



UV Reactor Report

Instructions for Form UV-CDA

General Instructions

This form is to be used for UV reactors that are to comply with 310 CMR 22.00 and automatically adjust the UV intensity based on changes in flow and transmittance (also known as the “Calculated Dose Approach”). UV reactors using the Calculated Dose Approach must have a MassDEP approved Validation Report that specifies the operating ranges for flow, transmittance, and power. The calculated dose equation, with variables derived during validation, that controls UV intensity, must be summarized on page 2 of Form **UV-CDA**.

Form **UV-CDA** must be completed for any month, or portion of any month, that the UV unit was in operation. A separate **UV-CDA** form must be completed for each UV unit that was in operation. The completed form must be signed and submitted to the appropriate MassDEP region by the 10th of the following month.

Form **UV-CDA** must also be submitted along with forms **UV-CAL** and **UV-OFF SPEC** (if applicable).

Detailed Instructions

Day	Operational Data				Data at Time ² of Minimum UV Dose							
	Run Time (hrs.)	Total Production (MG)	Max. Flow Rate ² (MGD)	Min. UVT ² (%)	Min. Power ² (% or kW)	Flow-MGD	UVT (%)	Min. Dose Applied ² (mJ/cm ²)	UV Sensor Intensity Reading – S (mJ/cm ²)	S/S ₀ ³	Lamp Banks In Operation	Instrument Calibration ⁴ (“S”, “T”, “Q”)

- **Max Flow Rate, Min UVT and Min Power** – select value from daily record as recorded every 5 minutes.
- **Flow, UVT, S/S₀ and # of Lamp Banks** – operational values from time of minimum UV dose.
- **S/S₀** - S is the actual UV intensity sensor reading and S₀ is the intensity at 100% lamp power.
- **Instrument Calibration** - Indicate if Intensity Sensors (S), Transmittance Analyzers (T) or Flow Meters (Q) were calibrated. You must also complete Form UV-CAL.

VI. General Equation

$$RED = 10^a \times A_{254}^b \times (S/S_0)^c \times (1/Q)^d \times B^e$$

RED is the Reduced Equivalent Dose, also called the ‘Calculated Dose’ (mJ/cm²)

a, b, c, d and e are constants derived from the validation study for various configurations of lamps and lamp power. The following table must be completed with the appropriate constants and lamp configurations from the validation study:

Coefficients	Lamp Banks in Operation						
a							
b							
c							
d							
e							

- **RED** - The controlling equation can be used with the coefficients and parameters from “Data at Time of Min. UV Dose” to hand-calculate and confirm the Minimum UV Dose value reported.
- **Coefficients** – obtained from the UV reactor validation report.