

88MLV Series

Open Channel Modular UV Systems



Series description

Modular 88MLV series is based on up-to-date high output amalgam lamps and designed for installation into open channels for wastewater disinfection. Lamps in a module are arranged in several staggered arrays installed in vertical direction perpendicular to water flow. Each lamp is placed in protective sleeve of quartz glass with high transmittance of UV radiation.

Application

Disinfection of secondary and tertiary treated wastewater effluents of municipal and industrial WWTP plants of medium and large flow capacities. Applications in combined sewer overflow and storm water disinfection systems.

88MLV series advantages

State-of-the-art high output low-pressure amalgam lamps with prolonged operating lifetime;
Safe, simple and quick maintenance of vertical lamps without lifting the module out of water;
Vertical design provides semi-turbulent plug flow ensuring that all water receives maximum exposure to germicidal UV light;
Absence of detachable bases immersed into water provides higher reliability of module operation during whole service life of UV equipment;
Vertical configuration allows to design high capacity UV systems with much more compact space layout;

The series is equipped with PLC based monitor and control system providing the control of each lamp in the UV system;

New electronic ballasts significantly reduce power consumption and increase overall system efficiency;

UV sensors provide greater operational security;

The series is equipped with effective cleaning systems of both chemical and mechanical types.

88MLV System Description and Components

UV Modules

LIT 88MLV UV Disinfection Systems have modular design for flexible, easy system integration, installation and operation. The key component of the 88MLV series UV system is 88MLV-36A module consisting of 36 vertically placed lamps. Lamps are arranged in four parallel rows of 9 lamps in each row. The modules can be installed in the channel separately or can be grouped in series and/or in parallel. Each module has quick-attachment cover lid that allows to check or replace lamps without having to remove the module out of the water flow and disturbance of quartz sleeve seals.

Ballast cabinets

Electronic ballast cabinets are installed near each UV bank above the channel. Each UV module is connected to the electronic ballast cabinet through the four waterproof plugs. High effective electronic ballasts are installed inside the cabinets. Each cabinet has a small LCD display to provide the information about UV module and UV lamp status in respective UV bank.

Power supply cabinets

For large-scale UV systems incorporating multiple UV channels the power supply of the UV system is realized through separate Distribution Power Supply Cabinet. In the cabinet there are overcurrent protection fuses, main power switch and power switches for each UV bank. The electricity requirements for UV system are 380 V / 3 phase / 50-60 Hz. From the distribution power supply cabinet there are electrical connections to the electronic ballast cabinets, water level control system, motor drives of shut-off sliding gates and cleaning system.

Operating and Control system

Control and operation of the UV plant is provided through a Control Cabinet. On a front door of the cabinet there is a control panel with graphical user interface to control the UV system. UV system can be operated both in automatic and manual modes. The control system is implemented on the base of industrial PLC system. There is an optional possibility to transmit all operational data from the UV system to the main WWTP control center through the standard industrial serial bus. The Control System incorporates the data logging function for recording all operating parameters as well as alarm history. The minimum capacity of the log register is 1 year.

UV sensor

Each bank of UV plant is equipped with UV-radiation intensity meter. UV sensor measures the UV intensity inside the UV bank, converts the analog signal to digital form and transmits it to the Operating and Control system.

Automatic level control system

Each disinfection channel is equipped with automatic level control system. It consists of motorized sliding gate mounted at the channel outlet, PLC controller and ultrasonic and/or variable-capacitance water level sensor. Level control system maintains proper water level inside the disinfection channel at 0-100% flow variations. It prevents the overflow of the UV system and guarantees that all water will be treated properly without bypass over UV modules.

Chemical cleaning system

88MLV UV system is provided with chemical cleaning system of quartz sleeves in each channel without removing lamp modules from the channels. All lamps in a channel being treated are cleaned simultaneously. During the cleaning period the UV channel is closed and water effluent passes through remaining channels. Cleaning system consists of a tank for cleaning solution preparation, circulation pump, system of pipes from stainless still and switching valves.

88MLV System Description and Components

Mechanical cleaning system

At high level of suspended solids in treated wastewater the Optional automatic mechanical wiping system can be supplied with 88MLV UV modules for quartz sleeves cleaning without removing UV modules from the channels. Such cleaning prevents quartz sleeve fouling during UV system operation. It removes deposits from quartz sleeve surface by mechanical wipers which are moved periodically along quartz tubes. The wiping frequency can be adjusted through PLC control unit supplied for entire wiping system. The pneumatic/hydraulic cylinders are powered by air compressor with receiving tank.

Additional components

UV Module Service Rack

88MLV UV system includes mobile frame to fix the extracted modules during service works (e.g. lamp replacement). Each frame is designed to support one module for repair, cleaning or storage.

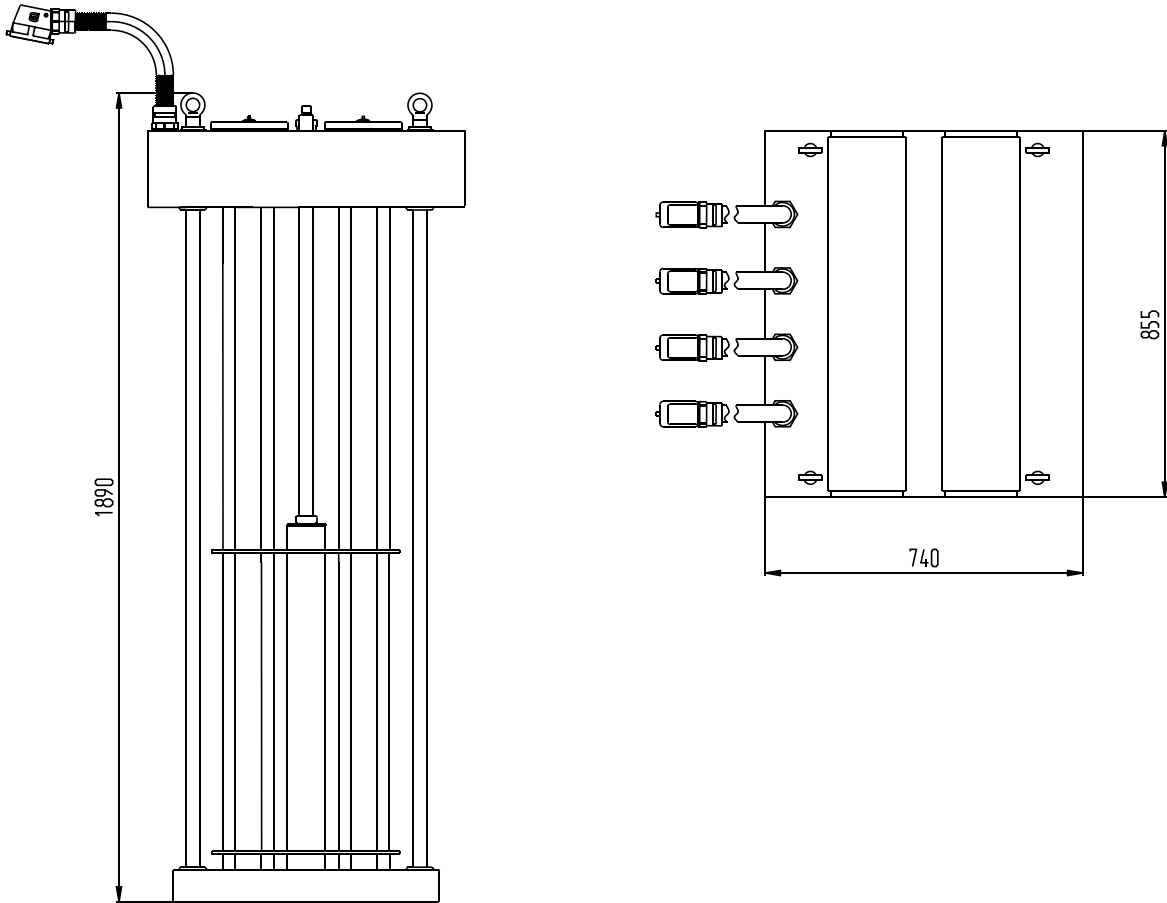
Baffle Plates

At space limited conditions, when the channel length is restricted, stainless steel gratings with profiled holes can be installed at each channel entry to provide better water flow mixing and distribution across channel.

Channel Cover Plates

When operating the channels with UV banks are covered by profiled plates from zinc galvanized iron.

Technical specifications of 88MLV-36A module

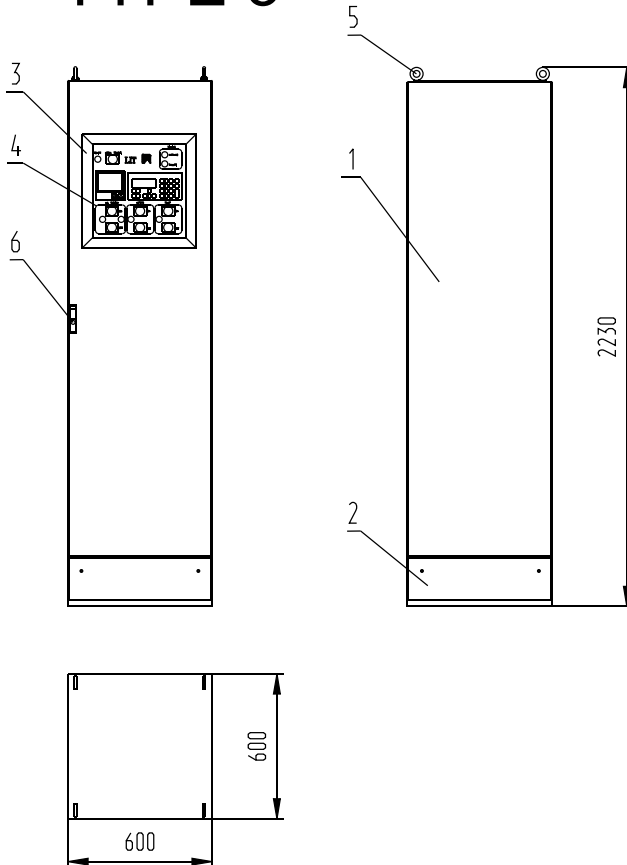


Technical specification

UV-module type	88MLV-36A
Number of UV-lamps per unit	36
UV-lamp type	DB-300
Guaranteed lifetime of the lamp	12 000 hours
UV module material	Stainless steel 304/316*
Maximum operating pressure	Open channel system
IP protection class	IP 67
Dry module weight	150 kg
Power consumption	220 V / 50-60 Hz / 10 kW
Power factor	0,96
Water temperature	1 C – 30 C
Cleaning type	Chemical/mechanical (opt)

* upon customer`s request

Control cabinet TYPE 3



General description

Control and monitoring of UV system operation is performed through control cabinet. LIT control cabinet (type 3) consists of painted steel (or optional stainless steel) housing with front door. On the front door there is a sighting window made of glass. Behind the window there is front panel that serves for monitoring and control. The liquid crystal display, keyboard, control buttons and light indicators are placed on the panel. The electronic ballasts are mounted inside the housing.

- 1 - housing,
- 2 - base,
- 3 - glass window,
- 4 - front panel,
- 5 - eyebolt,
- 6 - latch.

Electricity requirements	Weight	Dimensions, mm	Protection class
220 V / 50 - 60Hz	Max 200 kg	600 x 2230 x 600	IP 54

There are two main operating modes of the control cabinet:

- local - through keyboard and buttons on the panel of the cabinet
- remote control from central control room of water treatment plant - through dry contacts or RS-485 serial bus

Monitoring capability

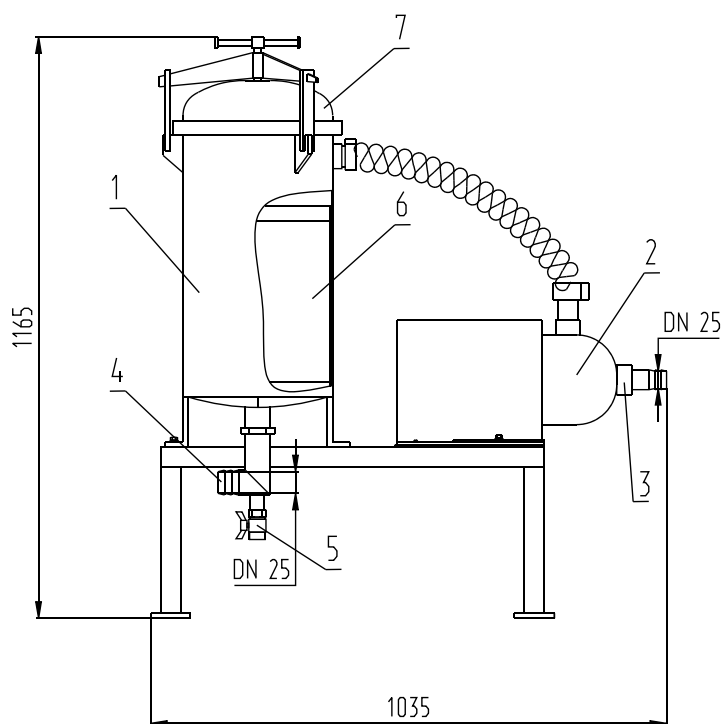
(in both local and remote modes):

1. UV system on/off status
2. Operation status (normal operation, warning, failure)
3. UV intensity in the chamber (W/m² or %)
4. Number of on/off cycles
5. Total operation time of UV system
6. Total operation time of UV lamps
7. Status of each lamp
8. Critical temperature in control cabinet
9. Critical temperature of treated water

Control capability

1. Local switching on/off the UV plant
2. Local switching on/off the chemical cleaning pump
3. Local switching on/off the mechanical cleaning system
4. Remote switching on/off the UV plant
5. Remote switching on/off the mechanical cleaning system

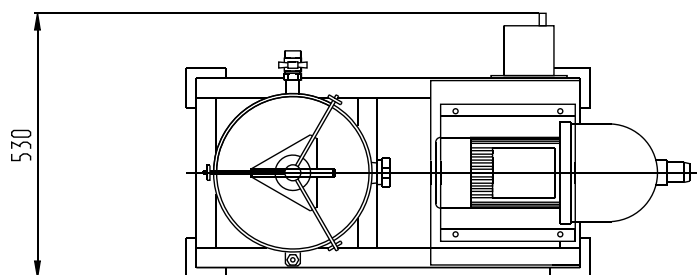
Chemical cleaning system WB-30



General description

The chemical cleaning system consists of circulation pump, stainless steel tank for preparation of cleaning solution, pipes and switch valves. All components of the system are mounted on the special supporting frame. Cleaning is carried out with oxalic (or citric) acid, which is supplied in the form of powder and dissolved in the tank before cleaning. When the pump is on the water mixes with cleaning solution and circulates through the channel (or chamber).

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



Technical specification

System type	WB-30
Cleaning tank material	Stainless steel 304/316*
Cleaning tank volume, l	30
Connection pipes	DN 40
Cleaning substance	Oxalic acid
Power supply	220/380 V, 50 Hz (60 Hz)
Power consumption, kW	1,2
Overall dimensions (length height width), mm	1035 1165 530
Weight, kg	50

* upon customer`s request