

Energy-autonomous automation

FESTO



Reduce costs with energy-autonomous automation of manual processes

Save time and reduce costs with energy-autonomous solutions

The manual operation of remote decentralised plants such as rainwater retention basins is costly in terms of both time and money. Travel to the location, actuate or inspect the system, travel back to the office: all of this takes time and is not very productive. The answer is energy-autonomous automation using photovoltaics while operation and monitoring take place in a central control room.

Connection to the power grid? Not necessary!

Ideal for remote locations without a public power supply. The autonomous system from Festo can be used to automate decentralised systems, thus eliminating the costs of connecting to the public power supply network.

A photovoltaic or wind power system generates the electrical energy needed to operate the

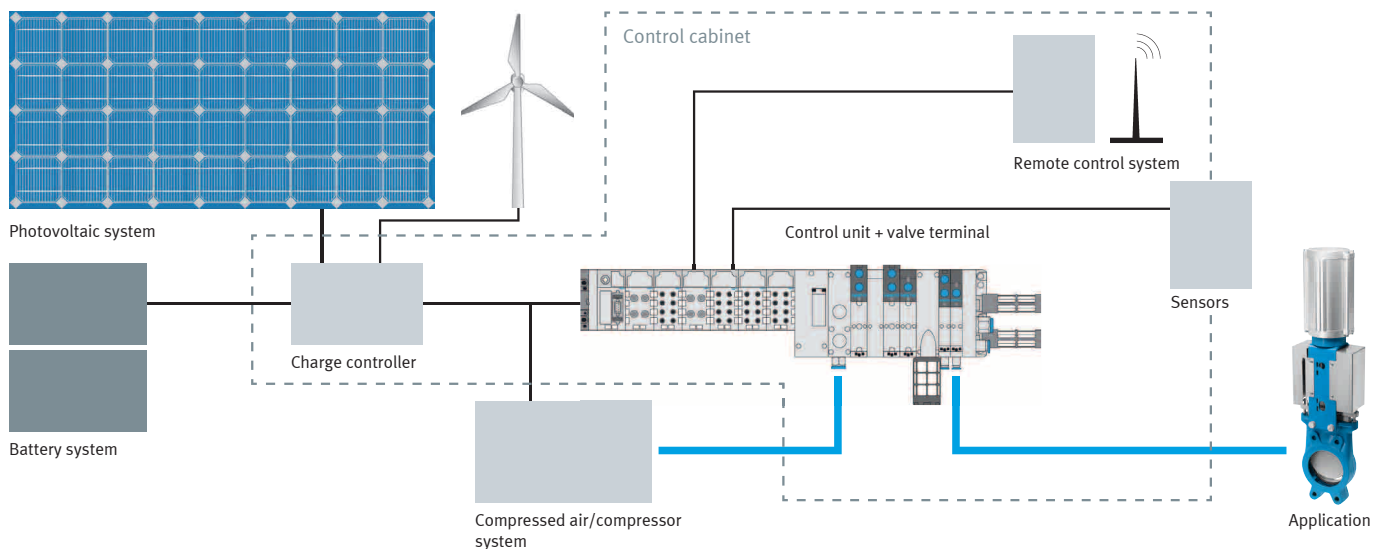
application. An air compressor and a rechargeable battery system as a power supply backup ensure safe and reliable operation of the pneumatic actuators. The air reservoir can be used for emergency operation in the event of a system failure, and a charge controller safeguards against overcharging and excessive discharging. Remote access takes place via UMTS/GPRS network with a GSM modem.

Individual dimensioning

This energy-autonomous station is individually dimensioned in terms of size and performance. Among the most important parameters are:

1. Location-specific data such as exposure to sunlight, orientation, presence of shade
2. Recording of the power consumption profile according to device type, duration of operation and operation period
3. Specification of the autonomy time required to ensure reliable operation in the case of an energy source failure.

The system components in detail



- Solar energy and wind power as energy source
- Battery system with lead-acid storage batteries for energy backup
- Energy management and protection against overcharging and excessive discharging with charge controller

- Pneumatic actuators for the process industry
- Compressed air generation with a compressor
- Air reservoir for emergency operation
- Remote access with GSM modem

- Monitoring and control with sensors via integrated controller CPX-CEC with valve terminal VTSA

“We’ve been using this energy-autonomous system to operate a rainwater retention basin for two years. During this time both the energy-autonomous solution and the use of pneumatic automation technology have proven their value, and have convinced us to continue using Festo systems in the future.”

Jürgen Michels
 Division Manager, Electrical Engineering
 Abwasserverband (wastewater association) Weißbach und Oberes Saalbachtal, Bretten, Germany

Complete monitoring for full control

All process-relevant data are recorded continuously both on-site and in the control room. On-site checks are reduced to a minimum.

Process control can be individually visualised according to your requirements.

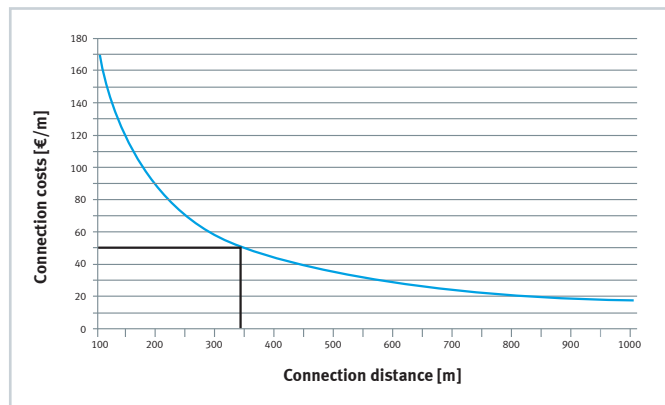
- Process characteristics such as gate valve positions
- Process status values such as charging level of the battery system, load current, charging/ discharging current
- Access to data and the controller is possible both on-site and from afar (e.g. control room)

Top quality for demanding environments

Valve terminal technology CPX/ VTSA from Festo combines electric and pneumatic control into a single robust housing. The proven system increases dependability and process reliability.

It pays off!

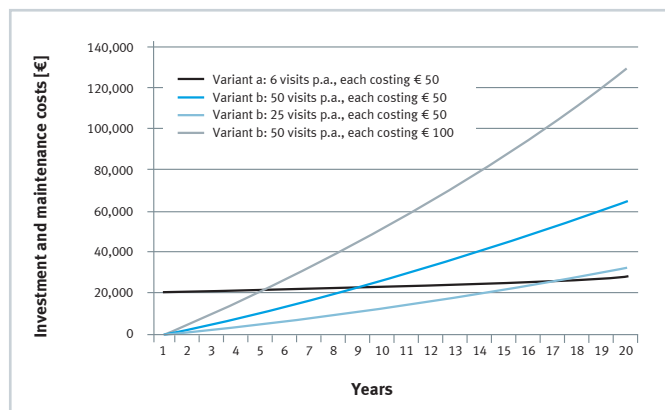
A quick look will tell you at which distance and service costs an energy-autonomous solution will pay for itself.



Cost limits for cable connection

From which point onwards is an energy-autonomous solution more economical than a cable connection?

For a typical system and grid connection costs of € 50 per metre, this would be the case from a connection distance of 340 metres.



Investment and maintenance costs for the automated variant (a) as opposed to various sensitivity studies for the non-automated variant (b).

With 50 on-site visits per year for the non-automated variant at a cost of € 50 each, the automated variant would be amortised in just 9 years – simply because of reduced staff costs.

Efficient and reliable – automated solutions with solar energy and pneumatics

This autonomous solution can be used wherever electrical power networks are unavailable, e.g. for decentralised control of rainwater overflow basins in the water and wastewater sector. The energy-autonomous system has already proven its value in this area.

The benefits to you

- We develop a suitable, individualised solution for your application
- Everything is provided by a single source, from the solar panels to the actuators
- You get an inexpensive, reliable solution
- The system is low-maintenance, eliminating many service visits
- Reliable remote access via VPN connection
- The system is matched precisely to your needs
- In the case of systems in remote locations, you avoid the high investment costs of connecting to the public power supply network
- You reduce staff and material costs through automation
- You have full control over the status of your system, even at a distance.
- Monitoring allows uninterrupted recording of process states

Energy-autonomous automation using a rainwater overflow basin as an example



Technical characteristics of the system:

- Operating voltage: 24 V DC
- Power supply: 3 solar panels, 1.46 m² each
- Power consumption: approx. 500 Wh per day
- Autonomy time: 5 days without energy harvest
- Number of gate valves: 2 x DN200 with pneumatic actuator DLP-160
- Actuators: 1 ... 2 full strokes per day per actuator
- Operating pressure: 5 ... 7 bar
- Protection class: IP65/67

