

# VLT® HVAC Drive

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 diverse 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.

**Product range:**

- 3 x 200 – 240 V ..... 1.1 – 45 kW
  - 3 x 380 – 480 V ..... 1.1 – 1000 kW
  - 3 x 525 – 600 V ..... 1.1 – 90 kW
  - 3 x 525 – 690 V ..... 45 – 1400 kW
- With 110% over load torque*

**Available enclosure ratings:**

- IP 00 ..... 45 – 630 kW
  - IP 20 ..... 1.1 – 400 kW
  - IP 21 (NEMA 1) ..... 1.1 – 1400 kW
  - IP 54 (NEMA 12) ..... 55 – 1400 kW
  - IP 55 (NEMA 12) ..... 1.1 – 90 kW
  - IP 66 (NEMA 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
Smart Logic Controller	Often makes PLC unnecessary
Real Time Clock	Enables daily and weekly settings
Integrated fan, pump and compressor functionality i.e.	Saves external control and conversion equipment
Fire Override Mode, Dry run Detection, Constant Torque etc.	Protects equipment and saves energy
Back-channel cooling for frame D, E and F frame	Prolonged lifetime of electronics
<b>Save energy – less operation cost</b>	
Automatic Energy Optimizer function, advanced version	Saves 5 – 15% energy
Advanced energy monitoring	Overview on energy consumption
Energy saving functions i.e. flow compensation, sleep mode etc.	Saves energy
<b>Unequalled robustness – maximum uptime</b>	
Robust single enclosure	Maintenance-free
Unique cooling concept with no ambient air flow over electronics	Problem-free operation in harsh environments
Max ambient temp. 50°C without derating (D-frame 45°C)	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 plug and play connection	Easy to use PC software tools
Global HVAC support organisation	Local service – globally
<b>Built-in DC coils and RFI filters – no EMC concerns</b>	
Integrated DC link harmonic filters	Small power cables. Meets EN 61000-3-12
Integrated EMC filters	Meets EN 55011 Class B, A1 or A2

## 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 analogue current output, 2 analogue voltage inputs.

### VLT® Relay Card MCB 105

Adds 3 relay outputs.

### 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 connected to supply, control and option cards.

### Sensor input card

Sensor input card for motor protection with 2 or 3 PT100 or PT1000 inputs (VLT® Sensor Input MCB 114).

### Brake chopper (IGBT) option

Connected to an external brake resistor, the built-in brake chopper limits the load on the intermediate circuit in the case the motor acts as a generator.

## Power options

A wide range of external power options are available for VLT® HVAC Drives in critical networks or applications:

- **Advanced harmonic filters:** For critical demands on harmonic distortion
- **dU/dt filters:** For special demands on motor isolation protection
- **Sine wave filters**

## HVAC PC software tools

- **VLT® Motion Control Tool MCT 10:** Ideal for commissioning and servicing the drive
- **VLT® Energy Box:** Comprehensive energy analysis tool. Energy consumption with and without drive can be calculated (drive payback time). Online function for accessing drives energy log.
- **VLT® Motion Control Tool MCT 31:** Harmonics calculation tool

## 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) 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 voltage
Switching on output	Unlimited
Ramp times	1–3600 sec.
Output frequency	0–590 Hz
Digital inputs	
Programmable digital inputs	6*
Logic	PNP or NPN
Voltage level	0–24 VDC
* 2 can be used as digital outputs	
Pulse inputs	
Programmable pulse inputs	2*
Voltage level	0–24 VDC (PNP positive logic)
Pulse input accuracy	(0.1–110 kHz)
* Utilize some of the digital inputs	
Analogue input	
Analogue inputs	2
Modes	Voltage or current
Voltage level	0 V to +10 V (scaleable)
Current level	0/4 to 20 mA (scaleable)
Analogue output	
Programmable analogue outputs	1
Current range at analogue output	0/4–20 mA
Relay outputs	
Programmable relay outputs	2 (240 VAC, 2 A and 400 VAC, 2 A)
Fieldbus communication	
Standard built-in: FC Protocol N2 Metasys FLN Apogee Modbus RTU BACnet embedded	Optional: LonWorks (MCA 108) BACnet (MCA 109) DeviceNet (MCA 104) Profibus (MCA 101)

## 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.

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