HOFFMANN TECHNICS AG
Elektroanlagen

POWER AND DRIVE SYSTEMS

AT24 UB SolarSync

Low voltage industrial drive

Hybrid control for continuous pumping

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Effective use of the sun's unlimited energy

System overview

The AT24 UB AquaSync offers an advanced pump control solution with features that enhance usability, efficiency, and durability. It combines all essential pump control functions in a single, powerful unit, ensuring optimal performance for a wide range of scenarios.

Key benefits

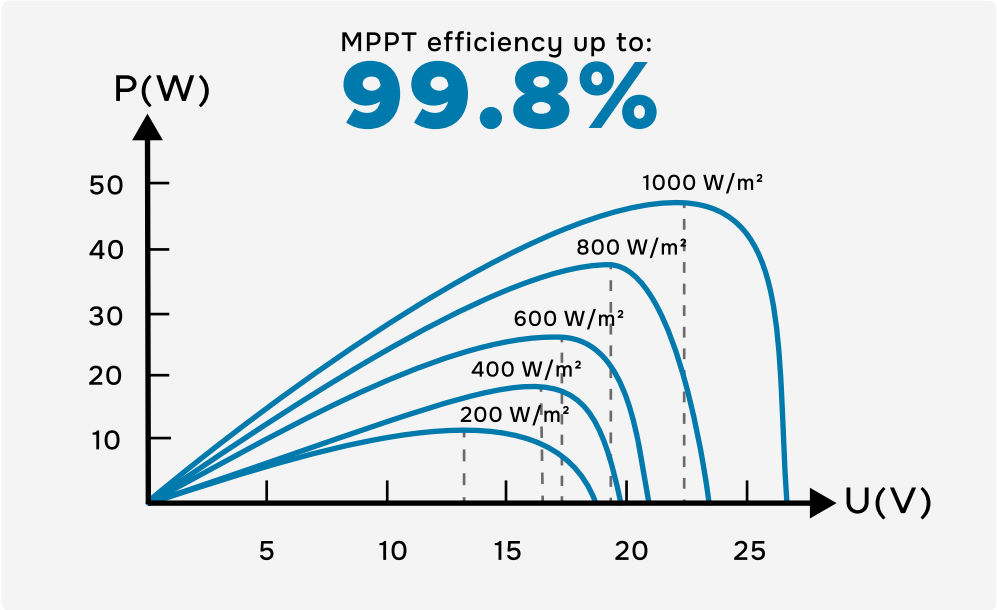
The main benefits of using this product are reduced energy costs, elimination of industrial power grid instability, improved environmental performance, and operation of pumping systems in remote areas where there is no centralised power supply.

Core functionality

The AT24 UB SolarSync includes all the necessary functions for optimal performance of solar-powered pumping: maximum power point controller for photovoltaic panels, intelligent power source management, and all main pump control functions.

Enhanced efficiency: maximum use of solar energy

The maximum power point controller for photovoltaic panels ensures maximum productivity and stable pump operation in(under) changing weather conditions, cloud cover, and reduced solar radiation in the morning and evening. The controller's various(adaptive) algorithms allow the system to(to maintain) operate in all possible conditions.



MPPT (Maximum Power Point Tracking)

The most effective mechanism for utilising energy from photovoltaic panels with automatic correction of maximum power voltage.

CVT (Constant Voltage Tracking)

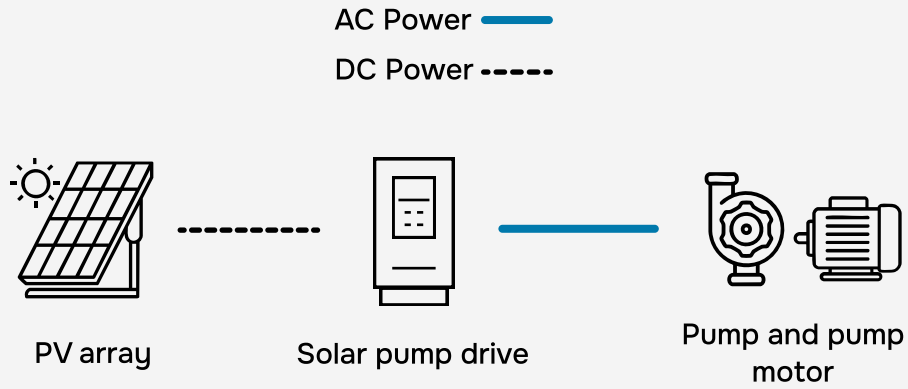
An algorithm with the simplest possible configuration, high stability, and sufficient efficiency under constant sharp changes in illumination with a static reference value of the maximum power point voltage.

Enhanced durability: stable operation

When the only power source is a photovoltaic panel, under certain conditions, problems with system stability may arise, which negatively affects the resource, reliability, and productivity of the system. The AT24 UB SolarSync takes these factors into account and minimises their impact.

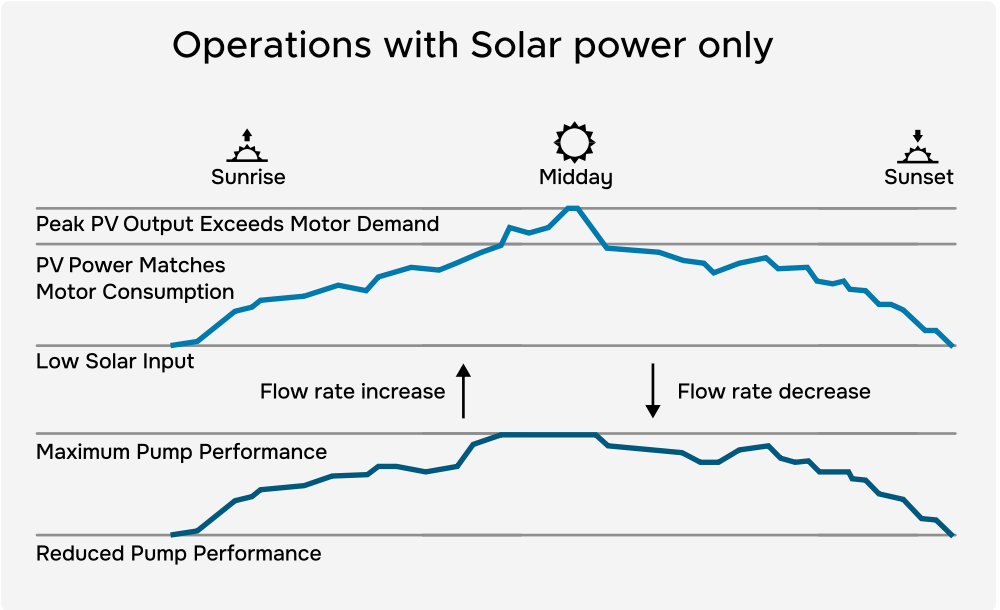
Detection of weak solar radiation

Elimination of frequent pump restarts during low solar radiation intensity in the morning and evening hours.



Detection of sudden power loss

Elimination of pump and VFD shutdown during sudden short-term shading of the photovoltaic panel.

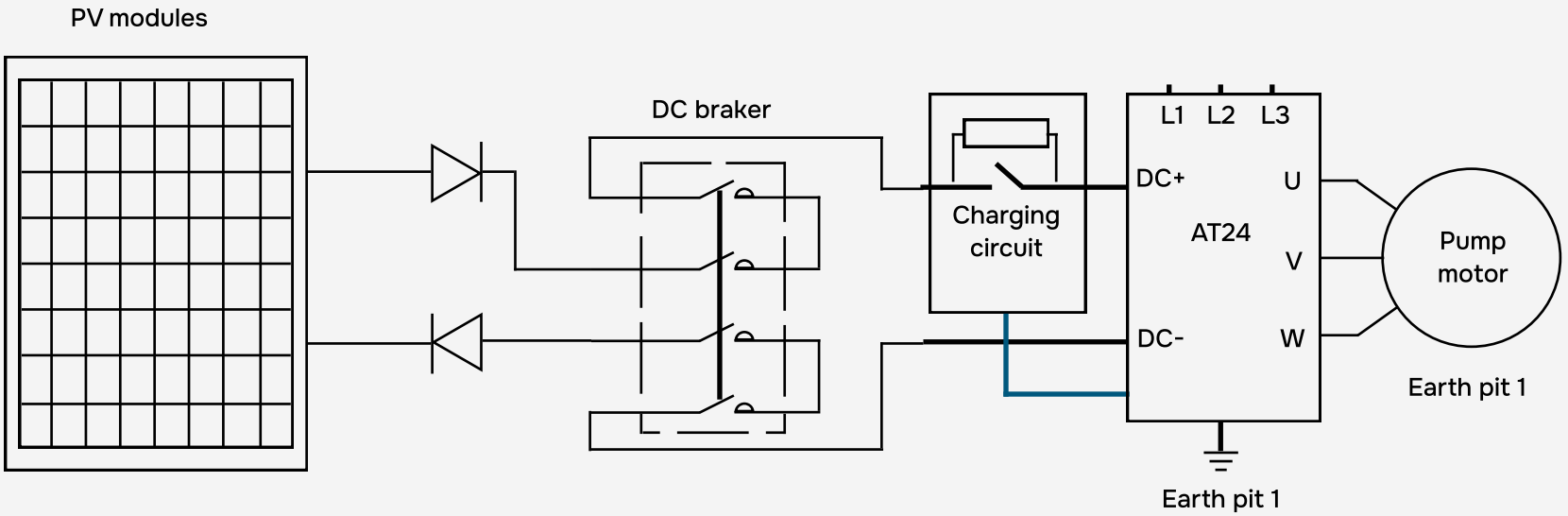


Simplified exploitation: connection of PV panels at any time

When hybrid power mode is used and there is no AC voltage, connecting photovoltaic panels to the DC link of the VFD during the day will result in a significant current surge and the likelihood of equipment damage. To enable safe operation with the equipment in such cases, the AT24 UB SolarSync includes an algorithm for soft charging of the DC link from photovoltaic panels.

DC-PV pre-charge

Soft charging of the DC link when connecting photovoltaic panels to the DC terminals of the VFD during the day (the contactor and charging resistor are external components).



Intelligent power management: operate 24 hours a day

For stable pumping throughout the day and night, reduce energy costs without compromising performance, or eliminate AC power instability, the AT24 UB SolarSync can be configured for any power supply scenario combining solar energy and AC grid power or a generator.

AC only mode

Operation only from an AC power source with disabling algorithms for photovoltaic panels.

PV only mode

Operation using only energy from photovoltaic panels

Hybrid mode

Connecting an AC power source and photovoltaic panels simultaneously.

Hybrid mode with AC grid control

Disabling algorithms for operation from photovoltaic panels when detecting the availability of AC grid power (an external discrete AC grid sensor must be connected).

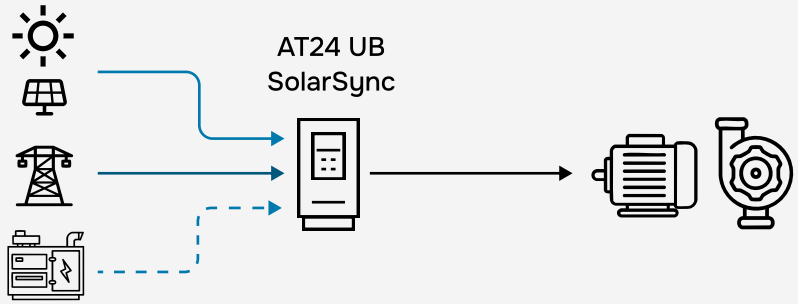
Sensorless AC/PV Switching Mode*

Connecting the AC grid when there is a low power from the PV panel and disconnecting the AC grid after a set time with a control decrease of performance before switching.

Sensor AC/PV Switching Mode*

Switching based on illuminance sensor and discrete AC grid control (AC grid control sensor optional).

*AC grid switching is provided by an built-in SolarSync System contactor.



Extended motor support: easy implementation

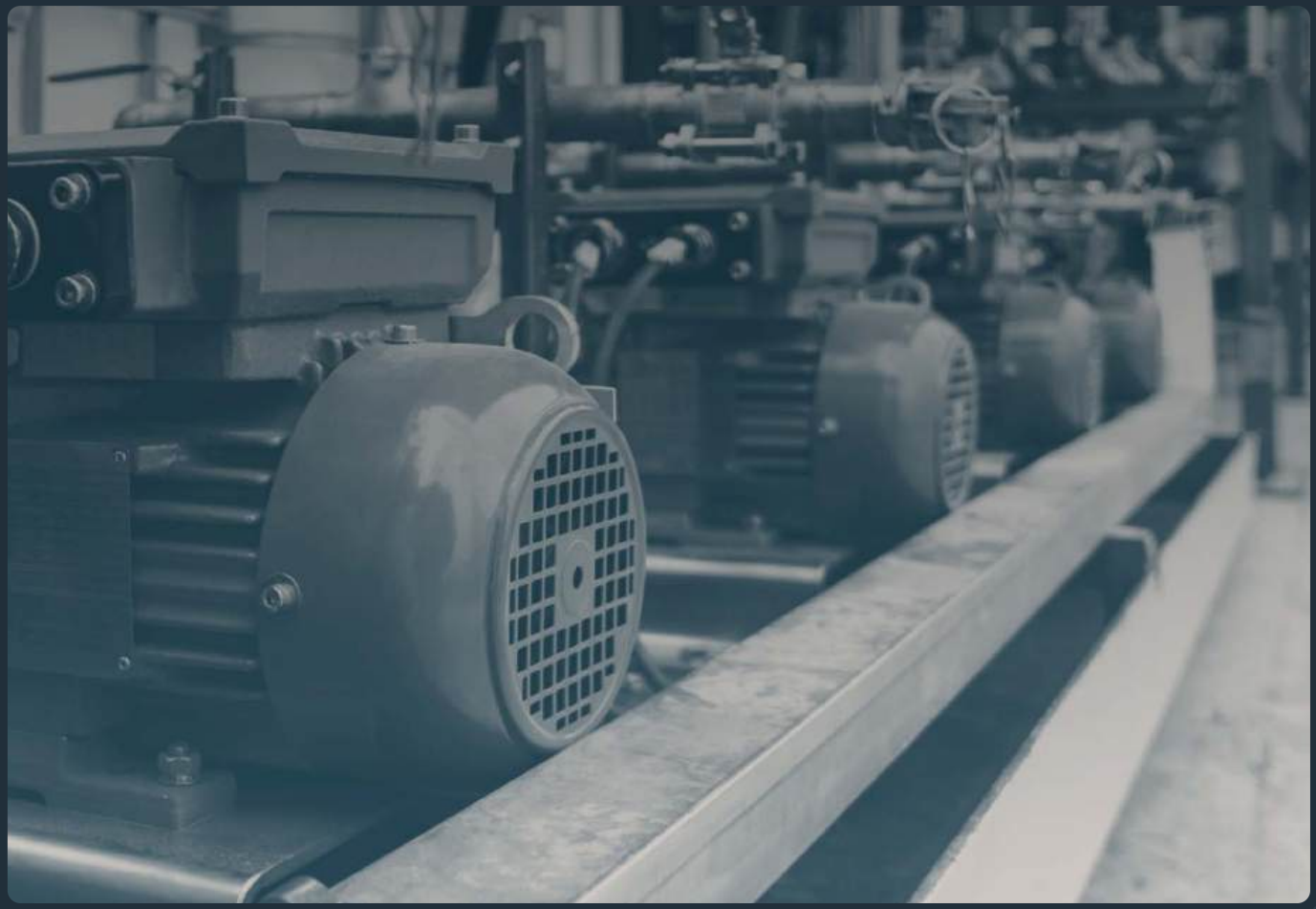
A large number of pump systems that operate or are being upgraded to use solar energy contain single-phase AC motors. Such motors usually require special VFD, but the AT24 UB SolarSync complex enables operation with both conventional three-phase motors and single-phase AC motors; the motor type is set by configuration.

Single-phase AC motor with capacitor

Control of single-phase motors with built-in Single-phase AC motor without capacitors.

Control of single-phase motors without capacitors

Power supply to the auxiliary winding is performed by the third output phase of the VFD.



Special algorithms: automatization and protection of solar-powered pumps

The AT24 UB SolarSync takes into account the details of the most common applications of solar-powered pumps, such as filling a tank during the day from the groundwater well, and includes the necessary algorithms for automatic operation and protection of these systems.

PID Controller with Sleep/Wake Function

Automatically adjusts to changing conditions, reducing energy consumption while maintaining precise system parameters in conjunction with the operating mode from PV panels.

Sensorless Flow Calculation

Estimated real-time fluid flow value for monitoring system performance

Automatic Start on Power-Up

Automatic pump start-up when power is supplied from photovoltaic panels or an AC power supply

Time relay mode

The pump operates at the times you need it to, according to programmable intervals within a 24-hour period.

Detailed description of functions and algorithms can be found in the document AT24 UB Line Variable Frequency Drive Operation Manual or catalogue.

Enhanced usability

Managing pump systems should be simple, efficient, and adaptable to your workflow. The AT24 UB SolarSync offers two control options, giving you the flexibility to choose the method that best suits your needs – whether you're working on-site or remotely.

Classic Front Panel

A familiar interface with physical buttons and a clear display for quick on-site adjustments, ensuring reliable manual control in any conditions.

EasyDrive Web Interface

A modern, wireless solution that allows you to configure and monitor the drive via Wi-Fi using a smartphone, tablet, or laptop. With step-by-step wizards and an intuitive dashboard, even complex setups can be completed in minutes.

Connect your smartphone to the VFD via Wi-Fi in just 10 seconds. Configuration and commissioning can be completed directly in under 5 minutes using the intuitive Wizard.

No extra documentation needed – Intuitive navigation and clear menus eliminate the need for complex manuals.

Guided Configuration – Step-by-step wizards ensure quick and accurate parameter settings.

AT24 UB SolarSync system configuration

- IP54 cabinet for solar-powered pumping system;
- IP20 AT24 UB VFD;
- VFD control panel located on the cabinet door;
- Modem for remote monitoring;
- Mains circuit breaker;
- Mains contactor;
- Discrete AC grid sensor;
- Line chokes or DC choke;
- EMC input filters;
- DC circuit breaker or fuses;
- DC-PV pre-charge unit;
- DC Surge protection unit;
- Antireverse diodes;
- Anti-condensation heating;
- Brake chopper;
- Brake resistor;
- Output filters (output chokes, dU/dt, sine filter);
- Optional extension units
- Number of option slots – 2.
- Types of extension units:

  - I/O (digital/ relay/ analog inputs/ outputs);
  - communication interface (additional RS-485 channels, Ethernet interface);
  - speed feedback interface (connection of different types of encoders).

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AT24 UB SolarSync key parameters

Parameter	Value
Power range, kW	0.75 to 500
AC Supply voltage	380..480 V, (-15% to +10%) which enables to use the VFD in different types of power supply networks
DC input voltage range	300... 800 V (minimum operating voltage 250 V)
Overload characteristic	Normal Duty (ND) - 120% of nominal VFD output current within 60s Heavy Duty (HD) - 150% of nominal VFD output current within 60s
Output frequency	0... 600 Hz
Motor control methods	Scalar voltage/frequency (V/f) control (5 points) Open/Closed loop vector control.
Enclosure protection design	IP20
Operating temperature	-10...+40 ˚C (-13... 104 F) without derating -10...+50 ˚C (-13... 122 F) with derating
Embedded communication	-RS-485 link (protocol Modbus-RTU) -Wireless connectivity (Wi-Fi control via built-in web interface)
Standard I/O	- 5 digital inputs; - 1 digital output; - 2 relay outputs; - 2 analog inputs; - 1 analog output.