

# Environmentally Friendly Football Stadium – Simply easy

New sports stadiums were built for the World Cup 2006 in Germany and others were modernised to meet the demanding requirements involved. This was also the case for the Gottlieb-Daimler stadium in Stuttgart, where environmental protection was also part of the extensive modernisation measures. Structures of this size represent a real challenge to the water supply and drainage system. ARIS, a leading manufacturer in rainwater harvesting systems, made use of Moeller's easy control relay.

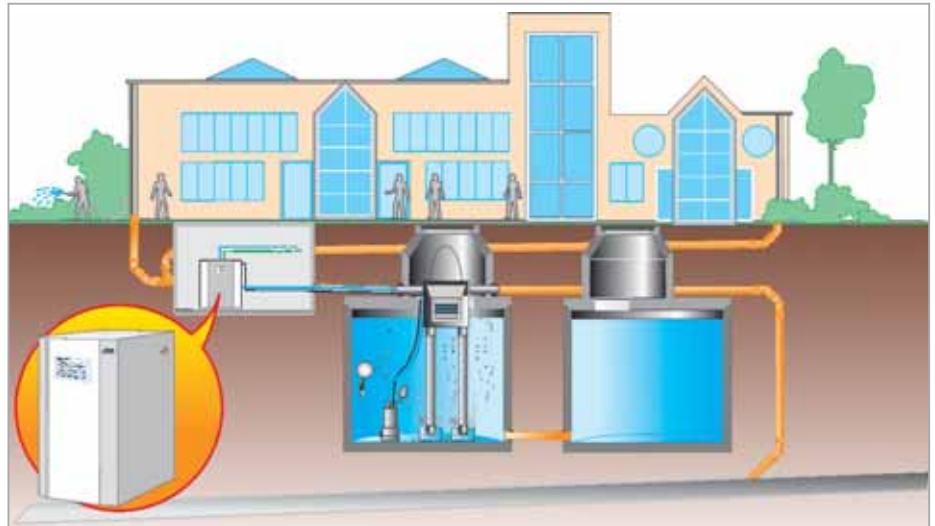


Picture: Landeshauptstadt Stuttgart, Sportamt

## Harvesting rainwater

The Gottlieb-Daimler stadium in Stuttgart is now one of the most advanced and purpose-built sports stadiums in Europe and will be the venue for six 2006 World Cup matches. The distinctive feature of the Gottlieb-Daimler stadium in Stuttgart is the steel cable truss construction of its membrane roof. The roof covers all the spectator seats with a total area of approximately 32 000 m<sup>2</sup>. When it rains, the large volumes of resulting surface water normally have to be removed via the drainage systems. The modernisation measures for the stadium included the construction of a 350 m<sup>3</sup> underground cistern in which the rainwater from around 14 000 m<sup>2</sup> of roofspace is collected and stored. This stored rainwater is primarily used for watering the grass areas and rinsing the toilets. This saves the Gottlieb-Daimler stadium annually around 8 000m<sup>3</sup> of drinking water and is the equivalent of two thirds of the annual requirement. The harvested rainwater is filtered entirely mechanically without any external power source and is made available without any chemical treatment.

The core of the fully automated rainwater centre of the ARIS modular rainwater harvesting system is the function tank that is specially designed for the building and is provided with a pressure booster system and drinking water supply. Four booster pumps with a delivery rate of 25 m<sup>3</sup>/h ensure a constant system pressure of 7.5 bar. The pumps are equipped with Moeller soft starters from the DS4 series in order to prevent water pressure surges caused in hydraulic systems during switching operations. During long drought



periods and if the cistern is empty, the drinking water is topped up in the function tank by means of a solenoid valve. Another feature of the ARIS rainwater harvesting system is the patented KIM! sensor: KIM! stands for 'cable-free integrated measuring process' and therefore measures the level of the cistern without the need for any external sensors.



## easy controlling, monitoring and signalling

An easy821-DC control relay controls the rainwater centre. The analog inputs of the easy device are used to monitor the system pressure and level in the function tank as well as in the cistern. The four booster pumps are controlled depending on the set pressure. The control relay switches the individual pumps on or off according to the pressure and also handles the exchanging of pumps. The control relay detects important system information such as leakages, any slight seepage in the system or pipe breaks and relays this information accordingly.

Thanks to the analog inputs integrated in the easy device and the software functions, the levels in the function tank and in the cistern can be measured very cost-efficiently. The levels are evaluated internally in advance for the system control and indicated as a percentage in the display integrated in the easy device. All specific system parameters can

be entered rapidly and simply in the parameter menu of the control relay. System states and operating data are shown in the display. The integrated KIM! sensor system allows straightforward and fast installation and commissioning of the system, even when the cistern is already filled.

## Open communication

Communication modules can be used to connect the easy devices to Ethernet, Profibus DP, CANopen or DeviceNet. The OPC server is a standard feature of easy800 devices for simpler remote visualization and operation. An easy control relay can be integrated without any problem in the building services management system or connected to SCADA systems via the OPC server.

## THE COMPANY

ARIS GmbH, is based in Wernau and was founded in 1997. It produces complete systems for rainwater harvesting, storage and drainage. Several related patents underline the competence of ARIS in this future-oriented branch. The services of ARIS range from consultation, support during planning and engineering via manufacturing, up to turnkey systems and service. The systems are installed via local specialist companies. Contact: [www.aris-systeme.de](http://www.aris-systeme.de)

## CONCLUSION

With easy, ARIS was able to replace the previous proprietary control system in its modular rainwater harvesting systems with a control relay that is widely used and well-established on the market. Decisive factors for their choice were its outstanding price/performance ratio and the ability to expand easy at any time. With Moeller's easy, ARIS was also investing in a future-proof system under continuous further development, which also allows data exchange to other controller systems and remote diagnostics and maintenance.



MS1312