



# VLT® HVAC Drive

The VLT® HVAC Drive series is available in a wide power range designed for all HVAC applications. This is an advanced drive built on HVAC dedication and knowledge.



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 – 1000 kW
  - 3 x 525 – 690 V ..... 1.1 – 1400 kW
- With 110% over load torque*

**Available enclosure ratings:**

- IP 00/Chassis: ..... 110 – 1000 kW
  - IP 20/Chassis: ..... 1.1 – 90 kW
  - IP 21/Type 1: ..... 1.1 – 1400 kW
  - IP 54/Type 12: ..... 110 – 1400 kW
  - IP 55/Type 12: ..... 1.1 – 90 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>	
<ul style="list-style-type: none"> <li>• Modular product concept with a wide range of options</li> <li>• Dedicated HVAC I/O functionality for temperature sensors etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Low initial investment – max. flexibility, later upgrade possible</li> <li>• External conversion saved</li> </ul>
<ul style="list-style-type: none"> <li>• Decentral I/O control via serial communication</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced wiring costs, and external controller I/O saved</li> </ul>
<ul style="list-style-type: none"> <li>• Wide range of HVAC protocols for BMS controller connectivity</li> </ul>	<ul style="list-style-type: none"> <li>• Less gateway solutions needed</li> </ul>
<ul style="list-style-type: none"> <li>• 4 x auto tuned PID's</li> </ul>	<ul style="list-style-type: none"> <li>• No external PID controller needed</li> </ul>
<ul style="list-style-type: none"> <li>• Smart Logic Controller</li> </ul>	<ul style="list-style-type: none"> <li>• Often makes PLC unnecessary</li> </ul>
<ul style="list-style-type: none"> <li>• Real Time Clock</li> </ul>	<ul style="list-style-type: none"> <li>• Enables daily and weekly settings</li> </ul>
<ul style="list-style-type: none"> <li>• Integrated fan, pump and compressor functionality i.e.</li> <li>• Fire Override Mode, Dry run Detection Constant Torque etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces external control and conversion equipment</li> <li>• Protects equipment and saves energy</li> </ul>
<b>Save energy – less operation cost</b>	
<ul style="list-style-type: none"> <li>• Automatic Energy Optimizer function, advanced version</li> </ul>	<ul style="list-style-type: none"> <li>• Saves 5 – 15% energy</li> </ul>
<ul style="list-style-type: none"> <li>• Advanced energy monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Overview of energy consumption</li> </ul>
<ul style="list-style-type: none"> <li>• Energy saving functions i.e. flow compensation, sleep mode etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Energy and extended lifetime</li> </ul>
<b>Unequalled robustness – maximum uptime</b>	
<ul style="list-style-type: none"> <li>• Robust single enclosure</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance-free</li> </ul>
<ul style="list-style-type: none"> <li>• Unique cooling concept with no ambient air flow over electronics</li> </ul>	<ul style="list-style-type: none"> <li>• Problem-free operation in harsh environments</li> </ul>
<ul style="list-style-type: none"> <li>• Max ambient temp. 50° C without derating</li> </ul>	<ul style="list-style-type: none"> <li>• No external cooling or oversize necessary</li> </ul>
<b>User friendly – save commissioning and operating cost</b>	
<ul style="list-style-type: none"> <li>• Smart start</li> </ul>	<ul style="list-style-type: none"> <li>• Quick and precise start-up</li> </ul>
<ul style="list-style-type: none"> <li>• Awarded graphical display, 27 languages</li> </ul>	<ul style="list-style-type: none"> <li>• Effective commissioning and operation</li> </ul>
<ul style="list-style-type: none"> <li>• USB plug and play connection</li> </ul>	<ul style="list-style-type: none"> <li>• Easy to use PC software tools</li> </ul>
<ul style="list-style-type: none"> <li>• Global HVAC support organisation</li> </ul>	<ul style="list-style-type: none"> <li>• Local service – globally</li> </ul>
<b>Built-in DC coils and RFI filters – no EMC concerns</b>	
<ul style="list-style-type: none"> <li>• Integrated DC link harmonic filters</li> </ul>	<ul style="list-style-type: none"> <li>• Small power cables. Meets EN 61000-3-12</li> </ul>
<ul style="list-style-type: none"> <li>• Integrated EMC filters</li> </ul>	<ul style="list-style-type: none"> <li>• Meets EN 55011 Class B, A1 or A2</li> </ul>

Perfect

match for:

– Any kind of HVAC application

## Application options

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

### General purpose I/O option (MCB 101)

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

### Relay option (MCB 105)

Adds 3 relay outputs

### Analog I/O option (MCB 109)

3 Pt1000/Ni1000 inputs, 3 analog voltage outputs

### External 24 VDC supply (MCB 107)

24 VDC external supply can be connected to supply, control and option cards.

### Battery back-up for Real Time Clock (MCB 109).

### Sensor input card

Sensor input card for motor protection with 2 or 3 PT100 or PT1000 inputs (MCB114).

### Brake chopper option:

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

### Mains Disconnect Switch

Mains Disconnect Switch as a built-in option.

### Power options

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

- **Advanced harmonic filters:** For critical requirements on harmonic distortion
- **dU/dt filters:** For special demands on motor insulation protection
- **Sine wave filters (LC filters):** For noiseless motor

### HVAC PC software tools

- **MCT 10:** Ideal for commissioning and servicing the drive
- **VLT® Energy Box:** Comprehensive energy analysis tool, shows the drive payback time
- **MCT 31:** Harmonic calculation tool

## Specifications

Mains supply (L1, L2, L3)	
Supply voltage	200–240 V ±10%
Supply voltage	380–480 V ±10%
Supply voltage	525–600 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.
Open/Closed loop	0–1000 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)
* Utilizes 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
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)

## Dimensions [mm]

	A2	A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	C4
H	268		400	420	480	650	399	520	680	770	550	660
W	90	130	200		242		165	230	308	370	308	370
D		205		177 (213)	195	260	249	242	310	335		333
H+		375		420			475	670			755	950
W+	90	130	200				165	255			329	391
	D1	D2	D3	D4	E1	E2	F1	F2	F3	F4		
H	1209	1589	1046	1327	2000	1547			2204			
W		420		408	600	585	1400	1800	2000	2400		
D		380		375	494	498		606				

Note: H and W dimensions are with back-plate. H+ and W+ are with IP/Type upgrade kit. D dimensions are without option A/B.