



Energy consumption and water waste reduced for the Torbole Casaglia booster station

LOCATION: Municipality of Torbole Casaglia (BS), Italy

CLIENT: Mauro Olivieri, Technical Director of Acque Bresciane and Luca Milani, Works Assistant, Acque Bresciane Technical Department

DESIGN: Denise Paghera, Engineer, Acque Bresciane

COMPANY CONSTRUCTING THE PLANT: IPTA Srl

PLANT END-USER: Acque Bresciane, provider of the Integrated Water Service in the Province of Brescia

Thanks to the installation of Grundfos' DDD electronic system, which controls and manages the submersible pumps ensuring the highest efficiency, the Brescia Province Integrated Water Service provider now saves 90,000 kWh of energy and 50,000 cubic metres of water per year.

The situation

With resolution 35/2016 of 28/10/2016, the Provincial Council of Brescia decided to entrust the Integrated Water Service – consisting of the set of public services for the catchment, supply and distribution of water for civil use, sewerage and wastewater treatment – to Acque Bresciane S.r.l., a company wholly owned by the Municipalities, which has proven to adequately ensure full compliance with the so-called 'in-house providing' model of direct awarding. Acque Bresciane S.r.l. currently manages aqueduct, sewerage and purification services in 98 Municipalities

in the Brescia province, with a catchment area of about 600,000 inhabitants, and controls over 1,000 plants, 4,500 km of aqueduct and 2,800 km of sewerage; the company employs about 300 people, between the main offices of Rovato and Padenghe sul Garda. For the Torbole Casaglia booster plant, there was the need to assess the feasibility of an optimisation and revamping operation to reduce energy consumption as well as to improve operating pressures and, consequently, network leakage volumes.

The solution

Reviewing the results of similar experiences in previous years using the Grundfos electronic DDD (Demand Driven Distribution) system, which manages and controls the activity of the pumps in a given plant, Acque Bresciane chose to install the Control DDD 4x22kw + LC + RTU system combined with 4 model SP95 submersible well pumps, designed for pumping groundwater. «The project involved the revamping of the Torbole Casaglia aqueduct booster station,» explains Mauro Olivieri, Technical Director of Acque Bresciane, «improving the efficiency of the automation and control system of network pressures through the DDD management and monitoring system. It has proven to be very effective in similar installations, with excellent results in terms of reducing energy consumption; the reliability of the Grundfos electromechanical equipment also helped to validate our choice.»

As a result, the electrical system and the control and automation panels were completely rebuilt, and the Control DDD system was installed; after that, the four booster pump motors were replaced, followed by the installation of boosters and re-piping of the system. The work, the total cost of which required an investment by Acque Bresciane of around € 172,000, was completed with the architectural renovation of the utility rooms. «Grundfos supplied us directly with the DDD system; we then contracted the electrical, plumbing and construction work separately,» Olivieri specifies. «The customisation of this solution coincided with the opportunity to replace the pump motors with external boosters of equal power and, in terms of problems, we did not encounter any particular difficulties, neither with the design nor the installation.»



Mauro Olivieri, Technical Director of Acque Bresciane.



Exterior of the electric panel room at the Torbole Casaglia (BS) waterworks booster station.

The outcome

The system, which took around three months to fully install, has been in operation since June 2022 and today guarantees excellent results in terms of energy savings, reduced mains pressures and reliability of the electromechanical equipment. «During commissioning of the plant, during start-up and calibration of the DDD system, we dealt with the need for a progressive pressure regulation at the critical point,» Olivieri concludes. «Apart from that, we can say that the devices started to work immediately as expected and that we are more than satisfied with the result.» Indeed, the company went from 220,000 kWh/year pre-work to 130,000 kWh/year post-work, with annual savings of 90,000 kWh, i.e. 40% less energy. Thanks to the reduction in operating pressures, there have also been significant savings in water lost from the mains: the pressure at the critical point is now 3.5 bar, whereas initially, before the work, it was 4.5 bar. This resulted in a 10% decrease approximately in the volume of water fed into the mains, equal to 50,000 cubic metres less water used per year.



From right to left: DDD system, inverter, switches and control selector switches.



Booster station with motor replacement.



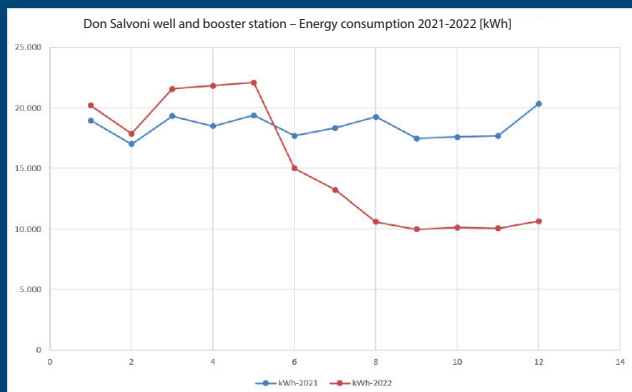
Inspection shaft: Critical Point pressure sensor.

Grundfos products installed

Control DDD 4x22kw + LC + RTU
4 SP95 submersible pumps

The advantages of Grundfos systems:

- quality of the materials
- reliability over time
- efficiency of devices
- energy savings
- savings in water use



Energy consumption trends in 2021 and 2022 – note the decrease in consumption from June 2022.

- Technical data on energy efficiency and cost savings concerning the Grundfos system:

Investment: 172,000 Euro

Reduction in energy consumption per year: from 220,000 kWh/year pre-work to 130,000 kWh/year post-work, an annual saving of 90,000 kWh

Energy savings: 40%

Economic savings: cannot be calculated due to the fluctuating energy costs in 2021-2022

Reduction in the volume of water fed into the mains: approximately 10%, i.e. 50,000 m³/year less water used

GRUNDFOS 

Possibility in every drop