Operating Manual

Electronic Power Supply

EVG UVT 2x 100-200 W 1.2-2.1 A
EVG UVT 2x 150-320 W 1.5-2.1 A
EVG UVT 2x 150-320 W 1.8-2.9 A
EVG UVT 2x 150-320.1 W 1.8-2.9 A

Imprint

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Warning notes and symbols in the operating instructions

These operating instructions describe the singled flamed electronic power supply of the EVG UVT series, its operation and its uses. The safety and warning notices explain the safe, proper handling of the device.

You will find the symbols listed below next to all safety and warning instructions in these operating instructions where there is danger to life and limb. An additional signal word indicates the severity of a possible danger.

Observe these notes closely and be especially careful in these cases in order to preclude accidents.

DANGER! The signal word marks a danger with high risk or an immediately threatening danger. If it is not avoided, death or very severe injuries / damage to health will result. Damage to property is possible.

WARNING! The signal word marks a danger with medium risk or dangerous situation. If it is not avoided, death or very severe injuries / damage to health could result. Damage to property is possible.

CAUTION! The signal word marks a danger with low risk or marks a possible danger. If it is not avoided, slight injury / damage to health could be possible. Damage to property is possible.

The symbols used in these operating instructions have the following meaning:

This symbol warns of a hazard area.

This symbol warns of a hot surface.

This symbol warns of hazardous electrical voltage.

The two following symbols are used to address practices for optimal operation and/or prevention of damage to the equipment. There is no danger for people here. Additionally, the signal words **ATTENTION** and **NOTE!** are used.

ATTENTION!
This symbol with signal word is found at those places in the operating instructions which must be observed so that damage or destruction of the equipment is prevented.

NOTE!
This symbol is found next to notes, tips on operation and useful information.

1 Device and function description

The EVG UVT is a microprocessor-controlled electronic ballast for UV low-pressure lamps. The two-lamp devices are available in two sizes for outputs of 2x 100-200W and 2x 150-320W. With the ballast, all UV low-pressure lamps in the power range from 100 W to 320 W and lamp currents from 1.2 A to 2.9 A can be operated. All standard lamps are covered with the standard devices described below. The device is available in different versions. The basic variant with rotary switch allows the selection of different lamp currents and the activation of the remote switching function. This variant can also be ordered with active LED outputs or alternatively with an RS485 interface. However, devices without a rotary switch that are already set to the lamp used are usually preferred.

The EVG UVT is intended for medium-sized systems and, thanks to the two-channel structure, reduces the costs per lamp. The devices have a remote-control input, which can be conveniently switched on and off remotely using an external 10-230 V AC / DC signal. The function is intended for the block-by-block switching of devices in order to keep switching peaks and network loads low in larger systems, to minimize the risk of EMC interference due to switching and to vary the lamp power required by switching lamps on or off. The function thus replaces the dimming function available for single-flamed ballasts and is active for devices with rotary switches in switch positions 5-9. In switch positions 0-4, the device is switched on and off by applying the mains voltage. Alternatively, the devices can be controlled in the variant with RS485 via Modbus RTU. The number of devices on the three-phase network must be distributed evenly over the existing phases. 1 to a maximum of 5 devices should be switched in blocks per channel.

A microprocessor controls and monitors the device and the connected lamps and protects them from damages during operation. Malfunctions are reported via a potential-free contact per lamp/channel and via the RS485 bus. Simultaneously, the LEDs indicate the operating status and the type of error that has occurred. The two lamps are operated independently of each other. The fault of one lamp does not lead to the failure of the second lamp. A permanent operation with only one lamp must be avoided if the allowed minimal input power will be undercut.

The EVG UVT does not have an integrated fan. To ensure proper cooling, it must be installed vertically with the mains connection facing downwards. With unimpeded convection, proper heat dissipation is possible up to a maximum ambient temperature of 40°C. The criterion for correct cooling is the specified tc-point temperature of 50°C on the housing cover. If this temperature is exceeded or the installation position deviates, the device must be actively cooled to avoid damage due to overheating. If the device is operated continuously at too high a temperature, a loss of service life is to be expected. Devices for the 150-320 W power range indicate this by a flashing yellow LED. If the temperature is excessively high, the device switches off.

For devices with a rotary coding switch, make sure that the switch position specified by uv-technik for the lamp used is set before commissioning. If this is not observed, the connected lamps may not be operated correctly or may be damaged. The following damage is not covered by the warranty. Unknown lamp types must be checked and approved in advance by uv-technik.

Before the lamps start, there is a lamp presence check. If no lamp is found at the output, there is no preheating / ignition. This function prevents ignition voltage spikes at unused lamp outputs that could damage the ballast or cause danger. The warm start makes the devices suitable for applications / systems with many switching cycles.

The EVG UVT is designated for integration into switch cabinet and switch boxes. The connection of the unit is realized by pluggable spring clamps and provides so the preassembling of the cables.

In summary, the EVG UVT has the following main advantages:

• Inrush current limitation installed

• Optional potential-free connection of external LEDs possible, supply of the LEDs is integrated

• RS485 Modbus RTU control selectable as an option

• customer Programming for special lamps in the specified power range possible

In summary, the EVG UVT has the following main advantages:

- compact design, low weight, little cabling effort
- two independent lamp channels
- constant power output over the entire input voltage range
- high frequency operation eliminates flickering of cathodes and raises the UV-efficiency
- integrated remote-control function to minimize EMC interference or for remote control
- mains voltage range allows connection to 230 V AC (Europe) and 208 V AC (USA)
- rotary coding switch for setting the lamp types and activating the remote-control function
- error messages per channel via potential-free contacts and LED flashing code
- preheating and warm start for longer lamp life
- energy-efficient operation with cut-off of the filament heating during operation
- inrush current limitation included
- optional potential-free connection of external LEDs possible, supply of the LEDs is integrated
- RS485 Modbus RTU control selectable as an option
- tailor made programming of special lamps within the power range possible

2 Safety instructions

General information

A sound knowledge of all basic safety regulations is essential to ensure safe and fault-free operation of the EVG UVT.

This operating manual contains all important safety regulations to ensure safe operation of the equipment.

This operating manual, and in particular the safety instructions, must be observed by all persons working with the equipment.

In addition, all relevant rules and accident prevention regulations relating to the operation site must be observed. In regular intervals, the operator will check that all personnel are observing the safety regulations.

Appropriate use

EVG UVT is a microprocessor-based electronic power supply for UV low pressure lamps.

Any other use or use above and beyond these terms is defined as inappropriate and is thus dangerous.

The operator may only operate the equipment as stipulated by the operating instructions in this manual.

The following are further conditions for appropriate use:

- the observance of all points listed in this user manual
- compliance with the general and specific safety instructions in this user manual
- compliance with the relevant accident prevention regulations

ATTENTION!
uv-technik international ltd is not liable for damage resulting from inappropriate use of the equipment.

Staff obligation

Before commencing work, all persons entrusted with work to be performed on the EVG UVT undertake the following:

- to observe the safety at work and accident prevention regulations
- to read the chapter on safety and the warnings printed in this manual and to observe them at all times while using the equipment

Hazards from handling the equipment

The EVG UVT has been manufactured in accordance with the very latest state-of-the-art technology and the recognized rules of safety technology.

The equipment may only be used under the following conditions:

- it is used for the purpose for which it was constructed
- in a condition in which the equipment complies with all safety technology requirements

DANGER! – HAZARDOUS ELECTRICAL VOLTAGE!
Switch off the main switch and the main contactor before working on the connections of the power on the power supply or the UV lamp, e.g. for a lamp replacement, in order to eliminate the danger of an electric shock.

Reason: During operation, the UV lamp is switched off by semiconductor components. This does not correspond to a safe separation from the mains supply according to VDE! Residual voltages!

Attention: Danger of life!

Warranty and liability

The General sales and delivery conditions of uv-technik international ltd apply. The operator will have received these terms, at the latest upon signing the contract. The uv-technik international ltd is not liable for any damage to persons or property arising from any one or more of the following:

- inappropriate use of the EVG UVT
- incorrect assembly, commissioning and operation of the EVG UVT
- operation of the EVG UVT with faulty and/or nonfunctioning safety and protection device
- nonobservance of the instructions given in the user's manual with reference to the safety, transport, storage, assembly, commissioning, operation and servicing of the device
- unauthorized alterations to the construction of the EVG UVT
- repairs which are carried out incorrectly
- catastrophes, the action of foreign bodies or acts of God
- damages or losses orginated from the use or a defect of the EVG UVT

Organizational measures

All safety devices on the equipment must be tested for correct functioning regularly, prior to carrying out work and at each shift change. Look for external signs of damage.

Informal safety measures

In addition to this user manual, the generally and locally applicable accident prevention and environmental protection regulations must be made available and observed.

Danger due to electricity

DANGER! – HAZARDOUS ELECTRICAL VOLTAGE!
There is a danger causes by direct or indirect contact with electricity!

The electrical components of the EVG UVT must be inspected regularly.

Before commencing work:

- check all equipment components for external signs of damage
- check that all electric cables are in perfect condition

Loose connections must be tightened and damaged wiring replaced immediately.

Service, maintenance, remedying faults

In the unlikely event of faults occurring on the EVG UVT, the chapter 'Faults' offers information on the causes of the fault and possible remedial action.
In the unlikely event of faults occurring which cannot be remedied by any of the procedures listed, please contact our customer service department.

No changes may be made to the EVG UVT, no fittings may be added, or conversions carried out without obtaining the prior permission of the uv-technik international ltd.

In the event of claims under the warranty, for our repair and spare parts service, please contact:

uv-technik international ltd

Office E04, Basepoint Business Centre, 110 Butterfield, Great Marlings, Luton, LU2 8DL (UK)

Phone +44 (0)1582 805410
E-Mail: info@uv-technik.co.uk
Website: www.uv-technik.co.uk

WARNING!
No repairs or changes to the equipment other than those described in this manual may be carried out.

3 Transport, storage, delivery

The EVG UVT will be delivered in an appropriate packing.

Any damage detected must be documented at once and reported immediately to your specialist dealer or directly to the uv-technik international ltd.

NOTE!

Packing material must be disposed of in an environment friendly way or re-used if possible. We would recommend that the packing material be kept to protect the equipment if it needs to be shipped onward or otherwise transported.

4 Order data for equipment

Order equipment from:

uv-technik international ltd
Office E04, Basepoint Business Centre, 110
Butterfield, Great Marlings, Luton, LU2 8DL (UK)

Tel.: +44 (0)1582 805410

E-Mail: info@uv-technik.co.uk

Equipment

Description	**Article/ Order Number**	
	flexible adjustable	preset
EVG UVT 2x 100-200 W 1,2-2,1 A	**203 020**01 - 03 xxxx	**203 020**10 – 203 02019 xxxx
EVG UVT 2x 150-320 W 1,5-2,1 A	**203 021**01 - 03 xxxx	**203 021**10 – 203 02119 xxxx
EVG UVT 2x 150-320 W 1,8-2,9 A	**203 022**01 - 03 xxxx	**203 022**10 – 203 02219 xxxx
EVG UVT 2x 150-320.1 W 1,8-2,9 A	**203 023**01 - 03 xxxx	**203 023**10 – 203 02219 xxxx

01: Device with adjustable lamp currents and active external LED
02: Device with adjustable lamp currents, external LEDs are not active
03: Device with adjustable lamp currents, controllable via RS485 Modbus RTU, no external LED
10-19: fixed devices, no external LED
xxxx: is used for the designation of customer-specific variants

The sales department of uv-technik international ltd will advise you on the correct device for the lamp you are using and explain the differences in detail on request.

5 Repair

Should the EVG UVT be damaged or defective in any way, you must send the unit back uv-technik international ltd for testing and/or repair!

By opening the unit or by breaking the unit's inspection seal, you lose any warranty claim!

6 Faults

General information

The following fault lists contain information on faults which may occur on the EVG UVT, possible causes and tips on how to remedy the fault.

If a fault occurs on your equipment and cannot be remedied by following these instructions, contact the customer service department of the uv-technik international ltd.

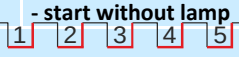
Contact address:
uv-technik international ltd Office E04,
Basepoint Business Centre, 110 Butterfield,
Great Marlings, Luton, LU2 8DL (UK)

Tel.: +44 (0)1582 805410

E-Mail info@uv-technik.co.uk

The EVG UVT switches of the lamp in case of a breakdown or failure. The failure status is indicated with the potential-free contact and additonally with a blinking code of the red LED. The failure status is maintained until switching off the mains voltage. Only by switching off the mains voltage, it is possible to reset the failure status. After having eliminated the failure cause and carried out a reset, you can start again the EVG UVT.

Status displays - operation / fault list

ballast status	failure contact	LED red	LED green	description	possible causes
start condition not fulfilled	off	steady blink	steady blink	ballast is waiting for start	- mains under- or overvoltage - start at over temperature - no lamp - lamp plug disconnected or cable break - no start command issued via RS485
start / preheating	off	on	blink	ballast in preheating	
start / ignition	off	on	on	ignition of the ballast	
normal operation	on	off	on	system lamp/ballast ok	
temperature failure	off	blink 1x	off	cut off by persisting over temperature, t_c-temperature exceeded, too high ambient temp.	- insufficient heat dissipation - wrong installation position - housing / cabinet too small - cabinet fan (cooling) out of order
mains undervoltage	off	blink 2x	off	cut off by persisting undervoltage	- mains voltage below threshold
mains overvoltage	off	blink 3x	off	cut off by persisting overvoltage	- mains voltage exceed threshold
incorrect lamp voltage	off	blink 4x	off	cut off by monitoring of the lamp voltage lamp voltage abnormal (too high or too low)	- wrong lamp type for parameter set - lamp at end of lifetime (rectifier effect) - deactivated lamp during operation - dimming below power threshold - start with deactivated lamp
overcurrent at half bridge during operation	off	blink 5x	off	cut off by overcurrent at the half bridge (abnormal operation)	- ignition not possible/successful - too long cable - defective/wrong lamp - defective contact or short circuit in the lamp cabling during operation
overcurrent at half bridge during preheating	off	blink 6x	off	cut off by overcurrent at the half bridge (abnormal operation)	- lamp cabling failure - short circuit in the lamp cabling - start without lamp
to count the numbers of blinking, please count the dark phases or rising edges, e.g.: 					

7 Technical data

Product description

main features	intended use
lamp-friendly preheating / warm start two independent lamp channels energy-saving cut-off of the filament heating during operation universally adjustable in 5 levels for lamps / current ranges by default, with remote control input with inrush current limiter optional external LED status display or RS485 interface	for all applications with Amalgam UV lamps for water and air applications for applications with many switches for installation in cabinets suitable for many lamps of various manufactures / suppliers

Performance data

EVG UVT	2x 100-200W	2x 150-320W	2x 150-320W	2x 150-320.1W
article number	203 020xx xxxx	203 021xx xxxx	203 022xx xxxx	203 023xx xxxx
mains input power* min. /max.	220 W / 450 W	300 W / 700 W	300 W / 700 W	300 W / 700 W
output power / lamp wattage	100…200 W	150…320 W	150…320 W	150…320 W
position rotary code switch: lamp current (±10%) 0-4: local start 5-9: remote start	0/5: 1.2 A 1/6: 1.5 A 2/7: 1.8 A 3/8: 2.0 A 4/9: 2.1 A	0/5: 1.5 A 1/6: 1.8 A 2/7: 1.8 A 3/8: 2.0 A 4/9: 2.1 A	0/5: 1.8 A 1/6: 2.0 A 2/7: 2.1 A 3/8: 2.5 A 4/9: 2.9 A	0/5: 2.0 A 1/6: 1.8 A 2/7: 2.0 A 3/8: 2.1 A 4/9: 2.9 A

* The minimal lamp power must not be undercut, also if only one lamp is connected.
Please note that the lamp power depends from its operation conditions.
Attention: The lamp name is not a save information regading the lamp power. Please gather the correct values from the lamp data sheet.

General data, mains connection

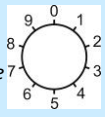
mains electricity supply (terminals 3-5)	**187…253 V AC** (208/230 ± 10%)**, 50/60 Hz**
Lamp connection (terminals 12-15, 16-19)	**2x 100-200W: keep short 14/15 and 18/19 for optimal EMC** **2x 150-320W: keep short 12/13 and 18/19 for optimal EMC**
power factor	**> 0.95 non-dimmed**
efficiency	**> 0.9 non-dimmed**
operating frequency	**approx. 28…50 kHz**
inrush current	**Î < 40 A after 30 µs / Î < 30 A after 300 µs** (with applying the supply voltage)
relay contacts (terminals 6-8, 9-11)	**1 changer per channel** **maximal load 5 A, 250 V AC / 5 A, 24 V DC ohmic load** **recommended minimal load ≥ 12 V DC / 10 mA**
remote input (terminals 1/2) *inactive with remote start (switch position 0-4)*	**10-230 V AC/DC galvanically isolated** (to be used for switching groups in big installations via remote control)
standby current	**approx. 2 W**
status output or RS485* (terminals 16-23)	**galvanically isolated connection for 4 external LEDs or RS485 interface**
leakage current to PE	**max. 5 mA (typically 3.5 mA)**

* optionally, only active for types with flexible adjustment

Characteristics

lamp types	**on request**
start behavior	**warm start with 12 sec preheating**
start frequency	**recommended for continuous operation, max. 6 starts per day**
lamp current	**5 steps adjustable within the power range of the ballast**
independent lamp channels	**1 channel ready for operation, even if 1 channel is faulty**

Adjustment of lamp current (only for types with flexible adjustment)

adjustment by rotary code switch **on top of the ballast** *must be done before applying the mains voltage* *no evaluation of a switchover during operation* 	**Our sales department will inform you about the correct setting for the lamp you are using.** **No warranty for damages caused by incompatible lamps or wrong adjustments!**
local start (with applying mains voltage)	**0-4: adjustable lamp currents according table performance data**
remote start (via remote input)	**5-9: adjustable lamp currents according table performance data**

Monitoring circuitry

mains voltage monitoring	**shutdown in case of continuous or repeated* undervoltage / overvoltage**
temperature monitoring	**shutdown in case of continuous or repeated* over temperature**
lamp presence check	**prevention of ignition if no lamp is connected**
filament check	**prevention of ignition if a wrong filament is identified**
short circuit of lamp wires	**immediate cut off**
lamp failure (see possible causes at status indication)	**cut off**

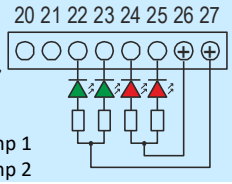
*Evaluation via counter, multiple short-term violations of the limits are recognized / added and lead to shutdown,
Reset internal counters by disconnecting from the main supply

Status indication - generally

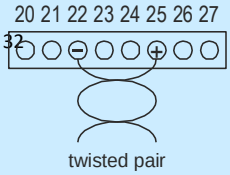
operation indicator	**LED green** (lamp side, close to lamp terminals)	**normal operation**
trouble indicator	**LED red** (lamp side, close to lamp terminals)	**failure by cut off**
potential free contact (failure contact)	**relay on** (6-7, 9-10 closed)	**normal operation**
relay / changer (terminal 6-8, 9-11)	**relay off** (7-8, 10-11 open)	**no mains / no lamp ignition / failure**

Status output respective RS485 interface (optional)

external status LED (clamp 20-27)
galvanic separated output for 2 external LED per lamp channel
supplied via internal 12 V DC
Driver stage protected against short circuit
Calculate series resistors according to LED current, minimum 600 ohms for 20 mA
27: +12V for green LED **26**: +12V for red LED
22: GND LED green, lamp 1 **25**: GND LED red, lamp 1
23: GND LED green, lamp 2 **24**: GND LED red, lamp 2



RS 485 interface (clamp 22/25)
Protocol Modbus RTU
Number of bus participants: 32
Baud rate: 9600
Data bits: 8
Stop bit: 1
Parity: none
22: Minus - **25**: Plus +



Please request transmission protocol if required

Installation instructions

designed for	**installation in electrical cabinets**
IP protection class	**IP20**
size of housing (w x d x h) borehole spacing 240 mm	**2x 100-200W: 250 x 105 x 60 mm, drill hole spacing 240 x 65 mm** **2x 150-320W: 250 x 150 x 60 mm, drill hole spacing 240 x 110 mm**
mounting position	**vertical** (mains clamp below for optimal heat dissipation)
ambient conditions	**ta = 0...40°C, max. 80% non-condensing**
temperature at tc - point	**tc = 50°C max. at housing** (forced cooling necessary if exceeded)

Wire length / cabling

allowed wire length / cable capacity	**to 5 m / max. 750 pF** (test longer cable lengths beforehand!)
shielded wire allowed	**yes** (Attention: Connect shield only at one side, avoid ground loops!)

* up to 30 m cable length possible; adaptation to lamp and cable types may be necessary; test / approval required

Connectors

clamp	connector for	type	wire gauge for	
			rigid / stranded wire	crimping ferrules
1, 2	remote input	Wago 734	0.2 … 1.5 mm²	0.25 … 1.5 mm²
3..5	mains	Wago 231	0.75 … 2.5 mm²	0.75 … 1.5 mm²
6..8, 9..11	relay contacts	Wago 734	0.2 … 1.5 mm²	0.25 … 1.5 mm²
12..15, 16..19	lamps	Wago 231	0.75 … 2.5 mm²	0.75 … 1.5 mm²
20..27	output (LED/485)*	Wago 733	0.08 … 0.5 mm²	0.25 … 0.34 mm²

* optionally, only active for types with flexible adjustment

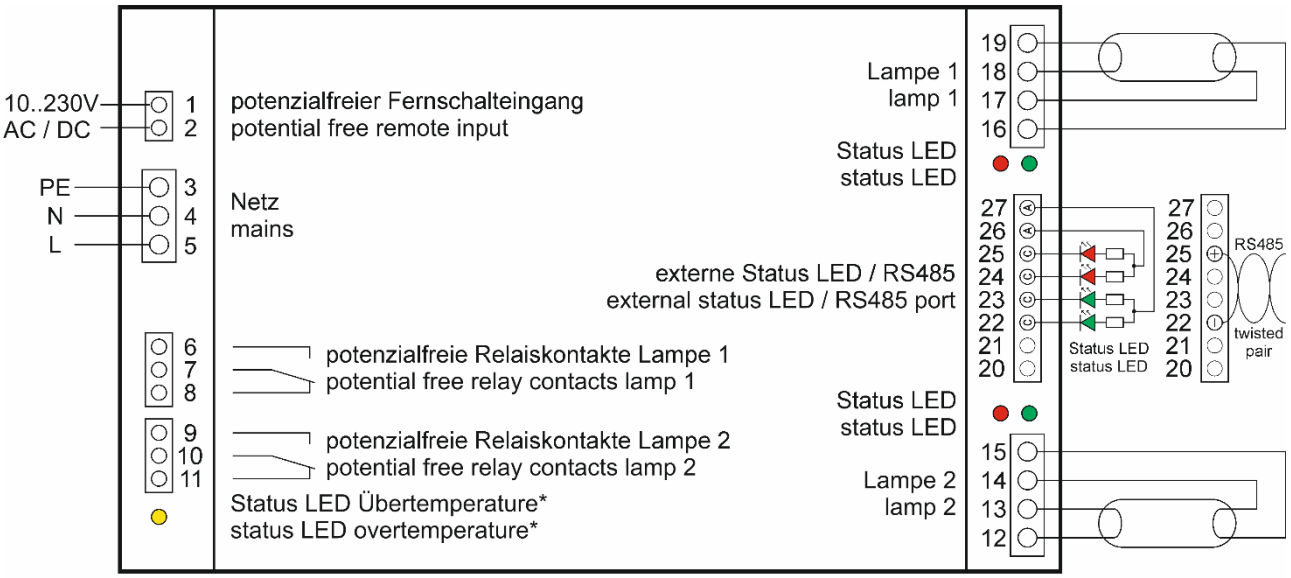
Compliance with standards

Safety	**EN 61347-2-3**
EMC limits for harmonic current emissions	**EN 61000-3-2**
EMC radio interference suppression	**EN 55011 class A1**
EMC immunity	**EN 61547**

The specified EMC standards apply to a single ballast and for cable lengths <3 m. The ballast is always part of a system for which mostly additional or different standards apply and separate approvals are required. As a result, further measures to reduce disturbances may be necessary.

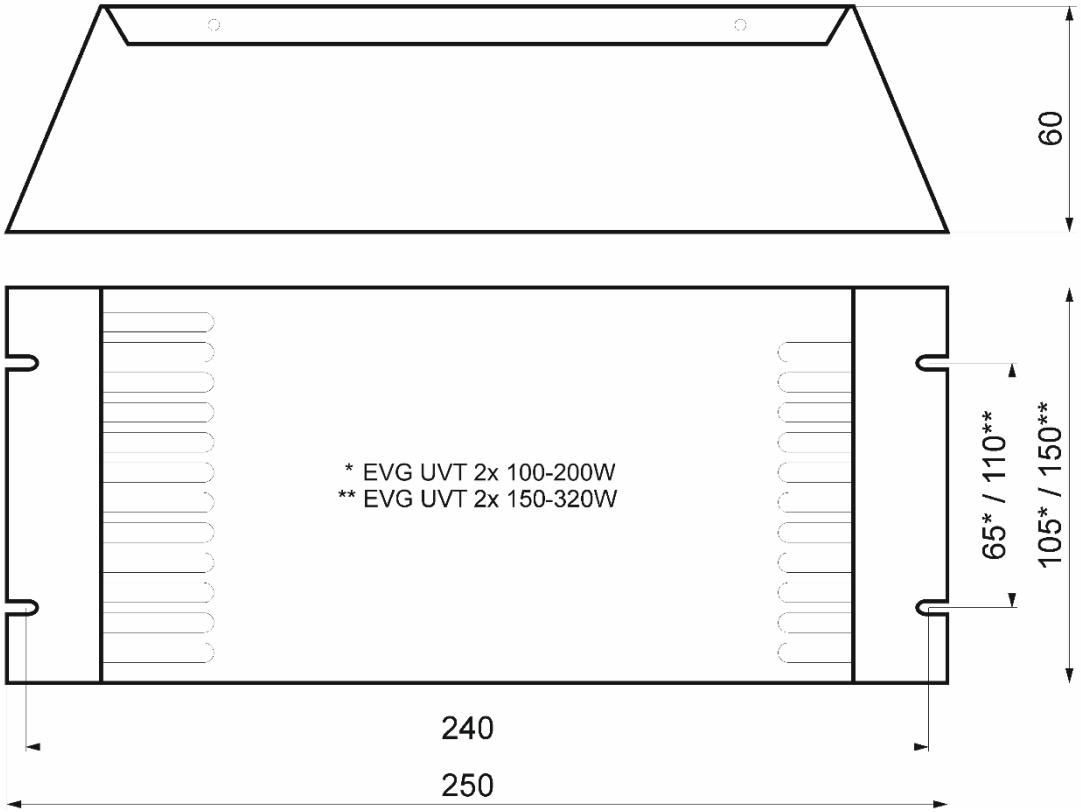
8 Technical documentation

Terminal diagram



* nur bei EVG UVT 2x 150-320W / only at EVG UVT 2x 150-320W

Dimensional drawing



9 Installation instructions

Point of installation

The EVG UVT must be installed and operated only in a dry, chemically and bioligically inactive environment. Installation in vibrating parts of the system is not allowed. Hints regarding IP protection have to be observed. The EVG UVT must be mounted upright at a grounded mounting base, which absorbs and removes ideally the emitted heat partly. For the installation, suitable fixing screws have to be selected. It is necessary to ensure that a distance between the screw and the printed ciruit board of at least of 3 mm is kept. In no case, wide flat screw heads may be used, which protrude below the PCB (danger of short ciruit!). The EVG UVT and its cabeling should be mounted separatelly from other components of the installation if possible. That is especially important for control, signal or sensor cables with its low voltages/currents.

Connection / cabling

The EVG UVT must be connected according the terminal diagram and the front sticker. The ballast is equipped with spring tension terminals, suitable as well for stranded wires as for rigid cables. The possible wire gauges are spezified in the technical data. Length of the stripped insulation or ferrules must be chosen according to the size of the terminals. The connection must be tight. Otherwise short ciruits, wrong or loose connections could cause disfunctions and damages.

Cabeling of lamps

Each lamp must be connected to the EVG UVT with an individual cable. It is not allowed to bundle several lamp cables into a multi-core cable. Cable connections to the lamp may not be disconnected during operation. By no means install additonal components into the lamp supply cable, such as relays, switches, ignitors or capacitors. The number of the clamping points in the lamp cable should be reduced to a minimum, if possible any additional clamping should be avoided. Designated clamps and connectors must be checked carefully, not only rearding electrical data but necessarily also relating to temperature and environmental conditions. Clamp contacts must be protected against corrosion. Sparks at corroded clamps could cause disfunctions or breakdown of the EVG UVT and imply fire hazard.

Because of the high frequency supply, lamp cables emitts disturbances. Hence never install mains supply cables or control cables parallel to lamp cables. To minimize EMC disturbances, lamp cables must be kept as short as possible. Do not exceed the maximal lenght or cable capacity specified in the technical data. It is allowed to use shielded cables to reduce interferences. But note thus increases the cable capacity. Installing lamp cables in parallel as well as at metallic surfaces or cable ducts raise also the capacity. The sum of all parasitic capacities detune the oscillator circuit in the EVG UVT and can cause ignition problems and a deviant lamp current.

Mains supply cabling

The mains supply cabling must have a low impedance and the installation of the power cable has to be such that interferences by the emission of lamp cables are minimized. Mains supply cables must be kept short and should not be installed parallel to the lamp cables or directly along the ballast housings. Intersections with lamp cables should be avoided where possible. If absolutely necessary, such crossings shall be made in right angles and a certain distance. Unavoidable noise interferences must be filtered with appropriate measures. Basically, the interference avoidance is preferable to interference elimination.

Grounding

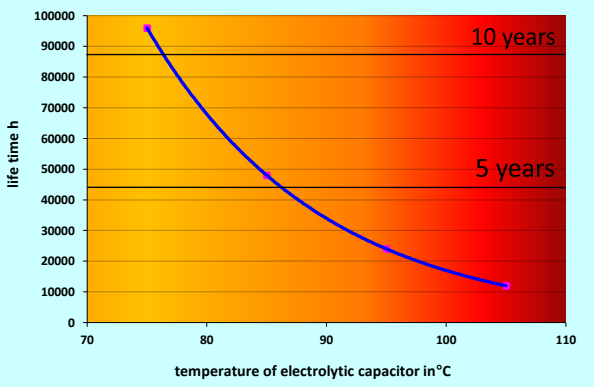
A clean earth potential and a proper grounding with an adequate cable cross section are the preconditions for compliance with the EMC standards. Only if this is guaranteed, high frequecy disturbances can be derived an thus prevented. Therefore, always connect all grounding terminals. Ground the mounting base plate. Do not forget to ground the cabinet door. Use toothed washers for a reliable contacting of painted surfaces/housings. Avoid ground loops.

Additional notes for cabling

Any damage to the cables must be avoided. Cable penetrations through housings shall have no burrs and must be adequate insulated. The same applies to edges touched by the cable. Use cable glands and bent protections and consider the allowed bending radiuses. The cable specification must comply with the environmental conditions on site. If necessary, special cables need to be used (e.g. waterproof, oil- or flame-resistant, etc.). Should cables be exposed to UV radiation or to ozone, generated by UV lamps, they must be insulated with Teflon (PTFE) or fibre glass. All other materials are not sufficiently UV-stable and need therefore to be protected in an appropriate manner.

Temperature behaviour

The lifetime of an electronic device is determined by the error rate of the electronic components of which it consists. Generally spoken, the higher the temperature, the higher the error rate, the shorter the lifespan. In the EVG UVT, the electrolytic capacitor is the lifespan-determining component (see chart). We use only premium-quality capacitors of the highest temperature stability. In compliance with the installation instructions as well as the maximum housing temperature, a lifetime of at least 50,000 hours is expected. That a temperature change of 10K doubles or halves the life of the capacitor can be seen as rough calculation. Please make sure that the specified maximum case temperature is not exceeded even in extreme operation (worst case). If you measure the temperature contact-free, please make sure that the correction factor for the measured surface is adjusted correctly. Otherwise, significant measurement errors may occur.



A sufficiently large cabinet should be chosen. The contained air must be able to circulate. If possible, use sheet metal housings. In comparison, plastic and stainless steel are the worse heat conductors. Also with regards to the shielding of electromagnetic radiation caused by the ballasts, the sheet metal is the best choice. When calculating the size of the cabinet according to the specified loss, do not forget to add the loss of other build in components. Assemble the ballasts if possible in the lower part of the cabinet, as it is cooler. The distance between the EVG UVT must be at least 1 cm. Do not restrict the air convection with other fixtures or installation channels. If you need to assemble the devices above each other, please note that their operation is influenced by heat generation. The maximum case temperature must not be exceeded even for the upper unit. Avoid the input of heat from the outside. Assemble a roof for shading the control box for example. Decouple warm lamp housings from the ballast housings. Otherwise, it is of course beneficial to couple thermally cold equipment (e.g. reactor with cold water) to the cabinet of the EVG UVT. Turn on active cooling when overheating threatens. Wait long enough while doing temperature tests to reach the thermal balance of the ballasts. This can take up to several hours. Try to keep the case

temperature of ballasts for most of the time below the maximum allowable temperature (approx. 10K less). Hence, you will achieve a longer lifetime and better operating safety.

Switching

When switching the EVG UVT on an inrush current pulse of very short duration arises by the up-charge of the integral storage capacitor for the internal power supply. So choose the fuses out not only by the indicated operating currents, but also by the impact load. If possible, use slow-blow fuses. The same applies to the ground fault circuit interrupter (GFCI), which is triggered either by the high temporary inrush current or a low continuous current. Here, the leakage currents arise on the interference suppression capacitors of the EVG UVT. If allowed, please install a surge resistant, short-delayed GFCI protection switch with 30 mA. Should the maximum possible number of EPS be exceeded for fuse or GFCI, you must group them wisely. Pay attention to the uniform load of the phases.

Please avoid repeated switch-off and on cycles of electronic ballasts. Wait at least 10 seconds after shut down before the next switching. In extreme switching loads you should check with the service of the uv-technik international ltd first, if the selected device is suitable for your application.

If a failure is indicated, the EVG UVT needs to cutoff from the mains voltage. Thus will reset the failure status and internal counters. After having eliminated the failure cause, you can start again the EVG UVT. The restart after a power failure will be carried out automatically.

Monitoring

Besides the usual operation LEDs, the EVG UVT are equipped with a potential free signal output per chanel/lamp, which notifies the proper function of the unit. This output is a relay that switches once the lamp is in operation. This relay output can be used for displaying/signalising or switching functions. Please note the specified values in the data sheets for the contact load. Inductive or capacitive loads have to be avoided. In addition to the maximum allowable load, the minimum load must be considered in particular. Since relay contacts are cleaned by the sparks resulting from switching, the permanent operation with too low power or too low voltage can cause contact problems. Especially keep this in mind, when the signal contacts are to be connected directly to a PLC, where only 5 V and a few mA are present in the communication circuit. Avoid, if possible, a series of signal contacts. If this is unavoidable, please make signal rings with just as few devices. In this case, select voltages/currents in the signal circuit, which are significantly above the allowed minimum values.

In addition to the relay outlet, the flexible adjustable types of the EVG UVT have the possibility to connect additional operation LEDs directly. This function is useful, if the ballast operation must be displayed in the front panel of the control box. The EVG UVT delivers 12 V DC supply for the connected LEDs. Please note that the LEDs have to be equipped with a series resistor. The specified current of the LEDs of 20 mA must not be exceeded. Please calulate the series resistor accordingly (minimal 600 Ohm) or related to the actual LED-current.

Dimming

The EVG UVT have by default no dimming function. Please never try to dim the EVG UVT by changing the mains supply voltage. The integral PFC regulates fluctuations in the supply voltage, so that there is no influence on the output power. Mains voltages out of specification cutoff the ballast and may cause damages.

Electromagnetic compatibility

The EVG UVT comply with the standards mentioned in the technical data and the CE declaration. As a part of a system, other/further rules may be valid. It is the responsibility of the manufacturer/installer or generally the operator to check the complete system according to the relevant rules. If several ballasts build in a unit, generally additional measures can be necessary to eliminate interferences.

Beside the observance of the thresholds of the supply voltage, the mains suppl may not loaded with distortions, burst and surge disturbances. If the mains quality is unknown, the installation of filters and overvoltage/lightning protectors is recommended. An undisturbed supply is the precondition for a failure-free operation.

In addition to the known technical contexts, all given instructions of this document are based on our experiences. We take no guarantee of completeness and correctness.