

# VLT® AutomationDrive

The premier, globally supported drive concept for exceptional control of motor driven applications.



Designed for variable speed control of all asynchronous motors and permanent magnet motors, on any industrial machine or production line, a VLT® AutomationDrive helps its owner save energy, increase flexibility, and optimize processes.

### Flexible and expandable

Built on a flexible, modular design concept the AutomationDrive is packed with standard, industry features out of the box. These can be expanded with plug-and-play options with additional features, positioning control, fieldbuses, safety functions such as STO, SS1, SLS, SMS and SSM, motor protection and more.

### Robust and safe

VLT AutomationDrives are proven performers in all industrial environments and grid voltages, including 690V. Enclosures are available up

to IP 66 (depending on model), and integrated DC chokes and RFI filters in all models protect installations by minimizing harmonic distortion and electromagnetic interferences. All drives are fully tested at the factory before they are shipped.

Easy to set up and operate via the user-friendly graphical control panel, a VLT AutomationDrive only requires little maintenance once in operation. The result is a market leading control solution that provides a fast return on investment and a highly competitive cost of ownership.

### Power range

|                          |                 |
|--------------------------|-----------------|
| 3 x 200 – 240 V.....     | 0.25 – 37 kW    |
| 3 x 380 – 480/500 V..... | 0.37 – 800 kW   |
| 3 x 525 – 600 V.....     | 0.75 kW – 75 kW |
| 3 x 525 – 690 V.....     | 1.1 kW – 1.2 MW |
| Normal overload.....     | 1.5 kW – 1.4 MW |

## 98%

### Energy efficiency

Optimize processes while reducing energy costs. Versatile, flexible, configurable and built to last.

| Feature                                              | Benefit                                                     |
|------------------------------------------------------|-------------------------------------------------------------|
| <b>Reliable</b>                                      | <b>Maximum uptime</b>                                       |
| Ambient temperature 50° C without derating           | Less need for cooling or oversizing                         |
| Available in IP 00, 20, 21, 54, 55 and 66 enclosures | Enclosures for all environments                             |
| Resistant to wear and tear                           | Low lifetime cost                                           |
| Back-channel cooling for frame D, E and F            | Prolonged lifetime of electronics                           |
| <b>User-friendly</b>                                 | <b>Saves commissioning and operating cost</b>               |
| Plug-and-Play technology                             | Easy upgrade and changeover                                 |
| Awarded control panel                                | User-friendly                                               |
| Intuitive VLT® interface                             | Saves time                                                  |
| Pluggable cage clamp connectors                      | Easy connection                                             |
| Exchangeable languages                               | User-friendly                                               |
| <b>Intelligent</b>                                   |                                                             |
| Intelligent warning systems                          | Warning before controlled stop                              |
| Smart Logic Control                                  | Reduces need for PLC capacity                               |
| Advanced plug-in features                            | Easy commissioning                                          |
| Safe stop                                            | Safety cat. 3, PL d (ISO 13849-1), Stop cat. 0 (EN 60204-1) |
| STO: Safe Torque Off (IEC 61800-5-2)                 | SIL 2 (IEC 61508)<br>SIL CL 2 (IEC 62061)                   |
| Intelligent heat management                          | Intelligent heat management                                 |

Facts about our products



### Fieldbus options

- VLT® PROFIBUS DP MCA 101
- VLT® DeviceNet MCA 104
- VLT® CanOpen MCA 105
- VLT® Profibus Converter MCA 113
- VLT® Profibus Converter MCA 114
- VLT® PROFINET MCA 120
- VLT® Ethernet/IP MCA 121
- VLT® Modbus TCP MCA 122
- VLT® POWERLINK MCA 123
- VLT® EtherCAT MCA 124
- VLT® DeviceNet Converter MCA 194

### I/O and feedback options

- VLT® General Purpose I/O MCB 101
- VLT® Encoder Input MCB 102
- VLT® Resolver Input MCB 103
- VLT® Relay Card MCB 105
- VLT® 24 V External Supply MCB 107
- VLT® Extended Relay Card MCB 113
- VLT® Sensor Input MCB 114

### Safety options

- VLT® Safe PLC I/O MCB 108
- VLT® PTC Thermistor Card MCB 112
- VLT® Safe Option MCB 140 Series
- VLT® Safe Option MCB 150 Series

### Motion Control Options

- VLT® Motion Control Option MCO 305
- VLT® Synchronizing Controller MCO 350
- VLT® Position Controller MCO 351
- VLT® Center Winder MCO 352

### Power options

- VLT® Brake resistors MCE 101
- VLT® Sine-Wave Filters MCC 101
- VLT® dU/dt Filters MCC 102
- VLT® Common Mode Filter MCC 105
- VLT® Advanced Harmonic Filters AHF 005/010

### Other accessories

- IP 21/NEMA 1 Kit (convert IP 20 to IP 21)
- PROFIBUS adapter
- Sub-D9 Connector
- Decoupling plate for fieldbus cables
- USB connection cable to PC
- Panel Through option
- LCP panel mounting kit

## Specifications

| Mains supply (L1, L2, L3)                                                                                               |                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply voltage                                                                                                          | 200 – 240 V ±10%<br>FC 301: 380 – 480 V ±10%<br>FC 302: 380 – 500 V ±10%, 525 – 600 V ±10%<br>525 – 690 V ±10%                                                |
| Supply frequency                                                                                                        | 50/60 Hz                                                                                                                                                      |
| True Power Factor (λ)                                                                                                   | 0.92 nominal at rated load                                                                                                                                    |
| Displacement Power Factor (cos φ) near unity                                                                            | (> 0.98)                                                                                                                                                      |
| Switching on input supply L1, L2, L3                                                                                    | Maximum 2 times/min.                                                                                                                                          |
| Output data (U, V, W)                                                                                                   |                                                                                                                                                               |
| Output voltage                                                                                                          | 0 – 100% of supply voltage<br>FC 301: 0.2 – 590 Hz (0.25 – 75 kW)<br>FC 302: 0 – 590 Hz (0.25 – 75 kW)<br>0 – 590 Hz (90 – 1200 kW)<br>0 – 300 Hz (Flux mode) |
| Output frequency                                                                                                        |                                                                                                                                                               |
| Switching on output                                                                                                     | Unlimited                                                                                                                                                     |
| Ramp times                                                                                                              | 1–3600 sec.                                                                                                                                                   |
| <i>Note: 160% current can be provided for 1 minute.<br/>Higher overload rating is achieved by oversizing the drive.</i> |                                                                                                                                                               |
| Digital inputs                                                                                                          |                                                                                                                                                               |
| Programmable digital inputs                                                                                             | FC 301: 4 (5) / FC 302: 4 (6)                                                                                                                                 |
| Logic                                                                                                                   | PNP or NPN                                                                                                                                                    |
| Voltage level                                                                                                           | 0–24 VDC                                                                                                                                                      |
| <i>Note: One/two digital inputs can be programmed as digital output for FC 301/FC 302.</i>                              |                                                                                                                                                               |
| Analogue input                                                                                                          |                                                                                                                                                               |
| Analogue inputs                                                                                                         | 2                                                                                                                                                             |
| Modes                                                                                                                   | Voltage or current                                                                                                                                            |
| Voltage level                                                                                                           | FC 301: 0 to +10 V<br>FC 302: -10 to +10 V (scaleable)                                                                                                        |
| Current level                                                                                                           | 0/4 to 20 mA (scaleable)                                                                                                                                      |
| Pulse/encoder inputs                                                                                                    |                                                                                                                                                               |
| Programmable pulse/encoder inputs                                                                                       | FC 301: 1 / FC 302: 2                                                                                                                                         |
| Voltage level                                                                                                           | 0 – 24 V DC (PNP positive logic)                                                                                                                              |
| Digital output*                                                                                                         |                                                                                                                                                               |
| Programmable digital/pulse outputs                                                                                      | FC 301: 1 / FC 302: 2                                                                                                                                         |
| Voltage level at digital/frequency output                                                                               | 0 – 24 V                                                                                                                                                      |
| Analogue output*                                                                                                        |                                                                                                                                                               |
| Programmable analogue outputs                                                                                           | 1                                                                                                                                                             |
| Current range                                                                                                           | 0/4–20 mA                                                                                                                                                     |
| Relay outputs*                                                                                                          |                                                                                                                                                               |
| Programmable relay outputs                                                                                              | FC 301: 1 / FC 302: 2                                                                                                                                         |
| Cable lengths                                                                                                           |                                                                                                                                                               |
| Max. motor cable lengths                                                                                                | FC 301: 50 m / FC 302: 150 m (screened/armoured)<br>FC 301: 75 m / FC 302: 300 m (unscreened/unarmoured)                                                      |

\*More analogue and digital inputs/outputs can be added with options.

- Mounting brackets
- Mains disconnect option
- USB Extension
- Interbus gateway MCA 110
- Option Adapter
- RCMB20/RCMB35 Leakage Current Monitor Module

### Brake chopper (IGBT) option

Limits the load on the intermediate circuit in the case the motor acts as a generator.

### High power options

- Emergency stop with Safety Relay
- Safety Stop with Safety Relay
- RFI Filters
- NAMUR terminals
- Residual Current Device
- Insulation Resistance Monitor
- Mains shielding
- Regen terminals

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

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