

# Variable speed drives for asynchronous motors

## Altivar 61

622835



Ventilation application

622836



Air conditioning application

622834



Pumping application

### Applications

The Altivar 61 drive is a frequency inverter for 3-phase asynchronous motors rated between 0.75 kW and 630 kW.

The drive has been designed for state-of-the-art applications in heating, ventilation and air conditioning (HVAC) in industrial and commercial buildings:

- Ventilation
- Air conditioning
- Pumping

The Altivar 61 can reduce operating costs in buildings by optimizing energy consumption whilst improving user comfort.

Its numerous integrated options enable it to be adapted to and incorporated into electrical installations, sophisticated control systems and building management systems.

The need for electromagnetic compatibility and a reduction in harmonics were taken into account at the outset of designing the drive.

Depending on its design characteristics, each type (UL Type 1/IP 20 and/or UL Type 12/IP 54) either has built-in class A or class B EMC filters and DC chokes, or these items are available as optional accessories.

### Functions

With its macro-configurations and "Simply Start" menu, the Altivar 61 drive can be used to start up your applications without delay and to make adjustments in virtually no time using user-friendly dialogue tools.

#### Functions designed specifically for pumping and ventilation applications

- Energy saving ratio, 2-point or 5-point quadratic ratio
- Automatic catching of a spinning load with speed detection
- Adaptation of current limiting according to speed
- Noise and resonance suppression by means of the switching frequency which, depending on the power rating, can be set to up to 16 kHz during operation, and random modulation.
- Preset speeds
- Integrated PID regulator, with preset PID references and automatic/manual ("Auto/Man.") mode
- Electricity and service hours meter
- Detection of absence of fluid, detection of zero flow rate, limiting of flow rate
- Sleep function, wake-up function
- Customer settings with display of physical values: bar, l/s, °C, etc.

#### Protection functions

- Motor and drive thermal protection, PTC thermal probe management
- Protection against overloads and overcurrents in continuous operation
- Machine mechanical protection via jump frequency function, phase rotation
- Protection of the installation by means of underload, overload and zero flow detection
- Protection via multiple fault management and configurable alarm groups

#### Safety functions

- Machine safety by means of the integrated "Power Removal" function  
This function prevents the motor starting accidentally; it meets the requirements of machine safety standard EN 954-1, category 3 and those of operational safety standard IEC/EN 61508, SIL2 (safety control/signalling applied to processes and systems).
- Installation safety by means of the function for forced operation with inhibition of faults, direction of operation and configurable references.

#### Flexibility and user-friendliness

The Altivar 61 has numerous configurable logic and analog inputs and outputs in order that it can be optimised for your applications.

It supports the Modbus and CANopen protocols as standard in order to increase the performance of your control systems. It also supports the industry's major communication buses and can be integrated easily into building management (HVAC) systems via option cards.

Furthermore, it features multi-pump cards, enabling it to provide flexible and user-friendly management of multiple pumps.

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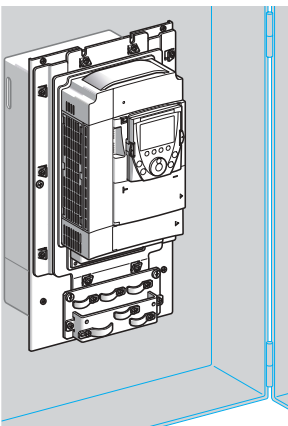
ATV 61HC31N4,  
ATV 61HD37M3X, ATV 61HU22N4

534628



ATV 61W075N4,  
ATV 61W075N4C

53235



ATV 61HU75N4 flush-mounted

### A comprehensive offer

The Altivar 61 range of variable speed drives extends across a range of motor power ratings from 0.75 kW to 630 kW with three types of power supply:

- 200...240 V 3-phase, 0.75 kW to 90 kW, UL Type 1/IP 20, (ATV 61H●●●M3, ATV 61H●●●M3X)
- 380...480 V 3-phase, 0.75 kW to 630 kW, UL Type 1/IP 20, (ATV 61H●●●N4)
- 380...480 V 3-phase, 0.75 kW to 90 kW, UL Type 12/IP 54, (ATV 61W●●●N4, ATV 61W●●●N4C),

Altivar 61 UL Type 1/IP 20 drives can also be used in conjunction with motors rated between 0.37 kW and 5.5 kW on a single phase 200...240 V supply (derating is required).

The Altivar 61 drive integrates the Modbus and CANopen protocols as standard as well as numerous functions. These functions can be extended using communication, I/O extension and multi-pump option cards and a "Controller Inside" programmable card (see page 60660/5).

Other external options, such as braking resistors, resistance braking units and filters, are available to complement this offer (see page 60660/5).

The entire range conforms to international standards IEC/EN 61800-5-1, IEC/EN 61800-2, IEC/EN 61800-3, is UL, CSA, DNV, C-Tick, NOM 117 and GOST certified and has been developed to meet the requirements of the directives regarding protection of the environment (RoHS, WEEE, etc) as well of those of the European Directives governing the issuing of the CE marking.

The Altivar 61 drive can be inserted in an installation's safety system. It integrates the "Power Removal" safety function which prevents the motor from restarting unintentionally.

### Electromagnetic compatibility EMC

The incorporation of EMC filters in ATV 61H●●●M3 and ATV 61●●●●N4 drives and the recognition of EMC requirements simplifies machine installation and provides a very economical means of meeting CE marking requirements.

ATV 61W●●●N4C drives feature integrated class B EMC filters, enabling them to meet the requirements of the EN 55011 (class B group 1) and IEC/EN 61800-3 (category C1) standards.

ATV 61H●●●M3X drives have been designed without an EMC filter. Filters are available as an option and can be installed by the user to reduce emission levels, see pages 60671/2 to 60671/5.

### Installation

The Altivar 61 drive has been designed to optimize the size of enclosures (floor-standing, wall-mounted, etc):

- The power part, with IP 54 degree of protection, can be easily mounted outside the enclosure using the kit for flush-mounting in a dust and damp proof enclosure (VW3 A9 5●●, see page 60664/3); this type of mounting can be used to limit the temperature rise inside the enclosure or to reduce the size of enclosure required.

- Ambient temperature inside the enclosure:

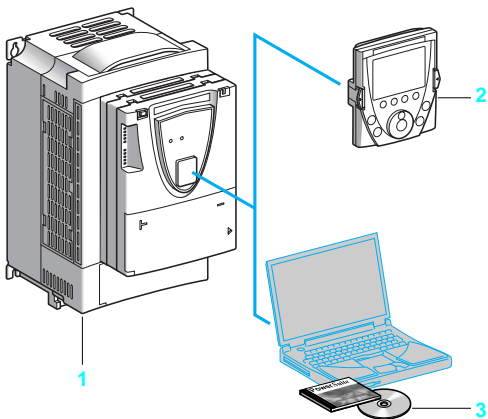
- 50°C without derating corresponding to the drive rating
- Up to 60°C using the control card fan kit VW3 A9 4●● corresponding to the drive rating and, if necessary, by derating the output current (see page 60664/2)

- Mounting side-by-side (see pages 60678/2, 60678/4 and 60678/8)

The Altivar 61 drive can also be wall-mounted in compliance with the requirements for UL Type 1 using kit VW3 A9 2●●, and in compliance with the requirements for IP 21 or IP 31 using kit VW3 A9 1●● (see pages 60664/4 and 60664/5).

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### Dialogue tools

The Altivar 61 drive **1** is supplied with a remote graphic display terminal **2**:

- The navigation button provides a quick and easy means of accessing the drop-down menus.
- The graphic screen displays 8 lines of 24 characters of plain text.
- The advanced functions on the display unit provide access to the more complex drive functions.
- The display screens, menus and parameters can all be customized for the user or the machine.
- Online help screens are available.
- Configurations can be stored and downloaded: four configuration files can be stored.
- The drive can be connected to several other drives via a multidrop link.
- It can be located remotely on an enclosure door with IP 54 or IP 65 degree of protection, a standard feature of UL Type 12/IP54 drives.
- It is supplied with 6 languages installed as standard (English, French, German, Italian, Spanish and Chinese). Other languages can be loaded to the flash memory.

Up to 45 kW at 200...240 V and 75 kW at 380...480 V, the Altivar 61 drive can be controlled using an integrated 7-segment display terminal (see pages 60663/2 and 60663/3).

The PowerSuite software workshop **3** can be used to configure, adjust and debug the Altivar 61 in just the same way as all other Telemecanique speed drives and starters. It can be used via a direct, Ethernet, modem or wireless Bluetooth® connection.

### Quick programming

#### Macro-configuration

The Altivar 61 offers quick and easy programming using macro-configurations corresponding to different applications or uses: start-stop, pumping and ventilation, general use, connection to communication networks, PID regulator. Each of these configurations is still fully modifiable.

#### “Simply Start” menu

In just a few steps, the “Simply Start” menu can be used to ensure the application operates correctly, obtain maximum motor performance and ensure motor protection.

The architecture, the hierarchical parameter structure and the direct access functions all serve to make programming quick and easy, even for more complex functions.

### Services

The Altivar 61 has numerous built-in maintenance, monitoring and diagnostic functions:

- Drive test functions with diagnostic screen on the remote graphic display terminal
- I/O maps
- Communication maps for the different ports
- Oscilloscope function that can be viewed using the PowerSuite software workshop
- Management of the drive installed base via processors with flash memory
- Remote use of these functions by connecting the drive to a modem via the Modbus port
- Identification of all the drive’s component parts as well as the software versions
- Fault logs with display of the value of up to 16 variables on occurrence of a fault
- Display terminal languages loaded in the flash memory
- A message of up to 5 lines of 24 characters can be stored in the drive.

534763

RUN	Term	+50.00Hz	5.4A
1.1 SIMPLY START <input type="checkbox"/>			
2/3 wire control :		2 wire	
Macro-configuration :		Pumps.Fans	
Standard mot. Freq.:		50Hz IEC	
Rated motor power :		2.2kW	
Rated motor volt. :		400V	
Code		<<	>>
		Quick <input type="button" value="v"/>	

Simply Start menu

533523

SCF1	Term	+50.00Hz	0.0A
FAULT HISTORY <input type="checkbox"/>			
Short circuit			
Overcurrent			
External FLT			
Overvoltage			
Undervoltage			
Help		Quick <input type="button" value="v"/>	

Fault log

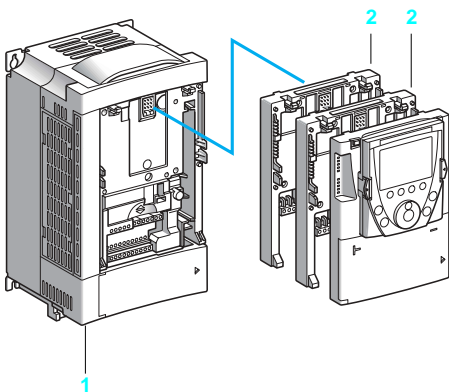
522162

SCF1	Term	+50.00Hz	0.0A
MOTOR SHORT CIRCUIT <input type="checkbox"/>			
Check the connection cables and the motor insulation.			
Perform the diagnostic test.			
		Quick <input type="button" value="v"/>	

Troubleshooting screen

# Variable speed drives for asynchronous motors

## Altivar 61



### Options

The Altivar 61 drive **1** can integrate up to two option cards simultaneously(1):

- I/O extension cards **2** (see pages 60667/2 and 60667/3)
- Communication cards **2** for use in industrial applications or for HVAC (see pages 60668/2 to 60668/11)
- Multi-pump cards **2** for the management of multiple pumps (see pages 60203/2 to 60203/5)
- “Controller Inside” programmable card **2**. This card is used to adapt the drive to specific applications quickly and progressively, by decentralizing the control system functions (programming in IEC 61131-3 compliant languages) (see pages 60204/2 to 60204/9).

External options can be associated with the Altivar 61:

- Braking units and resistors, see pages 60669/2 to 60669/9
- DC chokes, line chokes and passive filters, to reduce current harmonics (see pages 60670/2 to 60670/13)
- Additional EMC input filters (see pages 60671/2 to 60671/5)
- Motor chokes and sinus filters for long cable runs or to remove the need for shielding (see pages 60672/2 to 60672/7)

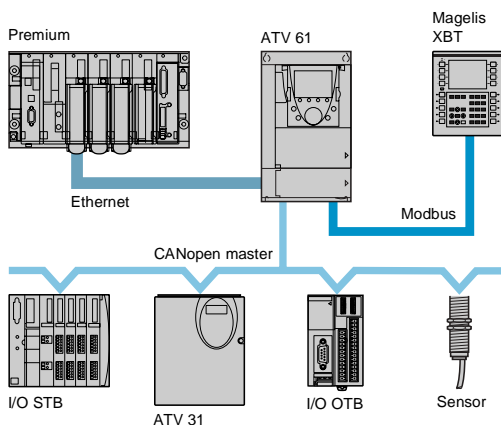
**Note:** Please refer to the compatibility summary tables to determine which options are available for individual drives (see pages 60674/2 to 60674/7).

### Integration into control systems and building management systems

The Altivar 61 integrates a combined Modbus or CANopen port for adjustment, supervision and configuration. A second port is available for connecting a Magelis terminal for machine dialogue.

The Altivar 61 drive can also be connected to other communication networks using the communication cards (see pages 60668/2 to 60668/11). All communication protocols designed for use in industrial applications (Ethernet TCP/IP, Fipio, Modbus, Modbus Plus, Uni-Telway, Profibus DP, DeviceNet and INTERBUS ) or in building management systems (LONWorks, METASYS N2, APOGEE FLN, BACnet) are available.

The option of powering the control part separately enables communication to be maintained (monitoring, diagnostics) even if there is no power supply to the power part.



Example of a drive equipped with a communication card and a “Controller Inside” programmable card

The “Controller Inside” programmable card transforms the drive into an automation island:

- The card integrates its own I/O; it can also manage those of the drive and an I/O extension card.
- It contains onboard application programs developed in IEC 61131-3 compliant languages, which reduce the control system’s response time.
- Its CANopen master port enables control of other drives and dialogue with I/O modules and sensors.

The two multi-pump cards enable the drive to be adapted for pump applications. The **VW3 A3 502** multi-pump card ensures the compatibility of pump applications developed for an Altivar 38 drive with an Altivar 61 drive.

The **VW3 A3 503** multi-pump card enables all multi-pump applications to be supported.

Multi-pump cards feature their own I/O. They can manage I/O on the drive as well as those on I/O extension cards. They can also make use of drive parameters such as those for speed, current, torque, etc.

(1) The Altivar 61 cannot support more than one option card with the same reference. Please refer to the compatibility tables summarizing the possible combinations for drives, options and accessories on pages 60674/2 to 60674/7.