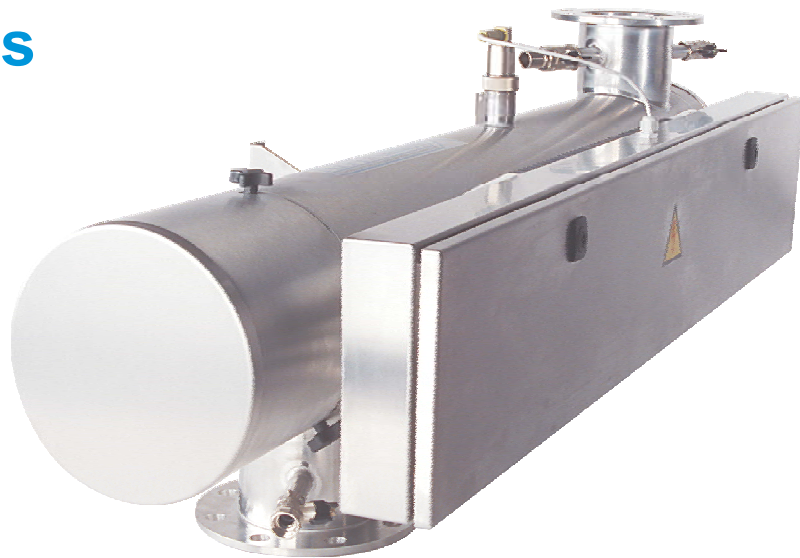


DUV Series



Series description

LIT has developed DUV series UV systems for industrial/commercial applications in potable water disinfection. The models of this series have packaged design with all components built in a compact stainless steel chamber and separate control cabinet. LIT DUV series units use mercury low-pressure germicidal lamps that emit UVGI at 254 nm wavelength. This wavelength is the most effective in killing bacteria, viruses and other waterborne microorganisms.

Design and manufacture process of DUV units comply with international standards for UV disinfection of potable water such as CE certificate.

Type	Number of UV lamps	Nominal flow rate* (m ³ /h)	Power consumption (kW)	Connection	Control cabinet type	Cleaning system type
DUV 1-15	1	0.62	0.025	DN 20	Type 1	-
DUV 1-30	1	1.5	0.038	DN 25	Type 1	-
DUV 1-55	1	2.2	0.065	DN 25	Type 1	-
DUV 1-75	1	3.3	0.090	DN 50	Type 2	WB-2
DUV 2-75	2	11	0.200	DN 50	Type 2	WB-2
DUV 4-75	4	35	0.340	DN 100	Type 2	WB-5C
DUV 5-75	5	41	0.450	DN 100	Type 2	WB-5C
DUV 7-75	7	78	0.600	DN 100	Type 2	WB-5C

* 400 J/m² at 98% water transmittance at the end of lamp life.

Application

LIT DUV series UV units are ideal for water disinfection at:

- municipal water supply plants of small communities, cottage villages and small towns;
- water supply systems of industrial enterprises;
- private and public swimming pools;
- food and beverage factories;
- marine industry;
- pharmaceutical industry;
- hospitals, hotels and restaurants;
- electronic industry.



DUV System Description and Components

Advantages

- reliable disinfection with low power consumption;
- continual UV monitoring and control by a highly selective calibrated UV sensor;
- extended lamp operating lifetime;
- easy operation and maintenance;
- compactness, high-quality materials and accessories;
- high reliability and long service life of the reactor and components of the system;
- simple and convenient lamp replacement procedure;
- low costs for service and maintenance;
- versatile design capabilities, UV units can be flexibly combined to achieve required capacities.

Principle of operation

UV reactors of DUV units has a longitudinal geometry with side inlet/outlet flanges. Water enters the reactor and is exposed to germicidal radiation that is lethal to bacteria and viruses. UV lamps are insulated from treated water by special quartz sleeves made of high quality fused quartz with high transmission coefficient for ultraviolet irradiation (95 %). After UV treatment no dangerous by-products are formed in water.

UV Dose

DUV units ensure high UV dose in a wide range of water transmission values. The minimal required dose is guaranteed over all time of lamp life allowing for lamp ageing.

UV Lamps

All units are equipped with modern germicidal lamps having long service life: up to 12 000 hours of continuous operation. Low depreciation of UVGI intensity at the end of lamp life ensures effective disinfection during the whole operational period of DUV units.

UV Sensor

All DUV units are equipped with UV-radiation intensity sensor. It allows to continuously monitor UV dose and generate alarm signals when UV dose drops lower than the necessary level. The optional port for reference UV sensor can be provided.

Control Cabinet

PLC-based Control Cabinet provides control of each UV-lamp, monitors UV-radiation intensity, and indicates elapsed time of the lamps and number of on/off switch circles. All operating data are displayed on LCD panel. LED indicators provide information on unit faults as well as their diagnostics and alert about necessity in cleaning the disinfection chamber. Inside the Control Cabinet there are dry contacts to provide alert signals to remote control center. Standard models of DUV Control Cabinet are supplied in high-grade shockproof plastic case with certified IP65 protection class. Optional stainless steel housing can be supplied on customer's request.

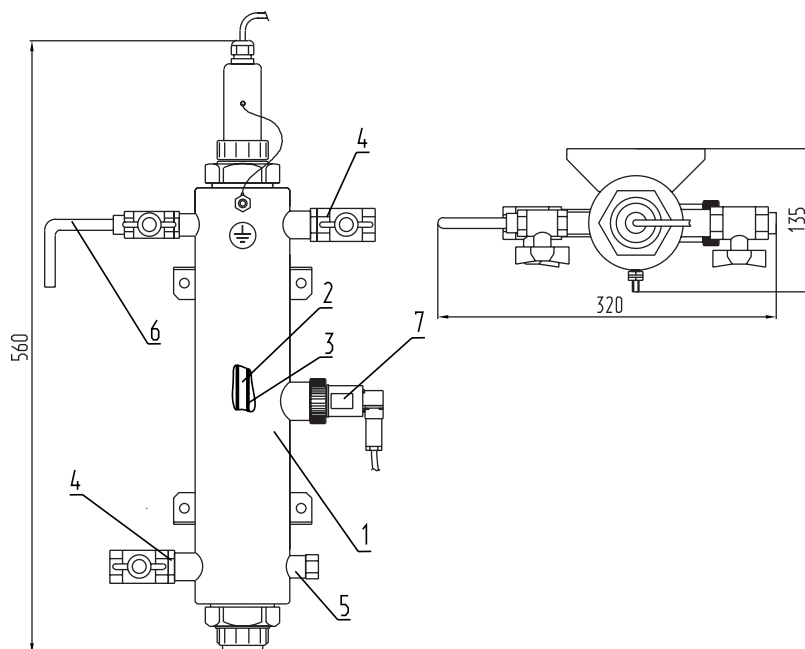
Cleaning System

A standard delivery package of all LIT DUV units includes a special chemical cleaning system for regular flushing of disinfection chamber and quartz sleeves. Chemical cleaning system consists of a stainless steel tank, water pump and set of pipes. The tank is used for preparation of cleaning solution. The water pump provides circulation of water mixed with cleaning solution through the chamber. The 0.2 % aqueous solution of citric or oxalic acid is used for periodical cleaning (once every 2-3 month) of the disinfection chamber. Chemical cleaning method provides effective removal of fouling from quartz sleeves and inner walls of disinfection chamber and requires minimum labour and material resources.

Example of typical installation



DUV 1-15 UV System



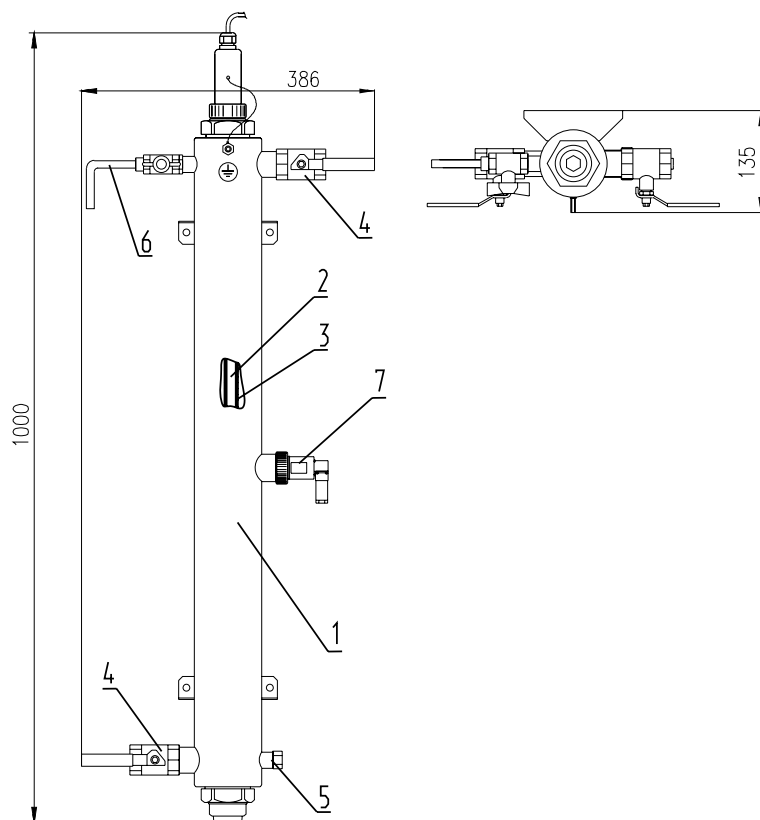
- 1 - disinfection chamber,
- 2 - UV lamp,
- 3 - quartz sleeve,
- 4 - input/output valves,
- 5 - drainage port,
- 6 - sample port,
- 7 - UV sensor.

Technical specification

UV-unit type	DUV 1-15
Nominal flow rate (400 J/m ² at 98% water transmittance)	0.62 m ³ /hr
Number of UV-lamps per unit	1
UV-lamp type	DB-15S
Guaranteed lifetime of the lamp	12 000 hours
UV chamber material	Stainless steel 304/316*
Chamber volume	1,9 liters
Maximum operating pressure	10 bar
UV chamber protection class	IP 65
Dry chamber weight	4.5 kg
Power consumption	220 V / 50 Hz / 0,025 kW
Connection	DN 20
Water temperature	1 °C – 40 °C
Head loss	See diagram

* upon customer's request

DUV 1-30 UV System



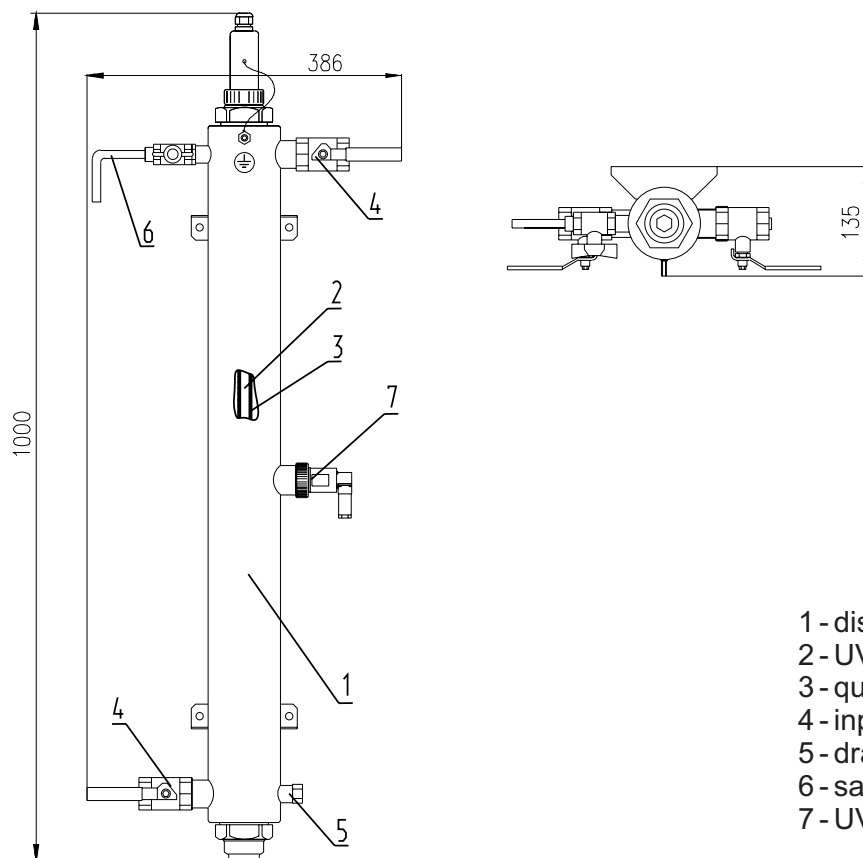
- 1 - disinfection chamber,
- 2 - UV lamp,
- 3 - quartz sleeve,
- 4 - input/output valves,
- 5 - drainage port,
- 6 - sample port,
- 7 - UV sensor.

Technical specification

UV-unit type	DUV 1-30
Nominal flow rate (400 J/m ² at 98% water transmittance)	1.5 m ³ /hr
Number of UV-lamps per unit	1
UV-lamp type	DB-30S
Guaranteed lifetime of the lamp	12 000 hours
UV chamber material	Stainless steel 304/316*
Chamber volume	3,8 liters
Maximum operating pressure	10 bar
UV chamber protection class	IP 65
Dry chamber weight	7.5 kg
Power consumption	220 V / 50 Hz / 0,038 kW
Connection	DN 25
Water temperature	1 °C – 40 °C
Head loss	See diagram

* upon customer`s request

DUV 1-55 UV System



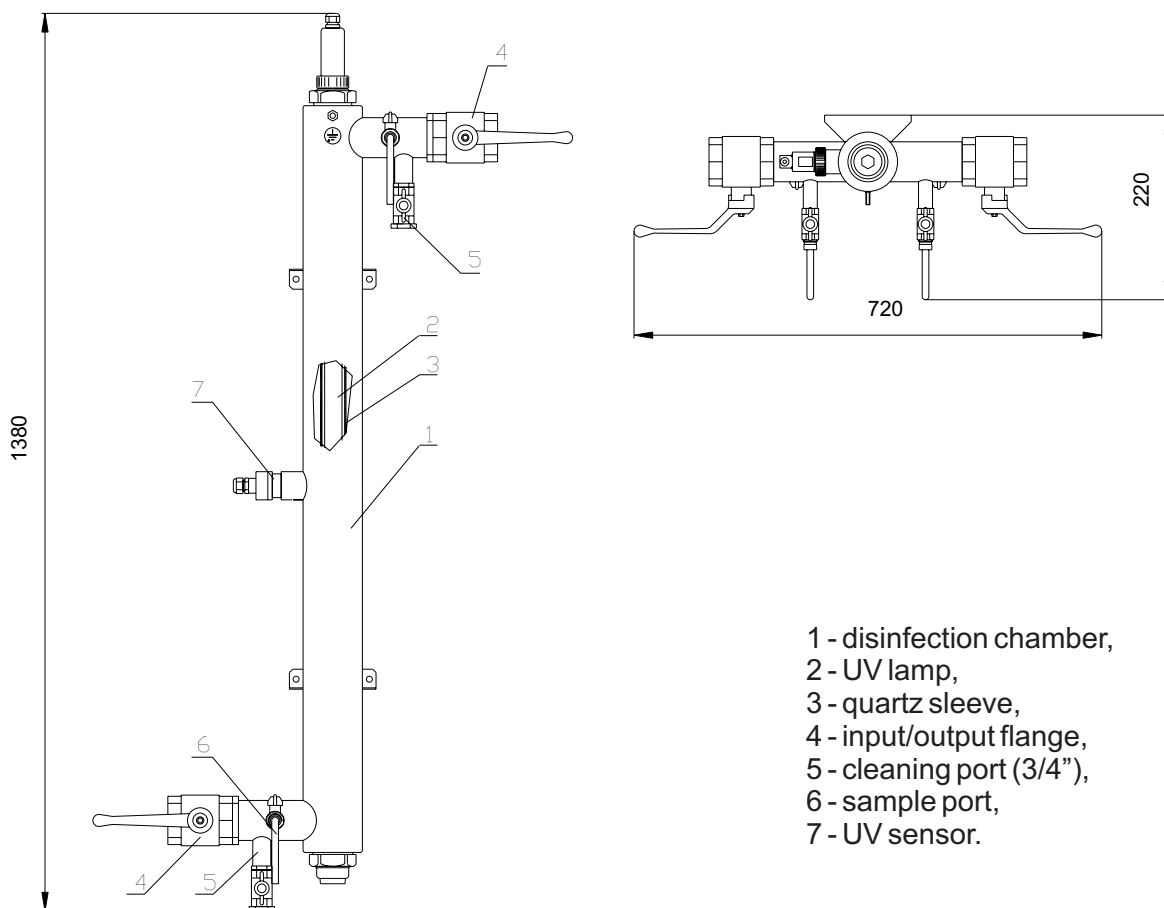
- 1 - disinfection chamber,
- 2 - UV lamp,
- 3 - quartz sleeve,
- 4 - input/output valves,
- 5 - drainage port,
- 6 - sample port,
- 7 - UV sensor.

Technical specification

UV-unit type	DUV 1-55
Nominal flow rate (400 J/m ² at 98% water transmittance)	2.2 m ³ /hr
Number of UV-lamps per unit	1
UV-lamp type	DB-55S
Guaranteed lifetime of the lamp	12 000 hours
UV chamber material	Stainless steel 304/316*
Chamber volume	3,8 liters
Maximum operating pressure	10 bar
UV chamber protection class	IP 65
Dry chamber weight	7.5 kg
Power consumption	220 V / 50 Hz / 0,065 kW
Connection diameter	DN 25
Water temperature	1 °C – 40 °C
Head loss	See diagram

* upon customer`s request

DUV 1-75 UV System

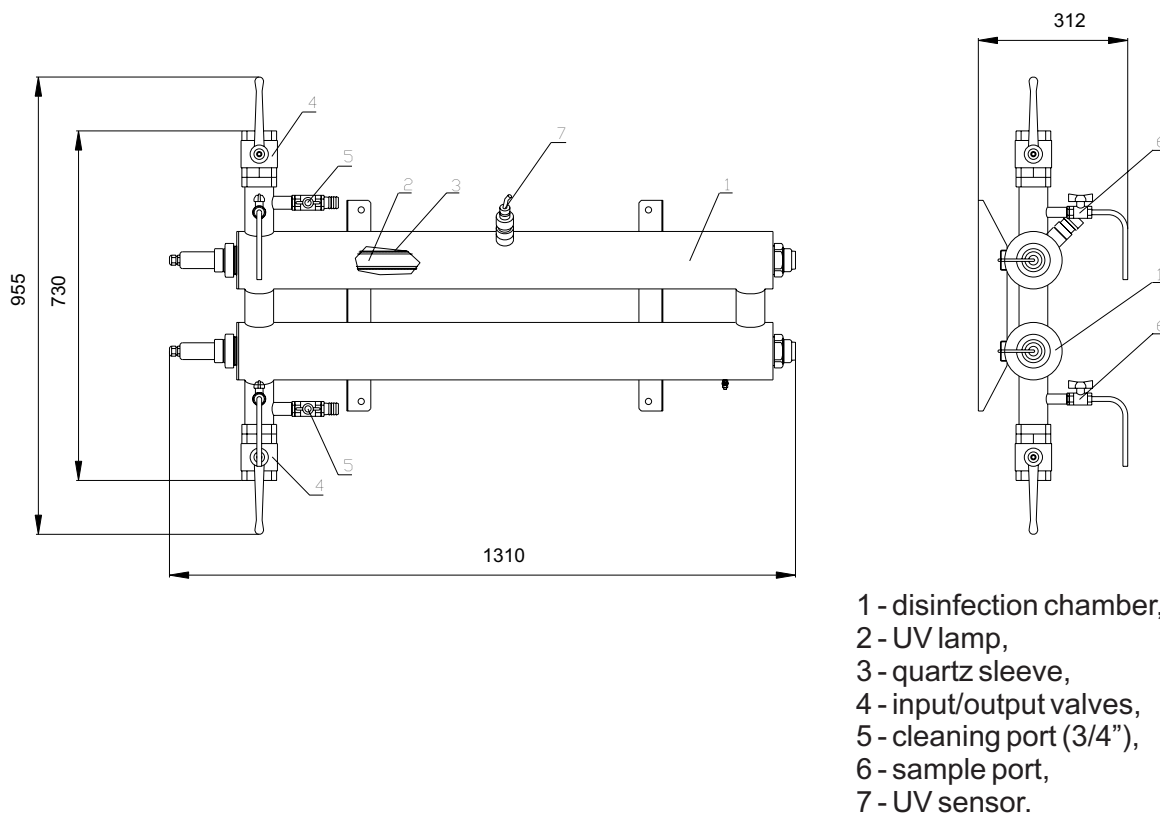


Technical specification

UV-unit type	DUV 1-75
Nominal flow rate (400 J/m ² at 98% water transmittance)	3.3 m ³ /hr
Number of UV-lamps per unit	1
UV-lamp type	DB-75
Guaranteed lifetime of the lamp	12 000 hours
UV chamber material	Stainless steel 304/316*
Chamber volume	5,5 liters
Maximum operating pressure	10 bar
UV chamber protection class	IP 65
Dry chamber weight	16 kg
Power consumption	220 V / 50-60 Hz / 0,09 kW
Connection	DN 50
Water temperature	1 °C – 40 °C
Head loss	See diagram

* upon customer's request

DUV 2-75 UV System

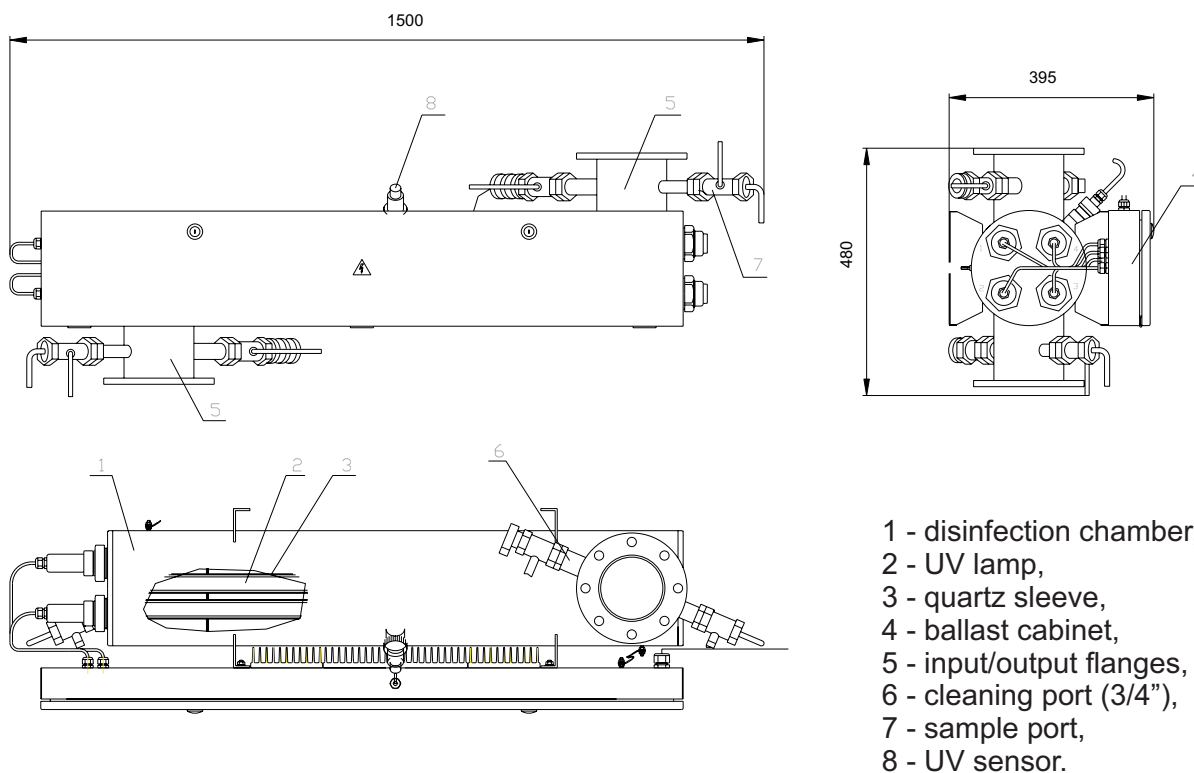


Technical specification

UV-unit type	DUV 2-75
Nominal flow rate (400 J/m ² at 98% water transmittance)	11 m ³ /hr
Number of UV-lamps per unit	2
UV-lamp type	DB-75-2S
Guaranteed lifetime of the lamp	12 000 hours
UV chamber material	Stainless steel 304/316*
Chamber volume	23 liters
Maximum operating pressure	10 bar
UV chamber protection class	IP 65
Dry chamber weight	26 kg
Power consumption	220 V / 50-60 Hz / 0,2 kW
Connection	DN 50
Water temperature	1 °C – 40 °C
Head loss	See diagram

* upon customer's request

DUV 4-75 UV System

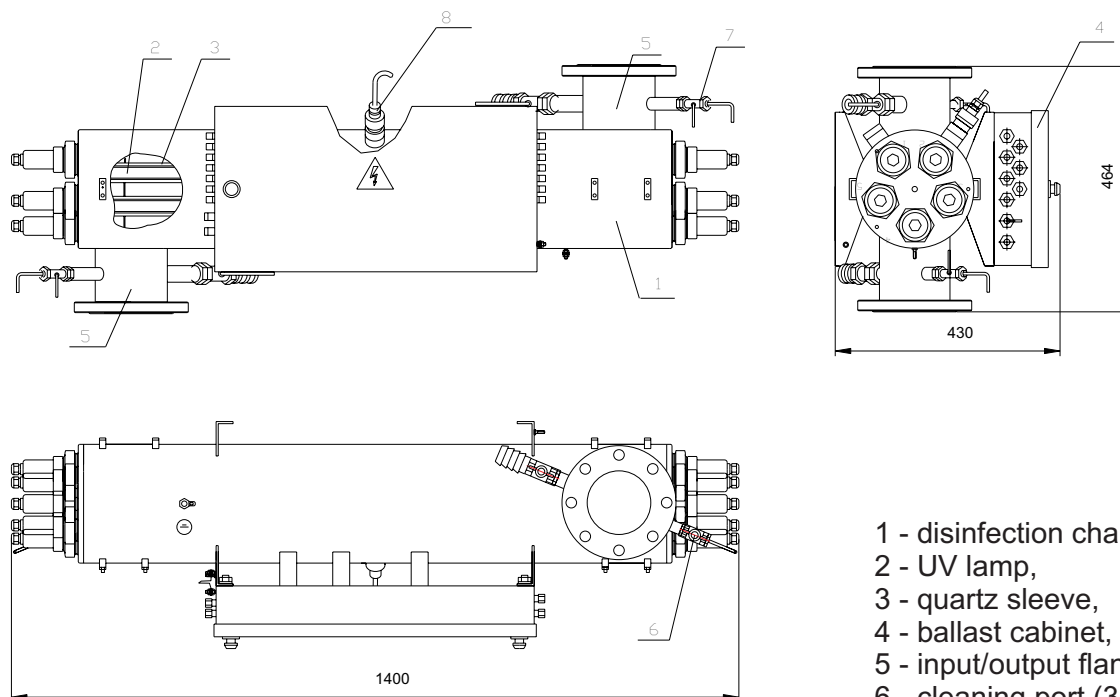


Technical specification

UV-unit type	DUV 4-75
Nominal flow rate (400 J/m ² at 98% water transmittance)	35 m ³ /hr
Number of UV-lamps per unit	4
UV-lamp type	DB-75
Guaranteed lifetime of the lamp	12 000 hours
UV chamber material	Stainless steel 304/316*
Chamber volume	40 liters
Maximum operating pressure	10 bar
UV chamber protection class	IP 65
Dry chamber weight	60 kg
Power consumption	220 V / 50-60 Hz / 0,34 kW
Connection	DN 100
Water temperature	1 °C – 40 °C
Head loss	See diagram

* upon customer`s request

DUV 5-75 UV System



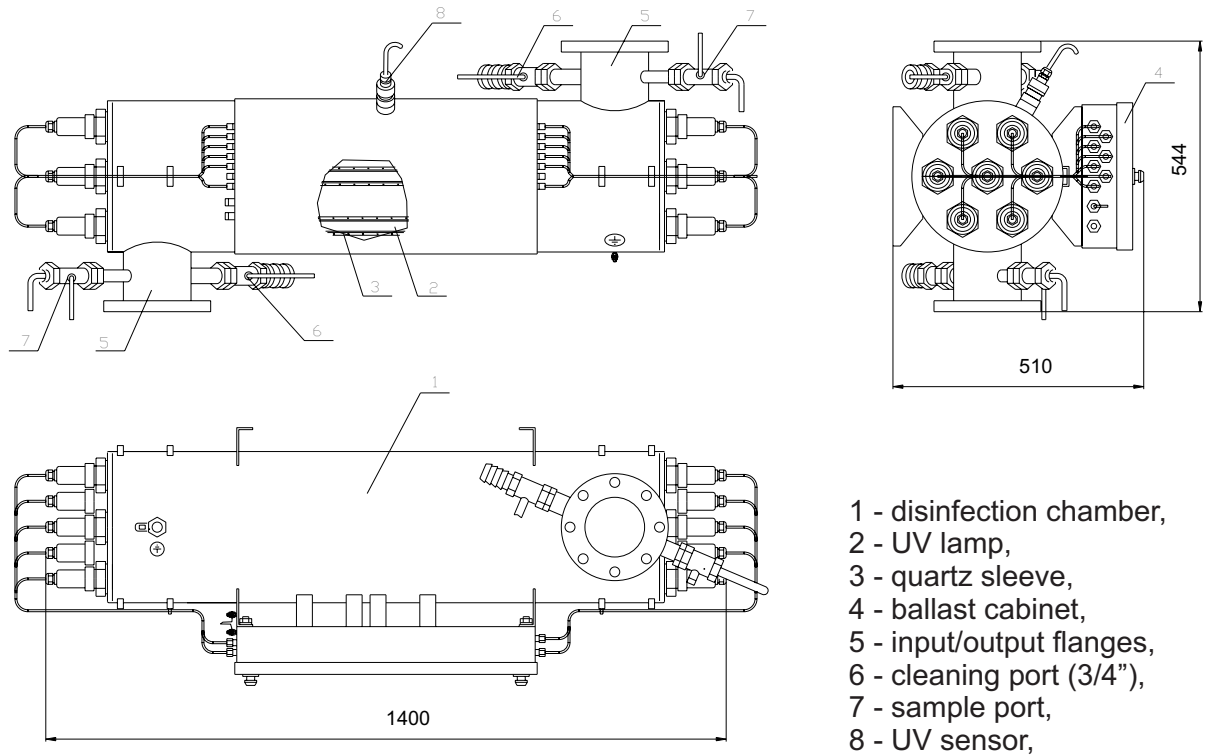
- 1 - disinfection chamber,
- 2 - UV lamp,
- 3 - quartz sleeve,
- 4 - ballast cabinet,
- 5 - input/output flanges ,
- 6 - cleaning port (3/4"),
- 7 - sample port,
- 8 - UV sensor.

Technical specification

UV-unit type	DUV 5-75
Nominal flow rate (400 J/m ² at 98% water transmittance)	41 m ³ /hr
Number of UV-lamps per unit	5
UV-lamp type	DB-75
Guaranteed lifetime of the lamp	12 000 hours
UV chamber material	Stainless steel 304/316*
Chamber volume	39 liters
Maximum operating pressure	10 bar
UV chamber protection class	IP 65
Dry chamber weight	61 kg
Power consumption	220 V / 50-60 Hz / 0,45 kW
Connection	DN 100
Water temperature	1 °C – 40 °C
Head loss	See diagram

* upon customer`s request

DUV 7-75 UV System

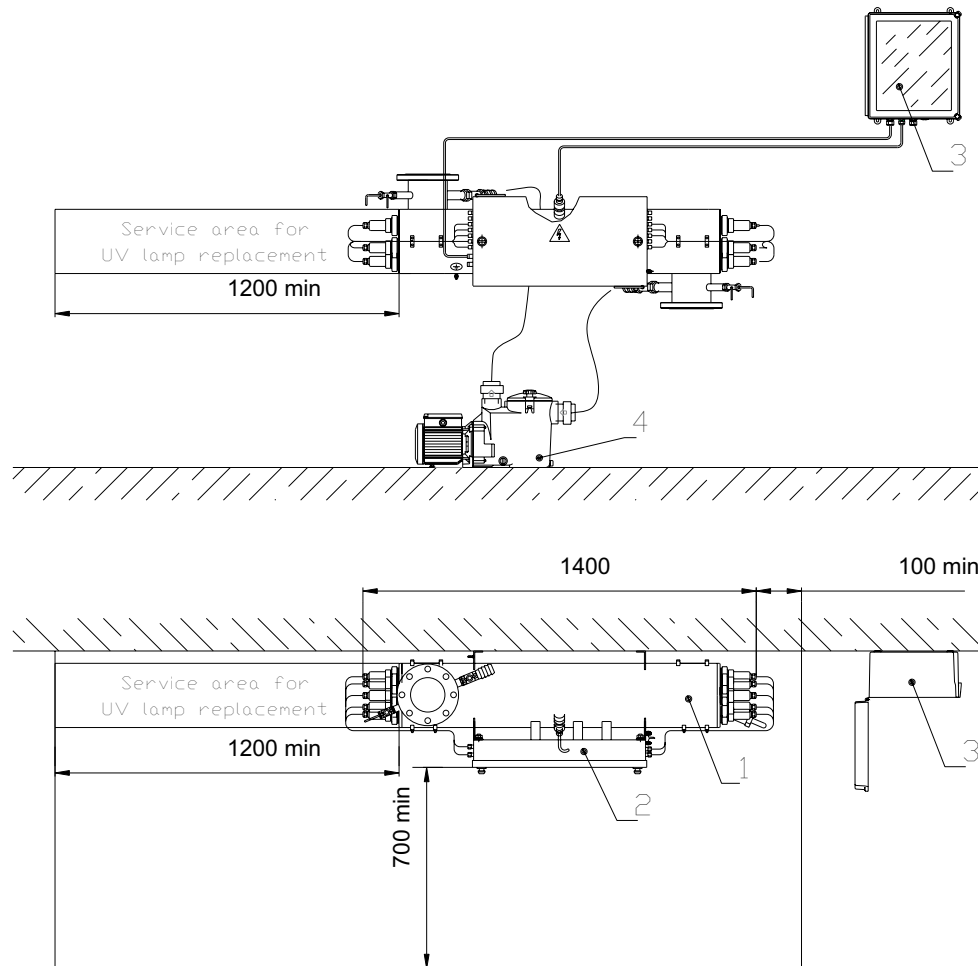


Technical specification

UV-unit type	DUV 7-75
Nominal flow rate (400 J/m ² at 98% water transmittance)	78 m ³ /hr
Number of UV-lamps per unit	7
UV-lamp type	DB-75
Guaranteed lifetime of the lamp	12 000 hours
UV chamber material	Stainless steel 304/316*
Chamber volume	72 liters
Maximum operating pressure	10 bar
UV chamber protection class	IP 65
Dry chamber weight	88 kg
Power consumption	220 V / 50-60 Hz / 0,6 kW
Connection	DN 100
Water temperature	1 °C – 40 °C
Head loss	See diagram

* upon customer`s request

Example of typical installation of DUV plants

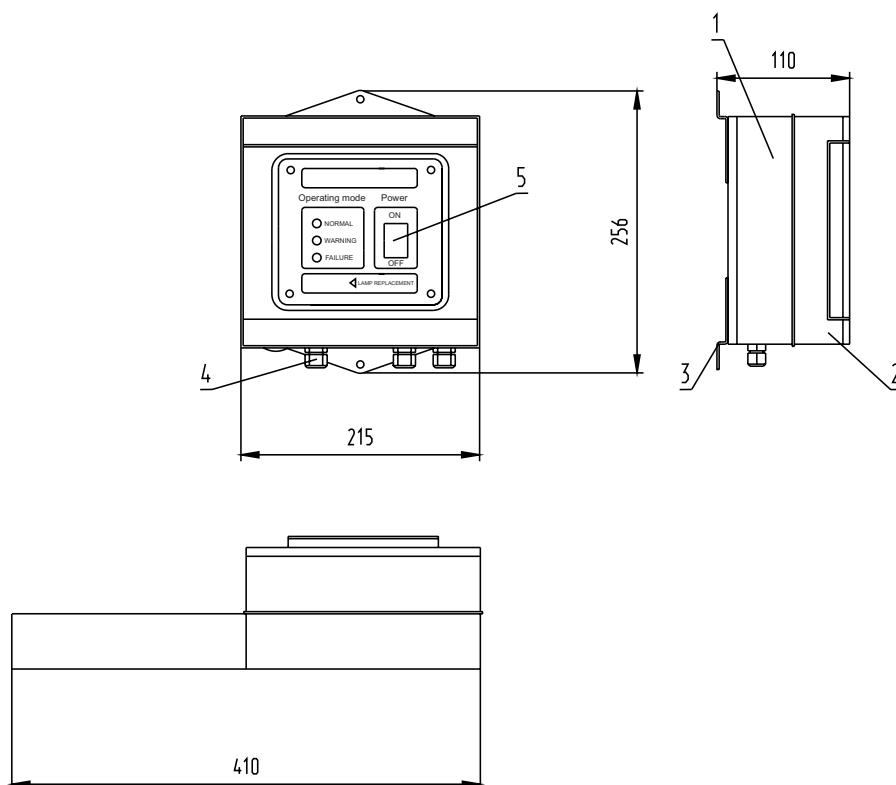


- 1- disinfection chamber,
- 2- ballast cabinet,
- 3- control cabinet,
- 4- chemical cleaning system.

Installation instructions

- DUV units must be installed according to the instructions provided in Installation, Operating and Maintenance Manual supplied with unit.
- Water pressure in connecting pipes should not exceed 1 MPa (10 Bar).
- It is recommended to equip water supply pipe with flow meter and flow regulating device.
- Sufficient space has to be allocated to install the components of UV system and provide free access to them during maintenance and repair works. Special service zones should be provided as it is indicated in assembly drawing.
- Control cabinet should be fixed on the wall or support frame in easily accessible place convenient for observation of the front panel.
- In the operating area temperature must be kept within the range of + 1°C + 35°C, humidity - not higher than 85%RH at 20°C.

Control panel. TYPE 1



General description

The control panel is designed to activate the UV system and indicate operational status. The control panel is made of hard plastic with dustproof and waterproof cable glands (according to

- 1 - housing,
- 2 - transparent cover,
- 3 - bracket,
- 4 - cable gland,
- 5 - power switch.

Applicable UV units	Electricity requirements	Weight	Dimensions, mm	Protection class
DUV 1-15 DUV 1-30 DUV 1-55	230V / 50 Hz	2,5 kg	215 x 256 x 110	IP 65

Control:

1. Local switching on / off the UV plant.

Monitoring:

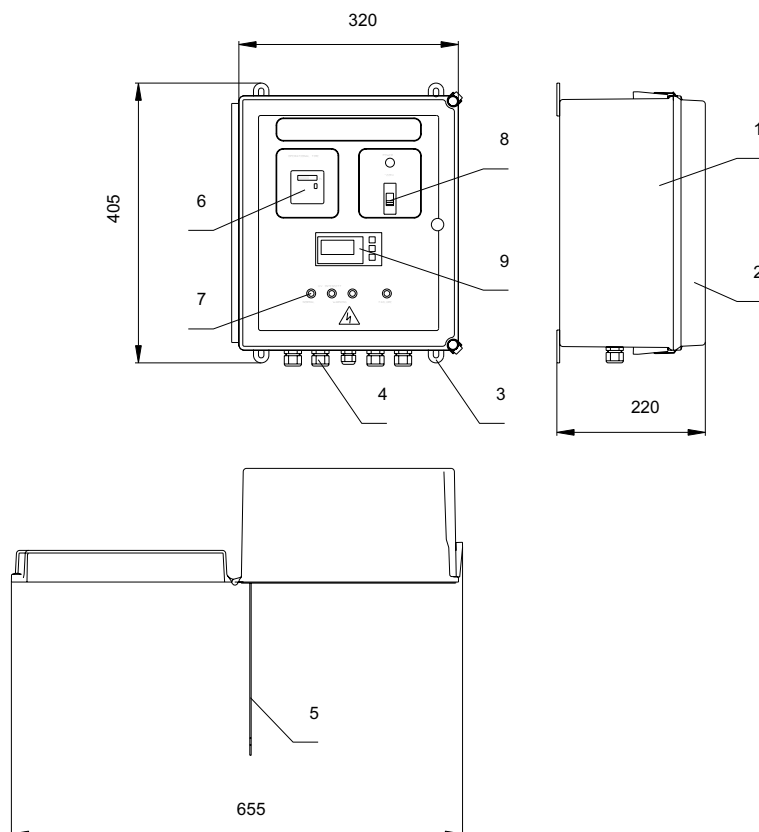
Local:

1. UV system on/off status.
2. Operational status (normal operation, warning, failure).

Remote (optional):

1. UV system on/off status.
2. Operational status: normal operation, warning, failure.
3. UV intensity in the chamber.

Control panel. TYPE 2



General description

The control panel is designed to activate the UV system and indicate its operational status. The control panel is made of hard plastic with dustproof and waterproof cable glands (according to protection class IP65).

Behind the transparent cover of control panel are circuit breaker, operational time counter, gauge and LED's for UV system monitoring.

- 1 - housing,
- 2 - transparent door,
- 3 - bracket,
- 4 - cable gland,
- 5 - control panel front,
- 6 - operational time counter,
- 7 - LED's,
- 8 - circuit breaker,
- 9 - gauge.

Applicable UV units	Electricity requirements	Weight	Dimensions, mm	Protection class
DUV 1-75 DUV 2-75 DUV 4-75 DUV 5-75 DUV 7-75	230V / 50Hz	10 kg	320 x 405 x 220	IP 65

Control:

1. Local switching on / off of the UV plant.

Monitoring:

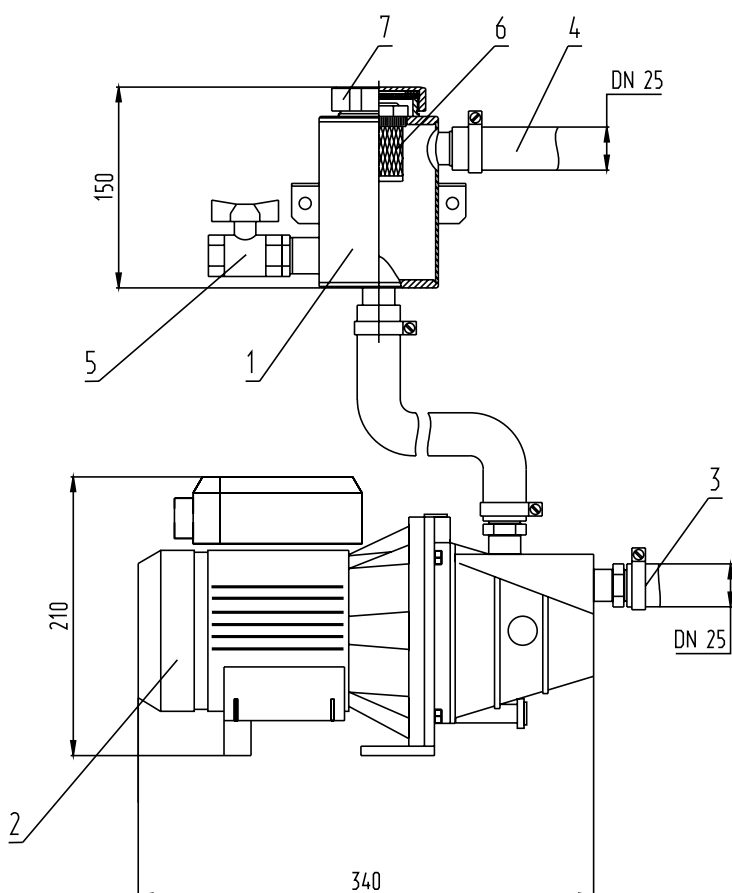
Local:

1. UV system on/off status.
2. Operational status (normal operation, warning, failure).
3. Operational time of UV system.
4. UV intensity in the disinfection chamber.

Remote (optional):

1. UV system on/off status.
2. Operational status: normal operation, warning, failure.
3. UV intensity in the chamber.

Chemical cleaning system WB-2



General description

The chemical cleaning system consists of a circulation pump, a stainless steel tank for preparation of cleaning solution, pipes and valves. The cleaning tank and pump are interconnected through a flexible pipe. Cleaning is done using oxalic (or citric) acid, which is supplied in the form of powder and shall be dissolved in the tank before cleaning. When the pump is powered the water starts mixing with cleaning solution and circulating through the UV chamber. After cleaning the water is drained out of the chamber through the water discharge tap mounted on the chamber.

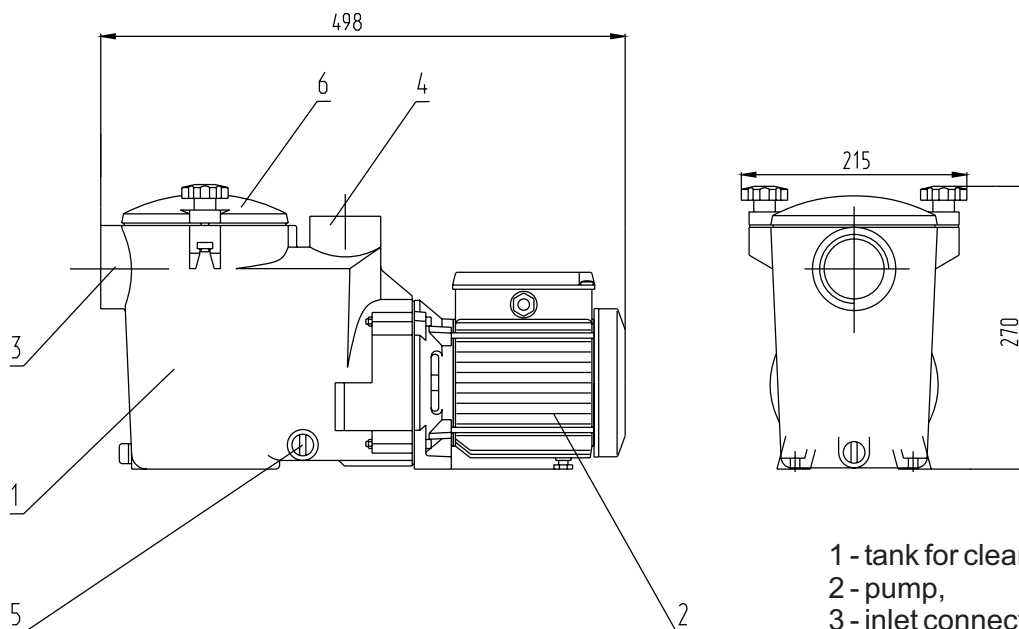
- 1- tank for cleaning solution,
- 2 - pump,
- 3 - inlet connection,
- 4 - outlet connection,
- 5 - drain valve,
- 6 - reservoir for cleaning agent,
- 7 - tank cap.

Technical specification

System type	WB-2
Cleaning tank material	Stainless steel 304/316*
Cleaning tank volume, l	0,7
Connection pipes	DN 25
Cleaning agent	Oxalic acid
Electricity requirements	220 V, 50 - 60 Hz
Power consumption, kW	0,72
Overall dimensions (length×height×width), mm	
• Electric pump	340×210×185
• Tank	210×150×112
Weight, kg:	
• Electric pump	7
• Tank	2

* upon customer's request

Chemical cleaning system WB-5C



- 1 - tank for cleaning solution,
- 2 - pump,
- 3 - inlet connection,
- 4 - outlet connection,
- 5 - seal,
- 6 - tank cap.

General description

The chemical cleaning system consists of a circulation pump with the embedded stainless steel tank for preparation of cleaning solution, pipes and valves. Cleaning is done using oxalic (or citric) acid, which is supplied in the form of powder and shall be dissolved in the tank before cleaning. When the pump is powered the water starts mixing with cleaning solution and circulating through the UV chamber. After cleaning the water is drained out of the chamber through the water discharge tap mounted on the chamber.

Technical specification

System type	WB-5C
Cleaning tank material	Plastic armored with glass fiber PRO-GF30
Cleaning tank volume, l	5
Connection pipes	DN 25
Cleaning agent	Oxalic acid
Electricity requirements	220 V, 50 - 60 Hz
Power consumption, kW	0,72
Overall dimensions (length×height×width), mm	498×270×215
Weight, kg	9

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