



APPLICATION NOTE

INDUSTRY-SPECIFIC APPLICATIONS FOR UV TECHNOLOGY

APPLICATION: Liquid Sugar

Aquafine® Ultraviolet Treatment Systems for Liquid Sugar

In today's increasingly regulated beverage market, beverage plants are striving to meet more stringent quality standards. Concentrated sugar syrups have a high osmotic pressure. Generally, in concentrations above 66°Brix (1°Bx is 1 gram of sucrose in 100 grams of solution), the osmotic pressure of the solution is so high, it prevents microorganisms from growing and reproducing. But they can still survive in spore form and may grow once the syrup is diluted – then they start to multiply. Liquid sugar applications utilizing UV are typically between 60°Bx and 67°Bx.

Microbial growth can cause food discoloration, adverse flavors, undesired odors, and reduced product shelflife. Controlling bacterial growth is, therefore, an important issue. The threat of microbial contamination is further increased as manufacturers respond to consumer demand for reductions in chemical additives and preservatives. As a result, food and beverage manufacturers are looking for alternative techniques to protect their products from microbial contamination while maintaining product quality and shelf-life without chemical additives preservatives.

For products that can tolerate the temperature, heat pasteurization may be an option. However, rising energy costs and the space constraint in many food processing plants have led to the successful adoption of ultraviolet (UV) technology as a solution. UV inactivates all known food spoilage organisms. It is a low-maintenance technology, but ensures high levels of microbial inactivation. Syrups – solutions of sugars like sucrose, fructose, and glucose – are key ingredients in thousands of food and beverage products, adding sweetness to soft drinks, fruit juices, confectionery, and even tomato ketchup.

Soft-drink manufacturers use various types of sugars and non-sugar sweeteners to create liquid sugar for soft drinks. Granulated sugar is the most popular option for most of the world and parts of Europe, while caloric sweeteners, such as high fructose corn syrup (HFCS), are used heavily in North America and other parts of Europe to create liquid sugar syrup. However, for noncaloric drinks, such as Coke Zero, ingredients such as Aspartame or sugar alcohols such as Erythritol is used to make the liquid sugar syrup to manufacture noncaloric drinks.

Typically, a medium to large size bottling plant will have liquid sugar flow rates in the range of 20,000-30,000 L/Hr, while small plants will have flow rates in the range of 10,000 L/Hr. Liquid sugar syrup ultraviolet transmittance (UVT) typically ranges between 20%-65%, while typical dosage required for liquid sugar treatment is 50 mJ/cm². This dosage ensures the inactivation of thermally resistant Alicyclobacillus acidoterrestris spores and common yeasts and molds in liquid sugar that lead to early spoilage.



LIQUID SUGAR







How UV Works for Liquid Sugar

UV is the part of the electromagnetic spectrum between visible light and x-rays. The specific portion of the UV spectrum between 200-400nm (known as UVC) has a strong microbial inactivation effect, with peak effectiveness at 265nm.

At these wavelengths, UV inactivates microorganisms by penetrating their cell membranes and damaging the DNA, making them unable to reproduce. UV is able to inactivate a wide range of microorganisms, including thermophilic spores that are tolerant to pasteurization. UV treatment is a proven technology, having been first applied to sugar solutions in the 1980s. Our UV systems have been successfully installed on liquid sugar applications by leading brands including AB InBev, Refresco, Coca-Cola, and Pepsi.

A typical UV system consists of one or several UV lamps housed in protective quartz sleeves and mounted within a cylindrical stainless-steel chamber. The liquid to be treated enters at one end and passes along the entire length of the chamber before exiting at the other end. Many liquids can be effectively treated using UV, including viscous sugar syrups, raw municipal water, filtered process water, and beverages.

Aquafine UV systems are optimized to treat liquids which have a low UV transmittance (i.e. low depth of UV penetration in a fluid) by forcing the liquid to be exposed closer to the lamps for a longer time period to receive higher doses of UV energy. Our systems are designed to treat liquid sugar with UV in dark fluids with high osmotic pressure, glucose, and sucrose. The two natural sugars that are used most often are fructose and sucrose. Fructose is produced from fruits and corn and is generally less e×pensive than sucrose, while sucrose is made from cane sugar and contains both glucose and fructose. UV works well on fructose and sucrose applications.

Benefits of UV

- Increases product quality and shelf life
- Reduces food discoloration
- Helps maintain flavor
- · Cost-effective vs. pasteurization



LIQUID SUGAR

Aquafine Liquid Sugar Treatment Solution

We offer UV solutions to meet all your needs for liquid sugar. Our product offering includes OptiVenn® and Avant series.

OptiVenn: A robust and versatile UV solution that offers the following features and benefits:

- 2-12 lamps: supports a wide flow rate range 9-220 gpm (2-50 m³/h) @ 50% UVT
- Flexible: can be installed in different positions to adapt to existing pipes and layout constraints
- 254nm wavelength: OptiVenn can provide treatment capabilities for liquid sugar solutions that have UVT as low as 20%

Avant: The latest, more intelligent and efficient addition that offers the following features and benefits:

- No. of lamps: 20–44 supporting flow rate ranges 345–728 gpm (78–165 m³/hr) @ 50% UVT
- Flexible: can be installed in different positions to adapt to existing pipes and layout constraints
- Intelligent: Display Lamp Status and UV Dose on 7" touchscreen. Enhanced lamp and driver diagnostic capabilities
- 254nm wavelength: Avant can provide Liquid Sugar treatment for solutions that have UVT as low as 20%





Conclusion

A method of controlling microbial contamination gaining increasing popularity is ultraviolet (UV) treatment. UV inactivates all known food spoilage organisms. It is a low maintenance, technology, and ensures high levels of microbial inactivation.

For food and beverage plants seeking to improve the quality of their final product, UV is an economic and effective option. UV systems are easy to install and retrofit and cause minimal disruption to the plant.

To learn more about the brands and affiliates of Trojan Technologies, please visit www.trojantechnologies.com



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OPTIVENN SERIES | LIQUID SUGAR

MODEL:	02CDS	03CDS	02CDM	02DDM	04CDM	04DDM	04CDL	04DDL	06DDL	08DDL	08EDL	08FDL	10GDL	12HDL		
Maximum Flow Rate																
Flow Rate (gpm)*	9 gpm - 220 gpm															
Flow Rate (m³/hr)*						2	m³/hr -	50 m³/l	nr							
Minimum Cooling Flow Rate gpm		0.2 0.4 0.5									0.7	0.8				
(m³/hr) @25°C			(0.	04)		,	(0.	08)		(0.	11)		(0.15)	(0.18)		
Number of UV Lamps	2	3	2	2	4	4	4	4	6	8	8	8	10	12		
	For App	olication	Specific	c Sizing,	please	contact	Trojan I	echnolo	gies							
Operating Conditions							/0 1210	0 (10 EE	o)							
		34° - 131° (1° - 55°)														
Nevireure Operating Decevere DCL (DAD)		20% - 50% UVT														
Maximum Operating Pressure PSI (BAR)							10/8	(10)								
Hot Water Sanitization °F (°C)						_	194*	(90°)								
Electrical Supply					110_	2/0\/ 5	0/60H-	l-Lorl	_N 2\//+	GND						
	0.2	0.2	0.2	0.2	03	03	0,00112,	07	10,200	1 2	12	12	15	1.8		
Chamber	0.2	0.2	0.2	0.2	0.5	0.5	0.7	0.7	1.0	1.2	1.2	1.2	1.5	1.0		
Material of Construction	316L Stainless Steel															
Lamp Length - in (cm)	15 ((38)		30	(76)					60 (152)					
Chamber Dismeter in (am)		((15)		0 (20)	(15)	0 (20)	((15)		0 (20)		10	12	14	16		
Chamber Diameter - in (cm)		6(15)	-	8 (20)	6(15)	8 (20)	6(15)		8 (20)		(25)	(30)	(36)	(41)		
I/O Sanitary Tri-clamp size - in (cm)		2 (5)			3 (8)		(10)		6 (15)		8 (20)			10 (25)		
Surface Finish	Ra15															
Elastomers	EPDM (EC1935/2004, FDA)															
Monitoring and Controls			•													
Standard							Base P	ackage:		(104)			/ (L)	0 1 1		
	Lan	np statu	is indica	tor, Sys	tem nou		eration, Monitori	Lamp ou	ade.	(LUA) an	a kemo	të start,	/stop (H	UAJ		
Optional					UV inte	nsity rea	ading wi	ith NIST	certified	d sensor						
Control Panel														_		
Standard	1															
Material of Construction						3	u4 Stain	less Ste	el				шт	(no. 12		
Rating				U	L Type 1	III Type 1 (IDE1) Forced Air & Mart										
			UL Type 1 (1P51) Forced Air & Vent													
Dimensions H×W×D - in (cm)	16 × 16 × 7 (41 × 41 × 18) 16 × 20 × 9 (41												Air &	Vent		
			16 ×	16 × 7 (41 × 41	(IP51) 	Forced	Air & Ve	16 ×	20 × 9 (4	41 × 51	× 23)	Air &	Vent 23 × 9		
Chang			16 ×	16 × 7 (41 × 41	(IP51) × 18)	Forced	Air & Ve	16 ×	20 × 9 (4	41 × 51	× 23)	Air & 22 × 2 (56 × 5	Vent 23 × 9 9 × 23)		
Shape			16 ×	16 × 7 (41 × 41	(IP51) × 18) Flat	Forced /	Air & Ve	16 ×	20 × 9 (4	41 × 51	× 23)	Air & 22 × 2 (56 × 5 Slope	Vent 23 × 9 9 × 23) ed Top		
Shape Installation Location Operation Trans Associate 05 (00)			16 ×	16 × 7 (41 × 41	(IP51) × 18) Flat	Forced / Top Indoo	Air & Ve	16 ×	20 × 9 (4	41 × 51	× 23)	Air & 22 × 2 (56 × 5 Slope	Vent 23 × 9 9 × 23) ed Top		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional			16 ×	16 × 7 (41 × 41	(IP51) × 18) Flat	Forced A Top Indoo 4° - 104	Air & Ve r Only ° (1° - 40	16 ×	20 × 9 (4	41 × 51 :	× 23)	Air & 22 × 2 (56 × 5 Slope	23 × 9 23 × 9 9 × 23) ed Top		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional			16 ×	16 × 7 (41 × 41	(IP51) × 18) Flat	Forced / Top Indoo 4º - 104	Air & Ve r Only ° (1° - 40	16 ×	20 × 9 (4	41 × 51	× 23)	(17-34) Air & 22 × 2 (56 × 5 Slope	vent 23 × 9 i9 × 23) ed Top		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional			16 ×	16 × 7 (41 × 41	(IP51) × 18) Flat 3.	Forced / Top Indoo 4º - 104	Air & Ve <u>r Only</u> ° (1° - 40	16 × ••)	20 × 9 (/	41 × 51	× 23)	UL Ty (IP 34) Air & 22 × 2 (56 × 5 Slope	vent 23 × 9 9 × 23) ed Top pe 4X 56)		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional		UL Type	16 ×	16 × 7 (41 × 41	(IP51) × 18) Flat 3.	Forced / Top Indoo 4° - 104 /Shroud	Air & Ve r Only ° (1° - 40	16 × 10 × 10 × 10 × 10 × 10 × 10 × 10 × 10 ×	20 × 9 (, be 12 (IP and) be 4X (IP	41 × 51 (54) Foro Vent (56) Foro	× 23) ced Air ced Air	UL Ty Forced	vent 23 × 9 9 × 23) ed Top vpe 4X 56) d Air &		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating		UL Type	16 ×	16 × 7 (41 × 41	(IP51) × 18) Flat 3.	Forced / Top Indoo 4º - 104' /Shroud	Air & Ve	°) UL Tyr	20 × 9 (4 pe 12 (IP and ' pe 4X (IP & Vent/	41 × 51 54) Ford Vent 56) Ford Shroud	× 23) ced Air ced Air	UL Ty (IP 54) 22 × 2 (56 × 5 Slope UL Ty (IP Forced Vent/S	vent 23 × 9 9 × 23) ed Top pe 4X 56) d Air & Shroud yre 4X		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating		UL Type	16 ×	16 × 7 (41 × 41	(IP51) × 18) Flat 3	Forced / Top Indoo 4º - 104 /Shroud	Air & Ve	°) UL Typ UL Typ UL Typ	20 × 9 (4 De 12 (IP and be 4X (IP & Vent/ ype 4X (I	41 × 51 54) Ford Vent 256) Ford Shroud P66) wi	× 23) ced Air ced Air th AC	UL Ty (IP 54) Air & 22 × 2 (56 × 5 Slope VL Ty (IP Forced Vent/5 UL Ty (IP6)	23 × 9 23 × 9 99 × 23) ed Top (pe 4X 56) d Air & Shroud (pe 4X with AC		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating		UL Type	16 ×	16 × 7 (41 × 41	(IP51) × 18) Flat 3.	Forced / Top Indoo 4° - 104 /Shroud	Air & Ve	°) UL Tyr UL Tyr UL Tyr	20 × 9 (4 poe 12 (IP and ' poe 4X (IP & Vent/ ype 4X (I	41 × 51 54) Ford Vent 56) Ford Shroud P66) wi	× 23) ced Air ced Air th AC	UL Ty (IP64) (56 × 5 Slope UL Ty (IP Forcec Vent/S UL Ty (IP66) 23 × 2	vent 23 × 9 9 × 23) ed Top d Top d Air & Shroud vpe 4X with AC 4.5 × 9		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating Size H×W×D - in (cm) ***		UL Type	16 ×	16 × 7 (56) Force 19 × 8 (41 × 41 ed Air ar 46 × 49	(IP51) × 18) Flat 3. nd Vent, × 21)	Forced / Top Indoo 4º - 104' /Shroud	Air & Ve	*) UL Tyr UL Tyr UL Ty 22 ×	20 × 9 (4 pe 12 (IP and ' pe 4X (IP & Vent/ ype 4X (I ype 4X (I ype 4X (I)	41 × 51 54) Ford Vent 56) Ford Shroud P66) wi	× 23) ced Air ced Air th AC × 23)	UL Ty (IP 64) (56 × 5 Slope UL Ty (IP Forced Vent/S UL Ty (IP66) 23 × 2 (59 × 5 24 5 × 5	23 × 9 23 × 9 9 × 23) 20 Top 20 Top 20 Air & 20 Air & 20 Air & 20 Air & 20 Air & 20 Air & 20 Air & 20 Air & 20 Air & 20		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating Size H×W×D - in (cm) ***		UL Type	16 ×	16 × 7 (56) Force 19 × 8 (41 × 41 ed Air ar 46 × 49	(IP51) × 18) Flat 3. nd Vent/ × 21)	Forced / Top Indoo 4° - 104 /Shroud	Air & Ve	16 × 16 × UL Tyr UL Tyr UL Tyr 22 × 24.5 ×	20 × 9 (4 De 12 (IP and De 4X (IP & Vent/ ype 4X (I 23 × 9 (1 × 23 × 9 (1)	41 × 51 54) Ford Vent 256) Ford (Shroud P66) wi 56 × 59 (62 × 59	× 23) ced Air ced Air th AC × 23) ' × 23)	UL Ty (1P64) (56 × 5 Slope VL Ty (1P Forced Vent/S UL Ty (1P66) 23 × 2 (59 × 5 24.5 × 5 (62 × 5	vent 23 × 9 99 × 23) ed Top pe 4X 56) d Air & Shroud rpe 4X with AC 4.5 × 9 16 × 23) 23 × 9 99 × 23)		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating Size H×W×D - in (cm) *** Shape		UL Type	16 ×	16 × 7 (56) Force 19 × 8 (41 × 41 ed Air ar 46 × 49	(IP51) × 18) Flat 3. nd Vent/ × 21)	Forced / Top Indoo 4° - 104' /Shroud	Air & Ve	16 × 16 × UL Tyr UL Tyr UL Tyr 22 × 24.5 *	20 × 9 (4 De 12 (IP and ' De 4X (IP & Vent/ ype 4X (I 23 × 9 (1 × 23 × 9 (1)	41 × 51 (54) Ford Vent (56) Ford (5hroud P66) wi (62 × 59 (62 × 59	× 23) ced Air ced Air th AC × 23) × 23)	UL Ty (IP64) (56 × 5 Slope UL Ty (IP Forcec Vent/S UL Ty (IP66) 23 × 2 (59 × 5 24.5 × (62 × 5	Vent 23 × 9 9 × 23) ed Top d Top d Air & Shroud /pe 4X with AC 4.5 × 9 66 × 23) 23 × 9 9 × 23)		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating Size H×W×D - in (cm) *** Shape Installation Location		UL Type	16 ×	16 × 7 (56) Force 19 × 8 (41 × 41 ed Air ar 46 × 49	(IP51) × 18) Flat 3. nd Vent/ × 21)	Forced / Top Indoo 4° - 104' /Shroud Slope Indoo	Air & Ve	°) UL Tyr UL Tyr UL Ty 22 × 24.5 ;	20 × 9 (4 De 12 (IP and ' De 4X (IP & Vent/ ype 4X (I 23 × 9 (1) × 23 × 9 (1)	41 × 51 54) Foro Vent 56) Foro (Shroud P66) wi 56 × 59 (62 × 59	× 23) ced Air ced Air th AC × 23) × 23)	UL Ty (IP 64) (56 × 5 Slope UL Ty (IP Forced Vent/S UL Ty (IP66) 23 × 2 (59 × 5 24.5 × (62 × 5	23 × 9 23 × 9 9 × 23) ed Top rpe 4X 56) d Air & Shroud rpe 4X with AC 4.5 × 9 66 × 23) 23 × 9 99 × 23)		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating Size H×W×D - in (cm) *** Shape Installation Location Operating Temp Ambient °F (°C)		UL Type	16 ×	16 × 7 (56) Force 19 × 8 (41 × 41 ed Air ar 46 × 49	(IP51) × 18) Flat 3. And Vent, × 21) 3.	Forced / Top Indoo 4° - 104 /Shroud /Shroud Slope Indoo 4° - 104'	Air & Ve <u>r Only</u> <u>o (10 - 40</u> <u>o (10 - 40</u> <u>o (10 - 40</u> <u>o (10 - 40</u> <u>o (10 - 40</u>	16 × 16 × UL Tyr UL Tyr UL Tyr 22 × 24.5 ;	20 × 9 (4 De 12 (IP and De 4X (IP & Vent/ ype 4X (I 23 × 9 (1 × 23 × 9 (1)	41 × 51 54) Ford Vent 256) Ford (Shroud P66) wi 56 × 59 (62 × 59	× 23) ced Air ced Air th AC × 23) × 23)	UL Ty (1P 54) 22 × 2 (56 × 5 Slope Vent/S UL Ty (1P 66) 23 × 2 (59 × 5 24.5 × (62 × 5	23 × 9 23 × 9 9 × 23) 2d Top 2d Top 2d Air & Shroud 2d Air & Shroud 2d Air & 2d Air & 2d Air & 23 × 9 23 × 9 20 × 23 20 × 25 20		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating Size H×W×D - in (cm) *** Shape Installation Location Operating Temp Ambient °F (°C)		UL Type	16 ×	16 × 7 (56) Force 19 × 8 (41 × 41 ed Air ar 46 × 49	(IP51) × 18) Flat 3. And Vent/ × 21) 3. 3.	Forced / Top Indoo 4° - 104' /Shroud /Shroud Slope Indoo 4° - 104'	Air & Ve <u>r Only</u> <u>o (10 - 40</u> <u>o 10 - 40</u> <u>o 10 - 40</u> <u>o 10 - 40</u>	16 × 16 × UL Tyr UL Tyr 22 × 24.5 ; (*)	20 × 9 (4 De 12 (IP and b be 4X (IP & Vent/ ype 4X (I 23 × 9 (1 × 23 × 9 (1)	41 × 51 (54) Ford Vent (56) Ford (5hroud P66) wi (62 × 59 (62 × 59	× 23) ced Air ced Air th AC × 23) × 23)	UL Ty (IP 54) 22 × 2 (56 × 5 Slope UL Ty (IP Force Vent/S UL Ty (IP66) 23 × 2 (59 × 5 24.5 × (62 × 5	Vent 23 × 9 23 × 9 19 × 23) ed Top ed Top d Air & 56) d Air & Shroud /pe 4X with AC 4.5 × 9 66 × 23) 23 × 9 19 × 23)		
Shape Installation Location Operating Temp Ambeint °F (°C) Optional Rating Size H×W×D - in (cm) *** Shape Installation Location Operating Temp Ambient °F (°C) Certifications		UL Type	16 ×	16 × 7 (56) Force 19 × 8 (41 × 41 ed Air ar 46 × 49	(IP51) × 18) Flat 3. And Vent, × 21) 3. C	Forced / Indoo 4° - 104' /Shroud Slope Indoo 4° - 104'	Air & Ve r Only ° (1° - 40 ed Top r Only ° (1° - 40 s	16 × 16 × UL Tyr UL Tyr UL Tyr 222 × 24.5 ; *)	20 × 9 (4 De 12 (IP and ' De 4X (IP & Vent/ ype 4X (I 23 × 9 (1 × 23 × 9 (1) NOM	41 × 51 54) Ford Vent 56) Ford 56) Ford 56 × 59 (62 × 59	× 23) ced Air ced Air th AC × 23) × 23)	UL Ty (IP64) (56 × 5 Slope UL Ty (IP6) UL Ty (IP66) 23 × 2 (59 × 5 24.5 × (62 × 5	Vent 23 × 9 9 × 23) ed Top d Top d Air & Shroud /pe 4X with AC 4.5 × 9 16 × 23) 23 × 9 9 × 23)		

* Dose Level: 50 m.J/cm² after 9,000 hours of operation @ 50% UVT ** Standard Control Panel *** Please consult drawings for exact specifications

AVANT SERIES | LIQUID SUGAR

MODEL:	Avant 20 Avant 36			Avant 44					
Maximum Flow Rate									
Flow Rate (gpm)*	345 gpm - 728 gpm								
Flow Rate (m³/hr)*	78 m³/hr - 165 m³/hr								
Minimum Cooling Flow Rate gpm (m ³ /hr) @25°C	1.5 (0.36)		2.4 (0.54)	2.9 (0.66)				
Number of UV Lamps	2	0	3	6	44				
For Ap	plication Specific	Sizing, please co	ntact Trojan Tech	nologies					
Operating Conditions									
Fluid operating temperature °F (°C)			34° - 131°	° (1° - 55°)					
UV Transmittance Range	20% - 50% UVT								
Maximum Operating Pressure PSI (BAR)	150 (10)								
Hot Water Sanitization °F (°C)	194° (90°)								
Electrical Requirements									
Electrical Supply	System Power	System Current	System Power	System Current	System Power	System Current			
208Vac, 3PH, 50/60Hz 3W + GND	3.9	12	6.8	19	8.3	24			
220-240Vac, 1PH, 50/60Hz, 2W + GND	3.9	18	6.9	31	8.3	38			
240Vac, 3PH, 50/60HZ, 3W + GND	4	11	6.9	17	8.3	21			
380/220Vac, 3PH, 50Hz, 4W + GND	3.9	7	6.9	11	8.3	13			
400/230Vac, 3PH, 50Hz, 4W + GND	3.9	6	6.9	11	8.3	13			
415/240Vac, 3PH, 50Hz, 4W + GND	4	6	6.9	10	8.3	12			
440Vac, 3PH, 50/60Hz, DELTA	4	7	6.9	12	8.3	15			
480/277Vac, 3PH, 60Hz, 4W + GND	4.3	6	7.2	9	8.7	12			
Chamber									
Material of Construction	316L Stainless Steel								
Chamber Length - in (mm) ¹			79 (2	.00.6)	1				
Chamber Diameter - in (cm)	12 (3	30.5)	14 (35.6)	16 (40.6)				
I/O Sanitary Tri-clamp size - in (cm)	4 (10)	6 (15)	6 (15)				
Surface Finish	Ra15								
Elastomers	EPDM (EC1935/2004, FDA)								
Monitoring and Controls			Pace D	ackaga:					
andard Lamp status indicator. System hours of operation. Lamp out alert (I OA) and Rem						start/stop (HOA)			
Ontional	UV Monitoring Package:								
	U	V intensity readir	ng with NIST cert	fied sensor, theo	retical dose displ	ау			
Control Panel - Modular (Standard)			Dointed Co	rhan Staal					
Deting	Painted Carbon Steel								
	UL Type I (IP51) with Forced Air and Vent								
	23 × 66 × 23 (57 × 168 × 57)								
Operating Tomp Ambaint °E (°C)									
Control Panel - Stand Alone (Optional)			54 - 104	(1 - 40)					
Standard									
Material of Construction			Painted Ca	rbon Steel					
Rating	UL Type 12 (IP 54) with Forced Air and Vent								
Installation Location	Indoor Only								
Operating Temp Ambeint °F (°C)	34° - 104° (1° - 40°)								
Optional									
Material of Construction			304 Stain	less Steel					
Rating	UL Type 4X (IP56) Forced Air and Vent, With Shroud								
Dimensions H×W×D - in (cm)	65 × 35 × 19 (166 × 90 × 50)								
Conduit Length	Standard: 9 feet								
Installation Location			Indoo	r Only					
Operating Temp Ambient °F (°C)			34° - 104°	° (1° - 40°)					
					-				
Certifications									

NOTES: Dimensions are for informational purposes only and not to be used for design. Refer to system layout drawings. 1. Overall Length with End Cap Installed * Dose Level: 50 mJ/cm² after 9,000 hours of operation @ 50% UVT