

# **EMPRESS**

## **THE DUTCH POWERHOUSE**

### **(E 650 XXX YY)**

## **INSTALLATION MANUAL**

V20200201E



**IMPORTANT: READ CAREFULLY BEFORE STARTING INSTALLING THE  
FIXTURE. KEEP FOR FUTURE REFERENCE.**



# PREFACE

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## Thank you for purchasing the Dutch Powerhouse Empress (E 650 XXX YY)

This manual contains all the information needed to quickly familiarize yourself with the LED fixture. We kindly request you to read through this information carefully, before you start installing the LED fixture. This manual does not provide information of the electrical system, water-cooling system and mounting system. These systems must be designed/provided by the installer.

This manual is intended for the installer of the Dutch Powerhouse Empress (E 650 XXX YY). This manual is originally written in English. All other languages are translations of the original manual. Keep this manual safe!

This manual contains warnings that point out hazardous situations and important remarks. These warnings and remarks are grouped and represented as follows:

### **DANGER**

**Danger!** The signal word that indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

### **WARNING**

**Warning!** The signal word that indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

### **CAUTION**

**Caution!** The signal word that indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

### **NOTICE**

**Notice** The signal word that indicates information considered important, but not hazard-related (e.g.) messages relating to property damage).

The Dutch Powerhouse Empress (E 650 XXX YY), where XXX YY ZZ = where XXX =  
LB (Low Blue)            LBW (Low Blue + White),  
MB (Medium Blue)      MBW (Medium Blue + White),  
HB (High Blue)         HBW (High Blue + White),  
XB (Extreme Blue)      XBW (Extreme Blue + White) or  
BS (Broad Spectrum) is compliant to the following standards:

#### cMETus listed (ANSI/UL)

- UL 1598
- CSA C22.2 No. 250.0-08

#### CE

- Low Voltage Directive (LVD) 2014/35/EU
- Electromagnetic Compatibility Directive (EMC) 2014/30/EU

#### General

- Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU
- Eco Design Directive 2009/125/EG

Please check our website for our warranty policy.

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## For further information please contact:

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# 1 PRODUCT DESCRIPTION

## 1.1 Intended use



The intended use of the LED fixture is to stimulate plant growth by use of light. Typical environments for the grow light are greenhouses and indoor growing facilities. The Dutch Powerhouse Empress (E 650 XXX YY) can only be used with an active cooling system. This cooling system needs to be custom made by the qualified certified professional installer.

The Dutch Powerhouse Empress (E 650 XXX YY) is mainly used in the horticultural industry.

The Dutch Powerhouse Empress (E 650 XXX YY) may only be used within the operating conditions as specified in Paragraph 2.1.

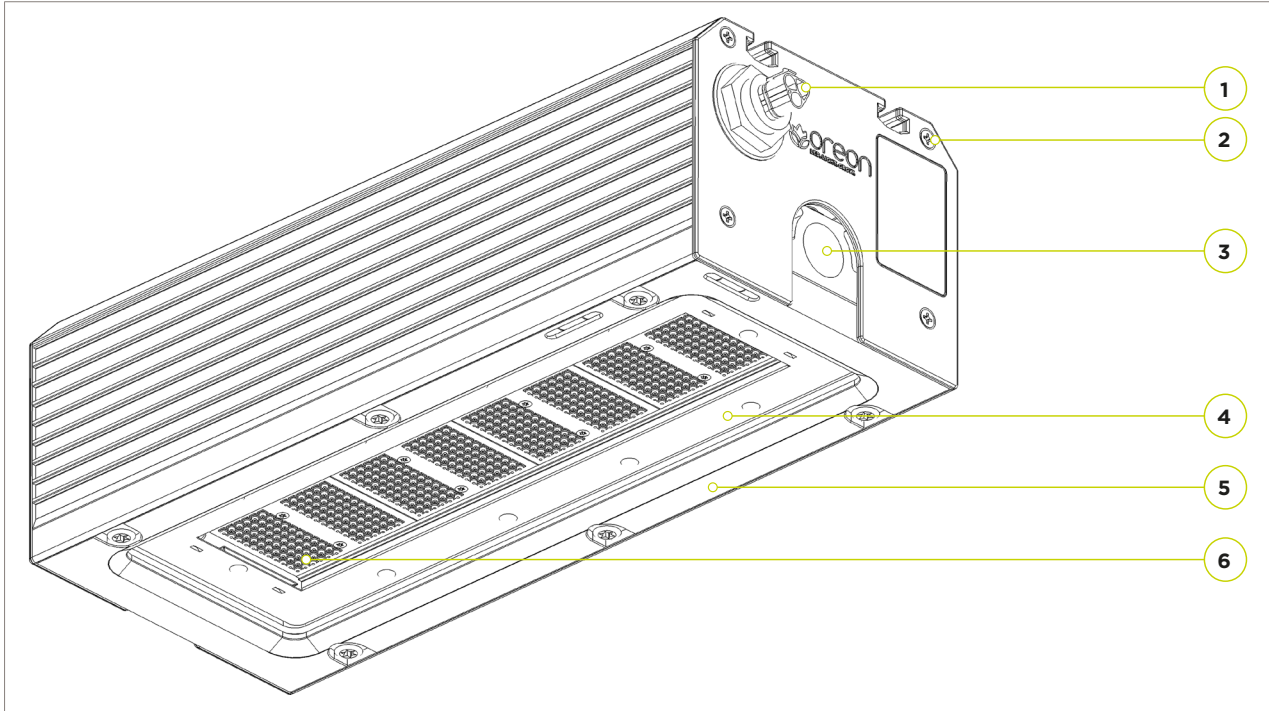
The Dutch Powerhouse Empress (E 650 XXX YY) is referred to as the “LED fixture” in this manual.

## 1.2 Symbols used on the product

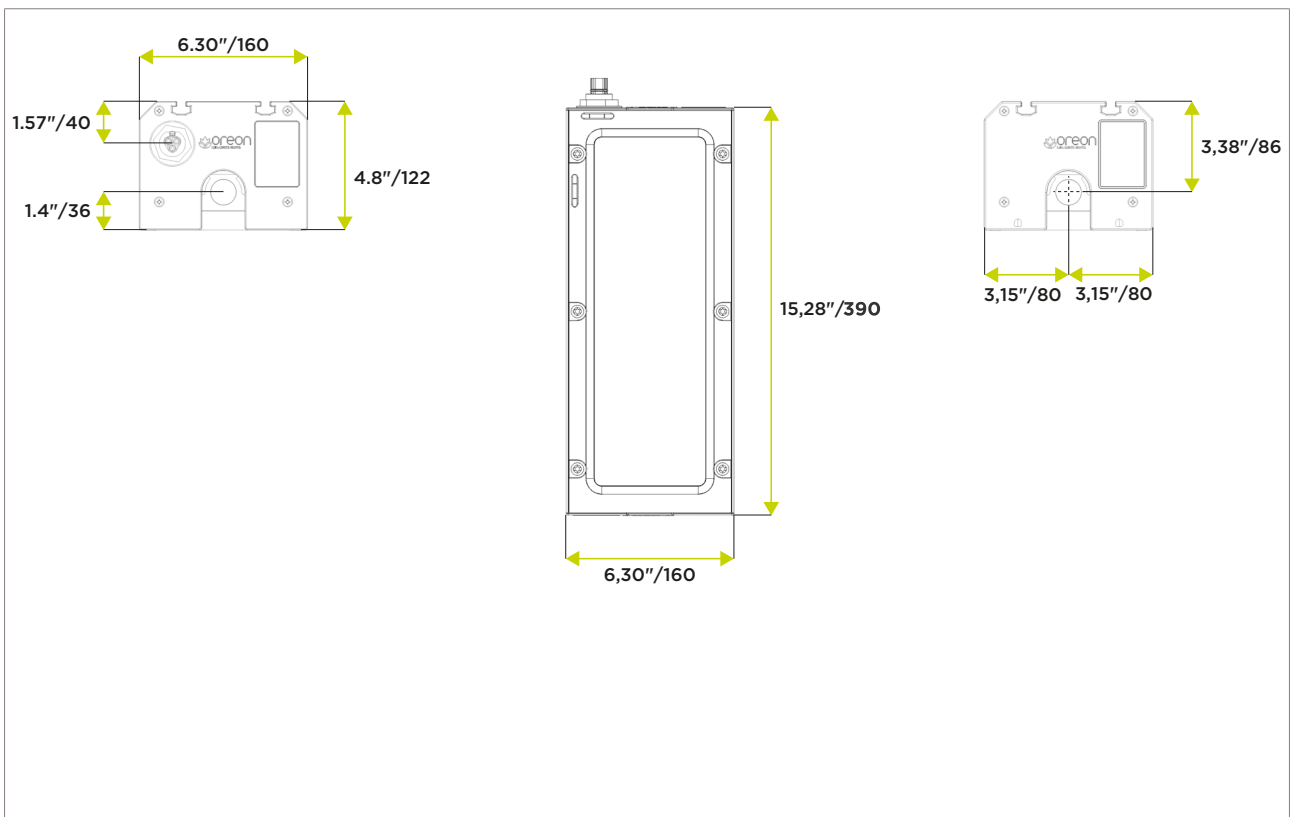
 <p>Risk Group 2 CAUTION. Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to the eye.</p>	Product is tested against EN62471
	The symbol on the material, the accessories or packaging indicates that this LED fixture may not be treated as domestic waste. Dispose of the equipment through a recycling centre that handles electronics and electrical appliances within the EU and in other European countries which use separate collection systems for used electronics and electrical appliances. By disposing of the equipment in the proper way, you will be helping to prevent potential risks to the environment and public health, which might otherwise be caused by improper handling of the discarded equipment. Recycling of materials contributes to the conservation of natural resources. Therefore, do not discard your old electrical and electronic equipment via the domestic waste.

### 1.3 Main components

1. Power inlet connector
2. T-slots for mounting
3. Water-cooling inlet/outlet (Pipe thread ISO 228 G3/ 4")
4. Glass cover
5. Aluminium enclosure
6. LED light source



### 1.4 General dimensions



## 2 TECHNICAL SPECIFICATIONS

### 2.1 General LED fixture specifications

#### NOTICE

See the Technical Datasheet for more specifications and properties of the LED fixture.

Power consumption	655 W ± 5%, depending on model
Power factor	> 0.96 @ 400 VAC
Supply voltage	200-480 VAC
Frequency range	50/60 Hz
Current range	3.5 - 1.5 A
Inrush current	< max. 40 A (t< 1msec)
Leakage current	< 0.75 mA @ 480 VAC
Recommended circuit breaker	type-K trip characteristic
Ambient operating conditions	32 to 113°F   0 to 45°C / 95% RH
Water-cooling inlet/outlet	Pipe Thread ISO 228 G3/4"
Power inlet connector <sup>1</sup>	Wieland RST20i3 male
Isolation class	Class I
Ingress protection	IP67 for LED module
Impact protection	IK-10 (IK-7 for glass cover)
Net. weight	19.0 lb   8,6 kg
LED fixture dimensions (l x w x h)	15.35" x 6.3" x 4.8"   390 mm x 160 mm x 122 mm

### 2.2 Cooling info light LED fixture

Heat imparted on the cooling liquid (W)	275-340 Watt (Depending on model)
Cooling liquid	Water
Cooling liquid temperature	From dew point to 113°F   45°C
Direction of flow	Can be both ways
Water connection	2x Pipe thread ISO 228-G 3/4" (26,4 mm)
Materials and corrosion	Use pipe fittings of a material compatible with aluminium. Do not use brass or steel fittings.
Water quality	Ideally the cooling water should have a PH-value between 4 and 8 to minimize any risk of corrosion.
Water filtration	Contaminated water should be filtered for optimal performance and cooling capacity of the light fixtures. Oreon advises a filter of 300 micron on the cooling system.

<sup>1</sup>To order the female Wieland connector, please contact Oreon.

### 3 PRECAUTIONS AND SAFETY INSTRUCTIONS

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#### **⚠ DANGER**

Follow proper grounding methods: The electrical system must be grounded. If you are not sure if your power system is grounded, DO NOT install the LED fixture. Contact a licensed electrician for information on proper grounding methods as required by your local electrical code. FAILURE TO FOLLOW THIS WARNING MAY LEAD TO DEATH, SEVERE INJURY, OR PROPERTY DAMAGE.

#### **⚠ WARNING**

- Ensure that the wiring meets the requirements in order to use the LED fixture within the specifications. The LED fixture is only suitable for a supply voltage of 200-480VAC.
- The LED fixture may only be installed by a qualified person.
- Use a suitable circuit-breaker that is able to handle the high inrush current of the LED fixture.
- Switch off the mains voltage before commencing installation or maintenance work.
- LED fixture installation must comply with the current applicable standards.
- Never roll up cables and ensure that connection cables are kept separate. This helps to prevent electromagnetic interference.
- The electrical power must be clean and have stable voltage and current and undistorted waveforms. The LED fixture contains a discrete surge protective device, but it is highly recommended to install suitable surge protective devices in the electrical panels to prevent damage by surge events. Failure to ensure power quality requirements will void warranty.
- The LED fixture must be installed in accordance with your local electric code. Oreon recommends that installation is only to be performed by a qualified electrician.
- Do not open or disassemble the LED fixture. Opening the LED fixture can prove hazardous and will void the warranty.
- Never exert excessive pressure on the LED casing.
- The warranty does not cover damages caused by misuse or improper handling of the LED fixture.
- Risk of eye injury! The high intensity light, produced by the LED fixture, can cause severe damage to the eye if viewed directly at close range. Avoid staring into the light or wear suitable protective eyewear.

#### **NOTICE**

The end user is responsible for ensuring correct installation and use of the LED fixture. Incorrect installation can cause damage or defects to the LED fixture. The warranty will void if the LED fixture and/or electronic components are damaged due to incorrect installation.



## 4 INSTALLATION

### Before installing the LED fixture, make sure that:

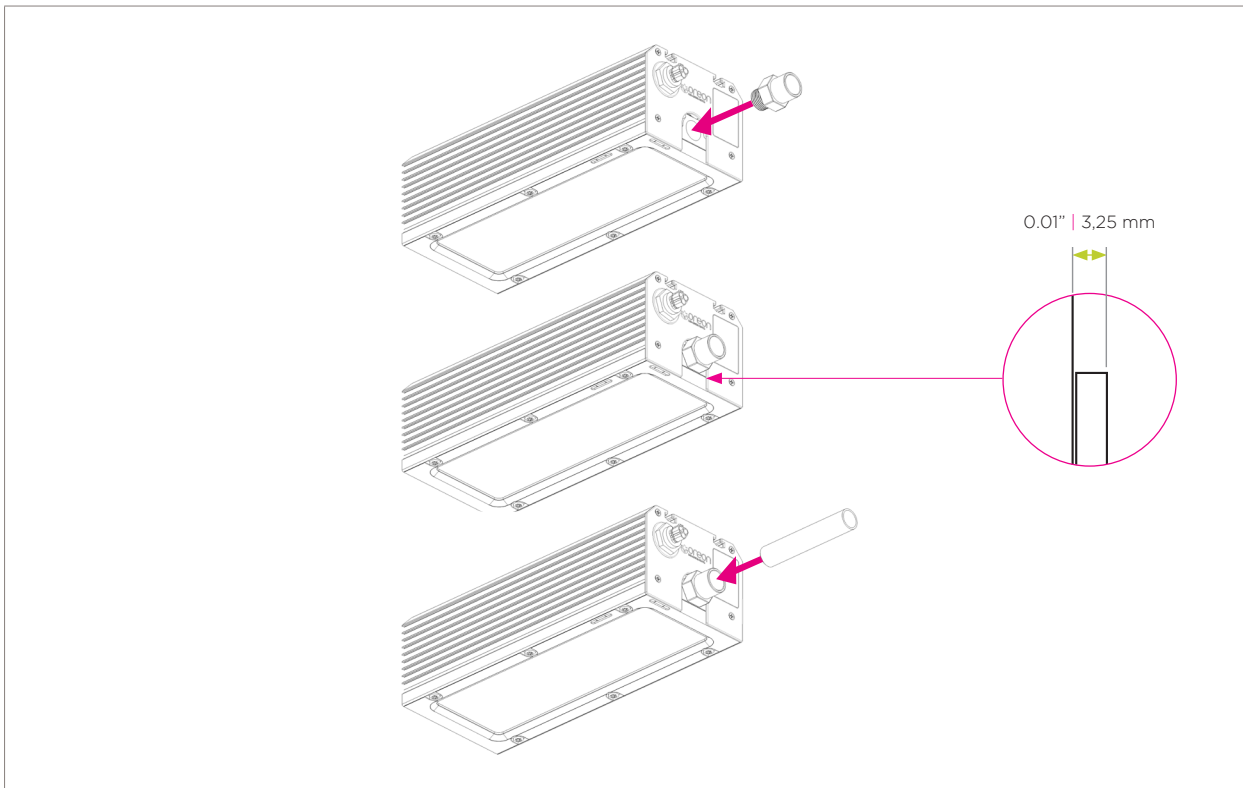
- The electrical system and water-cooling system are installed by the installer. These systems must be custom made. Oreon advises to install the water-cooling system in a closed loop system according to the Tichelmann configuration. It is highly recommended to consult a licensed mechanic/installer for the total design of the cooling system. If any questions arise, please contact Oreon. See Appendix I Water-cooling installation.
- You have chosen a mounting system which is suitable for the LED fixture, the amount of LED fixtures and the installation area.
- You own a lighting plan of the installation area. The lighting plan is made by Oreon and determines the number of LED fixtures that will be used in an installation. Every lighting plan is customized to the specific needs of our customers. The lighting plan determines where the grow lights will be located and specifies the electrical system and water-cooling system.

1. Switch off the mains voltage.
2. Read the lighting plan and make sure you are familiar with it.
3. Gather the equipment for mounting the LED fixture.
4. Mount the LED fixtures with the chosen mounting system.

The LED fixture has a water channel which makes it possible to cool the LEDs using water. The LED fixture has an inlet and an outlet to allow water flow through the lamp. The inlet/outlet are equipped with a standard G 3/4" inner thread. Use a pipe fitting with G 3/4" outer threading to connect the pipes to the inlet and outlet.

### To connect the LED fixture to the water-cooling system, follow the steps below:

5. Cut the tubes used to transport the cooling liquid to length. Connect the LED fixtures using the tubes. Calculate tube length? Note: thickness of the end plate and add 0.01" | 3,25 mm

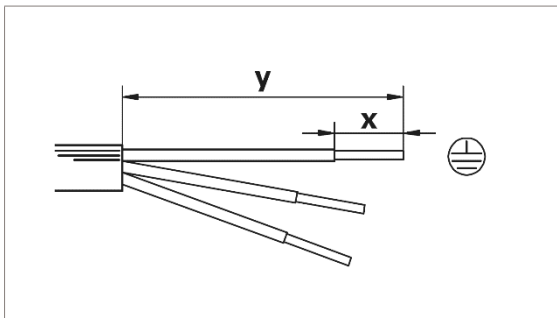


To connect the LED fixture to the electrical system, follow the steps below:

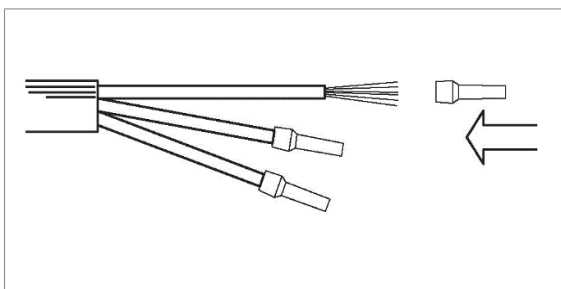
## NOTICE

You can order the female Wieland connector from Oreon. Please contact Oreon for details.

6. Strip the appropriate length of cable. ( $x=8\text{mm}$ ,  $y=30\text{mm}$  for PE wire & 25mm for N and L wires).



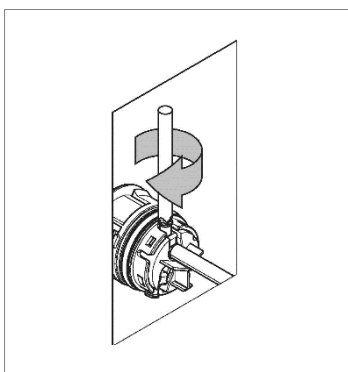
7. Crimp ferrule to the cable using the appropriate tool.



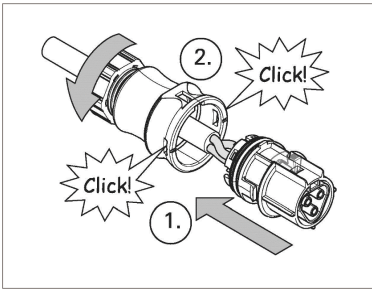
## ⚠ DANGER

Make sure to turn off the power before connecting the cable in the junction box.

8. Connect the wires of the electrical installation to the Wieland Female connector (torque typ. 0.8...1Nm). Use the required cable types as specified in paragraph 2.1.



9. Close the connector and tighten the cable gland (torque type 4+1 Nm).



10. Connect the female connector to the male connector integrated in the LED fixture.
11. Attach the LED fixture to the rail by choosing the correct mounting system.

## 5 INITIAL STARTING

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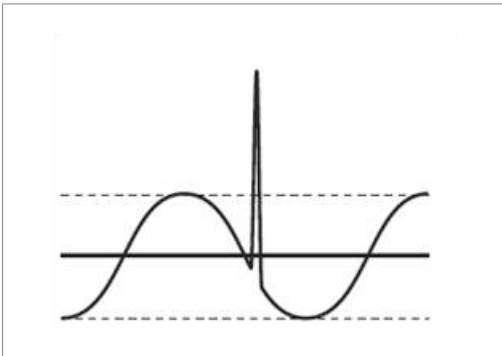
Installations containing a large number of LED fixtures may require specific requirements for start-up and shutdown of the installation. Consult a qualified electrician for the design of the electrical installation.

### Switching on

The LED fixture can have a considerable inrush current, therefore we advise against turning on a large number of LED fixtures at the same time. This can be achieved by switching on the LED fixtures in groups with a small delay (1 sec) between the groups. The dimensioning of the electrical installation determines the maximum number of LED fixtures that can be turned on together.

### Switching off

Depending on the characteristic impedance and length of the branch circuit, a sudden shutdown of all LED fixtures could cause a high voltage surge that can be damaging to the equipment connected to the branch circuit. Therefore an installation with a large number of LED fixtures should be designed in such a way that the LED fixtures are turned off in a sequence of groups of LED fixtures.



### NOTICE

See Chapter 8: Troubleshooting if the LED fixture fails to light up.

## 6 MAINTENANCE AND DISPOSAL

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### 6.1 Maintenance

1. Check the LED fixture at regular intervals for build-up of dust and dirt. Clean the LED fixture if necessary. Contamination can lead to overheating and reduced performance.
2. Clean the LED fixture with a dry, slightly damp cloth or use a garden hose if the LED fixture is very filthy.
3. In the event that the LED fixture is to be stored, it must be kept in a dry, non-condensing and clean environment with an ambient temperature of 0°C / 32F to 60°C / 140F, 85%RH.

### 6.2 Disposal

The product should be dismantled and disassembled safely and in an environmentally friendly way, in line with the rules defined by the national authorities.

## 7 TROUBLESHOOTING

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### **⚠ WARNING**

Do not open or disassemble the LED fixture. Opening the LED fixture can prove hazardous and will void the warranty.

### **NOTICE**

In the event that the LED fixture is defective or damaged, contact the dealer or installer. Never switch on a defective or damaged LED fixture.

What can you see?	What is the cause?	What should I do?
LED fixture turns off unexpectedly	The LED fixture is protected against overheating and will turn itself off when there is no cooling liquid flowing.	<ul style="list-style-type: none"><li>• Check cooling after ensuring cooling water is flowing.</li><li>• Switch off the power and then turn the power on again. The LED fixture should now work again.</li></ul>

If you have any questions about the LED fixture, or about the installation of the LED fixture, please contact us.

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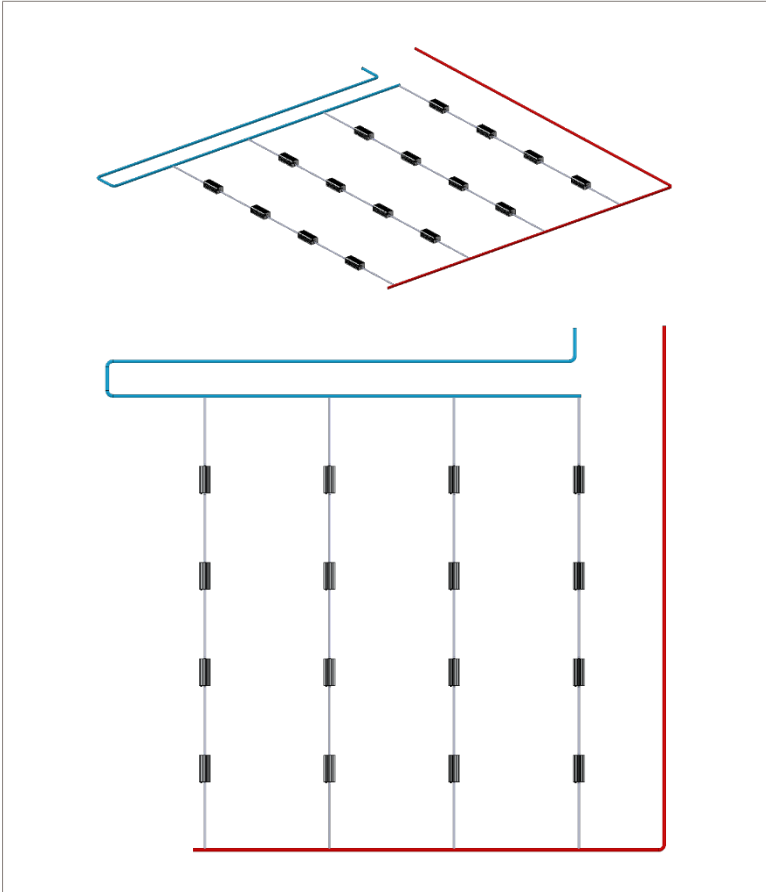
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Oreon cannot be held liable for any direct or indirect (consequential) damages as a result of any wrongful installation of the LED fixtures when the steps in the installation manual have not been followed in detail.

## APPENDIX I WATER-COOLING INSTALLATION

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Oreon advises to install the water-cooling system according to the Tichelmann configuration.



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