

VLT® AQUA Drive

Defining new standards for the Water/Wastewater/Irrigation market

Danfoss' unsurpassed experience in advanced variable frequency drive technologies makes the VLT® AQUA Drive the perfect choice for all water and wastewater applications. The first drive designed specifically for water, wastewater, and irrigation applications, the VLT® AQUA Drive offers the most advanced technology and features available in the market, including:

- Award-winning control panel (LCP)
- Graphical display of multiple parameters
- Internal Smart Logic Controller
- User-selectable VT or CT performance
- Modular design for easy field upgrades
- On-board manual via "Info" key
- Unique cooling design for high efficiency
- Advanced control strategies for pumps and blowers

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, 525–690 VAC: 1–1500 HP

Phase Conversion

For remote areas such as lift stations or farming fields where 3-phase power is not available, single-phase drives offer phase conversion and speed control in a single, compact package. Phase-converting VLT® AQUA Drives enable the use of cost-effective three-phase motors with only single-phase, 240 VAC or 480 VAC service.

Feature	Benefit
Dedicated features	
Modular design	Facilitates maintenance and field upgrades
SmartStart programming	Quick and easy start-up
Six-line LCP display	Simultaneously displays multiple parameters
Integrated Real-Time Clock	Time stamping of functions/process control
Integrated Cascade Control	Reduces equipment expenditures
Smart Logic Controller	Reduces (or eliminates) PLC requirements
Auto-tuning of PI controller	Effortless programming of PI loops
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
No/low flow detection	Pump protection
Pipe fill mode	Eliminates water hammer
Deragging	Rotates impeller backwards to remove strings and other debris
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
Cable lengths up to 1000 feet	No motor derating
Reliable	
Short circuit and ground fault protection	Prevents damage to drive
Monitors all 3 output phases	Unlimited switching on the output
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

Dedicated drive designed specifically for water, wastewater, and irrigation applications

Enclosure ratings

- Available in Chassis; UL/NEMA Types 1, 12, 3R, and 4X rated 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
- Advanced Harmonic Filters: reduce harmonic distortion in sensitive applications
- 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 ±10%; 380–480 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

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

Fieldbus communication	
FC Protocol and Modbus RTU built in. DeviceNet, Profibus Profinet, Ethernet IP, & Modbus TCP modules optional	

Ambient Temperature Rating	
0° C min – 50° C max	

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

Danfoss VLT Drives

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