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SN	**Page No.**	**Clause No.**	**Reference Document**	**Specified in Original Tender Enquiry**	**Revised Specifications**
1	51 of 101	4.04	Technical condition of contract	When Installed in the AHU, the UVGI system shall be installed downstream of the cooling coil. The selection and placement of the UVGI system shall ensure full irradiation of the entire face area of the cooling coil when installed in the AHU or of full cross-sectional area of the duct. In order to validate the performance of the proposed arrangement, the vendor shall submit a manufacturer approved computer simulation showing the resulting kill rate or time map of bacteria / virus over the coil. UVGI System should be developed using scientifically proven CFD design software to ensure UV dose delivery in varied conditions with respect to air temperature, coil size, lamp energy, and air flow volume.	When Installed in the AHU, the UVGI system shall be installed downstream of the cooling coil. The selection and placement of the UVGI system shall ensure full irradiation of the entire face area of the cooling coil when installed in the AHU or of full cross-sectional area of the duct. In order to validate the performance of the proposed arrangement, the vendor shall submit a manufacturer approved computer simulation showing the resulting kill rate or time map of bacteria / virus over the coil. UVGI System should be developed using scientifically proven CFD design software to ensure UV dose delivery in varied conditions with respect to air temperature, coil size, lamp energy, and air flow volume. ***The CFD Analysis shall show plotting of UVGI irradiance of the lamps with respect to distance of cooling coil from it. The simulation shall highlight the irradiance profile at four different distances from the cooling coil, i.e. 4 Inch, 8 Inch, 10 Inch & 14 Inch. The Simulation report shall depict the distribution of UV irradiance at every point of cooling coil surface through colour coding of the irradiance level. The Simulation report shall clearly mention the Make, Model, Length, Wattage & Amperage Rating of UL Listed Lamp.***
2	52 of 101	4.05	Technical condition of contract	The system shall be classified by UL (Underwriters Laboratories) as an Air Duct Mounted Accessory (ABQK) and meet the UL Standards 1995 (Heating and Cooling Equipment) and 2043 (Fire Test for Heat and Visible Smoke Release). The appropriate UL mark along with manufacturers UL file number shall be permanently marked on the exterior of the product.	The system shall be classified by UL (Underwriters Laboratories) as an Air Duct Mounted Accessory (ABQK) and meet the UL Standards 1995 (Heating and Cooling Equipment) and 2043 (Fire Test for Heat and Visible Smoke Release). ***Bidder should provide UL Certificate (UL-1995 & UL-2043) of the product along with their technical bid. Provided UL certificate should have been issued in the favour of considered OEM of the product only.***
3	52 of 101	5.11	Technical condition of contract	The UVGI system shall be suitable for operation on 230V +/- 10V, single phase A.C. power supply. Ballast may be installed inside the AHU/Duct but all other control electronics shall be installed outside the AHU /Duct, in a separate control panel. The ballasts, if installed within the AHU / Duct, must be integrated onto the module in a sealed aluminium or stainless steel enclosure to protect against moisture and humidity present in the AHU or duct. Ballasts shall be electronic Type with high power factor of > 0.90.	The UVGI system shall be suitable for operation on 230V +/- 10V, single phase A.C. power supply. Ballast may be installed inside the AHU/Duct ***or or in the Control Panel, as per the recommendations of the OEM*** but all other control electronics shall be installed outside the AHU /Duct, in a separate control panel. The ballasts, if installed within the AHU / Duct, must be integrated onto the module in a sealed aluminium or stainless steel enclosure to protect against moisture and humidity present in the AHU or duct. Ballasts shall be electronic Type with high ***power factor of > 0.95. The Ballast shall also be UL Listed.***
4	52 of 101	5.14	Technical condition of contract	The system shall have a separate Control Panel consisting of (as a minimum): a Main Incoming MCB / Disconnect Switch (suitable for 230V, 1 Phase, 50 Hz AC Power Supply) with Mains On Indication Lamp b Electronic Ballast(s), if not part of UV Fixture being installed within the AHU / Duct. c Microprocessor Controller with LCD Display - For Control & Monitoring of all the lamps, Run Status of lamps, Fault Status of Lamps, Run - Hour Metering etc. The controller shall also include a lamp current monitoring circuit which informs the customer of proper lamp functioning and lamp failure, if any. d Power Supply Converter / Rectifier for power supply to the microprocessor. e. Necessary required number of relays to control the operation of lamps along with interlocking arrangements. f. All internal power & control wiring and any other item to make the system complete.	The system shall have a separate Control Panel consisting of (as a minimum): a Main Incoming MCB / Disconnect Switch (suitable for 230V, 1 Phase, 50 Hz AC Power Supply) with Mains On Indication Lamp b Electronic Ballast(s), if not part of UV Fixture being installed within the AHU / Duct. c Microprocessor Controller with LCD Display - For Control & Monitoring of all the lamps, Run Status of lamps, Fault Status of Lamps, Run - Hour Metering etc. The controller shall also include a lamp current monitoring circuit which informs the customer of proper lamp functioning and lamp failure, if any. d Power Supply Converter / Rectifier for power supply to the microprocessor. e. Necessary required number of relays to control the operation of lamps along with interlocking arrangements. f. All internal power & control wiring and any other item to make the system complete. ***Since the Building shall be having an Integrated BMS System, the Control Panel / Microprocessor shall have RS-485 communication port for soft integration of UVGI System with BMS. The protocol for the same shall be Modbus / Bacnet / Open Type. Proprietary Protocol shall not be acceptable. Minimum Parameters to be indicated on the BMS shall include On – Off Status of Lamps, Lamp Run Hours, Fault Indication, Failure to Switch On & Failure to Switch Off.***

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5	6 of 101	2.2.3	NIT	Bidder shall deposit EMD in the prescribed form as mentioned in the tender conditions. EMD shall be enclosed with techno-commercial bid. In case of non-submission of EMD of prescribed amount in prescribed form, BHEL reserves the right to reject the tender without giving an opportunity to the bidder for re-submission. BHEL's decision in this regard shall be final & binding on the bidders. 'One Time EMD' will not be considered for this tender. All the bidders who have 'One Time EMD' with BHEL and want to participate in this tender, would also submit the requisite amount of EMD.	Bidder shall deposit EMD in the prescribed form as mentioned in the tender conditions. EMD shall be enclosed with techno-commercial bid. In case of non-submission of EMD of prescribed amount in prescribed form, BHEL reserves the right to reject the tender without giving an opportunity to the bidder for re-submission. BHEL's decision in this regard shall be final & binding on the bidders. 'One Time EMD' will not be considered for this tender. All the bidders who have 'One Time EMD' with BHEL and want to participate in this tender, would also submit the requisite amount of EMD. ***For Electronic Fund Transfer the details are as below-:*** ***Name of the Beneficiary -: Bharat Heavy Electricals Limited*** ***Bank Name: Kotak Mahindra Bank*** ***Bank Telephone No.(with STD code)-: 011-43543659*** ***Branch Address: Kotak Mahindra Bank. G-F 3A-3J, Ground Floor Ambadeep Building, 14 Kasturba Gandhi Marg, New Delhi-110001*** ***Bank Fax No. (with STD code) : 011-23350900*** ***Branch Code: 0172*** ***9 Digit MICR Code of the Bank Branch: 110485002*** ***Bank Account Number: 9011196535*** ***Bank Account Type: Current Account*** ***Digit IFSC Code of Beneficiary Branch: KKBK0000172***