



AIR QUALITY MEASUREMENT

AUTONOMOUS 24/7 POWER SUPPLY SOLUTION

FOR LATEST ENVIRONMENTAL SENSORS IN SMART CITIES

Project description

Air quality measurement and monitoring is part of the "Smart City" concept for digitalization of the infrastructure – here using Darmstadt as an example. In order to achieve the most comprehensive monitoring of air quality, around 40 measuring locations were defined. In order to save costs for laying new cables, the VAISALA AQT530 sensor system including the data gateway should be installed on site at street lights and supplied with 24 VDC via their 230 VAC power connection. Since the lighting only carries electricity in the dark, a continuous power supply was not guaranteed. Therefore, in close collaboration with Bicker Elektronik, a buffered power supply was created for safe operation around the clock.

The challenge

The new AC/DC UPS solution to be developed for outdoor use should be designed in such a way that the sensors and gateway can be reliably supplied with power at all times and for many years. The buffer storage must be optimally charged at night in order to have sufficient energy available during the day. It was important to take into account climatic and seasonal changes (illumination time), as well as quality and safety aspects.

➤ AQT530 Air Quality Transmitter

In addition to measuring fine dust particles and trace gases, the AQT530 also documents the air pressure, humidity and temperature of the ambient air.

These trace gases and fine dust particles can, among other things, be recorded:

- Nitrogen dioxide (NO₂)
- Nitrogen monoxide (NO)
- Carbon monoxide (CO)
- Ozone (O₃)
- Particulate matter:
PM_{2,5} und PM₁₀



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VAISALA



„We are working on innovations to better understand and forecast weather and environmental phenomena. Thanks to the cooperation with Bicker Elektronik, completely new possibilities have opened up for using our measuring systems autonomously in 24/7 continuous operation.“

Jens Dickau , Sales Manager Road Weather Systems Vaisala GmbH

The solution

With the tailor-made UPS solution UPSI-2406IP-38AC, the engineers at Bicker Elektronik were able to optimally meet the requirements profile. The robust and weatherproof IP65 aluminum housing protects the highly efficient AC/DC converter with wide-range input, the UPS control and charging technology and the newly developed LiFePO4 high-performance battery pack. This battery technology and the integrated battery management system (BMS) ensure maximum safety, a particularly long service life and outstanding performance at extreme temperatures. This means that a highly reliable and uninterrupted power supply is guaranteed at all times, even under demanding operating conditions.

Advantages & customer benefits

By using the UPSI-2406IP-38-AC, the complex and costly laying of new power lines for the permanent power supply of the environmental sensors could be avoided. Thanks to the intelligent and powerful outdoor UPS solution with LiFePO4 buffering, the time between the lighting intervals of the street lights can be safely bridged – even in the summer months with short charging times at night. The UPS system also offers reliable protection as an emergency power supply in the event of a power failure, flicker or voltage dips.

UPS-2406IP-38AC



Robust AC/DC UPS with IP65 protection for extreme environments

- 144 W / 24 V / 6 A
- AC wide-range input
- LiFePo4 energy storage
- Aluminum housing IP65
- Wall or pole mounting
- IEC/EN 62040-1 approval
- Operating temperature range -20...+50 °C



More information & Photos
<https://bit.ly/3Jf71cw>

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