Décovi SA, Vicques JU

By replacing the compressed air supply, Décovi SA in Vicques JU saves around 87 000 kWh of electricity per year and thus almost CHF 13 000 in electricity costs.

Décovi SA supplies precision-finished parts for the watch industry, medical technology or aviation. It machines a wide range of materials using turning and milling processes. Among other things, the company specialises in the production of flywheel masses for the watch industry, and receives regular requests from the major brands.
The factory building in Vicques JU was built in 2000 and has been expanded several times since then. Today, it houses around 90 employees and around 100 automatic turning and milling machines. These machines are supplied with compressed air via an approximately 800 m-long network of pipes. With the growth of the factory, the demand for compressed air also grew: in 2020, five compressors were in operation and responsible for around one fifth of the power consumption of the entire factory.

This historically developed constellation offered optimisation potential in several respects: the five autonomously operating compressors and their peripheral devices took up a lot of space, consumed a great deal of electricity and also tied up a lot of resources for their monitoring and maintenance. The system would probably have reached its limits with further growth. The compressed air supply system was therefore completely redesigned in collaboration with Schrad'Air Compresseurs SA.

The new system consists of three Renner compressors each with 45 kW capacity, one of which is equipped with a frequency converter. They are centrally controlled in cascade: the speed-controlled compressor runs constantly, the other two are switched on at full power when needed. The compressors are water-cooled and their waste heat is used to heat water and the building.

Compared to the old system, there is a capacity reserve of around 35 kW, which can also absorb future production increases. IE3 motors were used for the drives; in addition, a 45 kW motor has a better efficiency than three 15 kW machines. With the new arrangement, it was also possible to decongest the existing space and optimise the connections. As a result, it is less hot in the utility rooms and the required pressure is 0.3 bar lower. The control

Factory building of Décovi SA. Photo: Márton Varga, Topmotors

**Four old compressors in the old utility room.
Photo: Alain Chappatte, Energie du Jura**

system records all relevant operating parameters in real time, automatically creates reports and triggers alarms in the event of certain changes. For example, leakages in the widely ramified compressed air network or malfunctions in the compressors can be detected and quickly remedied.

Electricity consumption was measured for two weeks before and after implementation. The new compressed air generation saves around 87 000 kWh per year. This means that the investment will pay for itself in about 7.4 years. Thanks to the use of waste heat, the factory now only consumes as little fuel oil as a well-insulated single-family house. In the next few years, the last parts of the building will also be connected to the new 'heating system', completely eliminating CO_2 emissions.

The project was supported by the ProKilowatt funding programme under the direction of the Federal Office for Energy. The work was carried out by Schrad'Air Compresseurs SA; planning and implementation was supported by EDJ Energie du Jura SA.

«With the new control system I can monitor all compressors direct from my work station and detect malfunctions or leakages in the compressed air network much quicker.»

Pierre-Alain Broquet, Head of buildings and engineering

Topmotors
About one-third of the electricity consumption in Switzerland comes from industry. More than 70% is due to electric motor systems. Topmotors' priority is to give an impulse by encouraging the use of highly efficient motors and intelligent controls. All the Topmotors events, together with practical information, can be found here: www.topmotors.ch

The same utility room, with only one new compressor.
Photo: Michael Broccard, Schrad'air Compresseurs SA

Two new compressors in the spacious ventilation room.
Photo: Márton Varga, Topmotors

Comparison before/after		
	Before	**After**
Compressors	2x Kaeser SK 24 T, built in 2005 and 2009 1x Kaeser SK 25 T, built in 2011 1x Kaeser ASD 47 T, built in 2013 1x Renner RSF 1-30, built in 2016	2x Renner RS PRO 45, built in 2020 1x Renner RSF PRO 45, built in 2020
Motors	2x 15 kW, IE2 1x 15 kW, IE2 1x 25 kW, IE2 1x 30 W, IE2 with FC	2x 45 kW, IE3 1x 45 kW, IE3 with FC
Transmission	Each compressor individually	Centralised for all components
Installed power	100 kW	135 kW
Operating time	ca. 8 088 h/a	ca. 8 088 h/a
Electricity consumption	552 969 kWh/a	466 400 kWh/a

- Electricity saving per year: 86 569 kWh
- Cost saving per year: CHF 12 985
- Investment costs: CHF 127 198
- Subsidies ProKilowatt: CHF 31 652
- Payback: 9.8 years without subsidies, 7.4 years with subsidies