



# VLT® AQUA Drive

## The ultimate energy and water conserving solution for irrigation

Climate change and rising energy costs are increasing the need for more efficient irrigation processes in agriculture and landscaping. VLT® AQUA Drive is designed to optimise the supply of water and save energy while protecting pumps and piping in irrigation systems to reduce downtime and water loss.

- Conformal coating of circuit boards standard
- Outdoor-rated units available
- On-board manual via "Info" key
- Up to 98% drive efficiency
- 150 m screened/300 m unscreened motor cable runs as standard
- Multiple pump cascade controller
- Flow / pressure / level control
- Auto-tuning PID controller with flow compensation of setpoint
- Initial, Final and Check Valve ramps
- Dry Run Detection to protect the pump against damages from cavitation
- Pipe Fill Mode to protect the pipes and valves against water hammer, when starting up the irrigator
- UL-listed single-phase units provide phase conversion for applications in remote areas

**Power range:**

- 1-phase, 200–240 VAC: 1.1–22 kW
- 1-phase, 380–480 VAC: 7.5–37 kW
- 3-phase, 200–240 VAC: 0.25–45 kW
- 3-phase, 380–480 VAC: 0.37–1,000 kW
- 3-phase, 525–600 VAC: 0.75–90 kW
- 3-phase, 525–690 VAC: 45–1,400 kW

Features	Benefits
<b>Dedicated features</b>	
Modular design	Facilitates maintenance and field upgrades
Six-line LCP display	Simultaneously displays multiple parameters
Integrated Real-Time Clock	Time stamping of functions/sprinkler timer
Enhanced Sleep Mode	Improved energy savings/process control
Initial Ramp	Performance that matches pump demands
Flow compensation	Improved setpoint control
End of pump curve detection	Protects pump, detects leakage/cavitation
No/low flow detection	Pump protection
Pipe fill mode	Eliminates water hammering
Pulse counter with totalizer	VLT® AQUA Drive can be programmed to shut down at a predefined number of cubic meters used
<b>Energy saving</b>	
VLT® efficiency of >98%	Optimised performance
Automatic Motor Adaptation (AMA)	Optimal motor tuning without spinning motor shaft
Automatic Energy Optimisation	Additional 5–15% energy savings
Unique cooling concept	Effective heat management
<b>Reliable</b>	
Short circuit and ground fault protection	Prevents damage to drive
Line or motor phase imbalance monitoring	Maintains full torque under extreme conditions
Over and undervoltage protection	Protects drive and motor
Overtemperature monitoring	Provides operation capabilities in extreme temperatures
Electronic Thermal Protection	Protects motor
Optimum heat dissipation	Lengthens drive life
100% factory load testing	Ensures high reliability
Optional conformal coating on PCBs available	Provides additional protection in harsh environments

## Enclosure ratings

- **Available in IP00/20, IP21, IP54/55 and IP66 enclosures:**  
Designed either for mounting in existing panels or as standalone units. Indoor as well as outdoor installation is possible using standard factory enclosure.

## Available options

- **Modular application options:**  
Plug-and-play cards facilitate drive upgrades, startup and servicing.
- **dU/dt filters:**  
For providing motor isolation protection.
- **Sine filters (LC filters):**  
Reduce motor noise and provide the highest degree of motor protection. Especially recommended for deep-well submersible pump motors.
- **Advanced Active Filter/ Low Harmonic Drive**  
Provides the optimum active filtering of harmonic distortion and protects against transformer/generator overload.

## PC software tools

- **MCT 10:**  
Provides powerful functionality for commissioning and servicing drives.
- **VLT® Energy Box:**  
Comprehensive energy analysis tool.
- **MCT 31:**  
Harmonics calculation tool.



## Specifications

Mains supply (L1, L2, L3)	
Supply voltage	200–240 V ±10%; 380–480 V ±10%; 525–600 V ±10%; 525–690 V ±10%
Supply frequency	50/60 Hz
Displacement Power Factor (cos φ) near unity	(>0.98)
Switching on input supply L1, L2, L3	1–2 times/min.
Output data (U, V, W)	
Output voltage	0–100% of supply
Switching on output	Unlimited
Ramp times	1–3600 sec.
Closed loop	0–132 Hz
Digital inputs/outputs	
Programmable digital inputs (standard)	6 (two can be used as digital outputs)
General purpose I/O card (option)	3 additional digital inputs, 2 additional digital outputs
Logic	PNP or NPN
Voltage level	0–24 VDC
Analogue inputs	
Analogue inputs (standard)	2
General purpose I/O card (option)	2 additional analogue inputs
Advanced analogue I/O card (option)*	3 additional analogue inputs
Modes	Voltage or current
Voltage level	-10 to +10 V (scaleable)
Current level	0/4 to 20 mA (scaleable)
Pulse inputs	
Programmable pulse inputs (standard)	2 (two of the digital inputs can be used as pulse inputs)
Voltage level	0–24V DC (PNP positive logic)
Pulse input accuracy	(0.1–110 kHz)
Analogue outputs	
Programmable analogue outputs (standard)	1
General purpose I/O card (option)	1 additional analogue current output
Advanced analogue I/O card (option)*	3 additional analogue outputs
Current range at analogue output	0/4–20 mA
Relay outputs	
Programmable relay outputs (standard)	2 (240 VAC, 2 A and 400 VAC, 2 A)
Relay card (option)	3 additional dry contact relays (240 VAC, Form C)
Voltage level	0–24V DC (PNP positive logic)
Pulse input accuracy	(0.1–110 kHz)
External DC supply	
External 24V DC supply card (option)	Provides backup power for control and option cards
Fieldbus communication	
FC Protocol and Modbus RTU built-in (LonWorks, DeviceNet, Profibus and Ethernet IP modules optional)	
Ambient temperature rating	
50° C	

\* Advanced analogue I/O option card also provides 24V DC backup power for the VLT® AQUA Drive's real-time clock.