MAKING MODERN LIVING POSSIBLE

VLT® HVAC Basic Drive – for compact simple fan and pump applications

56%

Energy use reduction

in Mumbai's VSNL building. 'Only by using Variable Frequency Drives in the HVAC system could we achieve this target' – General Manager VSNL, India.

www.danfoss.com/drives

VLT® THE REAL DRIVE

VLT® HVAC Basic Drive

The VLT® HVAC Basic Drive is designed for simple fan and pump applications where the drive is used nearby the motor. The VLT® HVAC Basic Drive is designed to fit compact and basic functional performance HVAC applications, offering simple control features and most common HVAC protocols for a limited integration into your building management system.

The VLT® HVAC Basic Drive includes:

- > 98% basic energy efficiency
- Automatic Energy Optimisation
- User-friendly operation
- Programming in 7 languages
- Numerical or graphical control panel

Save money

The VLT® HVAC Basic Drive enables the user flexibility to select from a range of functional performance requirements to secure the best cost advantage for their application needs.

Easy commissioning

Its Quick Menu wizzard makes normal set-up and operation easy.

Maintenance free

Due to a series of self-protecting and monitoring features, the VLT® HVAC Basic Drive is maintenance free, except for general cleaning. Replacement of internal fans or capacitors is normally not required.

Save space

Due to its ultra compact design, the VLT® HVAC Basic Drive is easily mounted inside a HVAC unit or panel, reducing overall enclosure costs.

Fire Override Mode

Fire Override Mode helps keep fire escape routes free of smoke, overrides the drive's self-protecting features and keeps the driven equipment running as long as possible in the event of fire.

Activating Fire Override Mode will ensure the VLT® HVAC Basic Drive ignores "soft" faults and alarms to continue operation during essential services such as a "fire" command.

Integrated DC coils

The standard integrated DC coils also ensure low harmonic load on the network within EN 61000-3-12 and increase the lifespan of the DC link capacitors. They also ensure that the drive can operate motors to their full performance.

Danfoss also provides passive solutions including 12/18 pulse solutions, Advanved Harmonic Filters (AHF), and active harmonic mitigation for further protection against harmonic disturbances of the supply grid.

VLT® HVAC BasicDrive product range:

3 x 200 – 240 ..... 0.25 – 11 kW
3 x 380 – 480 V..... 0.37 – 90 kW

Available enclosure ratings:

- IP 20
- IP 21 w. kit
- Type 1 w. kit

Optimising energy savings

Automatic Energy Optimisation

AEO provides optimized motor magnetisation at all speeds and loads. This feature increases the energy savings gained by applying variable speed control and is standard on the VLT® HVAC Basic Drive.

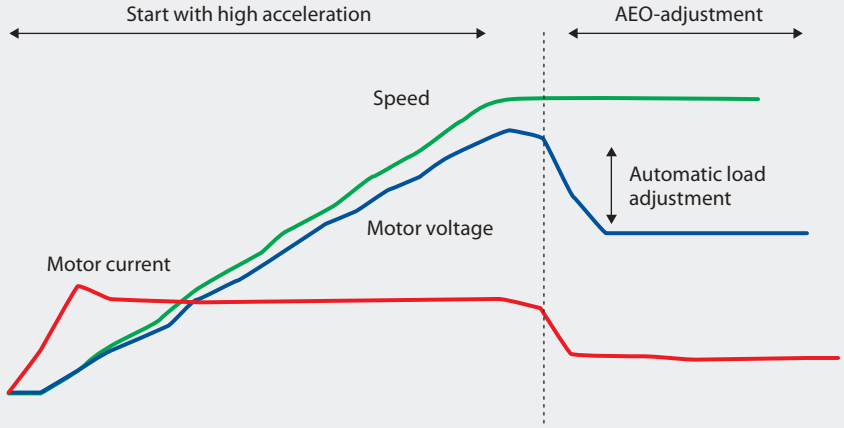
Automatic Motor Adaptation

Enter the name plate data, and VLT® HVAC Basic Drive automatically adjusts to the motor.

Suitable for "follower" operation

The drive's structure makes it suitable for "follower" operation required by BMS, PLC's or DDCs.

Automatic Energy Optimisation



The open communications drive

The VLT® HVAC Basic Drive integrates and communicates seamlessly with all HVAC devices, required by Building Management Systems via fieldbus.

Embedded fieldbuses

- BACnet
- Modbus RTU (std.)
- FC protocol
- N2 Metasys
- FLN Apogee

BACnet®

The VLT® BACnet optimizes the use of VLT® HVAC Basic Drive when combined with building management systems.

VLT® HVAC Basic Drive has objects defined to accept 3 separate feedbacks transmitted over BACnet.

This option makes it easy to control or monitor points required in typical HVAC applications.

The intuitive VLT® HVAC Basic Drive control panel

- 2-line alphanumeric display
- 7 languages + numeric menu
- Status LED's
- Quick menus (wizard for open loop applications, closed loop applications, and motor setup)
- IP 54 when mounted in a panel front
- Password protection
- Same parameter structure as other Danfoss FC drives
- Removable under operation
- Upload and download parameters (LCP copy function)

Makes your **buildings perform**

Danfoss commitment

Danfoss' longstanding experience in applying drives in HVAC systems has enhanced its ability to offer technical expertise integrating the drive into the overall system design to extract the maximum value from your initial investment and optimize your operational savings performance.

The 21st Century focus on energy efficiency is not new with regard to energy savings emphasis on the consequences of wasted energy and over-use of fossil fuels to produce energy is at the top of the agenda.

Climate Change is seen as a cost to the human race not just simply a financial cost.

Save energy and CO_2 emission

VLT® frequency converters save more than 20 million MWh energy globally each year. This is equivalent to the annual electricity consumption of 5 million homes.
This energy saving reduces annual CO_2 emissions by 12 million tons!

Building performance

Today the prime focus is on overall buildings performance which includes design, construction, efficiency, sustainability and the environmental impact of buildings in the future.

Energy efficient products form part of this overall plan. In most countries around the world the evaluation of high performance buildings falls under the banner LEED.

A wealth of knowledge

The various applications incorporated within high performance buildings are well understood by Danfoss and as global market leader we have built a wealth of knowledge and developed products and technology to ensure we meet and shape future trends in this industry.

Danfoss application and industry knowledge will ensure that the investment made in VLT® drives provides a qualified return.

Financial incentives are just as important as moral incentives to make people choose energy efficient solutions.

Reliable and cost effective

Correct drive selection is critical to reliability. Solutions that introduce unacceptable levels of RFI or harmonics can prove highly problematic and costly in addition to violating legislative regulations.

Danfoss' many years of experience in the application of VLT® drives and in the HVAC industry in particular, has resulted in a global team focused on delivering the best drive solutions, ensuring total security of your investment.

Minimum impact on the environment

When choosing a VLT® drive as part of the building control architecture, the lifetime sustainability is an important aspect to concider.

New regulations are forcing manufacturers to look at how they manufacture, what they manufacture and with what materials they use in manufacturing their products.

Are the products harmful to make? Are they harmful to dispose of at their end-of-life? RoHS, WEEE Directives, and ISO14001 are all standards and directives created to ensure minimum impact on the environment.

Clean power supply

VLT® HVAC Basic Drive introduces a minimum of RFI or harmonic distortion into the building and avoids problematic and, in some countries/regions, performance degregation.
VLT® HVAC Basic Drive is a reliable and cost effective investment.

DC coils reduce harmonic noise and protect the drive

EMC compatible

EMC protection coupled with harmonic filters ensures that the EMC environment and power supplies are maintained undisturbed throughout the operational lifetime of the system, negating any reduction in lifecycle costs.

VLT® HVAC Basic Drive meets the EMC product standard EN 61800-3 without additional external components and corresponds to the EMC guidelines 2004/108/EC, offering performance superior to other drives.
Critical for practical use is compliance with the environment standard EN 61800-3, class C1 (residential) and Class C2 (industrial area).

This ensures reliable plant operation through full compliance with all EMC requirements, product standards, prescribed warnings, and restrictions.

Integrated DC chokes minimise the network effects dramatically and thus maintain operation within the limits of EN 61000-3-12.
These chokes also make the VLT® HVAC Basic Drive stable and dynamic even during short supply voltage drops or other poor network conditions.

Categories according to EN 61800-3	C1	C2	C3	C4
Limits according to EN 55011	Class B	Class A1	Class A2	Exceeding class A2

Comparison of limits EN 55011/61800-3

For basic applications and requirements

VLT™ HVAC Basic Drive often represents the lowest investment cost to fit your basic application needs.

We understand the needs of our customers operating their facilities in a competitive environment which requires total system cost effectiveness and highest efficiency in daily operations with environmental sustainability.

Dedicated HVAC organization

Customer assurance stems from Danfoss' dedicated and highly experienced HVAC support team.

It has the depth of understanding in HVAC applications that ensures the maximum benefit is extracted from the customers' investment in VLT® drive systems.

Reducing acquisition costs

- HVAC functions to reduce other system components
- Ease of installation and set-up

Reducing operating costs

- Up to 98% efficiency
- Automatic Energy Optimisation
- Danfoss legacy and history in HVAC applications
- IP enclosures and optional conformal coating to provide robust & reliable performance in the harshest of environments
- 40-50° C ambient temperature
- Broadest range of drive and motor protection
- Maintenance free drive
- System diagnostics

Supporting software tool

Software tools are available to help design a system with minimal harmonics and best energy efficiency.

Protection mode

As soon as the system detects a critical status (e.g. over-current or overvoltage) the frequency of the VLT® HVAC Basic Drive will automatically be reduced and the modulation process adjusted.

Due to its ability to limit its switching operations the VLT® HVAC Basic Drive is very reliable and robust.

The protection mode will – if allowable – end after 10 seconds and the frequency will be restored under control.

≈ 98% efficiency

The VLT® HVAC Basic Drive follow the standards with up to 98% efficiency or more at full load. This reduces initial costs and operating costs due to the smaller heat load/air conditioning requirement in the switchroom/plantroom, thereby maximizing energy efficiency. Every kW of losses requires another ~0.5 kW of energy to remove the heat.

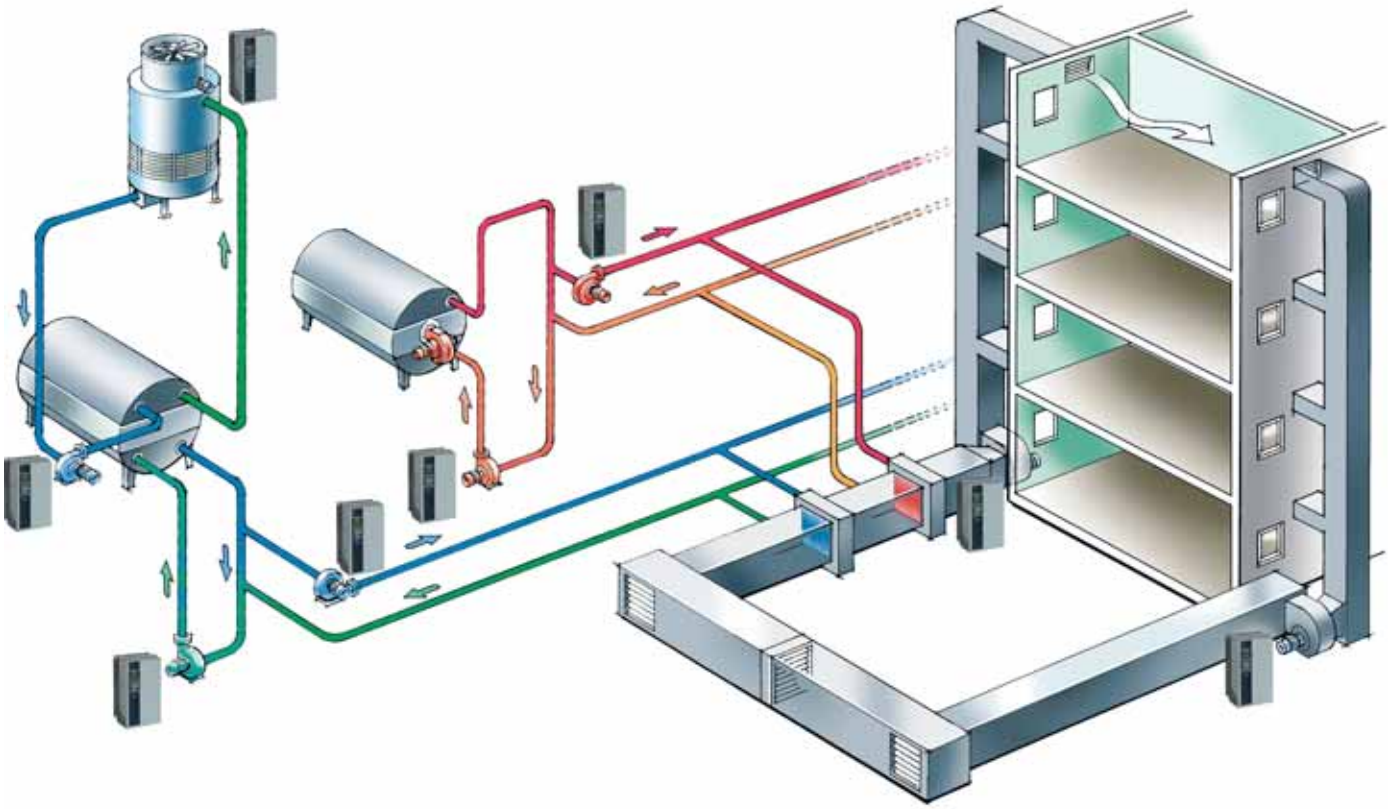
Installed in an air conditioned switchroom, lower losses can easily result in operating cost savings >5% – 10% of the cost of the drive every year (based on a typical load profile, with the drive operating 24/7). Also energy consumption and CO_2 emission is reduced.

High Ambient Temperatures

VLT® HVAC Basic Drive is designed to operate in ambient temperatures up to 50° C.

In most cases, the VLT® HVAC Basic Drive will handle abnormal situations without needing attention.

VLT® HVAC Basic Drive will manage the loss of a mains phase or a high mains imbalance by autoderating speed and load to maintain a period of reduced operation, enabling technicians to respond to the situation.



Enclosure protection **options**

VLT® drives are available in IP 20/Type1 **enclosures, optimized for installation in panels**

The installation volume and/or the mounting surfaces are minimized.

The functional sections nevertheless fulfil the highest requirements even for applications with long motor cables and ambient temperatures up to 50° C.

Compact design

Optimized efficiency and intelligent cooling technology make for a compact and service-friendly design. Supplementary equipment such as EMC filters, harmonics suppression are integrated into the ultra compact enclosure.

Save installation time

The IP 20/ Type 1 series is designed for easy accessibility and time-saving installation. Mechanical fastening points are easy to access from the front even with automatic tools.

All terminals are sufficiently dimensioned and clearly marked behind a plate

Accessories for bonding screened cables are included. The compact enclosures are easier to install. This is important especially within existing installations with limited accessibility. An extensive range of options and accessories are available, optimizing the drive for the respective application.

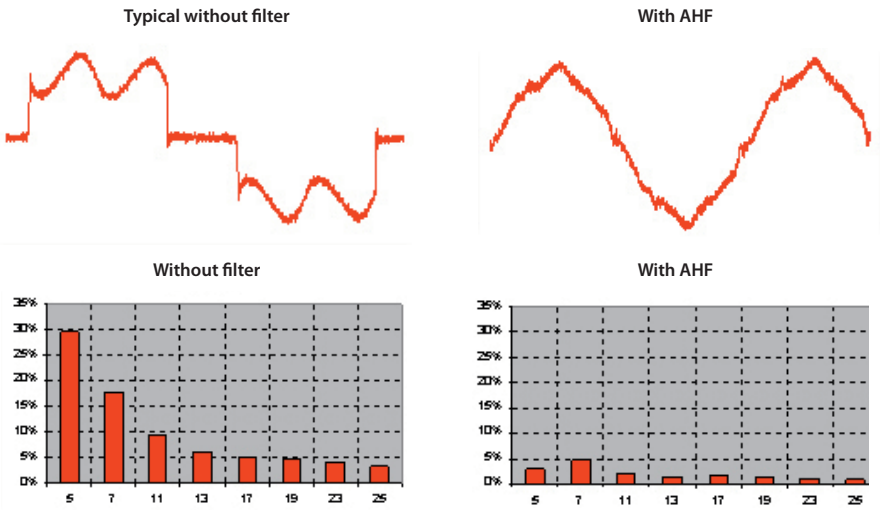
Managing Harmonics

Harmonic distortion on the supply grid is an increasing problem, mainly caused by electronic power devices including frequency converters, drawing non-sinusoidal current from the mains supply. This creates harmonic distortion on the supply depending on the supply impedance.

Danfoss' Harmonic Calculation Software MCT 31 makes it possible to calculate the extent of these harmonics at the planning stage and can suggest mitigation countermeasures.

Harmonic mitigation can be particularly valuable when the power supply is backed up by emergency generators, which have poorer tolerance to non-sinusoidal currents.

Current standards (EN 50106) are included in the software analysis tool which can quickly and easily be downloaded from www.drives.danfoss.com. Data can be entered, stored and recalled project by project. At a click the software presents a clear overview of each project with data presented in both tabular and bar-chart formats.



Harmonic disturbance with and without AHF filter.

Enhanced **safety built-in**

Fire Override Mode

Activating the function "Fire-mode" within the VLT® HVAC Basic Drive ensures secure and continued operation within applications such as stair-well pressurization, car park exhaust fans, smoke exhaust and essential service functions.

Clearly indicated

Fire mode is clearly indicated on the display to prevent any confusion. When set, the drive will override self protection and will continue operation despite the possibility of permanent damage in case of over-heating or overload. The vital goal is to keep the motor running even if it means self-destruction.

Typical application

Smoke extraction from traffic tunnels, subway stations, stairwells.

For simple **pump applications**

The VLT® HVAC Basic Drive offers pump-specific features developed in cooperation with OEMs, contractors and manufacturers around the world.

Sleep Mode

In Sleep Mode the drive detects situations with low or no flow. Instead of continuous operation, Sleep Mode boosts the system pressure and then stops to save energy. The drive starts automatically when the pressure falls below the lower set point.

For simple **fan applications**

User-friendly, distributed intelligence and reduced power consumption are beneficial for fan applications.

Basic AHU functions

This enables the HVAC Drive to control a wide range of functions, including:

Fire Override Mode

Fire Override Mode prevents the VLT® HVAC Basic Drive from stopping for self-protecting reasons. In this mode it will continue vital fan operation regardless of control signals, warnings or alarms.

Resonance Monitoring

By pressing a few buttons on the Local Control Panel the drive can be set to avoid frequency bands at which connected fans create resonances in the ventilation system.
This reduces vibration, noises and wear on equipment.

Stairwell Pressurisation

In the event of fire, the VLT® HVAC Basic Drive can maintain a higher level of air pressure in stairwells than in other parts of the building and ensure that fire escapes remain free of smoke.

Belt Monitoring

The drive can from the speed/current detect the case where the motor have lost contact to the fan and throw an alarm.

Flying start

The drive can detect speed and direction of a freely spinning fan or fan and “catch” it at the right frequency. This feature prevents violent starts and tear on the equipment.

VLT® HVAC Basic Drive
a compact OEM solution for basic applications

IP 21/ Type 1 Kit

The IP 21/ Type 1 kit is used for installation of VLT® HVAC Basic Drives in dry environments. The enclosure kits are available for all frame sizes.

- PG 16 and PG 21 holes for glands

LCP Panel Mounting Kit

For easy installation of the local control panel in a cabinet door.

- IP 54 (front)
- Thumb screws for tool-free installation
- Incl. 3 meters of cables in industry quality (also available separately)
- Easy to install

Frame size	IP 20 kit	UL Type 1 kit
H1	132B0212	132B0222
H2	132B0213	132B0223
H3	132B0214	132B0224
H4	132B0215	132B0225
H5	132B0216	132B0226
H6	132B0217	132B0217
H7	132B0218	132B0218
H8	132B0219	132B0219

Ordering number

132B0201 (Mounting kit for LCP including fasteners, 3 m cable and gasket).

VLT® Motion Control Tool

Set-up software provides easy control of details as well as a general overview of drive systems, large or small. The tool handles all drives-related data.

Explorer-like interface

The MCT 10 software features explorer-like interface design and functionality to ease both use and learning of the facilities.

More efficient service organisation

- Scope & logging: Analyze problems easily
- Read out alarms, warnings and fault log in one view
- Compare a saved project with an on-line drive

More efficient commissioning

- Off-line commissioning offsite
- Save/send/mail projects anywhere
- Easy fieldbus handling, multiple drives in project file. Enables service organization to be more efficient

Basic

- Scope & Graph
- Alarm history in saved projects
- Multiple fieldbus support

Advanced

- No limitation in number of drives
- Motor database
- Real-time logging from drive

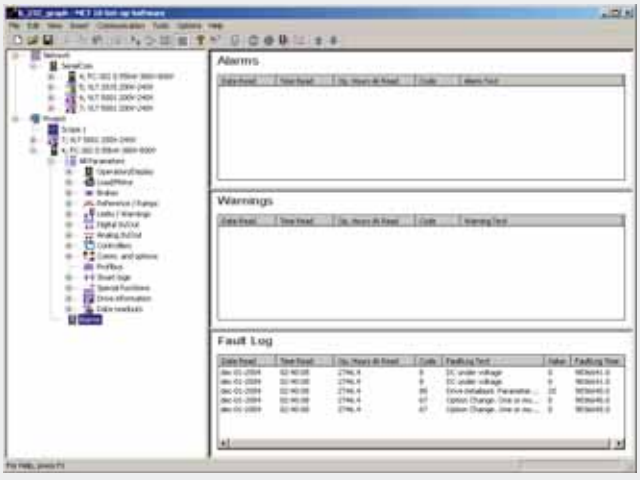
Two modes

On-line and off-line mode

In the online mode, you work with the actual setup of the drives in question. Your actions will have immediate effect on the performance of the drive(s).

Connections

- RS485



Specifications (Basic unit without extensions)

Main supply (L1, L2, L3)	
Supply voltage	200 – 240 V ±10%
Supply voltage	380 – 480 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.
Harmonic disturbance	Meets EN 61000-3-12

Output data (U, V, W)	
Output voltage	0 – 100% of supply voltage
Output frequency	0 – 400 Hz
Switching on output	Unlimited
Ramp times	1 – 3600 sec.

Digital inputs	
Programmable digital inputs	4
Logic	PNP or NPN
Voltage level	0 – 24 V DC
Maximum voltage on input	28 V DC
Input resistance, Ri	Approx. 4 kΩ

Analog inputs	
Analog inputs	2
Modes	Voltage or current
Voltage level	0 to +10 V (scaleable)
Current level	0/4 to 20 mA (scaleable)
Accuracy of analog inputs	Max. error: 0.5% of full scale

Analog output	
Programmable analog outputs	2
Current range at analog output	0/4 – 20 mA
Max. load to common at analog output (clamp 30)	500 Ω
Accuracy on analog output	Max. error: 1% of full scale

Analog outputs can be used as digital outputs

Control card	
RS485 interface	Up to 115 kBaud
Max. load (10 V)	25 mA
Max. load (24 V)	80 mA

Relay output	
Programmable relay outputs	2
Max. terminal load (AC) on 1-3 (break), 1-2 (make)	240 VAC, 2 A and 400 VAC, 2 A

Surroundings/external	
Enclosure	IP 20/Chassis (IP 21/Type 1 optional kit)
Vibration test	1.0 g
Max. relative humidity	5% – 95% (IEC 721-3-3; Class 3K3 (non-condensing) during operation
Ambient temperature	Max. 40-50° C
Galvanic isolation of all	I/O supplies according to PELV
Aggressive environment	Designed for coated/uncoated 3C3/3C2 (IEC 60721-3-3)

Fieldbus communication	
Standard built-in:	BACnet FC Protocol N2 Metasys FLN Apogee Modbus RTU

Protection mode for longest possible up-time
– Electronic thermal motor protection against overload
– Temperature monitoring of the heatsink ensures that the frequency converter trips if the temperature reaches 95° C ± 5° C.
– The frequency converter is protected against short-circuits on motor terminals U, V, W.
– The frequency converter is protected against earth faults on motor terminals U, V, W.
– Protection against mains phase loss

Power, current and frame size

		T2 200 – 240 V		T4 380 – 480 V	
FC 101	kW	Amp.	IP 20 Chassis	Amp.	IP 20 Chassis
PK25	0.25	1.5	H1		
PK37	0.37	2.2		1.2	H1
PK75	0.75	4.2		2.2	
P1K5	1.5	6.8		3.7	
P2K2	2.2	9.6	H2	5.3	H2
P3K0				7.2	
P4K0				9.1	
P3K7	3.7	15.2	H3		
P5K5	5.5	22	H4	12	H3
P7K5	7.5	28		15.5	
P11K	11	42	H5	23	H4
P15K	15			31	
P18K	18.5			37	H5
P22K	22			42.5	
P30K	30			61	H6
P37K	37			73	
P45K	45			90	
P55K	55			106	H7
P75K	75			147	
P90K	90			177	H8

Global Marine

Dimensions, powers and currents

200 – 240 VAC

Enclosure	IP 20/Chassis		H1				H2	H3	H4		H5
			PK25	PK37	PK75	P1K5	P2K2	P3K7	P5K5	P7K5	P11K
Typical Shaft Output		[kW]	0.29	0.37	0.75	1.5	2.2	3.7	5.5	7.5	11
		[HP]	0.33	0.5	1	2	3	5	7.5	10	15
Output Current (3 x 200 – 240 V)	Continuous	[A]	1.5	2.2	4.2	6.8	9.6	15.2	22	28	42
	Intermittent	[A]	1.7	2.4	4.6	7.5	10.6	16.7	24.2	30.8	46.2
Max. cable size Mains, motor		[mm²] ([AWG])	4/10						16/6		
Max. Input Current (3 x 200 – 240 V)	Continuous	[A]	1.1	1.6	2.8	5.6	8.8/7.2	14.1/12	21/18	28.3/24	41/38.2
	Intermittent		1.2	1.8	3.1	6.2	9.5/7.9	15.5/13.2	23.1/19.8	31.1/26.4	45.1/42
Environment											
Estimated power loss at rated max. load, best case		[W]	12	15	21	48	80	97	182	230	369
typically			14	18	26	60	182	120	204	268	386
Weight		[kg]	2.0			2.1	3.4	4.5	7.9		9.5
Efficiency [%], best case			97.0	97.3	98.0	97.6	97.1	97.9	97.3	97.5	97.2
typically			96.5	96.8	97.6	97.0	96.3	97.4	97	97.1	

380-480 VAC

Enclosure	IP 20/Chassis		H1			H2			H3		H4
			PK37	PK75	P1K5	P2K2	P3K0	P4K0	P5K5	P7K5	P11K
Typical Shaft Output		[kW]	0.37	0.75	1.5	2.2	3	4	5.5	7.5	11
		[HP]	0.5	1	2	3	4	5	7.5	10	15
Output Current (3 x 380-440 V)	Continuous	[A]	1.2	2.2	3.7	5.3	7.2	9.1	12	15.5	23
	Intermittent	[A]	1.3	2.4	4.1	5.8	7.9	9.9	13.2	17.1	25.3
Output Current (3 x 440-480 V)	Continuous	[A]	1.1	2.1	3.4	4.8	6.3	8.2	11	14	21
	Intermittent	[A]	1.2	2.3	3.7	5.3	6.9	9.0	12.1	15.4	23.1
Max. cable size Mains, motor		[mm²] ([AWG])	4/10						16/6		
Max. Input Current (3 x 380-440 V)	Continuous	[A]	1.2	2.1	3.5	4.7	6.3	8.3	11.2	15.1	22.1
	Intermittent	[A]	1.3	2.3	3.9	5.2	6.9	9.1	12.3	16.6	24.3
Max. Input Current (3 x 440-480 V)	Continuous	[A]	1.0	1.8	2.9	3.9	5.3	6.8	9.4	12.6	18.4
	Intermittent		1.1	2	3.2	4.3	5.8	7.5	10.3	13.9	20.2
Environment											
Estimated power loss at rated max. load, best case		[W]	13	21	46	46	66	95	104	159	248
typically			15	16	57	58	83	118	131	189	274
Weight		[kg]	2.0	2.0	2.1	3.3	3.3	3.4	4.3	4.5	7.9
Efficiency [%], best case			97.8	98	97.7	98.3	98.2	98	98.4	98.2	98.1
typically			97.3	97.6	97.2	97.9	97.8	97.6	98	97.8	97.9

Enclosure	IP 20/Chassis		H4	H5		H6			H7		H8
			P15	P18K	P22K	P30K	P37K	P45K	P55K	P75K	P90K
Typical Shaft Output		[kW]	15	18	22	30	37	45	55	75	90
		[HP]	20	25	30	40	50	60	75	100	125
Output Current (3 x 380-440 V)	Continuous	[A]	31	37	42.5	61	73	90	106	147	177
	Intermittent	[A]	34	40.7	46.8	67.1	80.3	99	116	161	194
Output Current (3 x 440-480 V)	Continuous	[A]	27	34	40	52	65	80	105	130	160
	Intermittent	[A]	29.7	37.4	44	57.2	71.5	88	115	143	176
Max. cable size Mains, motor		[mm²] ([AWG])	16/6			35/2			50/1	95/0	120/250 MCM
Max. Input Current (3 x 380-440 V)	Continuous	[A]	29.9	35.2	41.5	57	70	84	103	140	166
	Intermittent	[A]	32.9	38.7	45.7	62.7	77	92.4	113	154	182
Max. Input Current (3 x 440-480 V)	Continuous	[A]	24.7	29.3	34.6	49-46	61-57	73-68	89-83	121-113	143-133
	Intermittent		27.2	32.2	38.1	54-50	67-62	80-74	98-91	133-124	157-146
Environment											
Weight		[kg]	7.9	9.5		24.5			36		51

Ordering type code for VLT® HVAC Basic Drive

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]		[12]	[13]	[14]	[15]	[16]	[17]	[18]
FC-101								X	X	X	SXX X	X	AX	BX	CX	X	XX	DX

[1] Application

101	VLT® HVAC Basic Drive FC 101

[2] Power Size

PK25	
PK37	
PK75	
P1K5	
P2K2	
P3K0	
P4K0	
P3K7	
P5K5	
P7K5	*See ratings data on page 13 for power ratings*
P11K	
P15K	
P18K	
P22K	
P30K	
P37K	
P45K	
P55K	
P75K	
P90K	

[3] AC Line Voltage

T2	3 x 200/240 V AC *(1.1 – 11 kW)*
T4	3 x 380/480 V AC

[4] Enclosure

E20	IP 20 (enclosure H1 – H8)
P20	IP 20 (w. back plate. Enclosure H6 – H8)

[5] RFI Filter (EN 55011)

H2	RFI-Filter Class A2 (H6-H8)
H3	RFI -Filter Class A1/B (H6-H8)
H4	RFI-Filter, Class A1 (H1-H5)

[6] Braking & Safety

X	No brake IGBT

[7] Display (Local Control Panel)

X	No LCP installed

[8] Conformal Coating (IEC 721-3-3)

X	No conformal coating (H6-H8)
C	Conformal coating on all PCBs

[9] Mains Input

X	No option

[13] A Option (Fieldbus)

AX	No fieldbus option

[14] B Option (Application)

BX	No application option

[18] D Option (Control Power Backup Input)

DX	No DC input option

Please beware that not all combinations are possible. Find help configuring your drive with the online configurator found under: driveconfig.danfoss.com

Based on your selection, Danfoss manufactures the desired VLT® HVAC Basic Drive.
You will receive a fully assembled frequency converter, tested under full load conditions.

		Power [kW/Hp]		Height [mm/inch]			Width [mm/inch]		Depth [mm/inch]	Hole [mm]
Frame	IP class	3 x 200 – 240V	3 x 380 – 480 V	A	A incl. decoupl.plate	a	B	b	C	D
H1	IP 20	0.25-1.5 kW/0.33-2 HP	0.37-1.5 kW/0.5-2 HP	195/7.7	273/10.7	183/7.2	75/3	56/2.2	168/6.6	4.5
H2		2.2 kW/3 HP	2.2-4 kW/3-5.4 HP	227/8.4	303/11.9	212/8.3	90/3.5	65/2.6	190/7.5	5.5
H3		3.7 kW/5 HP	5.5-7.5 kW/7.5-10 HP	255/10	329/13	240/9.4	100/3.9	74/2.9	206/8.1	
H4		5.5-7.5 kW/7.5-10 HP	11-15 kW/15-20 HP	296/11.7	359/14.1	275/10.8	135/5.3	105/4.1	241/9.5	7
H5		11 kW/15 HP	18.5-22 kW/25-30 HP	334/13.1	402/15.8	314/12.4	150/5.9	120/4.7	255/10	
H6			30-45 kW/40-60 HP	518/20.4	595/23.4 635/25	495/19.5	239/31.5	200/7.9	242/9.5	8.5
H7			55-75 kW/100-120 HP	550/21.7	630/24.8 690/27.2	521/20.5	313/12.3	270/10.6	335/13.2	
H8			90 kW/120 HP	660/26	800/31.5	631/24.8	375/14.8	330/13	335/13.2	

What VLT® is all about

Danfoss VLT Drives is the world leader among dedicated drives providers – and still gaining market share.

Environmentally responsible

VLT® products are manufactured with respect for the safety and well-being of people and the environment.

All activities are planned and performed taking into account the individual employee, the work environment and the external environment. Production takes place with a minimum of noise, smoke or other pollution and environmentally safe disposal of the products is pre-prepared.

UN Global Compact

Danfoss has signed the UN Global Compact on social and environmental responsibility and our companies act responsibly towards local societies.

EU Directives

All factories are certified according to ISO 14001 standard. All products fulfil the EU Directives for General Product Safety and the Machinery directive. Danfoss VLT Drives is, in all product series, implementing the EU Directive concerning Hazardous Substances in Electrical and Electrical Equipment (RoHS) and is designing all new product series according to the EU Directive on Waste Electrical and Electronic Equipment (WEEE).

Impact on energy savings

One year's energy savings from our annual production of VLT® drives will save the energy equivalent to the energy production from a major power plant. Better process control at the same time improves product quality and reduces waste and wear on equipment.

Dedicated to drives

Dedication has been a key word since 1968, when Danfoss introduced the world's first mass produced variable speed drive for AC motors – and named it VLT®.

Twenty five hundred employees develop, manufacture, sell and service drives and soft starters in more than one hundred countries, focused only on drives and soft starters.

Intelligent and innovative

Developers at Danfoss VLT Drives have fully adopted modular principles in development as well as design, production and configuration.

Tomorrow's features are developed in parallel using dedicated technology platforms. This allows the development of all elements to take place in parallel, at the same time reducing time to market and ensuring that customers always enjoy the benefits of the latest features.

Rely on the experts

We take responsibility for every element of our products. The fact that we develop and produce our own features, hardware, software, power modules, printed circuit boards, and accessories is your guarantee of reliable products.

Local backup – globally

VLT® motor controllers are operating in applications all over the world and Danfoss VLT Drives' experts located in more than 100 countries are ready to support our customers with application advice and service wherever they may be.

Danfoss VLT Drives experts don't stop until the customer's drive challenges are solved.