

Fact Sheet

# VLT® HVAC Drive FC 102



**The VLT® HVAC Drive series is available in a wide power range designed for all HVAC applications. An advanced drive built on HVAC dedication.**

The VLT® HVAC Drive is a full-featured, HVAC dedicated drive with built-in intelligence. The VLT® HVAC Drive has a vast number of functions developed to meet the needs of the HVAC business. It is the perfect match for pumps, fans and compressors in modern buildings that are fitted with increasingly sophisticated solutions.

Intelligent application functions support and optimize the application operation to gain maximum uptime with minimal energy consumption. A built-in energy meter documents the consumption and Condition Based Monitoring, with application baseline, indicated from first power up the application performance.

**98%**  
energy efficiency

Save energy and money with up to 98% efficiency VLT® drives.

## Product range

3 x 200 – 240 V.....	1.1 – 160 kW
3 x 380 – 480 V.....	1.1 – 1000 kW
3 x 525 – 600 V.....	1.1 – 90 kW
3 x 525 – 690 V.....	1.1 – 1400 kW

*With 110% overload torque*

## Available protection ratings

IP 00 .....	355 – 1200 kW
IP 20.....	1.1 – 800 kW
IP 21 (Type 1).....	1.1 – 1400 kW
IP 54 (Type 12).....	75 – 1400 kW
IP 55 (Type 12).....	1.1 – 90 kW
Type 3R.....	1.1 – 400 kW
IP 66 (Type 4X indoor) .....	1.1 – 90 kW

*Optional coating providing extra protection for aggressive environments.*

Feature	Benefit
<b>All built-in – low investment</b>	
Modular product concept with a wide range of options	Low initial investment – max. flexibility, later upgrade possible
Dedicated HVAC I/O functionality for temperature sensors etc.	External conversion saved
Decentral I/O control via serial communication	Reduced wiring costs, and external controller I/O saved
Wide range of HVAC protocols for BMS controller connectivity	Less extra gateway solutions needed
4 x auto tuned PID's	No external PID controller needed
Programmable Smart Logic Controller	Often makes PLC unnecessary
Real Time Clock	Enables daily and weekly operation with intelligent features
Integrated fan, pump and compressor functionality for optimal control	Saves external control and conversion equipment
Intelligent feature like Fire Emergency Mode, Dry run Detection, Constant Torque etc.	Multi operation zones to protect human life & inventory and save energy.
<b>Save energy – less operation cost</b>	
Smart "Back-channel" cooling concepts to minimize room ambient temperature	Reduce energy to cool-down the drives and prolong
Automatic Energy Optimizer function	Saves 5 – 15% energy
Advanced energy monitoring	Overview on energy consumption
Energy saving functions i.e. flow compensation, sleep mode etc.	Saves energy and wear & tear on the system
<b>Built to last - maximize uptime</b>	
Advanced Condition Based Monitoring with application baseline.	Maximize uptime on notification when application change
Robust single enclosure	Easy installation even in a demanding environment
Unique cooling concept with no ambient air flow over electronics	Problem-free operation in harsh environments
Operation temperature from -25C to +55C, see design guide for more details.	No external cooling or oversize necessary
<b>User-friendly – save commissioning and operating cost</b>	
Smart Start	Quick and precise start-up
Awarded graphical display, 27 languages	Effective commissioning and operation
USB and Wifi connection	Easy to use PC software tools and Apps for Smart devices
Global HVAC support organisation	Local service – globally
<b>Built-in DC coils and RFI filters – no EMC concerns</b>	
Integrated DC link harmonic filters	Effective harmonic mitigation with low power consumption. Meets EN 61000-3-12
Integrated EMC filters	Meets IEC 61800-3 in Category C1, C2 and C3

## Application options

A wide range of integrated HVAC options can be fitted in the drive:

### VLT® General Purpose I/O MCB 101

3 digital inputs, 2 digital outputs,  
1 analog current output,  
2 analog voltage inputs.

### VLT® Relay Card MCB 105

Adds 3 relay outputs.

### VLT® Extended Relay Card MCB 113

7 digital inputs, 2 analog outputs 4  
SPDT relays, Meets NAMUR recommen-  
dations, Galvanic isolation capability

### VLT® Analog I/O MCB 109

3 Pt1000/Ni1000 inputs, 3 analogue  
voltage outputs and back-up power for  
Real-Time Clock.

### VLT® 24 V External Supply MCB 107

24 VDC external supply can be con-  
nected to supply, control and option  
cards.

### VLT® Sensor Input MCB 114

Sensor input card for motor protection  
with 2 or 3 PT100 or PT1000 inputs

### Brake chopper (IGBT) option

Connection to external brake resistor to  
absorb the generated energy from the  
motor.

### PTU-025 Pressure transmitter

4 sensor inputs to monitor AHU filter  
and control the airflow.



## Power options

A wide range of external power options  
to support critical applications:

### ■ VLT® Advanced Harmonic Filter

For critical demands on harmonic  
distortion

### ■ VLT® dU/dt Filter

For special demands on motor  
isolation protection

## Specifications

Mains supply (L1, L2, L3)	
Supply voltage	200 – 240 V ±10% 380 – 480 V ±10% 525 – 600 V ±10% 525 – 690 V ±10%
Supply frequency	50/60 Hz
Displacement power factor (cos φ)	> 0.98 near unity
Switching on input supply L1, L2, L3	1–2 times/min.
Output data (U, V, W)	
Output voltage	0–100% of supply voltage
Ramp times	1–3600 s
Output frequency	0–590 Hz
Digital inputs	
Programmable digital inputs	6*
Programmable pulse inputs	2* (PNP positive logic)
Pulse input accuracy	(0.1–110 kHz)
Logic	PNP or NPN
Voltage level	0–24 VDC
* 2 can be used as digital outputs or pulse inputs	
Relay outputs	
Programmable relay outputs	2 (240 VAC, 2 A and 400 VAC, 2 A)
Digital outputs	
Programmable digital output	2*
Voltage level	24 VDC (+1, -3 V) 200mA
* Utilize some of the digital inputs	
Analog input	
Analog inputs	2
Modes	Voltage or current
Voltage level	0 V to +10 V (scaleable)
Current level	0/4 to 20 mA (scaleable)
Analog output	
Programmable analog outputs	1
Current range at analog output	0/4–20 mA
Fieldbus communication	
Standard built-in: FC Protocol N2 Metasys FLN Apogee Modbus RTU BACnet MSTP embedded	Optional: MCA 108 - VLT® LonWorks MCA 109 - VLT® BACnet MCA 125 - VLT® BACnet/IP MCA 104 - VLT® DeviceNet MCA 101 - VLT® PROFIBUS DP MCA 120 - VLT Profinet MCA 121 - VLT Ethernet TCP/IP MCA 122 - VLT Modbus TCP

### ■ VLT® Sine Wave Filter

For motor protection, noise & bearing  
current reduction

### ■ VLT® All-Mode filter

For motor & EMC protection and long  
unshielded motor cables (1000m).

## HVAC PC software tools

### ■ VLT® Motion Control Tool MCT 10

Ideal for commission, customize and  
servicing the drive.

### ■ VLT® Energy Box

Comprehensive energy tool to  
document and optimize energy  
consumption.

### ■ VLT® Motion Control Tool MCT 31

Harmonics calculation tool

## High power options

### ■ IEC Emergency stop with

Safety Relay

### ■ Safety Stop with Safety Relay

### ■ RFI filter

### ■ NAMUR terminals

### ■ RCD

### ■ IRM

### ■ Mains shielding

### ■ Regen terminals

Please see the VLT® High Power Drive Selection Guide  
for the complete range of options.