

New Line of Medium Pressure Ballasts

**ZED goes
Medium Pressure**



...go with ZED

always one step ahead

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professional electronics for UV systems

Latest News

now available:

PPT systems

- optimized lamp/ballast sets 250...1000 W

for system upgrades
or new innovative designs

see page 16 for details



now available:

ZED Ozone Generator ZO3gen

for cost-efficient ozone generation

see page 20 for details



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Digital communication with ZED

Why digital?

The internal digital processing of the ZED digital ballasts and D-sensors combined with digital communication interfaces allows the constant monitoring and control of all important parameters in UV systems.

Digital ZED ballasts can be remotely controlled, e.g. started, stopped, dimmed etc. via digital commands. They provide information relating to lamp/ballast operation state, lamp power, lamp current, mains voltage or ballast temperature. Using control units the ballasts can be adjusted optimally to the conditions on site.

Digital ZED UV-C sensors provide a larger total measurement range than common analog sensors. They implement several internal measurement ranges in combination with an integrated automatic range selection. The digital signal transmission allows longer cables and longer distances between measuring position and monitoring unit.

The digital devices communicate with the control unit via RS485 bus systems. ZCON protocol is used for the ready-to-use ZED control units. These units are optimized for operating UV-C systems mainly containing ballasts and sensors. The ModBus protocol allows partners and customers to integrate digital ZED components directly in their systems using their own PLC.

ZED control units can be used as interface between customers PLC and the digital ballasts and sensors. So the customer does not have to deal with the single devices in details, but get gathered information concerning the UV-state of the system.

Abstract

ballasts and sensors with digital signal interface

digital communication for system control and monitoring

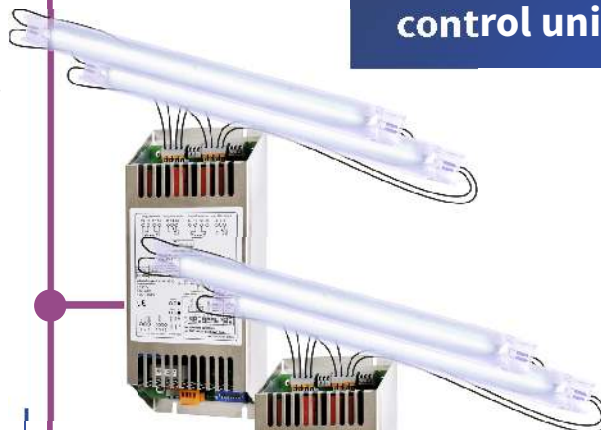
simplification of fault detection and handling

control units



ZCON control unit

customer specific control unit



digital electronic ballasts



temperature sensors

digital sensors



UV sensors

RS485 bus

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ZED ballasts for Medium Pressure Lamps ...2500W

Features

electronic ballasts for medium pressure lamps,
power range up to 2500W

- options:
EVG-M2500-IG - compact design with internal ignitor
EVG-M2500 - extended cable length with external ignitor
- lamp operation parameter can be **set and modified** by customer using ZED ballast monitor software
- lamp operation control via RS485
using ModBus or ZCON protocol, stand alone operation possible
- dimming by digital or analog control interface
- lamp and ballast status indication
- via RS485 using ModBus or ZCON protocol,
LEDs and potential free relay contact
- enhanced protection:
- power range control, undervoltage protection,
overtemperature protection, ground fault protection
- high efficiency, active power factor correction (PFC)
(low THD according to EN 61000)
- active fan for optimal thermal management
- dimensions: 279x317x81mm (10.98x12.48x3.19inch)



pictures similar

Abstract

lamp power	up to 2500W
lamp current	up to 12A
max. lamp voltage	300V

use with

lamp types

medium pressure lamps
up to 2500W

PLC

via ModBus RTU

ZED control units

ZCONmini II

PC software



ZED BallastMonitor

Ignition cable



IG-M

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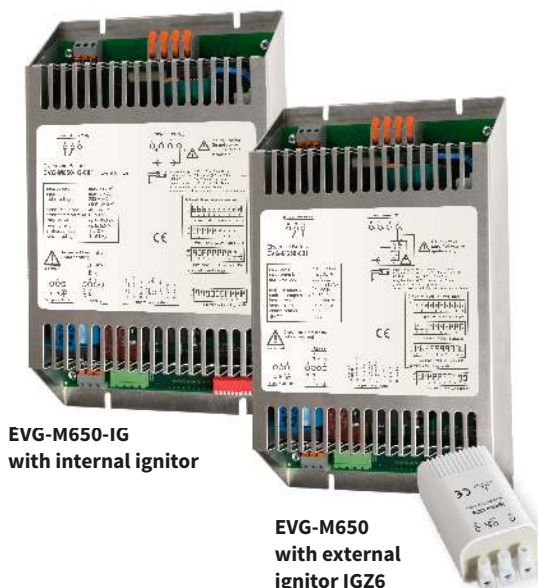
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ZED ballasts for Medium Pressure Lamps ...650W

Features

electronic ballasts for medium pressure lamps,
power range up to 650W

- options:
EVG-M650-IG - compact design with internal ignitor
EVG-M650 - extended cable length with external ignitor
- lamp operation parameter can be **set and modified** by customer using ZED ballast monitor software
- lamp operation control via RS485
using ModBus or ZCON protocol, stand alone operation possible
- dimming by digital or analog control interface
- lamp and ballast status indication
- via RS485 using ModBus or ZCON protocol,
LEDs and potential free relay contact
- enhanced protection:
- power range control, undervoltage protection,
overtemperature protection, ground fault protection
- high efficiency, active power factor correction (PFC)
(low THD according to EN 61000)
- active fan for optimal thermal management
- dimensions: 268x167x60mm (10.55x6.57x2.36inch)



pictures similar

Abstract

lamp power	up to 650W
lamp current	up to 5.5A
max. lamp voltage	300V

use with

lamp types

medium pressure lamps
up to 650W

PLC

via ModBus RTU

ZED control units

ZCONmini II

PC software



ZED BallastMonitor

Ignition cable



IG-M

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Features

out-of-the-box control unit for use as master control

- for UV applications with up to 32 ZED PHplus ballasts (single to quad lamp types)
- support for the upcoming ZED ballasts for medium pressure lamps
- UV-C monitoring using up to 4 D-SiC sensors
- temperature monitoring using D-ST sensors
- different add-ons available allowing flow monitoring, dynamic lamp dimming, reactor flushing...
- status indication
 - multicolor LCD,
 - green, red and yellow LEDs,
 - relay contacts
 - status forwarding via analog output
 - detailed status forwarding via ModBus RTU

Abstract

master control unit with ModBus support for digital ZED ballasts and sensors

- remote control
 - operation control via analog inputs
 - remote command execution via ModBus RTU
- operation hour counter, cycle counter
- flexible logging of measurement data and events to SD card
- import/export of settings from/to SD card
- multi language support
- supports in-system updates
- meets all requirements by DVGW W294 and ÖNORM M5873



ZCONmini II
with SD-Card slot
and optional IP20 frontpanel

new Features

- enhanced user interface
- more detailed status information on screen
- number of controllable ballasts raised to 32
= up to 128 lamps on using quad lamp ballasts
- support for the upcoming ZED ballasts for medium pressure lamps
- temperature monitoring using D-SiC UV-C sensors with temperature measuring option
- detailed status forwarding via ModBus RTU
- remote command execution via ModBus RTU
- logging of measurement data and events to SD card
- import/export of settings from/to SD card, supports in-system updates via SD-Card

new PC software: ZED LogDataViewer



use with

Ballasts

ZED Ballasts for low pressure, amalgam and medium pressure lamps with digital interface

Sensors

digital ZED UV Sensors, digital and analog ZED Temperature Sensors

Control Units

PLC via ModBus RTU, PLC via 4-20mA signals, PLC via switching inputs/outputs

PC Software

ZED LogDataViewer

- Import log data from ZCONmini II or ZED SmartMeter
- Integrated data base for multiple points of measurement
- Flexible configurable display options
- Data export into CSV file/direct export into Microsoft® Excel

Features

universal handheld unit for use as

- **UV-C Reference Radiometer**
for checking DVGW and ÖNORM compliant sensors
- **185nm measuring device**
for checking ozone producing low pressure UV lamps
- **UV-C meter**
with ZED digital UV sensors for low and medium pressure applications
- **Data logger**
data logging to SD-Card duration and intervall adjustable
- **Sensor configuration tool**
set/change ModBus address set 100% reference value for analog output
- **optional: in-field recalibration tool**
readjustment of ZED D-SiC sensors on-site by authorized customers

certified



carrying case with optional accessories

ÖNORM UV-C reference sensor
0.01...250W/m²
0.1...500W/m²

use with

ZED UV Sensors D-SiC
ZED 185nm Sensors D-VUV

ZED SmartMeter with Reference sensor

co-financed by



In-Field Recalibration of UVC Sensors

Abstract

In-Field Recalibration
of digital ZED UVC-sensors
using
ZED SmartMeter
and ZED Reference Sensor

In most UV systems, monitoring of UV-C irradiance is essential to ensure disinfection on water treatment systems or to ensure the effect on photochemical processes. The UV probes used for these measurements are exposed to high-energy UV radiation, which may cause aging effects. Due to that, periodic testing and recalibration is required to meet different regulations.

ÖNORM M5873-1 recommends a certification validity and recalibration interval of one year.

Cyclic recalibration requires considerable effort if recalibration is carried out by the original manufacturer.

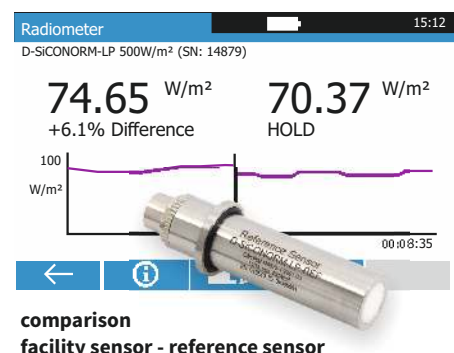
The 2nd generation ZED Digital UVC sensors allow to be recalibrated by the plant manufacturer or even by the operator in a simple process:

The ZED SmartMeter, used together with a certified ZED Reference sensor, guides the user through an automated process, which takes only a couple of minutes.

The complete recalibration history is stored inside each sensor; a password is set to ensure, that recalibration is done by authorized personnel only. The option for recalibration is available for all digital UVC sensors, including ZED digital UV sensors that have analog output.

The in-field recalibration enables time and cost efficient recalibration cycles. The intended use of this feature is the recalibration by the plant manufacturer at his own test bench or calibration box. The recalibration on location by customer service or customer himself is another application possibility.

The in-field recalibration feature is an optional feature; it requires a customer specific key for each UVC sensor. This key is to be entered on ZED SmartMeter during in-field recalibration.



Digital UVC Sensors with analog interface

Features

for replacing analog UVC sensors in existing UVC systems

- variable signal amplification (AutoRange)
 - internal signal conversion to absolute UVC intensity values in W/m^2
 - optimum signal resolution over the entire measurement range
 - low pressure: $2 \dots 500 \text{ W/m}^2$
 - medium pressure: $20 \dots 3000 \text{ W/m}^2$ (6000 W/m^2)
 - assignment of the facility-specific UV value to the analog output value can be set by customer (e.g. set $123 \text{ W/m}^2 = 20 \text{ mA}$) using ZED SmartMeter or PC software
- the facility-specific variety of analog UVC sensors can be replaced by one digital ZED sensor with analog signal output
- = just one sensor type required in stock**

Abstract

digital sensors with
current/voltage signal interface
 $4 \dots 20 \text{ mA}$
 $0 \dots 2 \text{ V} / 3 \text{ V} / 5 \text{ V} / 10 \text{ V}$

use with

ZED SmartMeter
for UV value assignment



ZED Sensor Configurator
with USB/RS485 adapter



ZED UV monitors, analog PLC...

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for detailed technical specification
see datasheets at:

www.z-e-d.com/d-sic-ui



D-SiC133
(-I/-U2/-U10)

D-SiC141
(-I/-U2/-U10)

D-SiC131
(-I/-U2/-U10)

D-SiCONORM
(-I/-U2/-U10)

D-SiCDVGW
(-I/-U2/-U10)

Features

display unit for use as

- **UV-C Reference Radiometer***
for checking DVGW and ÖNORM
compliant sensors

* on using digital ZED Reference sensors

certified

- **UV-C meter**
with ZED digital UV sensors
for low and medium pressure applications
- optimized for cost sensitive applications
- simplified usage, base functionality
- alphanumeric display
with dynamic resolution and backlight
- protected against dust and streams of water
(IP 65)
- compact dimension (just 130x75x25mm)
- low power consumption / long operation time
with normal alkaline battery
- connects to all ZED digital UV sensors*

*(types with measurement in W/m^2 , production date starting 2017)

Abstract

cost efficient
Reference Radiometer /
UV Meter

University of Veterinary Medicine
Institute of Physiology, Pathophysiology and Biophysics
Unit of Physiology and Biophysics
Veterinärplatz 1
A 1210 Vienna
Austria
20. 01/19

BESTÄTIGUNG / CONFIRMATION

„D-SICONORM-LP-REF“ & „ZED TinyMeter“

Die Kombination aus „D-SICONORM-LP-REF“ max. 500 W/m^2 (*) und „ZED TinyMeter“ (ZED, Ziegler Electronic Devices GmbH, In den Folgen 7, 98704 Langewiesen, Deutschland) entspricht den Anforderungen eines Referenzradiometers gemäß ÖNORM M 5873-1 (1.3.2001) für UV-Trinkwasserdesinfektionsanlagen mit Quecksilberdampf Niederdruckstrahlern im folgenden Arbeitsbereich (*):

Bestrahlungsstärke E_{280nm} : 0,1 W/m^2 bis 500 W/m^2

Temperatur: 0°C bis 40°C

unter der Bedingung, dass die letzte Kalibrierung nicht länger als 12 Monate zurückliegt.

The combination of „D-SICONORM-LP-REF“ max. 500 W/m^2 (*) and „ZED TinyMeter“ (ZED, Ziegler Electronic Devices GmbH, In den Folgen 7, 98704 Langewiesen, Germany) fulfils the requirements of a reference radiometer according to the Austrian Standard ÖNORM M 5873-1 (1.3.2001) for UV-disinfection plants for drinking water equipped with mercury low pressure lamps within the following working range (*):

Irradiance E_{280nm} : 0,1 W/m^2 to 500 W/m^2 (*)

Temperature: 0°C to 40°C

only, if the last calibration does not date back longer than 12 months.



Mag. Dr. A.W. Schmalwieser
20. Dez. 2018 (Unit of Physiology and Biophysics)

(*) Reference: Gutachten Z: 002-16, 17.3.2016



ÖNORM/DVGW compliant
digital sensors



digital UV
system sensors



ZED TinyMeter
with Reference sensor



carrying case
with optional accessories

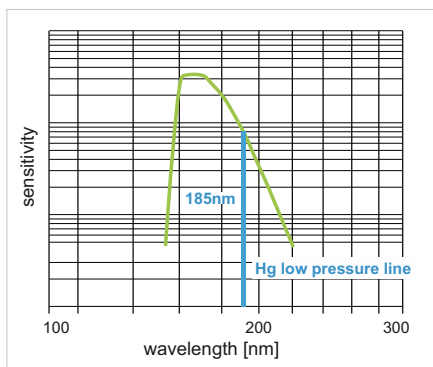
use with

ZED UV Sensors D-SiC:
ÖNORM/DVGW compliant types,
system sensors,
reference sensors

ZED Sensor D-VUV 185nm

Features

- for checking ozone producing low pressure mercury UV lamps
- use of high sensitivity and high stability phototube
 - spectral response between 160 - 220nm
 - extremely low response at 254nm
- easy measurement on air based on direct lamp contact
- intended for laboratory use
- connect to ZED SmartMeter or Windows PC using ZED Sensor Configurator software to display and log measurement values (measurement range: 1...1500.00 digits)



spectral sensitivity

- Use the Sensor fastener F01 for correct mounting and repeatable positioning of the sensor at the lamp. The sensor fastener can be used for lamp diameters between 12 - 40 mm.



D-VUV185
with sensor fastener F01

Abstract

185nm measurement on air
digital interface RS485
for ZCON/ModBus



use with



ZED SmartMeter



ZED Sensor Configurator
with USB/RS485 adapter



sensor fastener F01

co-financed by



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for detailed technical specification
see datasheets at:

www.z-e-d.com/vuv

ZED Sensor-Configurator Software

Features

- Windows PC software
for operating digital ZED sensors via PC
- displaying and logging measurement values
 - displaying sensor properties
sensor type, firmware type, calibration date
 - activating/deactivating ModBus protocol,
setting ModBus address
 - adjusting analog sensor outputs (4...20mA, 0...10V)
on ZED D-SiC analog sensors
 - optional: in-field recalibration
readjustment of ZED D-SiC sensors
by authorized customers
 - recommended accessory:
ZED USB to RS485 serial adapter + interface cable

Abstract

UV/VUV monitor
UV Data Logger
Sensor Configuration Tool
In-Field Recalibration Tool

use with

ZED UV Sensors D-SiC
ZED 185nm Sensors D-VUV



Sensor
Configurator
Software

USB to RS485
Adapter

... individual adjustment
of ZED D-SiC analog UV sensors

... individual setup
of digital ZED sensors for ModBus operation

optional:
self-reliant sensor recalibration

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for detailed technical specification
see datasheets at:

www.z-e-d.com/sensorconfigurator

Features

analog ZED UV-C sensors with **enhanced variety of signal interfaces** for replacing analog UV-C sensors in almost all UV-C systems

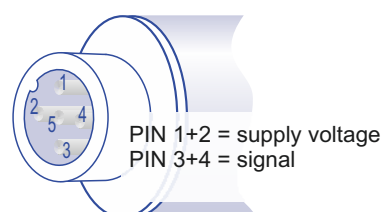
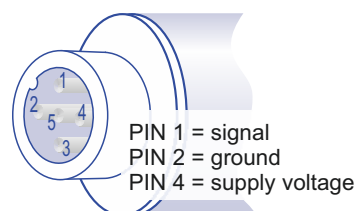
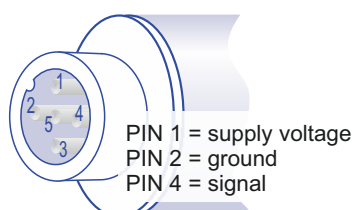
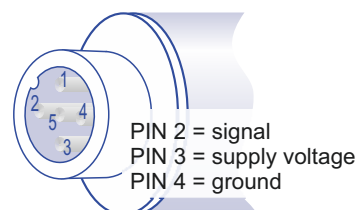
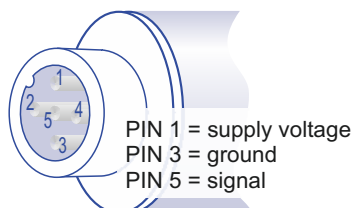
- ✓ common output signals
 - 0...1V / 2V / 3V / 5V / 10V
 - 4...20mA (3wire)
 - 4...20mA (2wire, loop powered)
- ✓ common sensor connector types:
 - M12 5pin male
 - M12 5pin female
- ✓ common connector pin configurations
- ✓ common housing designs
- ✓ wide supply voltage range:
 - 5V...27V DC
- ✓ available for
 - low pressure UV systems up to 500W/m²
 - medium pressure UV systems up to 3000W/m²
- ✓ spectral range 220...290nm
- ✓ high stability of measurements over time due to special quartz optics



Abstract

analog sensors with most common signal interfaces

Examples



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24V DC Ballast for Off-Grid Applications

Features

- electronic ballast for low pressure lamps for solar panel or battery supply
- supply voltage 24V DC
- lamp power up to 40W
- preheat start types available
- high efficiency > 85%
- inrush current limitation
- reverse polarity protection
- lamp status indication (lamp on / fault)
 - green and red LED
 - dry relay contact
- metall housing, designed for optimal thermal flow
- dimensions: 170x56x79mm (6.69x2.20x1.92inch)

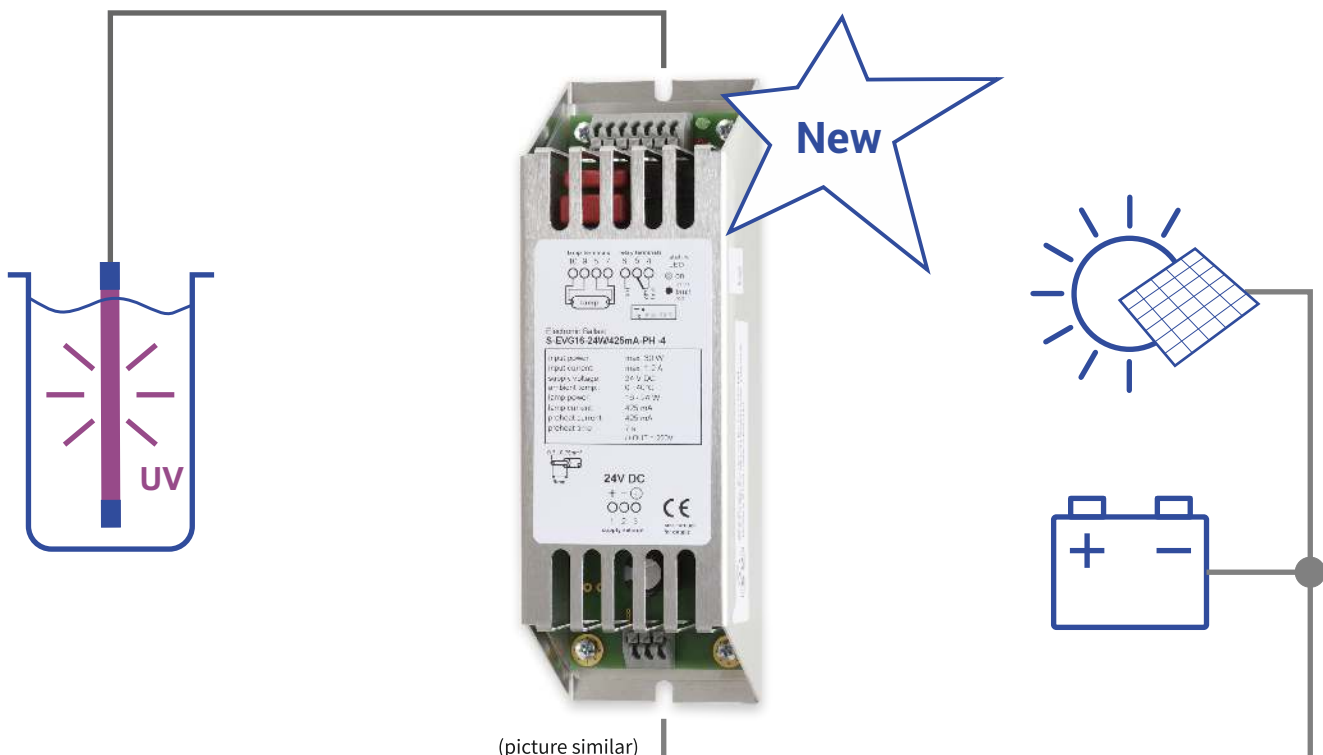
Abstract

lamp power	up to 40W
lamp current	up to 440mA
supply voltage	24V DC

use with

lamp types

GPH303T5L
GPH436T5L
TUV16W (T5)
TUV20W (T5)
G36T5
TUV 36T5
TUV PL-L 36W/4P



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PPT - Perfect Performance Tool

Features

- Optimized amalgam lamps for water treatment applications
- Constant UV output in a wide range of water temperatures at full power
- Predictable UV output at all dimming levels even on very low and very high water temperatures
- Standard lamp dimensions - existing UV system designs can be upgraded for better performance
- 'Out of arc' amalgam lamps 250 – 1000W (= T9, T10 or T12) can be used as basis for PPT lamp designs
- Ready to use - T10 and T12 'out of the box' PPT lamp-ballast sets are available containing PPT lamp, suitable quartz sleeve and specific electronic ballast
- Best energy efficiency
= best cost efficiency
= best carbon footprint
- Reduction of power headroom of the UV system due to predictable UV output for normal flow and peak flow on different water temperatures
- No extra wires required for PPT operation (four lamp wires only)



**Ready to use:
T10 and T12 'out of the box'
PPT lamp ballast sets available**

**PPT-Set =
amalgam lamp
+ ZED ballast
+ quartz sleeve**

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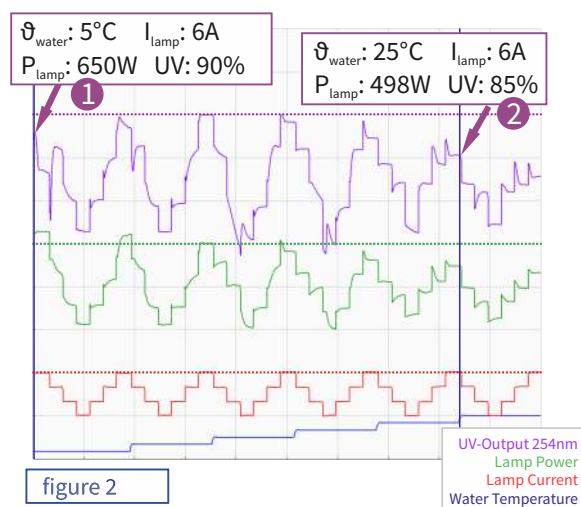
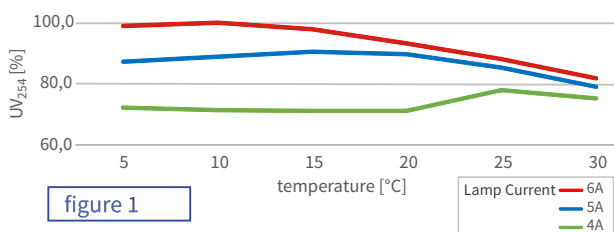
info@z-e-d.com

Short Introduction

The UV-output of low-pressure amalgam UV-lamps is strongly dependent on temperature conditions. Small changes of ambient temperature could result in a significant drop of UV-output. The same effect can be noted when a lamp is operated in dimmed mode. Since the lamp dissipates less heat if operated with less power, dimming the lamp is changing its temperature – thus significant variations in UV-output might occur. These variations may be even greater the more the ambient temperature is changing.

Original lamp

Figure 1 shows the average UV output over several water temperatures on a typical amalgam lamp.



The actual temporal UV profile of this lamp at different water temperatures is shown in figure 2. Point (1) and (2) are indicating a selected UV value at identical lamp current values for different water temperatures. A temperature raise from 10°C to 25°C leads to a UV decrease of 15% for this lamp.

PPT lamps generate very predictable and stable UV-output values for all dimming levels in a wide range of environmental temperature. Besides that, due to the high stability, higher peak design power can be achieved – resulting in a higher UV-output. Besides stable and predictable UV-output, using PPT lamps may save energy and hardware equipment.

PPT lamp

The appropriate characteristics of the PPT lamp are shown in figure 3 and 4. The UV output is uniformly stable irrespective of water temperature and electrical power.

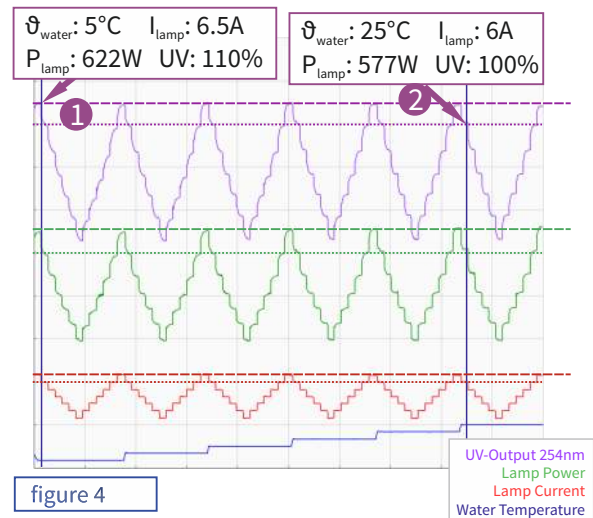
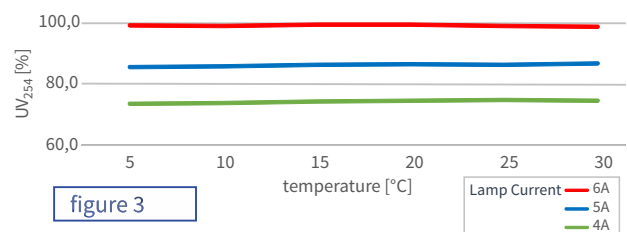
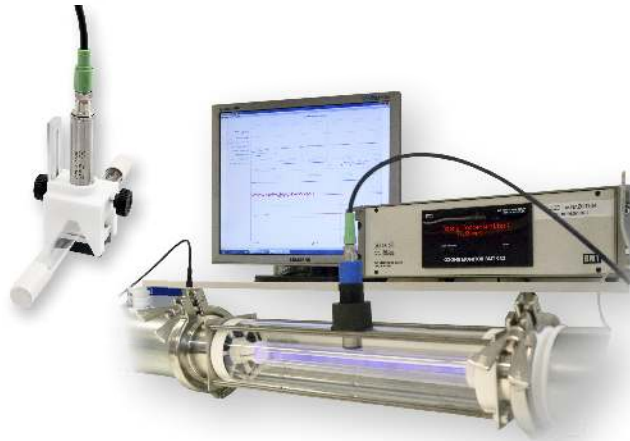


Figure 4 additionally shows the lamp operation with raised lamp current. The UV output remains stable. That means an 20% increase of UV output compared to the original lamp is possible when using the PPT. So the number of UV lamps could be reduced in large facilities.

VUV-Measurement

Measurement and visualization of:

- all relevant electrical lamp parameters
- VUV by contact 185nm, 172nm
- Datalogging (trend file, csv / jpg export)



UV Lamp Performance Measurement – Forced Air

Measurement and visualization of:

- all relevant electrical lamp parameters
- UV / VUV by contact 254nm, 185nm, 172nm
- Ozone concentration up to 250ppm
- Airflow, humidity and temperature
- Datalogging (trend file, csv / jpg export)

Variable forced air flow from 0,25m/s (4,5m³/h) up to 10m/s (180m³/h)



Medium Pressure UV Lamp Performance Measurement – Forced Air

Measurement and visualization of:

- all relevant electrical lamp parameters
- UV-A/B/C
- Spectral analysis 200-500nm
- Lamp surface temperature
- Visual analysis
- Datalogging (trend file, csv / jpg export)

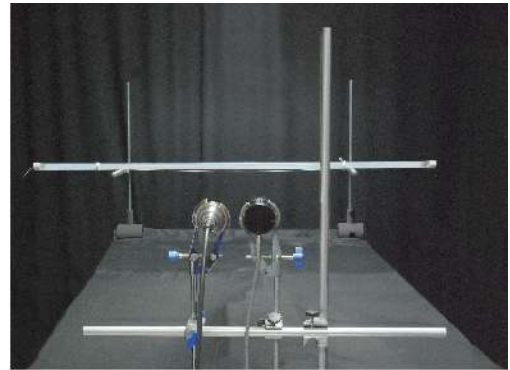


UV-Measurement according to IUVA recommendation

Measurement and visualization of:

- all relevant electrical lamp parameters
- UV output 254nm (W/m^2)
- Datalogging (trend file, csv / jpg export)

IL1700 + SED240 / ZED reference sensor



UV Lamp Performance Measurement – Water

Measurement and visualization of:

- all relevant electrical lamp parameters
- UV output 254nm (W/m^2)
- Datalogging (trend file, csv / jpg export)
- Ozone concentration up to 250ppm

Typical settings:

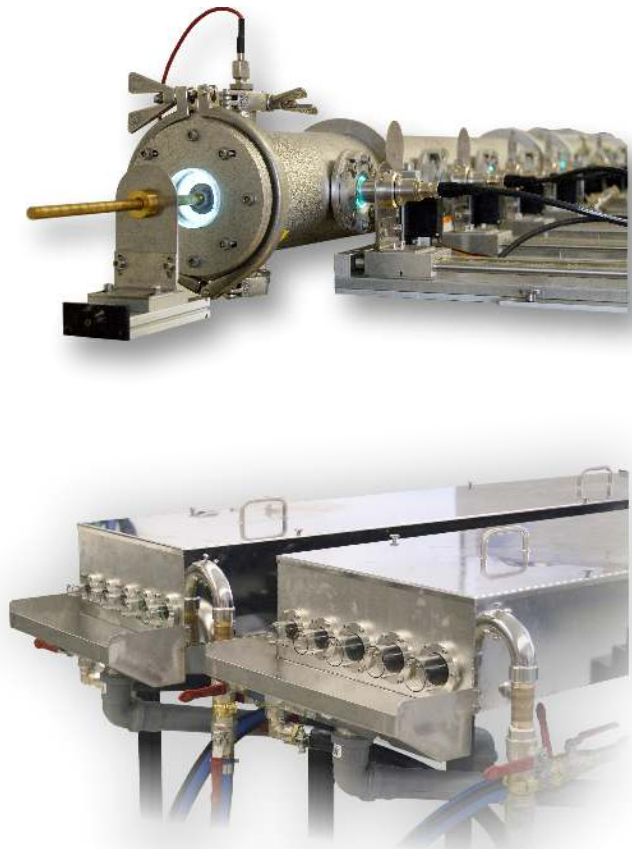
- 5...30°C water temperature (step size 5°C)
- 100...50% lamp current each temperature (step size 500mA, stabilization time 1h)

Multi sensor / single sleeve:

- horizontal & vertical lamp orientation
- sleeve inner diameter 22 / 26 / 40 / 45mm

Single sensor / multi sleeve:

- horizontal lamp orientation
- sleeve diameter 20...46mm



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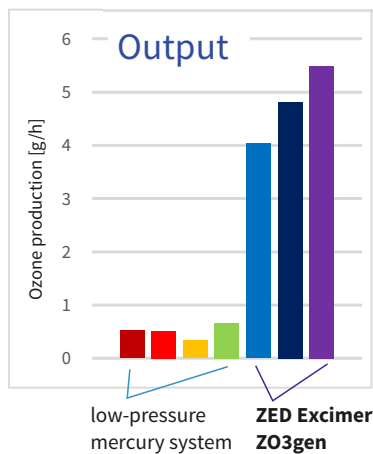
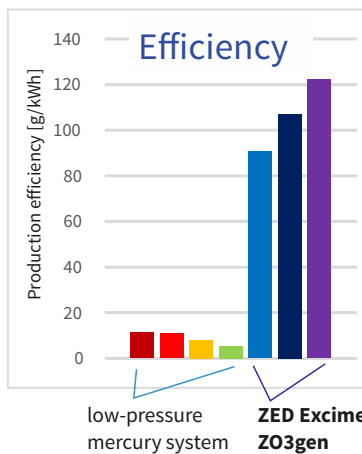
for further information contact

info@z-e-d.com

ZED Ozone Generator - Z03gen

Features

- cost-efficient ozone generation
- 172nm excimer technology
- mercury free
- instant start
- secure encapsulated design
- modular and compact
- highest efficiency
- no infrared generation
- high quality and reliability
- longlife surface electrodes
- life time > 8.000 hours
- simple maintenance
- plug and play with standard fittings (DIN 32676, ISO 2852)



Available Designs

lamp length	200 mm	300 mm	400 mm
input power	45 W	45 W	45 W

Schematics

