



# VLT® Low Harmonic AQUA Drive

VLT® AQUA Drive is now available in a low harmonic version

Where the performance of other low harmonic technologies depend on the stability of the grid and load or affect the controlled motor, the new Danfoss Low Harmonic Drives continuously regulate the network and load conditions without affecting the connected motor.

VLT® Low Harmonic Drives are motor friendly, with output impulse & shaft voltages compatible with motors conforming to IEC 60034-17/25 & NEMA-MG1-1998 part 31.4.4.2), as per standard VLT® Drives.

The VLT® Low Harmonic Drive has the same modular build-up as our standard high power drives and shares similar features: high energy efficiency, back-channel cooling and user-friendly operation.

The VLT® Low Harmonic Drive meets the toughest harmonic recommendations and gives the user full readout of the unit performance towards the grid, including graphical overview of grid behavior.



### Perfect for water applications

- > Meeting toughest harmonics recommendation/standards within the water and wastewater business
- > Generator-powered installation
- > Installation with generator backup
- > Soft power grid
- > Installation of drives in grids with limited excess power capacity

### Voltage range

- > 380 – 480 V AC 50 – 60 Hz

### Power Range

- 177 – 845 HP High Overload/  
214 – 952 HP Normal Overload  
(Matching drive frames D, E and F)

### Enclosure degree

- > IP 21 / NEMA 1, IP 54 Hybrid

Features	Benefits
<b>Energy saving</b>	<b>Lower operating costs</b>
Energy saving functions (e.g., sleep mode, standby mode) Variable switching frequency for lower switching losses High product efficiency network changes	Saves energy
Reduced harmonics	Improved power factor/reduced load on supply network Lower transformer, switchgear and cable losses
Back-channel cooling (85% heat dissipated via back channel)	Less control room cooling Less fan power consumption
<b>Unequaled robustness</b>	<b>Maximum up time</b>
Robust enclosure	Maintenance free
Unique cooling concept with no ambient airflow over electronics	Problem-free operation in harsh environment
Coated PCBs	Problem-free operation in harsh environment
100% factory test	Problem-free operation
<b>Highest possible harmonic mitigation</b>	<b>Save initial and operation cost</b>
Maximum 5% THiD	Meeting toughest harmonics recommendation/standards
Robust against voltage imbalance and grid predistortion	Optimized transformer/generator grid capacity, more drives on same transformer
Dynamic regulation to load changes	Energy optimization
<b>All built-in</b>	<b>Low investment</b>
Modular concept and a wide range of options	Low initial investment with maximum flexibility and possibility of future upgrades
Decentral I/O control via serial communication	Reduced cost for wiring and external I/O controller
Integrated EMC RFI filters	Meets EN55011 (A1 optional, A2 standard)
<b>User friendly</b>	<b>Save commissioning and operation cost</b>
Award-winning graphical display, 27 languages	Effective commissioning and operation
Full overview of grid condition	Reduced test effort
Timely tracking of grid conditions	Reduced test effort



## PC software

### MCT 10

Ideal for commissioning, servicing, monitoring and performance logging.

### MCT 31

Harmonic calculation tool supporting VLT® Low Harmonic Drives.

### RoHS compliant

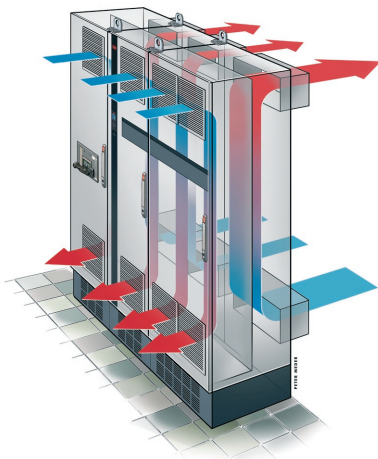
VLT® Low Harmonic Drives are manufactured with respect for the environment and comply with the RoHS directive.

### Options

- > **dU/dt filters:**  
Protect motor insulation
- > **Sine filters (LC filters):**  
Reduce motor noise

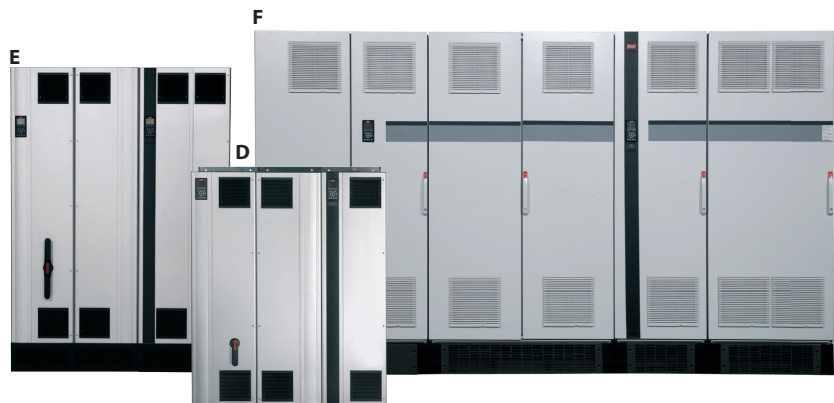
### Back-channel cooling

A unique design uses a ducted back channel to pass cooling air over heat sinks with minimal air passing through the electronics area. This allows 85% of the heat losses to be exhausted directly outside of the enclosure, improving reliability and prolonging life by dramatically reducing temperature rise and contamination of the electronic components. There is an IP 54 seal between the back-channel cooling duct and the electronics area of the low harmonic drive.



## Specifications

Harmonic mitigation performance	< 5% THD Meet individual harmonic levels of IEEE 519 for ISC/IL>20 Meeting EN/IEC61000-3-4/IEC61000-3-12
True power factor	> 0.98
Displacement factor	> 0.98
PC software & user interface	Commissioning tool function Configuration and installation settings function User settings and information function Control panel function Data logger and event log function Network monitoring and measurement function Filter load and status function Software update function
LCP Regulation	UL-file, CE marking, cULus (UL508C) and c-tick (AS/NZS 2064). IEEE519 / EN61000-3-xx harmonic mitigation guidelines IEEE587/ANSI C62.41/ EN61000-4-5 surge immunity EN55011 electromagnetic compatibility EN50178, EN60146 safety/design
Ambient temperature	-10° C to +45° C, up to 3280 feet above sea level, with relative humidity of 5% – 85% RH, class 3K3 (functions to be maintained up to 95% RH not condensing)
Power fuses	Optional
RFI filtering	Class A2 RFI; Class A1 RFI optional
Cooling	Air cooled with primary cooling through back channel



400 VAC (380 – 480 VAC)					Frame	Dimensions H x W x D	Weight kg
Normal Overload		High Overload		IP 21 [inches]			
Power HP	Current [A]	Power HP	Current [A]				
214	315	177	260	D	68.5 x 49.6 x 15.0	380	
268	395	214	315			380	
335	480	268	395			406	
422	600	335	480	E	78.7 x 56.7 x 19.7	596	
476	658	422	600			623	
536	745	476	658			646	
603	800	536	695	F	86.6 x 145.6 x 23.6	646	
670	880	603	800			2009	
751	990	670	880			2009	
845	1120	751	990			2009	
952	1260	845	1120			2009	

**Danfoss Drives**, Division of Danfoss Inc., 4401 N. Bell School Rd., Loves Park, IL 61111, Tel. +1 (815) 639-8600 (main), Tel. +1 (800) 432-6367 (24h Service for Drives), Fax +1 (815) 639-8000, [www.danfossdrives.com](http://www.danfossdrives.com) • E-mail: [salesinformation@danfoss.com](mailto:salesinformation@danfoss.com)

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