



VLT® AQUA Drive

The Ultimate Energy and Water Conserving Solution for Irrigation

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

- UL-listed single-phase to three-phase units provide phase conversion for applications in remote areas
- Conformal coating of circuit boards standard to 3C2 rating
- Outdoor-rated units available
- On-board manual via "Info" key
- Up to 98% drive efficiency
- 500' shielded / 1000' unshielded motor cable runs as standard
- Multiple pump cascade controller
- Flow / pressure / level control
- Auto-tuning PI controller with flow compensation of setpoint
- Initial, Final, and Check Valve ramps
- Preventive maintenance functions

Power range:

- 1-phase, 200–240 VAC: 1.5–30 HP
- 1-phase, 380–480 VAC: 10–50 HP
- 3-phase, 200–240 VAC: 1/3–60 HP
- 3-phase, 380–480 VAC: 1/2–1500 HP
- 3-phase, 525–600 VAC: 1–125 HP
- 3-phase, 525–690 VAC: 15–1500 HP

Feature	Benefit
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 hammer
• Pulse counter with totalizer	• VFD can be programmed to shut down at a predefined number of gallons used

Energy saving	
• VLT efficiency of >98%	• Optimized performance
• Automatic Motor Adaptation (AMA)	• Optimal motor tuning without spinning motor shaft
• Automatic Energy Optimization	• 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 up to 3C3 rating	• Provides additional protection in harsh environments





Outdoor weather shield

Designed to be mounted above FC 202 to protect from direct sun and falling debris.

Enclosure ratings

- **Available in Chassis, NEMA 1, NEMA 12 and NEMA 4X enclosures:** designed either for mounting in existing panels or as standalone units

Available options

- **Modular application options:** plug-and-play cards facilitate drive upgrades, startup and servicing
- **dV/dt filters:** for providing motor isolation protection
- **Sine filters (LC filters):** reduce motor noise

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



Mains supply (L1, L2, L3)

Supply voltage	200–240 V $\pm 10\%$; 380–480 V $\pm 10\%$; 525–600 V $\pm 10\%$; 525–690 V $\pm 10\%$
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

Analog inputs

Analog inputs (standard)	2
General purpose I/O card (option)	2 additional analog inputs
Advanced analog I/O card (option)*	3 additional analog 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)

Analog outputs

Programmable analog outputs (standard)	1
General purpose I/O card (option)	1 additional analog current output
Advanced analog I/O card (option)*	3 additional analog outputs
Current range at analog 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
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Fieldbus communication

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

Ambient Temperature Rating

0° C min – 50° C max

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

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