



# **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
Dedicated features	
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
Energy saving	
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
Reliable	
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 deepwell submersible pump motors.
- **Low Harmonic Drive** Provides the optimum active filtering of harmonic distortion and protects against transformer/generator overload.

#### **PC software tools**

Advanced Active Filter/

Provides powerful functionality for commissioning and servicing drives.

■ VLT® Energy Box: Comprehensive energy analysis tool.

■ MCT 31:

Harmonics calculation tool.



Supply voltage  200–240 V ±10%; 380–480 V ±10%; 525–600 V ±100%; 525–600 V	Specifications	
Supply Voltage 525–690 V ±10%  Supply frequency 50/60 Hz  Displacement Power Factor (cos φ) (>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 (standard) 2  General purpose I/O card (option) 2 additional analogue inputs  Analogue inputs (Standard) 2 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 additional analogue current output Advanced analogue I/O card (option)* 3 additional analogue current output Advanced analogue 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)	Mains supply (L1, L2, L3)	
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Switching on output Ramp times 1–3600 sec. Closed loop 0–132 Hz  Digital inputs/outputs Programmable digital inputs (standard) 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) 3 additional analogue inputs Advanced analogue I/O card (option) 4 Voltage or current Voltage level Voltage level 1-10 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) General purpose I/O card (option) 1 additional analogue current output Advanced analogue I/O card (option) 1 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)	Output data (U, V, W)	
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Programmable analogue outputs (standard)  General purpose I/O card (option)  Advanced analogue I/O card (option)*  Current range at analogue output  Programmable relay outputs  Programmable relay outputs (standard)  Relay card (option)  3 additional analogue outputs  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)
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Relay card (option)  3 additional dry contact relays (240 VAC, Form C)  Voltage level  0–24V DC (PNP positive logic)	Programmable relay outputs (standard)	2 (240 VAC, 2 A and 400 VAC, 2 A)
Voltage level 0–24V DC (PNP positive logic)		3 additional dry contact relays (240 VAC, Form C)
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#### **External DC supply** External 24V DC supply card (option)

Fieldbus communication

FC Protocol and Modbus RTU built-in (LonWorks, DeviceNet, Profibus and Ethernet IP modules optional)

### Ambient temperature rating

50° C

Provides backup power for control and option cards

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