

# VLT® Low Harmonic Drives

**Where the performance of other low harmonic technologies depends on stability and load or effect 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 have the same modular build-up as our normal high power drives and share features like high energy efficiency, backchannel 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 behaviour.



### VLT® Low Harmonic Drive is the perfect solution for

- Meeting IEEE519 recommendation
- Generator powered installation
- Installation with Generator Backup
- Soft power grid
- Installation of HP-drive in grids with limited excessive power capacity

### Voltage range

- 380 – 480 V AC 50 – 60 Hz

### Power Range

160 - 710 kW  
(Matching drive frames D, E and F)

### Enclosure degree

- IP 21, IP 54\*

\* IP54 electronic, IP21 magnetics.

Features	Benefits
<b>Energy saving</b>	<b>Less operation cost</b>
Energy saving functions i.e sleep mode. Standby mode. Variable switching frequency for lower switching losses. High product efficiency	Saves energy
Reduced harmonics	Increased transformer efficiency Reduced cable losses
Back channel cooling	Less control room cooling Less fan power consumption
<b>Unequalled robustness</b>	<b>Maximum up time</b>
Robust enclosure	Maintenance free
Unique cooling concept with no ambient airflow	Problem free operation in harsh environment
Coated PCB's	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	Meets IEEE519
Robust against voltage imbalance and grid pre distortion	Optimized 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 - max flexibility, later upgrade possible
Decentral I/O control via serial communication	Reduced cost for wiring and external I/O controller
Integrated EMC filters	Meets EN55011 A1, A2
<b>User friendly</b>	<b>save commissioning and operation cost</b>
Awarded 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**

The VLT® Low Harmonic Drives are manufactured with respect to the environment, and they comply with the RoHS directive.

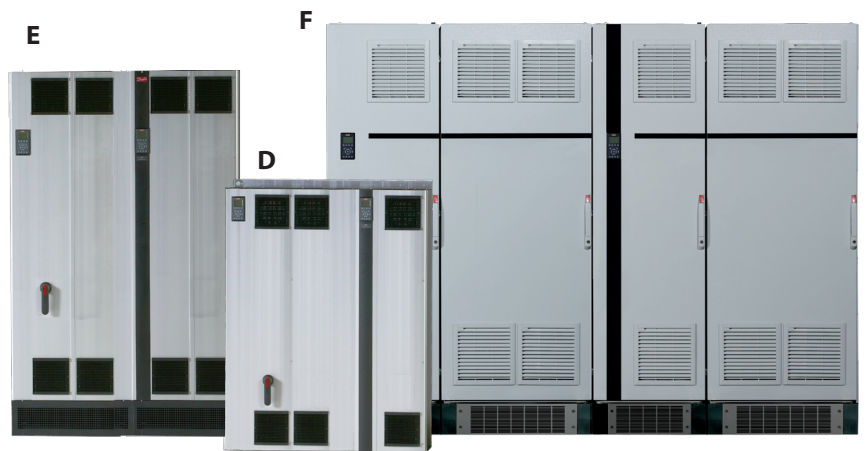
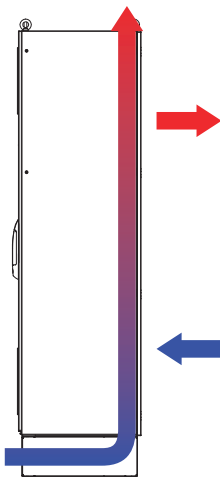
**Options**

- **dU/dt filters:**  
For providing motor insulation protection
- **Sine filters (LC filters):**  
Reduce motor noise

Specifications	
Harmonic mitigation performance	< 5% THD Meet individual harmonic levels of IEEE 519 for ISC/IL>20
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 measurements 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 1000 meters 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

**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 IP54 seal between the back-channel cooling duct and the electronics area of the drive.



T4 (380-480 VAC)				
Power	Current	Order number	Frame	Dimensions
High Overload	Low Harmonic Drive FC102			H*W*D
[kW]	[A]	RFI A2, IP21,		IP21, IP54[mm]
160	315	FC-102P160T4E21A2xxxx	D	1740*1260*380
200	395	FC-102P200T4E21A2xxxx		
250	480	FC-102P250T4E21A2xxxx		
315	600	FC-102P315T4E21A2xxxx	E	2000*1440*500
355	658	FC-102P355T4E21A2xxxx		
400	745	FC-102P400T4E21A2xxxx		
450	800	FC-102P450T4E21A2xxxx		
500	880	FC-102P500T4E21A2xxxx	F	2200*3400*600
560	990	FC-102P560T4E21A2xxxx		
630	1120	FC-102P630T4E21A2xxxx		
710	1260	FC-102P710T4E21A2xxxx		