



VLT® AQUA Drive

Defining new standards for the Water/Wastewater market

Danfoss Drives' unsurpassed experience in advanced variable frequency drive technologies makes the VLT AQUA Drive the perfect choice for all water and wastewater applications.

The first variable frequency drive designed specifically for water and wastewater applications, the VLT AQUA Drive offers the most advanced technology and features available in the market, including:

- Compact design
- 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 improved efficiency
- Advanced control strategies for pumps and blowers

Power range:

| | |
|-----------------------|---|
| 1-phase, 200–240 VAC: | 3–30 HP |
| 3-phase, 200–240 VAC: | 1/3–60 HP |
| 3-phase, 380–480 VAC: | 1/2– 650 HP (1250 HP available soon) |
| 3-phase, 525–690 VAC: | 15–650 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/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 |
| 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 ft | • No motor derating |
| 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 |



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 (LonWorks, DeviceNet, Profibus modules optional) | |

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

North America Motion Controls

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