

Validated UV Equipment Small and Medium Capacities

UV disinfection of potable and industrial process water



About LIT

Founded in 1991, LIT is a worldwide leading developer and manufacturer of UV systems for water, air and surface disinfection.

LIT has production facilities in Germany and Russia. Local Sales and Service support is assured with subsidiary offices in the Netherlands, China, Hungary and Poland.

The company has a strong focus on research in the field of UV applications for various industries.

The Research, Development and Design Engineering Departments are scientifically empowered by top-level experts including Professors and Doctors of Science.

LIT offers a wide range of UV disinfection systems for potable and industrial process water, wastewater and other applications with capacities per unit from 1 to 10,000 m³/hr.

A wide range of the LIT UV systems are attested for their reliable disinfection performance in accordance with the international standards ÖVGW, DVGW, USEPA.



Scientific & Production Centre, Erfurt, Germany

Advantages of UV Technology

- High disinfection efficiency against a wide range of microorganisms: bacteria, viruses, protozoa, including chlorine resistant forms . UV irradiation also destroys carriers of infectious diseases such as typhoid, cholera, dysentery, viral hepatitis, polio, cryptosporidiosis and others
- Environmentally safe. Unlike chemical oxidation technologies (chlorination and ozonation), UV does not form any harmful by-products, even if the required UV dose is significantly exceeded
- UV radiation at a wavelength of 254 nm with an applied dose for disinfection impacts only on microorganisms and does not change physical, chemical or organoleptic properties of water
- The UV disinfection process time varies from 1 to 10 seconds; which allows for in-flow water treatment, without the necessity of contact reservoirs
- LIT UV equipment is compact and easy to operate; does not need special operational safety precautions; has low power consumption and economic operational costs

DUV Series

The LIT certified UV systems are pressurized disinfection vessels with capacities starting from 1 to 2400 m³/hr and higher. LIT UV units are designed for potable water and process water disinfection.

Certification

LIT UV equipment is duly certified. The LIT UV systems are attested for their individual disinfection performance in accordance to Austrian ÖVGW PW 806 standard (ÖNORM M 5873-1), German DVGW W 294-2 standard, or American US EPA UVDGM (November 2006).

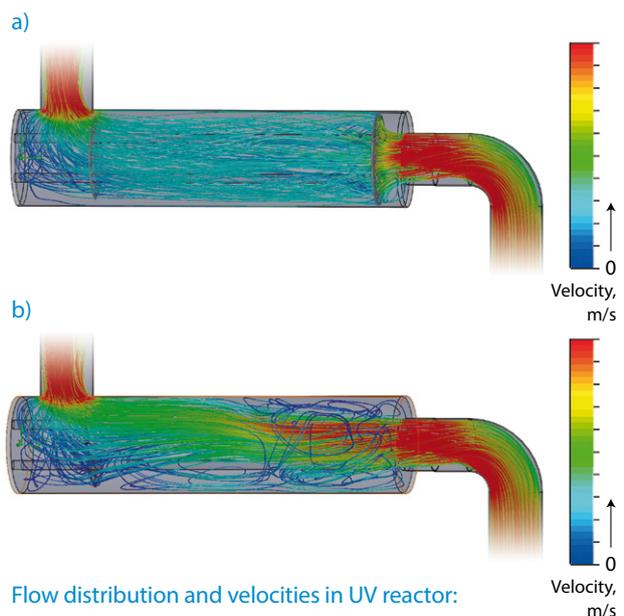
In addition to the large range of pre-certified UV units, LIT UV systems can also be certified according to customer's request, for specific application conditions as well as certification of tailor made UV systems.

The high performance of the UV systems is repeatedly confirmed by biosimetric tests – the most objective and worldwide accepted method of UV equipment evaluation.

The main purpose of biosimetric tests is to verify that the required UV dose is provided under various operational conditions, such as reduced intensity of the UV lamps, fluctuations of flow rate and variation in UV transmittance.



Certification of UV equipment according to ÖVGW standard (Austria)



Flow distribution and velocities in UV reactor:

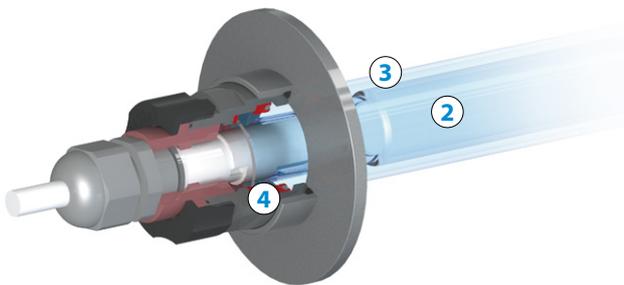
a) with hydraulic optimization;

b) without hydraulic optimization.

DUV Series

① UV Reactor

The standard UV reactor is made of stainless steel AISI 316 and designed for operating pressure of 10 bar. Optionally the UV reactor can be made of any grade of stainless steel and operating pressure up to 16 bar.



② UV Lamps

The DUV series UV units apply non-ozone low pressure germicidal lamps. For different models LIT offers highly efficient and environmentally safe compact amalgam lamps. LIT UV amalgam lamps allow us to significantly reduce the equipment dimensions and required service area.

③ Quartz Sleeve

The quartz sleeve provides water tightness, electrical and thermal isolation of the UV lamps and has a high UV transmittance at a wavelength of 254 nm.

④ Lamp Sealing

Ultra-reliable and long-life lamp sealing enables fast and easy lamp replacement.

⑤ UV Sensor

The UV sensor is used for continuous monitoring of the UV intensity in the disinfection reactor. UV units are equipped with ÖNORM* certified UV intensity sensors. The Control System uses the UV sensor's signal to monitor the performance of the UV lamps, check the fouling rate of the quartz sleeves and to pace the applied UV dose.

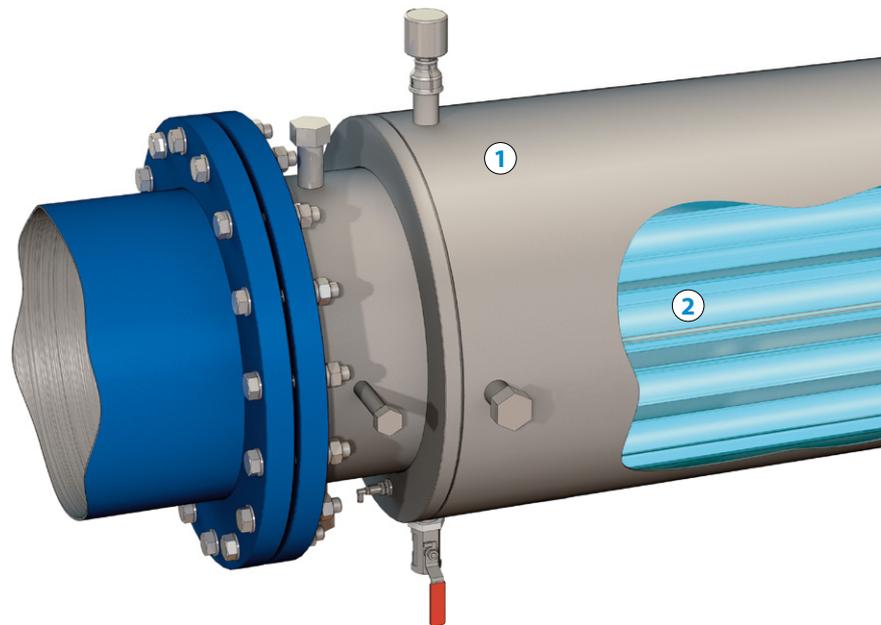


* UV sensor certified according to ÖNORM:

- the sensor is selective for measuring only the germicidal UV wavelength (254 nm);
- its design allows the sensor to be replaced by a reference sensor without interrupting the disinfection process in UV system.

⑥ Temperature Sensor

The reactor temperature sensor automatically avoids overheating by precautionary switching off the UV lamps.





7 Control Panel

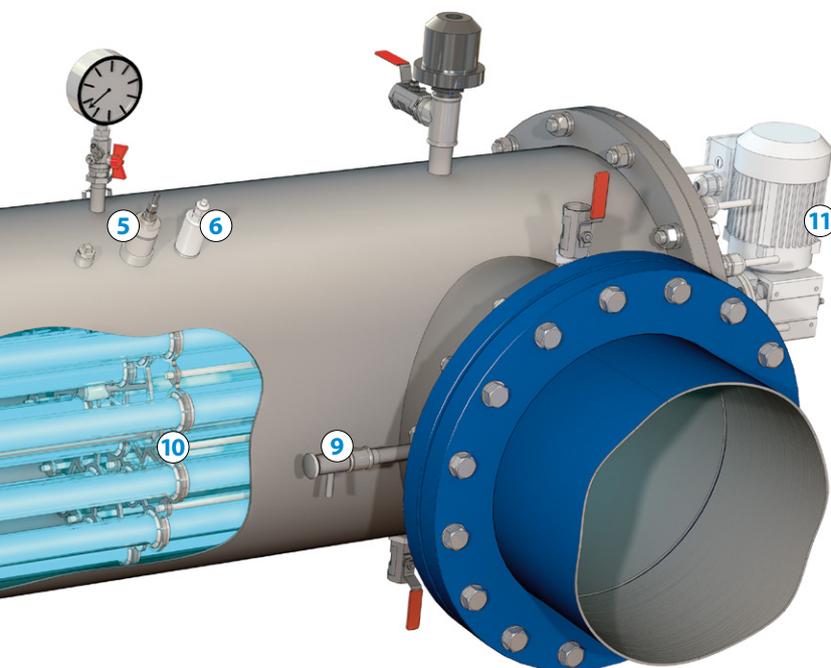
The control panel consists of electronic ballasts and process control system which is based on industrial standard plcs of globally renowned brands. A user-friendly operator interface is used to monitor lamp operating hours and number of ON/OFF cycles per lamp, to give a warning at the end of a lamp life and failure signal to indicate the need to clean the system. Optionally the equipment can be fitted with remote control and monitoring system adapted to the project specific communication protocol.

8 State-of-the-Art Electronic Ballasts

The LIT UV ballast technology provides long lamp life time (12,000–16,000 hours) and is almost not limited by the number of ON/OFF cycles. Dimmable ballasts are utilized to optimize energy consumption by stepless adjusting the lamp power from 50% to 100%, following the operational water quality fluctuations and flow rate. The LIT UV dose pacing technology constantly provides the required UV dose with minimum energy costs and extends the lamp life.

9 Sample Ports

The sample ports at the inlet and outlet flanges of the UV system enable quick and easy water sampling for microbiological analysis.



10 Hydraulic Optimization

The hydraulic optimization provides improved hydraulic flow distribution and equalization of the water flow through the UV system over the entire range of the system's flow capacities. This results in high certified disinfection capacities for the LIT UV units with high electrical efficiency and minimum head loss.

11 Cleaning Systems

Organic and inorganic compounds in treated water can lead to fouling and scaling on the surface of quartz sleeves; hence the UV intensity will be reduced. For easy service and maintenance UV systems can be equipped with automatic mechanical wiping system. Special durable wipers move along the sleeve and clean its surface by removal of fouling.

The chemical cleaning system is available for periodic cleaning of the whole UV reactor including the inner surface of the reactor.

Selection of UV Equipment

Certified Capacity (40 mJ/cm²), m³/h

UV Units	UVT %, 254 nm, 10 mm					Certification
	80	85	90	95	98	
DUV-1A120HO	1.45 (75%)	2.3	-	-	3.6	DVGW
DUV-1A250HO	-	6.65	8.9	11.8	14	ÖVGW
	-	6.6	9.1	12.4	14.6	DVGW
DUV-1A500HO	-	7.9	15	31	50	ÖVGW
	-	7	16 (92%)	25	40	DVGW
DUV-2A500HO	-	32	53	87	116	ÖVGW
	21	33	-	-	125	DVGW
DUV-3A500HO	-	34	80	153	249	ÖVGW
	-	35	80 (92%)	125	200	DVGW
DUV-4A500	-	94 (87%)	134	250	378	ÖVGW
	-	75 (87%)	120	-	385	DVGW
DUV-6A500	-	88	152	331	523	ÖVGW
	-	94	235 (91%)	375	600	DVGW
DUV-7A700HO	-	156	266	476	799	ÖVGW
	-	155	365 (92%)	580	900	DVGW / UVDGM
DUV-15A700HO	-	-	-	779	1142	ÖVGW
	230 (82%)	340 (86%)	540 (91%)	850	1300 (99%)	DVGW
DUV-21A700HO	479	675	1010	1549	-	ÖVGW
DUV-24A700HO	1280	-	-	-	-	US EPA UVDGM
DUV-48A700HO	-	950	2300 (92%)	-	-	DVGW
DUV-54A900HO	1500 (76%)	2400	-	-	-	DVGW

Technical Specifications

UV Units	Power, kW	Connection Type	Lamp number/type	Reactor	ÖVGW	DVGW	US EPA UVDGM
DUV-1A120HO	0.14	G 2"	1/DB-120HO	L		+	
DUV-1A250HO	0.24	DN 80	1/DB-250HO	L	+	+	
DUV-1A500HO	0.46	DN 100	1/DB-500HO	L	+	+	
DUV-2A500HO	0.9	DN 150	2/DB-500HO	L	+	+	
DUV-3A500HO	1.3	DN 200	3/DB-500HO	L	+	+	
DUV-4A500	1.9	DN 200	4/DB-500	L	+	+	
DUV-6A500	2.9	DN 250	6/DB-500	L	+	+	
DUV-7A700HO	4	DN 400	7/DB-700HO	L	+	+	+
DUV-15A700HO	9.5	DN 400	15/DB-700HO	L	+	+	
DUV-21A700HO	13	DN 500	21/DB-700HO	L	+		
DUV-24A700HO	14	DN 400	24/DB-700HO	L			+
DUV-48A700HO	27	DN 500	48/DB-700HO	L		+	
DUV-54A900HO	38	DN 600	54/DB-900HO	L		+	

Equipment Advantages

- High certified disinfection efficiency (99,9–99,99%)
- No danger for overdosing and no formation of by-products allow for easy operation, service and maintenance
- High quality components; environmentally safe, corrosion-proof and long-life materials (all grades of stainless steel including duplex, and polymeric materials PTFE)
- Low power consumption due to high efficient low pressure UV lamps and optional dose pacing system
- Easy to operate and service due to continuous monitoring of UV intensity and chemical cleaning of UV lamps
- Optimized hydrodynamic system design assures efficient water flow through the UV reactor and minimizes head losses
- Compact design facilitates easy installation
- User-friendly interface with remote control and monitoring
- Electronic ballasts have a power factor corrector which improves noise reduction and operational stability of other electronic devices
- Electrical equipment is certified according to TÜV standard



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