

# **Humidifiers replacement 2024**

## **SCOPE OF WORK**

### **FOR**

**Replacement of existing Humidifiers with Carel**

**U.S. EMBASSY  
Sofia, Bulgaria**

**June 2024**

**CONTENTS:**

- I. INTRODUCTION – page 1
- II. SCOPE – page 1
- III. POC – page 9
- IV. Additional documentation – page 10

## Humidifiers replacement 2024

### I. INTRODUCTION

This Statement of Work (SOW) outlines the scope, objectives, and requirements for the replacement of existing Humidifiers with new Carel humidifiers. Due to the depreciation and insufficient capacity of the existing vapor-humidification systems built into the air duct network of the AHU, it is necessary to replace them with new ones like the existing ones and with a greater capacity, if this is possible without replacing the electrical supply cables and protective equipment. The project involves the replacement of 13 units and encompasses installation, parametrization, testing and commissioning. The existing systems is located at US Embassy Sofia, 16 Kozyak str.

II. SCOPE: The purpose of this scope of work (SOW) is to define the requirements for the installation and commissioning work procedures. Work shall be done in accordance with this SOW, and with referenced codes. The work shall consist of the furnishing of all materials and labor, necessary for the complete installation work in accordance with the following scope of work and specifications. It is the intent of these SOW, to form a guide for the mounting work that needs to be performed. Therefore, any minor items not specifically noted, but reasonably necessary for a complete maintenance and repair shall be furnished under this Contract and included in the unit prices, no separate payment will be made for any minor items. The replacement, installation and the commissioning shall efficiently cover the whole Embassy Humidifiers units and should follow the following steps:

1. Conduct preliminary coordination with the post via telephone and e-mail, to accomplish, as minimum, the following:
  - a. Obtain from Sofia Embassy Facility Management Section technical documentation for the existing location that will facilitate accomplishment of project required under this SOW.
  - b. Advise post on what preparations will need to be made for the project and what data the post should collect and make available to the contractors.
  - c. The Contractor will be allowed a site visit during the pre-bid meeting to obtain an overview of the project and site conditions to allow for proper cost estimating, and scheduling of work. Work should be approved and done during weekdays, and for some units Only weekends are allowed. This will be discussed on later stage with the company that will win the tender.
2. Codes, permits and licenses.
  - a. Materials, construction, and installation procedures shall conform to all Codes and Regulations governing the trades included in this work. The Contractor shall obtain and pay for all necessary permits required for this work if required. Permits are required for hot work, electrical work and welding if needed.
  - b. Contractor shall be licensed for work to be performed. The Contractor shall carry out the work in accordance with all applicable statutes and regulations relating to pollution control of water and air.

## Humidifiers replacement 2024

### 3. Requirements

New steam humidification systems must meet the following requirements:

- To be equipped with electric heaters resistant to corrosion (for example - titanium)
- Do not require pre-treatment of the water with which they are supplied except with mechanical filters. In particular, the device should be able to work with any kind of purified water, even extremely aggressive water with a conductivity below 1  $\mu\text{S}/\text{cm}$  and softened to 0° fH
- Not to have to replace the existing electrical installation for their power supply.
- The steam generators should be installed on floor stands so that they are ergonomically comfortable for work and service.
- Steam distributors to be installed in an air duct, with short distances for moisture absorption (highly efficient) and frame model.

If it is necessary to provide the corresponding transitions for the embedding of the distributors in the air duct network of the relevant installation.

- The distributors must be drained and with minimal condensation.
- For the steam generator, a mixing valve should be provided to reduce the temperature of the drained water discharged into the sewer.
- To provide two analog moisture sensors - rH. Limiting and basic for installation in an air duct.
- To provide ON/OFF air flow devices for synchronizing the operation of the humidifiers with the corresponding installation by air.
- Electrical power supply – three-phase 380V/ 50Hz.
- Possibility of integration to BMS via Modbus

Data about the installations that will be renovated.

Installation	Air flow rate (L/sec.)	Duct size (mmXmm)	Total power (kW)	Operating point rH (%)	Voltage (V)	Phases	Frequency
AHU – L01A	2,124	1100X450	21	48	380	3	50Hz
AHU – L01B	2,124	700X600	12	48	380	3	50Hz
AHU – L02	4,955	1150X600	16	48	380	3	50Hz
AHU – L03	4,720	900X600	21	51	380	3	50Hz
AHU – L04	850	500X350	6	53	380	3	50Hz
AHU – L05	2,690	450X1050	21	53	380	3	50Hz
AHU – P.01	2,690	900X600	21	53	380	3	50Hz
AHU – P.03	3,304	900X600	21	48	380	3	50Hz
AHU – P.04	5,191	1900X450	21	59	380	3	50Hz

## Humidifiers replacement 2024

AHU – P.05A	1,157	600X600	6	53	380	3	50Hz
AHU – P.05B	967	600X600	6	53	380	3	50Hz
AHU – P.06	1,652	600X600	6	48	380	3	50Hz
AHU – 2.01	1,652	700X600	6.9	53	380	3	50Hz

### Appendix 1

A set of example humidifier selections for AHU in files (please see the Appendix 1 at the endo of the SOW) :

Example selection of AHU L01A.pdf  
 Example selection of AHU L01B.pdf  
 Example selection of AHU L02.pdf  
 Example selection of AHU L03.pdf  
 Example selection of AHU L04.pdf  
 Example selection of AHU L05.pdf

Example selection of AHU P01.pdf  
 Example selection of AHU P03.pdf  
 Example selection of AHU P04.pdf  
 Example selection of AHU P05A.pdf  
 Example selection of AHU P05B.pdf  
 Example selection of AHU P06.pdf  
 Example selection of AHU 2.01.pdf

#### 4. The work should follow the steps listed below:

##### 4.1. Site Assessment and Preparation:

Conduct a thorough assessment of the site to evaluate the existing humidification systems, including their placement, and surrounding infrastructure.

Identify any spatial constraints, accessibility issues, or environmental considerations that may impact the replacement process. Prepare the site by clearing the area around the existing units and ensuring safe access for installation and removal.

##### 4.2. Removal of Existing Units:

Disconnect power and utilities to the existing humidifiers, following appropriate safety protocols. Carefully dismantle and remove the old humidification systems, taking precautions to minimize disruption to surrounding equipment and structures.

##### 4.3. Installation of New Systems:

Prepare the installation area for the new humidifiers, including mounting stands and necessary infrastructure adjustments. Install the new steam generators on floor stands in accordance with manufacturer guidelines and ergonomic considerations. Integrate necessary transitions for

## Humidifiers replacement 2024

embedding distributors into the existing air duct network, ensuring proper alignment and sealing. Install steam distributors in the air duct, optimizing placement for efficient moisture absorption and minimal condensation. Connect electrical power supply (three-phase 380V/50Hz) to the new humidification systems, adhering to electrical safety standards and regulations.

### 4.4. Commissioning and Testing:

Conduct comprehensive testing of all components and functionalities of the new humidification systems (72 hours). Calibrate moisture sensors and integrate ON/OFF air flow devices for synchronization with existing air installations. Verify integration capabilities with the Building Management System (BMS) via Modbus protocol if applicable. Adjust settings and configurations as needed to ensure optimal performance and compatibility with existing infrastructure.

### 4.5. Documentation and Training:

Prepare detailed installation and commissioning reports documenting the procedures, observations, and outcomes of the replacement process. Provide operation manuals and documentation for maintenance and troubleshooting of the new humidification systems. Existing drawings must be updated with newly added equipment, using Autocad. Conduct training sessions for relevant personnel on the operation, maintenance, and safety protocols associated with the new equipment.

### 4.6. Final Inspection and Acceptance:

Conduct a final inspection of the installed humidification systems to ensure compliance with specified requirements and standards. Address any outstanding issues or discrepancies identified during the inspection process. Obtain formal acceptance of the replacement project from the stakeholders, signifying the successful completion and functionality of the new systems.

### 4.7. Post-Installation Support:

Provide ongoing support and assistance to address any operational or maintenance concerns that may arise after the replacement process.

### 4.8. Project Closeout:

Complete all administrative and documentation requirements associated with the replacement project.

Close out the project formally and archiving relevant documentation.

## 5. Working conditions

## Humidifiers replacement 2024

- a. All losses or damage to equipment, to the Government property, while in the possession of or being used by the Contractor, shall be the responsibility of the Contractor, and he shall repair, replace, or otherwise compensate for any such loss. The Contractor always at his own expense shall provide adequate security of materials and work on site. The working area shall be kept clean of all debris, waste, or dirt. Clean-up and removal of all equipment, excess materials, etc., shall be completed before acceptance will be approved by the client. If needed, welding and hot works permit should be approved prior to any task that is related to such approval.
  - b. Overtime work will be at the Contractor's option and expense, unless requested in writing by the COR.
6. Workmanship
- a. The Contractor shall have had considerable experience and demonstrated ability in the building, commissioning, and installation activities of this type.
  - b. All work shall be performed by skilled persons proficient in the trades required, in a neat, orderly, and responsible manner, with recognized standards of workmanship.
7. Quality assurance
- a. All work shall be inspected and approved by the COR, for correctness and completeness which includes permission and safety plan.
  - b. The Contractor shall guarantee all materials, equipment, and installation work, for a period of ONE year against defective workmanship and handling.
8. Warranty
- a. Warranties shall become effective from the date of the Completion Certificate and cover period of one year
  - b. The warranty will include but not limited to the following specific items in addition to the normal warranty coverage
    - Malfunction of the equipment
    - Repair and/or replace materials which do not meet the Specifications and whose substitution was not approved by COR
    - Correct any works not in accordance with the SOW unless specifically authorized by the COR, which may be discovered during the warranty period.
9. When on site, the Contractor shall do following.

## Humidifiers replacement 2024

- a. **Personnel Qualifications:** The contractor will employ only qualified, experienced and well-trained workers who are skilled in performing the requirements of this service contract. They will be physically able to perform the assigned work.
- b. **De-energizing/Energizing Equipment:** The contractor shall not turn off or on any Embassy-owned equipment. All de-energizing/energizing equipment will be coordinated through Embassy on-site personnel.
- c. **Environmental Health & Safety Requirements:** The contractor shall designate a Safety Officer, who is familiar with the latest edition of the OHSAS regulations.

### 10. Repair and instruction obligations.

- a. During the execution of this Contract, the Contractor shall keep a technically qualified person on the job full time and maintain adequate labor and equipment at the site to immediately repair the system or components in the event of any leak of failure.
- b. Prior to completion of the job, the Contractor shall thoroughly instruct the Owner's personnel in the proper operation, maintenance and repair of the system.

### 11. Site safety – The installation and commissioning of the Humidifiers shall adhere to the following US standards and regulations:

#### 11.1. National Electrical Code (NEC):

- Compliance with NEC requirements for electrical installations, wiring methods, and equipment.

#### 11.2. National Fire Protection Association (NFPA):

- Adherence to NFPA standards pertaining to electrical safety and fire protection. 15 FAM 957.7 Electrical safety work practice requirements

#### 11.3. Occupational Safety and Health Administration (OSHA):

- Ensuring worker safety in accordance with OSHA regulations for electrical installations and workplace safety. EM 385-1-1 Safety & Health requirements manual and Appropriate PPE.

#### 11.4. Manufacturer Guidelines:

- Following Carel installation, operation, and maintenance instructions provided in the product manuals and technical documentation.

### 12. Maintenance and clean-up of work site

- a. The Contractor shall be responsible to maintain and cleanup the work site on an ongoing basis from the commencement of installation to the completion of the project.



## Humidifiers replacement 2024

- b. The work site shall be maintained in an orderly manner and shall not be used to store the Contractor's equipment and materials, which are not used for this project.
- c. Waste, debris, unnecessary excess material shall not be stockpiled on the work site and shall be disposed of properly by the Contractor.

### 13. Project Deliverables:

Upon completion of the project, the following deliverables will be provided:

- Documentation of removed Humidifiers.
- Installation records and documentation for each newly installed Humidifier.
- Parametrization settings for each Humidifier.
- Test reports detailing testing procedures, results, and any corrective actions taken.
- Commissioning documentation, including verification of compliance with standards and regulations.
- AutoCAD drawings

### 14. Project Timeline:

The project timeline shall be as follows:

- Preparation Phase: 30 days
- Installation Phase: 90 days, including weekends
- Testing and Integration Phase: 20 days, including weekends
- Commissioning Phase: 10 days, including weekends

### 15. Project Responsibilities:

- Client: Provide access to existing Humidifiers and necessary facilities. Review and approve project deliverables.
- Contractor: Execute the installation, parametrization, testing, and commissioning activities according to the agreed-upon scope and schedule. Ensure compliance with all applicable standards and regulations.

### 16. Mechanical drawing layout example for each humidifier:



m70-01\_as-built-Mo  
del.pdf

This is an overview of the existing situation for one of the above-described humidifiers.

### III. POC AT POST

All questions concerning the scope and requirements of the U.S. Embassy, shall be directed to the POC (see below):

## Humidifiers replacement 2024

ACOR
Georgi Penev
PenevGP@state.gov
Telephone # +35929375674

### IV. Additional documentation

#### Appendix 1

Technical information for each humidifier:



AHU L01A.pdf



AHU L01B.pdf



AHU L02.pdf



AHU L03.pdf



AHU L04.pdf



AHU L05.pdf



AHU P01.pdf



AHU P03.pdf



AHU P04.pdf



AHU P05A.pdf



AHU P05B.pdf



AHU P06.pdf



MSGQ AHU  
2.01.pdf

END OF SCOPE OF WORK