

# Operating Manual

## Electronic Power Supply

<b>EVG UVT 2x 30-80 W</b>	<b>0.35-0.8 A</b>
<b>EVG UVT 2x 30-80 W</b>	<b>0.8-1.5 A</b>
<b>EVG UVT 2x 60-100 W</b>	<b>0.35-0.65 A</b>
<b>EVG UVT 2x 80-125 W</b>	<b>0.8-1.5 A</b>



## Imprint

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**Summary description: Electronic power supplies EVG UVT 2x 30-125 W**

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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.

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The two following symbols are used to address practices for optimal operation and/or prevention of damage to the equipment. These information are not related to hazardous situations. 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.

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## 1 Device and function description

The EVG UVT is a microprocessor-based electronic power supply for two UV low pressure lamps. It is available in the same size for wattages from 2x 30-125W. It allows to operate all UV low pressure lamps in a power range from 30 W up to 125 W with lamp currents from 0.35 A up to 1.5 A. All commercially available lamps are covered with the standard types described like follows. The device is available with different options. The basic version with rotary switch allows the selection of different lamp currents and the activation of the remote switching function. This version can also be ordered with active LED outputs or alternatively with RS485 interface. Fixed devices without rotary switches are also possible.

The EVG UVT is designated for medium size installations. The two-channel design minimizes the costs per lamp. The two-flamed unit comes by default with an input for remote control. Via an external 10-230 V AC/DC signal a remote control can be realized easily. The function provides the possibility for switching block by block. Especially in bigger installations will that minimize switching peaks, can reduce the risk of EMC disturbances and shall be used to vary the power according to the requirements. The function is active in the devices with rotary switch in the 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 total number of devices should be evenly distributed among the existing phases. Per channel, 1 to a maximum of 5 devices should be switched in blocks.

A microprocessor controls and monitors the device and the connected lamps. Malfunctions are reported via a potential-free contact per channel. Simultaneously LEDs indicate the operating status as well as the type of error that has occurred. The two lamps are operated independently. The error of a lamp does not lead to the failure of the second lamp. Operation with only one lamp is possible but should be avoided if the minimum input power is permanently undershot.

The EVG UVT has no integrated fan. For perfect cooling, it must be mounted vertically with the mains connection facing downwards. With unobstructed convection, a proper heat dissipation up to a maximum ambient temperature of 40 ° C is possible. The criterion for proper cooling is the specified tc-point temperature of 50 ° C on the housing cover. If this temperature is exceeded or the mounting position deviates, the device must be actively cooled to prevent damage due to overheating. If the device is operated permanently at too high temperature, loss of life can be expected. If the temperature is excessively high, the device switches off.

The correct lamp current must be set via the rotary switch before commissioning. A preheating current does not have to be considered, as the electronic ballasts EVG UVT start the lamps without preheating. 4 connections are only available so that it can be checked via the filaments, whether a lamp is connected (lamp presence test). If no lamp is detected at the output, there is no ignition. By means of this function ignition voltage peaks at the unused lamp outputs are avoided, which could permanently damage the ballast or cause danger. When using instant start lamps with only 2 connections, the connections 12/13, 14/15, 16/17, 18/19 must be bridged so that the EVG UVT does not switch off during the lamp presence test. Due to the instant start, the ballasts are recommended for applications with continuous operation or less switches. For applications with many switches, we recommend our ballasts with preheating.

The EVG UVT is designed for installation in control cabinets and control boxes. The device is connected via plug-in spring-loaded terminals. This allows prefabrication of cables.

The EVG UVT offers the following essential advantages:

- compact design, low weight, low cabling effort
- two independent lamp channels
- constant performance over the entire input voltage range
- integrated remote switching function for minimizing EMC interference or for remote control
- mains voltage range allows connection to 230 V AC (Europe) and 208 V AC (USA)
- rotary switch to use one type for different lamps or remote control
- error messages per channel via potential-free contacts and LED blink code
- energy-efficient operation, low power loss
- integrated inrush current limiter
- optional potential-free connection of external LEDs possible, supply of LEDs is integrated
- RS485 Modbus RTU control selectable as option
- customer specific programming for special lamps in the specified 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

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#### ATTENTION!



uv-technik Speziallampen GmbH is not liable for damage resulting from inappropriate use of the equipment.

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### 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

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#### **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!**

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## Warranty and liability

The General sales and delivery conditions of uv-technik Speziallampen GmbH apply. The operator will have received these terms, at the latest upon signing the contract. The uv-technik Speziallampen GmbH 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 originated 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

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### **DANGER! – HAZARDOUS ELECTRICAL VOLTAGE!**

There is a danger caused by direct or indirect contact with electricity!

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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 Speziallampen GmbH.

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

uv-technik Speziallampen GmbH  
Gewerbegebiet Ost 6  
98693 Ilmenau

Tel.: 0049 - 36785 - 520 0

Fax: 0049 - 36785 - 520 21

E-Mail: [info@uvtechnik.com](mailto:info@uvtechnik.com)

Website: [www.uvtechnik.com](http://www.uvtechnik.com)



### **WARNING!**

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

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## 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 Speziallampen GmbH.

### 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 Speziallampen GmbH  
Gewerbegebiet Ost 6  
98693 Ilmenau

Tel.: 0049 - 36785 - 520 0  
Fax: 0049 - 36785 - 520 21  
E-Mail: [info@uvtechnik.com](mailto:info@uvtechnik.com)

Devices/ Designation	Article / Order Number	
	flexibly adjustable devices	permanently set devices
<b>EVG UVT 2x60-100W 0,35-0,65A</b>	<b>203 07001 - 03 xxxx</b>	<b>203 07010 - 19 xxxx</b>
<b>EVG UVT 2x30-80W 0,35-0,8A</b>	<b>203 07101 - 03 xxxx</b>	<b>203 07110 - 19 xxxx</b>
<b>EVG UVT 2x30-80W 0,8-1,5A</b>	<b>203 07201 - 03 xxxx</b>	<b>203 07210 - 19 xxxx</b>
<b>EVG UVT 2x80-125W 0,8-1,5A</b>	<b>203 07301 - 03 xxxx</b>	<b>203 07310 - 19 xxxx</b>

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: permanently set devices, one external LED

xxxx: is used to designate customer-specific variants

The sales and distribution department of the uv-technik Speziallampen GmbH provide you advice regarding the correct equipment for the used lamp type and clarify in detail the differences.

## 5 Repair

Should the EVG UVT be damaged or defective in any way, you have to send the unit back uv-technik Speziallampen GmbH for testing and/or repair!

Opening the device or breaking the inspection seal voids 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 Speziallampen GmbH.

Contact address:

uv-technik Speziallampen GmbH  
Gewerbegebiet Ost 6  
98693 Ilmenau

Tel.: 0049 - 36785 - 520 0

Fax: 0049 - 36785 - 520 21

E-Mail: [info@uvtechnik.com](mailto:info@uvtechnik.com)

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 additionally 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 indicator – 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 - kein Signal am Starteingang
start / ignition	off	on	on	ignition of the ballast	
normal operation	on	off	on	system lamp/ballast ok	
temperature excessive	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 life time (rectifier effect) - deactivated lamp during operation - dimming below power threshold - start with deactivated lamp
overcurrent at half bridge	off	blink 5x	off	cut off by overcurrent at the half bridge (abnormal operation)	- ignition not possible/successful - defective contact or short circuit in the lamp cabling during operation - lamp cabling failure - no bridges in case of 2pin lamps - defective/wrong lamp - too long cable
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
ballast for instant start 2 independent lamp channels, 2 lamps per channel possible lamps and current adjustable in 5 steps by default, with remote control input with inrush current limiter optional external potential-free status LED or RS485 Modbus RTU interface	for all applications with Standard and Amalgam UV lamps for water and air applications for applications with continuous operation or less switches for installation in cabinets suitable for many lamps of various manufactures / suppliers

### Performance data

EVG UVT	2x 60-100W 0,35-0,65A	2x 30-80W 0,35-0,8A	2x 30-80W 0,8-1,5A	2x 80-125W 0,8-1,5A
article number	203 070XX YYYY	203 071XX YYYY	203 072XX YYYY	203 073XX YYYY
mains input power <sup>1</sup> min. /max.	120 W / 225 W	60 W / 185 W	60 W / 200 W	160 W / 270 W
output power <sup>2</sup> per channel	60...100 W	30...80 W	30...80 W	80...125 W
rotary switch position:	0/5: 350 mA	0/5: 350 mA	0/5: 0.8 A	0/5: 0.8 A
lamp current (±10%)	1/6: 425 mA	1/6: 425 mA	1/6: 1.0 A	1/6: 1.0 A
0-4: directly start	2/7: 450 mA	2/7: 550 mA	2/7: 1.2 A	2/7: 1.2 A
5-9: remote start	3/8: 550 mA	3/8: 650 mA	3/8: 1.4 A	3/8: 1.4 A
	4/9: 650 mA	4/9: 800 mA	4/9: 1.5 A	4/9: 1.5 A

<sup>1</sup> The minimal lamp power must not be undercut, also if only one lamp is connected.

<sup>2</sup> The series connection of 2 lamps per output channel is allowed as long as the permissible power per channel is maintained.

Please note that the lamp power depends from its operation conditions.

Attention: The lamp name is not a save information regarding the lamp power. Please gather the correct values from the lamp data sheet.

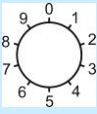
### General data, mains connection

mains electricity supply (terminal 3-5)	187...253 V AC (208/230 ± 10%), 50/60 Hz
power factor	> 0.95
efficiency	> 0.9
operating frequency	approx. 28...70 kHz
inrush current	$\hat{I} < 40 \text{ A}$ after 30 $\mu\text{s}$ / $\hat{I} < 30 \text{ A}$ after 300 $\mu\text{s}$ (with applying the supply voltage)
relay contacts (terminal 6-8, 9-11)	1 changer/channel maximal load 5 A, 250 V AC / 5 A, 24 V DC ohmic load recommended minimal load $\geq 12 \text{ V DC} / 10 \text{ mA}$
remote input (terminal 1/2) <i>inactive with immediate start (switch position 0-4)</i>	10-230 V AC/DC galvanically isolated (to be used for switching of groups in big installations via remote control)
standby current	approx. 2 W
status output (RJ45, terminal 20)	galvanically isolated connection for 4 external LED
leakage current to PE	max. 5 mA (typically 3.5 mA)

### Characteristics

lamp types	on request
ignition	instant start without preheating
switching cycles	recommend for continuous operation, max. 1 switching per day
using with / without remote input	adjustable with rotary switch
lamp current	5 steps adjustable within the power range of the ballast
independent lamp channels	1 channel is in operation even if the other one has a disfunction

### Adjustment of lamp current

adjustment by turning the code switch on top of the ballast <i>must be done before applying the mains voltage;                      no evaluation of a changeover during operation</i>		Our sales team will inform you about the correct setting for the lamp you are using. <b>No warranty for damages caused                      by incompatible lamps or wrong adjustments!</b>
internal start (directly start with applying mains)	0-4: adjustable lamp currents according table performance data	
remote start (start via remote input signal)	5-9: adjustable lamp currents according table performance data	

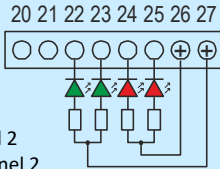
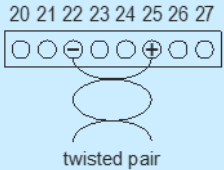
## Monitoring circuitry

mains voltage monitoring	cut off in case of persisting under- or overvoltage
temperature monitoring	cut off in case of persisting over temperature
lamp presence check filament check	prevention of ignition if lamp is not connected or if a wrong filament is identified
short circuit of lamp wires	immediate cut off
lamp failure (see possible causes at status indication)	cut off

## Status indication - generally

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

## Status output and RS485 interface (optional)

<p><b>external LED status indication</b> (terminals 20-27)  <b>galvanically isolated connection of 2 external LED per lamp channel</b>  <b>supplied via internal 12 V DC</b>          Driver stage protected against short circuit          Calculate series resistors according to LED current, minimum 600 ohms for 20 mA          20: +12V for green LED      21: +12V for red LED          22: GND LED red, channel 1    23: GND LED red, channel 2          24: GND LED green, channel 1   25: GND LED green, channel 2</p> 	<p><b>RS 485 interface</b> (clamp 22/25)  <b>Protocol Modbus RTU</b>          number of bus participants: 32          baud rate: 9600          data bits: 8          stop bit: 1          parity: no          22: minus -    25: plus  <i>Please request transmission protocol if required</i></p> 
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## Installation instructions

designed for	installation in electrical cabinets
IP protection class	IP20
size of housing (w x d x h)	263 x 74 x 58 mm (borehole spacing 255 mm)
mounting position	vertical (mains supply connector downside for optimal heat dissipation)
ambient temperature	ta = 0...40°C
relative humidity	max. 80% non-condensing
temperature at tc - point	tc = 50°C max. at housing (forced cooling necessary if exceeded)

## Wire length / cabling

max. allowed wire length	5 m (longer cable possible, depending from cable capacity and laying)
max. allowed cable capacity	750 pF
shielded wire allowed	yes (Attention: Ground shield only at one side, avoid ground loops!)

## Connectors

clamp	connector for	allowed stranded wire gauge with ferrule	allowed rigid wire gauge
1, 2	remote input	∅: 0.25...1.0 mm <sup>2</sup> / 30-17 AWG	0.2-1.5 mm <sup>2</sup> / 32-16AWG
3..5	mains	∅: 0.75...1.5 mm <sup>2</sup> / 18-16 AWG	0.75-2.5 mm <sup>2</sup> / 18-11AWG
6..8, 9..11	relay contacts	∅: 0.25...1.0 mm <sup>2</sup> / 30-17 AWG	0.2-1.5 mm <sup>2</sup> / 32-16AWG
12..15, 16..19	lamps	∅: 0.75...1.5 mm <sup>2</sup> / 18-16 AWG	0.75-2.5 mm <sup>2</sup> / 18-11AWG
20 (RJ45)	output (LED/485)	optionally: accessory cable 1 m, with RJ45 plug	

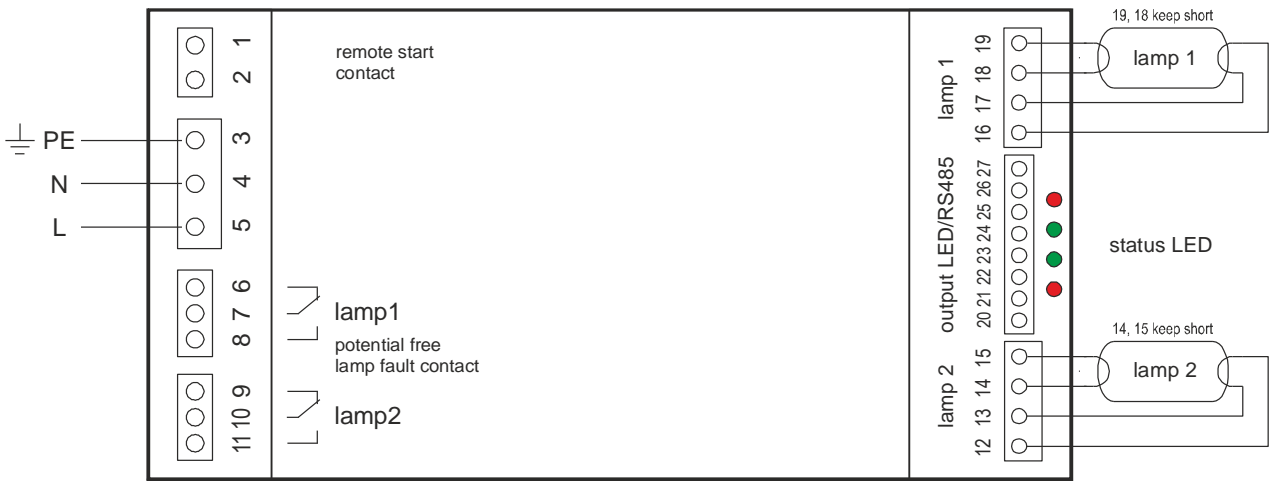
## Compliance with standards

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

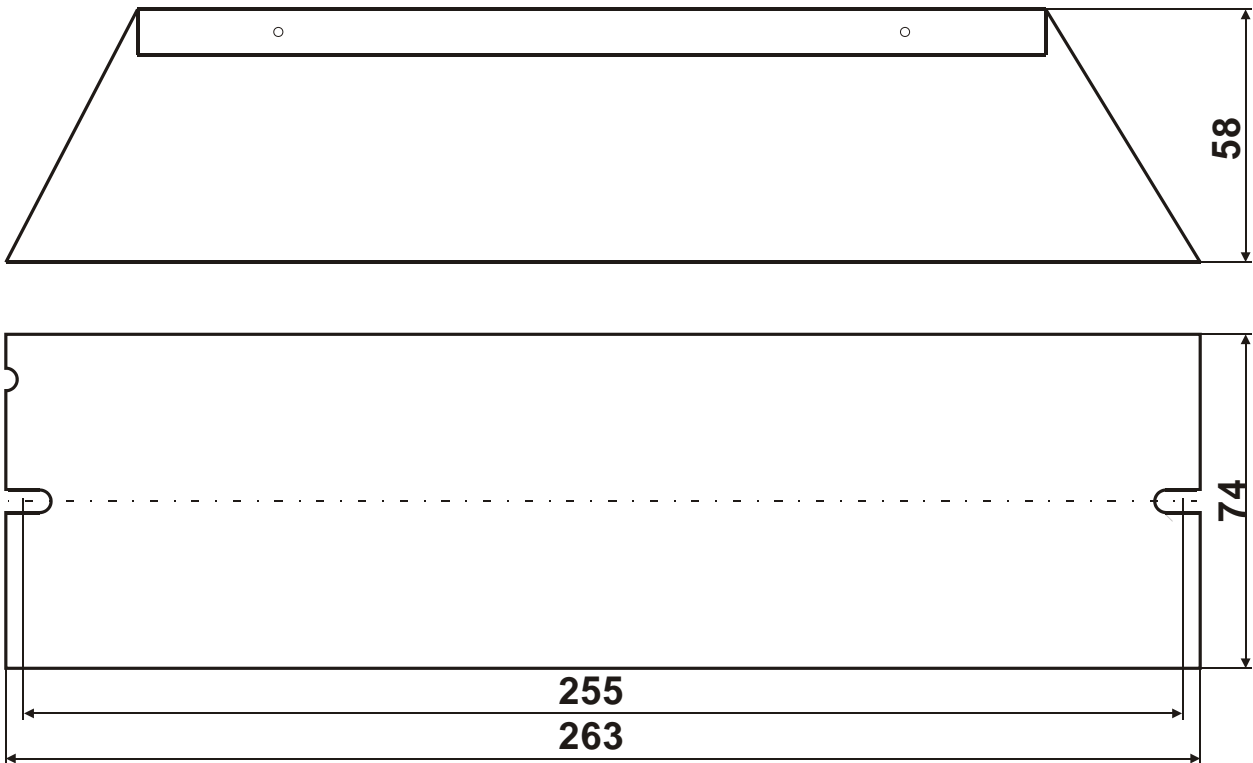
The stated EMC standards apply only to single ballast and for cable length < 3 m. Since the ballast is a part of an installation it needs in most cases an extra EMC approval of the whole device and necessarily additional measures to reduce disturbances.

## 8 Technical documentation

### Terminal diagram



### Dimensional drawing



## 9 Installation instructions

### Point of installation

The EVG UVT must be installed and operated only in a dry, chemically and biologically 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 circuit 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 circuit!). The EVG UVT and its cabling should be mounted separately 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 specified 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 circuits, 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 additional 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 regarding 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 emits 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 length 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

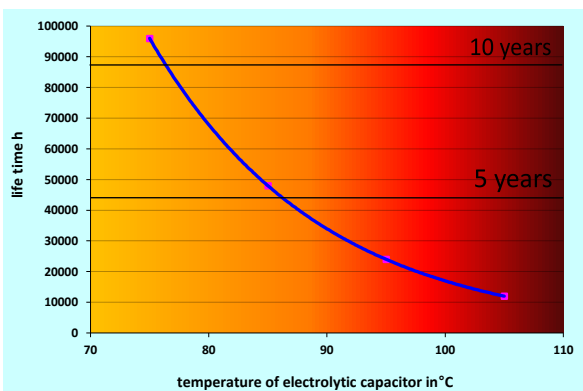
A clean earth potential and a proper grounding with an adequate cable cross section are the preconditions for compliance with the EMC standards. Only if this is guaranteed, high frequency disturbances can be derived and thus prevented. Therefore, always connect all grounding terminals. Ground the mounting 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 Speziallampen GmbH 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 channel/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/signalling 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 signal output, the EVG UVT have the option of connecting additional operating 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 calculate the series resistor accordingly (minimal 600 Ohm) or related to the actual LED-current.

Another option is the control and monitoring of the EVG UVT via the optional RS485 Modbus RTU interface. The communication protocol is described in a separate document and can be requested if required.

## 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.