Wash & clean Evaporator coil with karchar pump |
| iii | Condensate drain pan wash and clean with karchar pump. |
| iv | Condensate drain trap wash and clean |
| v | Air handler Fan / Fan motor clean properly. |
| vi | AHU body to be clean from internal & external area properly. |
| vii | Check drive belt condition if required change with new |
| viii | Measure ampere before service & after service. |
| ix | Cleaning of AHU shaft with kerosene oil and apply grease if necessary |
| x | Fan blower bearings wash and clean / grease. |
| xi | Motor ball bearing grease if required |
| xii | Check alignment of motor / fan if necessary align |
| xiii | Chilled water strainer removed, clean and re-fix. |
| xiv | Check pressure gauges accuracy change with new if necessary |
| xv | Check temperature gauges accuracy change with new if necessary |
| xvi | Check motorized valve functioning properly with auto control BMS |
| xvii | Check / clean of electric panel and tighten loose connection if any. |
| xviii | Check and record voltage |
| xix | Check and record ampere. |

|  |  |
| --- | --- |
| 1. **ANNUAL INSPECTION** | |
| i | Removal of washable aluminum filters (wash & clean) & refix properly |
| ii | Wash & clean Evaporator coil with karchar pump |
| iii | Condensate drain pan wash and clean with karchar pump. |
| iv | Condensate drain trap wash and clean |
| v | Air handler Fan / Fan motor clean properly. |
| vi | AHU body to be clean from internal & external area properly. |
| vii | Check drive belt condition if required change with new |
| viii | Measure ampere before service & after service. |
| ix | Cleaning of AHU shaft with kerosene oil and apply grease if necessary |
| x | Fan blower bearings clean with grease gun. |
| xi | Motor ball bearing grease if required |
| xii | Check alignment of motor / fan if necessary align |
| xiii | Chilled water strainer removed, clean and fix. |
| xiv | Check pressure gauges accuracy change with new if necessary |
| xv | Check temperature gauges accuracy change with new if necessary |
| xvi | Check motorized valve functioning properly with BMS |
| xvii | Cleaning / service of electric panel and check and tighten loose connection |
| xviii | Check and record voltage |
| xix | Check and record ampere. |
| xx | Check motor ball bearing change if necessary |
| xxi | Check blower ball bearing change if necessary |
| xxii | Painting of unit if necessary |
| xxiii | Aluminum Filter replaced with new if necessary |
| xiv | Check up and observe any other work to be carried out if required. |

**FAN COIL UNIT SERVICE INSTRUCTION**

|  |  |
| --- | --- |
| 1. **MONTHLY INSPECTION** | |
| I | Removal of filters (wash & clean) |
| ii | Evaporator coil clean if necessary |
| iii | Condensate drain pan clean properly |

|  |  |
| --- | --- |
| 1. **QUARTERLY INSPECTION** | |
| i | Removal of filters (wash & clean) |
| ii | Evaporator coil clean if necessary |
| iii | Condensate drain pan clean properly |
| iv | Check motorized valve functioning properly |
| v | Check room temperature maintaining |
| vi | Check thermostat working properly. |

|  |  |
| --- | --- |
| 1. **SEMI ANNUAL INSPECTION** | |
| i | Removal of filters (wash & clean) |
| ii | Evaporator coil clean if necessary |
| iii | Condensate drain pan clean properly |
| iv | Check motorized valve functioning properly |
| v | Check room temperature maintaining |
| vi | Check thermostat working properly. |
| vii | Removal and cleaning of chilled water strainers if required |
| viii | Check pressure gauges accuracy change with new if necessary |
| ix | Check temperature gauges accuracy change with new if necessary |
| x | Check motorized valve functioning properly. |
| xi | Cleaning / service of electric panel and check and tighten loose connection |
| xii | Check and record voltage |
| xiii | Check and record ampere. |

|  |  |
| --- | --- |
| 1. **ANNUAL INSPECTION** | |
| i | Removal of filters (wash & clean) |
| ii | Evaporator coil clean if necessary |
| iii | Condensate drain pan clean properly |
| iv | Check motorized valve functioning properly |
| v | Check room temperature maintaining |
| vi | Check thermostat working properly. |
| vii | Removal and cleaning of chilled water strainers if required |
| viii | Check pressure gauges accuracy change with new if necessary |
| ix | Check temperature gauges accuracy change with new if necessary |
| x | Check motorized valve functioning properly. |
| xi | Cleaning / service of electric panel and check and tighten loose connection |
| xii | Check and record voltage |
| xiii | Check and record ampere. |
| xiv | Check unusual noise check / repair |
| xv | Check blower ball bearing change if necessary |
| xvi | Painting of unit if necessary |
| xvii | Filter replace with new if necessary |
| xviii | Check up and observe any other work to be carried out if required. |

**FRESH AIR FAN SERVICE INSTRUCTION**

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| 1. **MONTHLY INSPECTION** | |
| i | Fan body cleaning from internal / external properly |
| ii | Check drive belt condition if required change with new |
| iii | Aluminum Filter wash and clean and refix properly. |

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| 1. **QUARTERLY INSPECTION** | |
| i | Fan body cleaning from internal / external properly |
| ii | Check drive belt condition if required change with new |
| iii | Aluminum Filter wash and clean and refix properly. |
| iv | Cleaning of blower / motor from dust / dirt. |
| v | Fan blower bearings wash and clean with kerosene oil / grease |
| vi | Motor ball bearing grease if required |
| vii | Check alignment of motor / fan if necessary align |

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| 1. **SEMI ANNUAL INSPECTION** | |
| i | Fan body cleaning from internal / external properly |
| ii | Check drive belt condition if required change with new |
| iii | Aluminum Filter wash and clean and refix properly. |
| iv | Cleaning of blower / motor from dust / dirt. |
| v | Fan blower bearings wash and clean with kerosene oil / grease |
| vi | Motor ball bearing grease if required |
| vii | Check alignment of motor / fan if necessary align |
| viii | Cleaning / service of electric panel and check and tighten loose connection |
| ix | Check and record voltage |

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| 1. **ANNUAL INSPECTION** | |
| i | Fan body cleaning from internal / external properly |
| ii | Check drive belt condition if required change with new |
| iii | Aluminum Filter wash and clean and refix properly. |
| iv | Cleaning of blower / motor from dust / dirt. |
| v | Fan blower bearings wash and clean with kerosene oil / grease |
| vi | Motor ball bearing grease if required |
| vii | Check alignment of motor / fan if necessary align |
| viii | Cleaning / service of electric panel and check and tighten loose connection |
| ix | Check and record voltage |
| x | Check and record ampere. |
| xi | Aluminum Filter replaced with new if necessary |
| xii | Check motor ball bearing change if necessary |
| xiii | Check blower ball bearing change if necessary |
| xiv | Painting of unit if necessary |
| xv | Check up and observe any other work to be carried out if required. |

**EXHAUST AIR FAN SERVICE INSTRUCTION**

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| 1. **MONTHLY INSPECTION** | |
| i | Fan body cleaning from internal / external properly |
| ii | Check drive belt condition if required change with new |
| iii | Aluminum Filter wash and clean and refix properly. |

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| 1. **QUARTERLY INSPECTION** | |
| i | Fan body cleaning from internal / external properly |
| ii | Check drive belt condition if required change with new |
| iii | Aluminum Filter wash and clean and refix properly. |
| iv | Cleaning of blower / motor from dust / dirt. |
| v | Fan blower bearings wash and clean with kerosene oil / grease |
| vi | Motor ball bearing grease if required |
| vii | Check alignment of motor / fan if necessary align |

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| 1. **SEMI ANNUAL INSPECTION** | |
| i | Fan body cleaning from internal / external properly |
| ii | Check drive belt condition if required change with new |
| iii | Aluminum Filter wash and clean and refix properly. |
| iv | Cleaning of blower / motor from dust / dirt. |
| v | Fan blower bearings wash and clean with kerosene oil / grease |
| vi | Motor ball bearing grease if required |
| vii | Check alignment of motor / fan if necessary align |
| viii | Cleaning / service of electric panel and check and tighten loose connection |
| ix | Check and record voltage |
| x | Check and record ampere. |
| 1. **ANNUAL INSPECTION** | |
| i | Fan body cleaning from internal / external properly |
| ii | Check drive belt condition if required change with new |
| iii | Aluminum Filter wash and clean and refix properly. |
| iv | Cleaning of blower / motor from dust / dirt. |
| v | Fan blower bearings wash and clean with kerosene oil / grease |
| vi | Motor ball bearing grease if required |
| vii | Check alignment of motor / fan if necessary align |
| viii | Cleaning / service of electric panel and check and tighten loose connection |
| ix | Check and record voltage |
| x | Check and record ampere. |
| xi | Aluminum Filter replaced with new if necessary |
| xii | Check motor ball bearing change if necessary |
| xiii | Check blower ball bearing change if necessary |
| xiv | Painting of unit if necessary |
| xv | Check up and observe any other work to be carried out if required. |

**FIRE PUMP SERVICE INSTRUCTION**

|  |  |
| --- | --- |
| 1. **MONTHLY INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refix if required |
| iv | Cleaning of pump /motor |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Motor voltage. |
| vii | Check Motor Amps. |
| viii | Check Motor Temperature. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Set on auto operation of pump after completion of service. |

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| 1. **QUARTERLY INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refax if required |
| iv | Cleaning of pump /motor |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Motor voltage. |
| vii | Check Motor Amps. |
| viii | Check Motor Temperature. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Check Mechanical seal condition (not leaking) |
| xiii | Check power wiring / terminal of motor tighten if necessary including panel. |
| xiv | Check air vents working properly. |
| xv | Check gate valves / non-return valves functioning properly lubricate if necessary. |
| xvi | Set on auto operation of pump after completion of service. |

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| 1. **SEMI ANNUAL INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refax if required |
| iv | Cleaning of pump /motor |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Motor voltage. |
| vii | Check Motor Amps. |
| viii | Check Motor Temperature. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Check Mechanical seal condition (not leaking) |
| xiii | Check power wiring / terminal of motor tighten if necessary including panel. |
| xiv | Check air vents working properly. |
| xv | Check gate valves / non-return valves functioning properly lubricate  if necessary. |
| xvi | Check and tight coupling if necessary |
| xvii | Foundation bolt tighten if necessary |
| xviii | Motor / pump ball bearing lubricate if necessary. |
| xix | Set on auto operation of pump after completion of service. |

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| 1. **ANNUAL INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refax if required |
| iv | Cleaning of pump /motor |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Motor voltage. |
| vii | Check Motor Amps. |
| viii | Check Motor Temperature. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Check Mechanical seal condition (not leaking) |
| xiii | Check power wiring / terminal of motor tighten if necessary including panel. |
| xiv | Check air vents working properly. |
| xv | Check gate valves / non-return valves functioning properly lubricate if necessary. |
| xvi | Check and tight coupling if necessary |
| xvii | Cleaning / service of electric panel and check and tighten loose connection |
| xviii | Foundation bolt tighten if necessary |
| xix | Motor / pump ball bearing lubricate if necessary or relocate if required. |
| xx | Painting of unit if necessary |
| xxi | Set on auto operation of pump after completion of service. |

**FIRE PUMP SERVICE INSTRUCTION**

|  |  |
| --- | --- |
| 1. **MONTHLY INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refix if required |
| iv | Cleaning of pump /motor |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Motor voltage. |
| vii | Check Motor Amps. |
| viii | Check Motor Temperature. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Set on auto operation of pump. |

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| 1. **QUARTERLY INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refix if required |
| iv | Cleaning of pump /motor |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Motor voltage. |
| vii | Check Motor Amps. |
| viii | Check Motor Temperature. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Check Mechanical seal condition (not leaking) |
| xiii | Check power wiring / terminal of motor tighten if necessary including panel. |
| xiv | Check air vents working properly. |
| xv | Check gate valves / non-return valves functioning properly lubricate if necessary. |
| xvi | Set on auto operation of pump. |

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| 1. **SEMI ANNUAL INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refix if required |
| iv | Cleaning of pump /motor |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Motor voltage. |
| vii | Check Motor Amps. |
| viii | Check Motor Temperature. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Check Mechanical seal condition (not leaking) |
| xiii | Check power wiring / terminal of motor tighten if necessary including panel. |
| xiv | Check air vents working properly. |
| xv | Check gate valves / non-return valves functioning properly lubricate if necessary. |
| xvi | Check and tight coupling if necessary |
| xvii | Foundation bolt tighten if necessary |
| xviii | Motor / pump ball bearing lubricate if necessary. |
| xix | Set on auto operation of pump. |

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| 1. **ANNUAL INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refix if required |
| iv | Cleaning of pump /motor |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Motor voltage. |
| vii | Check Motor Amps. |
| viii | Check Motor Temperature. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Check Mechanical seal condition (not leaking) |
| xiii | Check power wiring / terminal of motor tighten if necessary including panel. |
| xiv | Check air vents working properly. |
| xv | Check gate valves / non-return valves functioning properly lubricate if necessary. |
| xvi | Check and tight coupling if necessary |
| xvii | Cleaning / service of electric panel and check and tighten loose connection |
| xviii | Foundation bolt tighten if necessary |
| xix | Motor / pump ball bearing lubricate if necessary or relocate if required. |
| xx | Painting of unit if necessary |
| xxxi | Set on auto operation of pump. |

**FIRE ENGINE PUMP SERVICE INSTRUCTION**

|  |  |
| --- | --- |
| 1. **MONTHLY INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refix if required |
| iv | Cleaning of Engine pump. |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Engine filter replace with new if required. |
| vii | Check Engine oil level fill if required. |
| viii | Check batteries water level and check charge |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Check fuel tank / level fill if required. |
| xiii | Set on auto operation of pump after completion of service. |

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| 1. **QUARTERLY INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refix if required |
| iv | Cleaning of Engine pump. |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Engine filter replace with new if required. |
| vii | Check Engine oil level fill if required. |
| viii | Check batteries water level and charge. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Check fuel tank / level fill if required. |
| xiii | Check engine oil and replace if required. |
| xiv | Check Mechanical seal condition (not leaking) |
| xv | Check power wiring / terminal of motor tighten if necessary including panel. |
| xvi | Check air vents working properly. |
| xvii | Check gate valves / non-return valves functioning properly lubricate if necessary. |
| xviii | Set on auto operation of pump after completion of service. |

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| 1. **SEMI ANNUAL INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refix if required |
| iv | Cleaning of Engine pump. |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Engine filter replace with new if required. |
| vii | Check Engine oil level fill if required. |
| viii | Check batteries water level and charge. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Set on auto operation of pump. |
| xiii | Check fuel tank / level fill if required. |
| xiv | Check engine oil and replace if required. |
| xv | Check Mechanical seal condition (not leaking) |
| xvi | Check power wiring / terminal of motor tighten if necessary including panel. |
| xvii | Check air vents working properly. |
| xviii | Check gate valves / non-return valves functioning properly lubricate if necessary. |
| xix | Check and tight coupling if necessary |
| xx | Foundation bolt tighten if necessary |
| xxi | Motor / pump ball bearing lubricate if necessary. |
| xxii | Set on auto operation of pump after completion of service. |

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| 1. **ANNUAL INSPECTION** | |
| i | Switch Off pump before service start. |
| ii | Flushing of strainer from ball valve. |
| iii | Remove strainer wash / clean and refix if required |
| iv | Cleaning of Engine pump. |
| v | Check pressure gauge calibration inlet / outlet if required replace with new. |
| vi | Check Engine filter replace with new if required. |
| vii | Check Engine oil level fill if required. |
| viii | Check batteries water level and charge. |
| ix | Electric panel clean from dust / dirt |
| x | Check auto / manual pump in operation properly |
| xi | Check unusual noise / repair if necessary. |
| xii | Set on auto operation of pump. |
| xiii | Check fuel tank / level fill if required. |
| xiv | Check engine oil and replace if required. |
| xv | Check Mechanical seal condition (not leaking) |
| xvi | Check power wiring / terminal of motor tighten if necessary including panel. |
| xvii | Check air vents working properly. |
| xviii | Check gate valves / non-return valves functioning properly lubricate if necessary. |
| xix | Set on auto operation of pump. |
| xx | Check and tight coupling if necessary |
| xxi | Foundation bolt tighten if necessary |
| xxii | Motor / pump ball bearing lubricate if necessary. |
| xxiii | Painting of unit if necessary |
| xxiv | Set on auto operation of pump after completion of service. |