

Altivar 61 and Altivar 61 Plus variable speed drives

for 3-phase motors from 1 to 2500 HP, .75 to 1800 kW

e-Catalog

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Schneider
Electric

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ATV61HC31N4,
ATV61HD22M3X, ATV61HU22N4



ATV61W075N4



Introduction

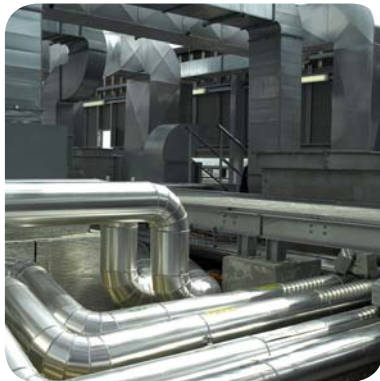
The Altivar™ 61 variable-speed drive defines ease of use for centrifugal pump, fan, and normal duty industrial applications. It offers advanced features, functions, and user flexibility while its revolutionary design reduces installation cost and start-up time, and offers reliable operation, simple diagnostics, and energy efficiency.

The Altivar 61 variable-speed drive enables you to:

- Lower energy costs by reducing motor speeds on centrifugal pump and fan applications.
- Decrease installation costs by eliminating throttling valves or inlet guide vane typically used to control flow.
- Manage real-time data by offering internal connection to industrial and building networks.
- Improve uptime with voltage sag ride-through, qualified by SEMI F47 standard.
- Reduce life cycle costs of the installation by eliminating mechanical shock to belts and motor loads.
- Improve indoor air quality and occupant comfort through accurate flow control.

Features and benefits

- Reduce start-up time with macros for pump, fan, PID regulator, and network configuration.
- Unique random switching frequency modulation provides enhanced occupant comfort by reducing audible motor noise.
- Configurable automatic restart parameters and broken belt detection minimize downtime.
- Robust motor starts with catch-on-the-fly by speed search, regardless of motor direction.
- Suppress resonance in mechanical structures with selectable skip frequencies.
- Configurable loss of follower and alarm management settings minimize downtime.
- Bump-less transfer from local to automatic control reduces maintenance time.
- Power removal safety input prevents unintended motor operation.



Air treatment application



Air purification application



Water treatment application

Applications

The Altivar 61 drive incorporates advanced functions for optimum efficiency for applications in industrial and commercial buildings:

- Ventilation
- Air conditioning
- Air purification, smoke extraction
- Cooling tower applications
- Pumping and booster stations
- Irrigation stations
- Pumps for lift stations, influent, effluent, sludge, and dewatering
- Normal duty applications requiring up to 110% or 120% overload and not running continuously below 5 Hz

Advanced functions

The Altivar 61 drive meets many requirements due to its many integrated application functions, while helping improve the reliability of equipment with its protection and safety functions.

Functions designed specifically for pump and fan applications

- Energy saving ratio, 2 or 5 point quadratic ratio
- Automatic catching a spinning load with speed detection
- Adaptation of current limiting according to speed
- Noise and resonance suppression due to the capability of adjusting the switching frequency up to 16 kHz (depending on the rating) and the possibility of configuring skip frequencies
- Preset speeds
- Integrated PID regulator
- Automatic/manual (Auto/Man.) mode
- Electricity and service hours meter
- Zero flow and limited flow detection
- Pump sleep function, wake-up function
- Custom settings with display of physical measurements

Protection functions

- Motor and drive thermal protection, and PTC thermal probe management
- Protection against overloads and overcurrents in continuous operation
- Machine mechanical protection via skip frequency function, output phase rotation
- Protection of the installation: underload or overload
- Protection via management of fault notification and configurable alarms

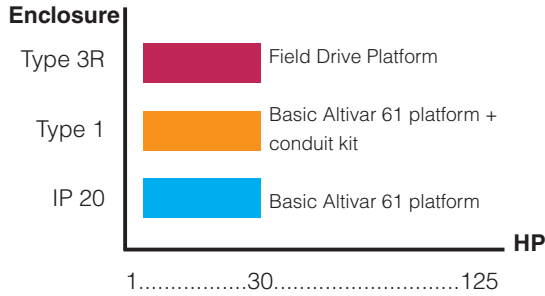
Safety functions

- Equipment safety via the integrated Power Removal function
- This function stops the motor and helps preventing accidental restarts; it complies with machine safety standard ISO 1389-1, category 3 and the standard for functional safety IEC/EN 61508, SIL2 capability (safety control-signaling applied to processes and systems).
- This safety function means that the drive can be installed as part of the safety system for an Electrical/Electronic/Programmable Electronic control system relating to the safety of a machine or industrial process.

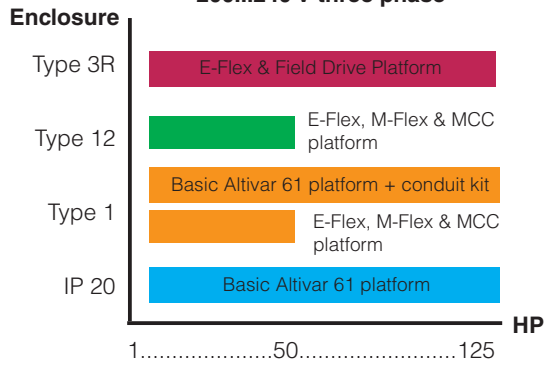
Altivar 61 variable speed drives

Introduction Product Range

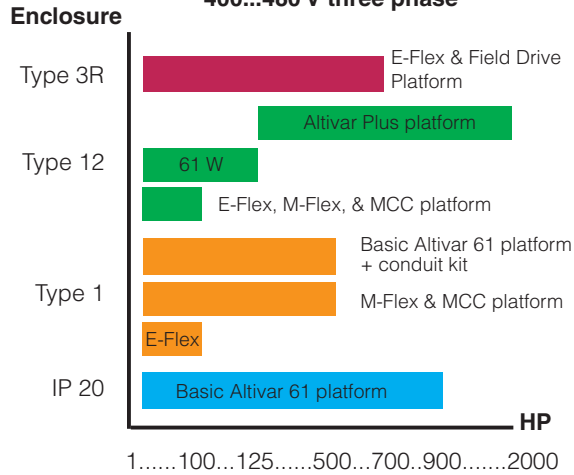
200...240 V single phase



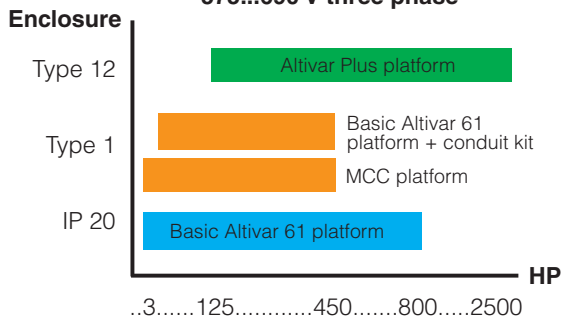
200...240 V three phase



400...480 V three phase



575...690 V three phase



Product range

The Altivar 61 range of variable speed drives covers a wide range of motor power ratings from 1 to 2500 HP, .75 to 1800 kW in three voltage ranges.

In addition to the enclosure options listed below, customized enclosed options can be provided by Schneider Electric Drives Systems.



Basic Altivar 61 platform

Field Drive



Type 1 E-flex

Type 3R E-flex



Altivar Plus

Product range (continued)

The Altivar 61 AC drive is designed for the control of three-phase asynchronous and synchronous motors in variable-torque and normal duty applications. It includes an LCD Graphic display keypad with an easy-to-read display and navigation wheel that allows users to scroll through drop-down menus.

The Altivar 61 comes standard with:

- LCD graphic keypad, eight lines of 24 characters
- Integrated RJ45 port, Modbus, or CAN networks selectable
- Removable control terminal block with the following I/O:
 - Six logic inputs
 - One power removal input
 - Two analog inputs
 - One analog output
 - Two relay outputs (1NO/NC, 1NO)

The Altivar 61 drive integrates the Modbus and CANopen protocols as standard, as well as over 150 functions. These functions can be extended using communication option cards, I/O extension cards, or an Integrated Machine controller card, which allows customer programming in the SoMachine environment.

External options such as line reactors, and filters complete the offer.

Mounting options

The Altivar 61 drive can be mounted in a variety of ways.

Wall Mounting

The Altivar 61 can be mounted directly on a wall without having to be installed inside an enclosure. UL Type 1 can be achieved using kits **VW3A92●●**.

Flange-mounting in enclosure

The Altivar 61 drive has been designed to optimize the size of enclosures by mounting the power section and heatsink out the back of the enclosure. This type of flange-mounting can be used to reduce the size of enclosure required and to limit the temperature rise inside the enclosure:

- The power section, with Type 12/IP 54 degree of protection, can be mounted outside the enclosure using kit **VW3A95●●**.

This type of mounting can lead to ambient temperatures of up to 60°C inside the enclosure without derating. It may be necessary to use a control card fan kit **VW3A94●●** appropriate for the drive rating in order to avoid hot spots.

Eco-friendly and energy-saving

In addition to providing energy savings on pump and fan installations, the Altivar 61 drive has been designed as an eco-friendly product (using 90 % recyclable materials, compliant with environmental standard ISO 14040). It is RoHS-compliant.

Compliance with international standards and certifications

The entire range conforms to international standards IEC/EN 61800-5-1, IEC/EN 61800-2, IEC/EN 61800-3, is UL 508C, CSA, DNV, C-Tick, NOM 117 and GOST certified, and has been developed to meet the requirements of directives regarding the protection of the environment (RoHS, WEEE, etc.) as well as those of European Directives (CE mark).

Functional safety and ATEX applications

The Altivar 61 drive features a Power Removal safety function that is designed to help improve motor stopping and help prevent accidental restarts. This safety function means that the drive can be installed as part of the safety system for an Electrical/Electronic/Programmable Electronic control system relating to the safety of a machine or industrial process.

It meets the requirements of category 3 of the ISO 1384 machine safety standard, SIL 2 of IEC/EN 61508 and standard IEC/EN 61800-5-2 which covers the functional safety requirements of power drive products. The Power Removal safety function also enables the Altivar 61 drive to offer protection for motors installed in explosive atmospheres (ATEX certification).

Electromagnetic compatibility

Observing requirements of electromagnetic compatibility were considered from the design stage. The incorporation of EMC filters in **ATV61H●●●M3**, **ATV61●●●N4**, and **ATV61●●●Y** drives and the recognition of EMC requirements facilitates installation and provides economical means of helping ensure that machines receive the CE mark. **ATV61H●●●M3X** and **ATV61H●●●S6X** drives have been designed without an EMC filter. Filters are available as an option and can be installed by the customer to reduce the level of emissions.

Altivar 61 variable speed drives

Introduction Product Range



Graphic display keypad & configuration tools

Graphic display keypad

The Altivar 61 drive (1) is supplied with a graphic display keypad (2). It is user-friendly, offering quick and easy access to the plain text menus and advanced functions, and online help screens in six languages. Four configuration files can be stored in the graphic display keypad.

Customizable units can be created to display machine applicable data. It can be mounted remotely on an enclosure door with Type 12 or IP 54 degree of protection. The drive's application functions are easily accessible via the user dial and programmable function keys on the display unit.

SoMove setup software (3)

SoMove software for PCs can be used to configure, adjust and debug the Altivar 61 drive with the Oscilloscope function and also for maintenance of this drive. It can also be used to customize the integrated display keypad menus. It can be used with a direct cable connection or a Bluetooth® wireless connection. The Altivar 61 requires the use of the Modbus-Bluetooth® adaptor (4).

Simple Loader and Multi-Loader programming tools

The Simple Loader tool (5) enables one drive's configuration to be downloaded, saved, and up-loaded with a simple, two button device.

The Multi-Loader tool (6) enables a number of configurations to be stored from the SoMove software to be saved or copied and downloaded to another drive. The Altivar 61 drives must be powered up.

Quick programming

Simply Start menu

The Simply start menu can be used to quickly enter the minimum parameters to get the drive running, maximize motor performance and provide motor protection.

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

Macro-configuration

The Altivar 61 drive offers quick and easy programming using macro-configurations for different applications:

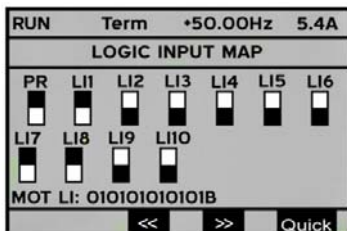
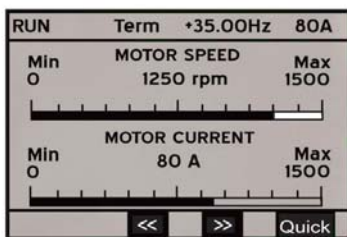
- Simple start-stop applications
- General use
- Connection to communication networks
- PID regulator applications
- Pump and fan applications

After a macro configuration is selected, the user can further modify and customize the settings.

Built-in, monitoring and diagnostic functions

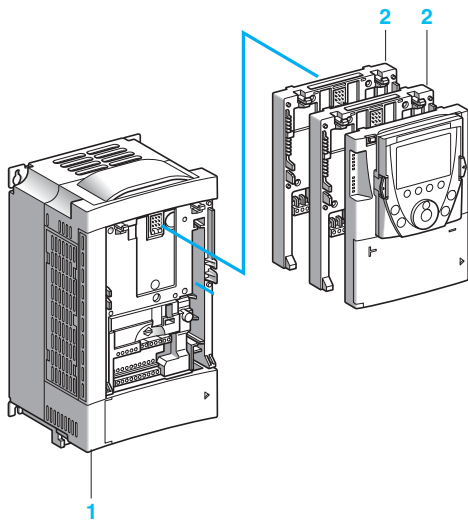
The Altivar 61 has numerous built-in monitoring and diagnostic functions:

- Built-in drive test functions with diagnostic screen on the graphic display keypad
- I/O maps for active status display of inputs and outputs
- Communication maps for the different ports
- Oscilloscope function that can be viewed using the SoMove setup software
- Apply filtering and scaling to analog inputs and outputs
- Remote use of these functions by connecting the drive to an identification of the drive's part number, ratings and software versions
- Error logs with display of the value of up to 16 variables at time of a fault
- Add timing delays to logic inputs, logic outputs and relay outputs
- A service message of up to 5 lines of 24 characters can be stored in the drive



Altivar 61 variable speed drives

Introduction Options



A wide range of options

The Altivar 61 has a wide range of options to adapt to a variety of installations and applications.

Option cards

The Altivar 61 drive (1) can integrate up to three different option cards simultaneously, including:

- Two of the following cards:
 - I/O extension cards (two versions available) (2)
 - Communication cards (2)
 - Integrated Machine Controller programmable card (2) to adapt the variable speed drive to specific applications

Other options

Numerous other external options can be combined with the Altivar 61:

- Flange Mounting kits to mount the heatsink outside of an enclosure
- Type 1 Conduit kits which provide conduit landing when wall mounting the drive
- Line reactors and passive filters to reduce harmonic currents
- Additional EMC input filters to reduce conducted emissions on the incoming power line
- Load reactors and output filters for long cable runs

Integration into PLC architectures

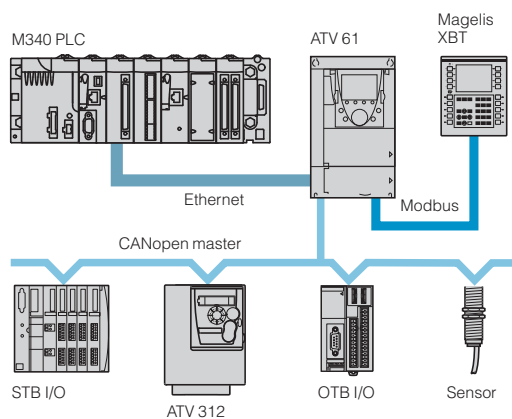
The Altivar 61 drive has a built-in combined Modbus or CANopen port for quick, accurate control, adjustment, supervision and configuration. A second RJ45 port is available on the face of the product and can accept the graphic display keypad or for a Magelis terminal for a user interface.

The Altivar 61 drive can be integrated into many networked industrial applications using the communication option cards. The following protocols are available: Modbus TCP Daisy Chain, Modbus/Uni-Telway, EtherNet/IP, DeviceNet, PROFIBUS DP V0 and V1, and Profinet. In addition, the Altivar 61 is able to interface with the most common Building Automation Systems: BACnet, LonWorks, METASYS N2, and APOGEE™ FLN.

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

The Integrated Machine Controller (IMC) card transforms the drive into an automation island. This is used to adapt the drive to customized applications by decentralizing the control system functions:

- The IMC card has additional I/O; it can also manage the drive I/O and an I/O extension card.
- It contains onboard application programs developed in IEC/EN 61131-3 languages.
- Its CANopen master port enables control of other drives and dialogue with I/O modules and sensors.



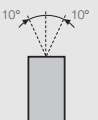
Electrical Specifications

Input power	Voltage	V	200 - 15%...240 + 10% single phase for ATV 61H075M3...HD45M3X 200 - 15%...240 + 10% three-phase for ATV 61H...M3 and ATV 61H...M3X 380 - 15%...480 + 10% three-phase for ATV 61...N4 500 - 15%...690 + 10% three-phase for ATV 61H...Y 500 - 15%...600 + 10% three-phase for ATV61H...S6X
	Frequency	Hz	50 - 5%...60 + 5%
Drive output voltages		V	Maximum three-phase voltage equal to line supply voltage
Output frequency range	ATV61H...M3 ATV61HD11M3X...HD37M3X ATV61H075N4...HD37N4 ATV61H...S6X	Hz	0...599 on standard product. 0...1600 operation is available in product with specific firmware. Delivery of product requires compliance with Control of Export EU Regulation No 961/2010, Section II.A3. 003
	ATV61HD45M3X...HD90M3X ATV61HD45N4...HC63N4 ATV61H...Y	Hz	0...500
Configurable switching frequency	ATV61H...M3 ATV61HD11M3X, HD15M3X ATV61H075N4...HD30N4 ATV61H...S6X	kHz	Nominal switching frequency: 4 kHz without derating in continuous operation. Adjustable during operation from 1...16 kHz Above 4 kHz, see the derating curves in the Installation Manual.
	ATV61HD18M3X, HD45M3X ATV61HD37N4...HD75N4	kHz	Nominal switching frequency: 2.5 kHz without derating in continuous operation. Adjustable during operation from 1...16 kHz Above 2.5 kHz, see the derating curves in the Installation Manual.
	ATV61HD55M3X, HD90M3X ATV61HD90N4...HC63N4	kHz	Nominal switching frequency: 2.5 kHz without derating in continuous operation. Adjustable during operation from 2.5...8 kHz Above 2.5 kHz, see the derating curves in the Installation Manual.
	ATV61HU22Y...HD30Y	kHz	Nominal switching frequency: 4 kHz without derating in continuous operation. Adjustable during operation from 2.5...6 kHz Above 4 kHz, see the derating curves in the Installation Manual.
	ATV61HD37Y...HC63Y	kHz	Nominal switching frequency: 2.5 kHz without derating in continuous operation. Adjustable during operation from 2.5...4.9 kHz Above 2.5 kHz, see the derating curves in the Installation Manual.
Speed range	ATV61H...M3 ATV61H...M3X ATV61...N4 ATV61H...S6X		Asynchronous motor: <ul style="list-style-type: none"> ■ 1...1000 in closed-loop mode with encoder feedback ■ 1...100 in open-loop mode without encoder feedback Synchronous motor: <ul style="list-style-type: none"> ■ 1...50 in open-loop mode without encoder feedback
Speed accuracy	For a torque variation of 0.2 Tn to Tn		± 0.01% of nominal speed, in closed-loop mode with encoder feedback ± 10% of nominal slip, without encoder feedback
Torque accuracy			± 15% in open-loop mode without encoder feedback
Braking torque			30% of nominal motor torque without braking resistor (typical value) Up to 150% with braking resistor installed as an option
Maximum transient current	ATV61H037M3...HD45M3X ATV61H075N4...HD75N4 ATV61H...S6X ATV61HU22Y...HD90Y		120% of the nominal drive current for 60 s (typical value) 190% of the nominal drive current for 2 s (typical value)
	ATV61HD55M3X, HD75M3X ATV61HD90N4...HC63N4 ATV61HC11Y...HC80Y		110% of the nominal drive current for 60 s (typical value) 170% of the nominal drive current for 2 s (typical value)
Motor control profiles	ATV61H...M3 ATV61H...M3X ATV61...N4 ATV61H...S6X ATV61H...Y		Asynchronous motor: <ul style="list-style-type: none"> ■ Sensorless Flux Vector Control (SFVC) (voltage or current vector) ■ Voltage/frequency ratio (2 or 5 points) Synchronous motor: <ul style="list-style-type: none"> ■ Vector control without speed feedback

Electrical Specifications (continued)

Frequency loop		PI regulator with parameters to adjust response time.
Slip compensation		Automatic. Can be suppressed or adjusted.
Drive noise level		Conforming to directive 86-188/EEC
ATV61H037M3...HU15M3, ATV61H075N4...HU22N4	dBA	43
ATV61HU22M3...HU40M3, ATV61HU30N4, HU40N4	dBA	54.5
ATV61HU55M3, ATV61HU55N4, HU75N4	dBA	55.6
ATV61HU75M3, ATV61HD11N4, ATV61H●●●S6X	dBA	57.4
ATV61HD11M3X, HD15M3X, ATV61HD15N4, HD18N4	dBA	60.2
ATV61HD18M3X, HD22M3X, ATV61HD22N4, ATV61HU22Y...HD30Y	dBA	59.9
ATV61HD30M3X...HD45M3X, ATV61HD30N4, HD37N4	dBA	64
ATV61HD45N4...HD75N4, ATV61HD37Y...HD90Y	dBA	63.7
ATV61HD55M3X, ATV61HD90N4	dBA	60.5
ATV61HD75M3X, ATV61HD90M3X, ATV61HC11N4	dBA	69.5
ATV61HC13N4, HC16N4	dBA	66
ATV61HC22N4...HC63N4, ATV61HC11Y...HC80Y	dBA	77
Indicator LED		1 red LED: LED lit indicates the presence of drive voltage
Electrical impedance		Inductance of approximately 1-2%
ATV61H075M3...HU75M3, ATV61H075N4...HD15N4, ATV61HU15S6X...HU75S6X, ATV61HU22Y...HD11Y		
ATV61HD11M3X...HD45M3X, ATV61HD18N4...HD75N4, ATV61HD15Y...HD90Y		Integrated DC choke Inductance of approximately 2-3%
ATV61HD55M3X...HD75M3X, ATV61HD90N4...HC63N4, ATV61HC11Y...HC80Y		DC choke ships with drive for field installation Inductance of approximately 3%
ATV61HD55M3XD...HD75M3XD, ATV61HD90N4D...HC63N4D		DC choke is not included with drive Requires inductance of approximately 3%, such as AC line reactor be installed.
Electrical isolation		Between power and control (inputs, outputs, power supplies)
Acceleration and deceleration ramps		Ramp profiles: <ul style="list-style-type: none"> ■ Linear, can be adjusted separately from 0.01 to 9999 s ■ S, U or customized Automatic adaptation of deceleration ramp time if braking capacities exceeded, possible inhibition of this adaptation (use of braking resistor)
Braking to a standstill		By DC injection: <ul style="list-style-type: none"> ■ By a command on a programmable logic input ■ Automatically as soon as the estimated output frequency drops to < 0.1 Hz, period adjustable from 0 to 60 s or continuous, current adjustable from 0 to 1.2 In (in open loopmode only).
Main drive protection and protection features		Thermal protection: <ul style="list-style-type: none"> ■ Against overheating ■ Of the power stage Protection against: <ul style="list-style-type: none"> ■ Short-circuits between motor phases ■ Input phase breaks ■ Overcurrents between output phases and ground ■ Overvoltages on the DC bus ■ A break on the control circuit ■ Exceeding the limit speed ■ Line supply overvoltage and undervoltage ■ Input phase loss, in three-phase
Motor protection		Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: <ul style="list-style-type: none"> ■ The motor thermal state is saved when the drive is powered down. ■ Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks Protection with PTC probes
Dielectric strength	ATV61H●●●M3 ATV61H●●●M3X	Between ground and power terminals: 2830 V ~ Between control and power terminals: 4230 V ~
	ATV61●●●N4 ATV61H●●●S6X	Between ground and power terminals: 3535 V ~ Between control and power terminals: 5092 V ~
	ATV61H●●●Y	Between ground and power terminals: 3110 V ~ Between control and power terminals: 5345 V ~
Insulation resistance to ground		> 1 MΩ (electrical isolation) 500 V ~ for 1 minute
Frequency resolution	Display units	Hz 0.1
	Analog inputs	Hz 0.024/50 Hz (11 bits)

Environmental Specifications

Vibration resistance	ATV61H●●●M3 ATV61HD11M3X...HD45M3X ATV61H075N4...HD75N4 ATV61HU22Y...HD90Y ATV61H●●●S6X		1.5 mm peak to peak from 3...13 Hz, 1 gn from 13...200 Hz, conforming to IEC/EN 60068-2-6
	ATV 61HD55M3X, HD75M3X ATV 61HD90N4...HC63N4 ATV 61HC11Y...HC80Y		1.5 mm peak to peak from 3...10 Hz, 0.6 gn from 10...200 Hz, conforming to IEC/EN 60068-2-6
Shock resistance	ATV 61H●●●M3 ATV 61HD11M3X...HD45M3X ATV 61H075N4...HD90N4 ATV61HU22Y...HD90Y ATV61H●●●Y ATV61H●●●S6X		15 gn for 11 ms conforming to IEC/EN 60068-2-27
	ATV61HD55M3X, HD75M3X ATV61HD90N4...HC16N4 ATV61HC11Y...HC16Y		7 gn for 11 ms conforming to IEC/EN 60068-2-27
	ATV61HC22N4...HC63N4 ATV61HC22Y...HC80Y		4 gn for 11 ms conforming to IEC/EN 60068-2-27
Maximum ambient pollution Definition of insulation	ATV61H●●●M3 ATV61HD11M3X, HD15M3X ATV61H075N4...HD18N4 ATV61H●●●S6X		Degree 2 conforming to IEC/EN 61800-5-1
	ATV61HD18M3X...HD75M3X ATV61HD22N4...HC63N4 ATV61H●●●Y		Degree 2 conforming to IEC/EN 61800-5-1 Degree 3 in accordance with UL marking conforming to UL840
Environmental conditions Use	ATV61H●●●M3, ATV61HD11M3X...HD45M3X ATV61H075N4...HD75N4 ATV61H●●●S6X		IEC 60721-3-3 classes 3C1 and 3S2
	ATV61H●●●M3S337 ATV61HD11M3X337... HD45M3X337 ATV61HD55M3X, HD75M3X ATV61H075N4S337... HD75N4S337 ATV61HD90N4...HC80N4, ATV61●●●Y		IEC 60721-3-3 class 3C2
Relative humidity		%	5...95% without condensation or dripping water conforming to IEC 60068-2-3
Ambient air temperature around the device	Operation	°C	For ATV61H●●●●● drives: - 10...+ 50 without derating Up to + 60°C with derating and with the control card fan kit VW3 A9 4●● corresponding to the drive rating. See the derating curves in the Installation Manual.
	Storage	°C	- 25...+ 70
Maximum operating altitude	ATV61H●●●M3 ATV61H●●●M3X ATV61H●●●N4	m	1000 without derating 1000...3000 derating the current by 1% per additional 100 m. Limited to 2000 m for the "Corner Grounded" distribution network
	ATV61H●●●Y	m	1000 without derating 1000...2260 derating the current by 1% per additional 100 m.
Operating position Maximum permanent angle in relation to the normal vertical mounting position			

Certifications and Compliance

Conformity to standards		Altivar 61 drives have been developed to conform to the strictest international standards and the recommendations relating to electrical industrial control devices (IEC, EN), in particular: low voltage, IEC/EN 61800-5-1, IEC/EN 61800-3 (conducted and radiated EMC immunity and emissions).
Protection		IEC/EN 61800-3, Environments 1 and 2 (EMC requirements and specific test methods) IEC/EN 61000-4-2 level 3 (electrostatic discharge immunity test) IEC/EN 61000-4-3 level 3 (radiated, radio-frequency, electromagnetic field immunity test) IEC/EN 61000-4-4 level 4 (electrical fast transient/burst immunity test) IEC/EN 61000-4-5 level 3 (surge immunity test) IEC/EN 61000-4-6 level 3 (immunity to conducted disturbances, induced by radio-frequency fields) IEC/EN 61000-4-11 (voltage dips, short interruptions and voltage variations immunity tests)
Conducted EMC emissions for drives		IEC/EN 61800-3, environments 1 and 2, categories C1, C2, C3
	ATV61H037M3...HU22M3 ATV61H075N4...HU40N4	Integrated EMC filter meets EN 55011 class A group 1, IEC/EN 61800-3 category C2 Use with additional EMC filter to meet: ■ EN 55011 class B group 1, IEC/EN 61800-3 category C1
	ATV61HU30M3...HU75M3 ATV61HU55N4...HC63N4 ATV61H●●●S6X	Integrated EMC filter meets EN 55011 class A group 2, IEC/EN 61800-3 category C3 Use with additional EMC filter to meet: ■ EN 55011 class A group 1, IEC/EN 61800-3 category C2 ■ EN 55011 class B group 1, IEC/EN 61800-3 category C1
	ATV61H●●●M3X	Use with additional EMC filter to meet: ■ EN 55011 class A group 1, IEC/EN 61800-3 category C2 ■ EN 55011 class B group 1, IEC/EN 61800-3 category C1
	ATV61H●●●Y	Integrated EMC filter meets EN 55011 class A group 2, IEC/EN 61800-3 category C3
CE marking		The drives are marked CE according to the European low voltage (2006/95/EC) and EMC (89/336/EEC) directives
Product certifications	ATV61H●●●M3 ATV61HD11M3X...HD45M3X ATV61HD55M3XD, HD75M3XD ATV61H075N4...HD75N4 ATV61HD90N4...HC63N4 ATV61H●●●S6X ATV61H●●●Y	UL 508C, CSA, C-Tick, NOM 117 and GOST ABS, DNV
Degree of protection		IEC/EN 61800-5-1, IEC/EN 60529
	ATV61H●●●M3 ATV61HD11M3X...HD45M3X ATV61H075N4...HD75N4 ATV61H●●●S6X ATV61HU22Y...HD90Y	IP 21, IP 41 on upper part, IP 54 on isolated power component and heatsink section, UL Type 1 with accessory VW3A92●●
	ATV61HD55M3X, HD75M3X ATV61HD90N4...HC63N4 ATV61HC11Y...HC80Y	IP 00, IP 41 on upper part and IP 30 on front panel and side parts. IP 54 on isolated power component and heatsink section UL Type 1 with accessory VW3A92●●

I/O and Control Specifications

Available internal supplies	Short-circuit and overload protection: <ul style="list-style-type: none"> 1 x 10.5 V c \pm 5% supply for the reference potentiometer (1 to 10 kΩ), maximum current 10 mA 1 x 24 V c supply (min. 21 V, max. 27 V), maximum current 200 mA
For external + 24 V power supply	24 V $\overline{\text{---}}$ (min. 19 V, max. 30 V) Power 30 W
Analog input	AI1-/AI1+
	1 bipolar differential analog input \pm 10 V $\overline{\text{---}}$ (maximum voltage 24 V). Max. sampling time: 2 ms \pm 0.5 ms. Resolution: 11 bits + 1 sign bit. Accuracy: \pm 0.6% for a temperature variation of 60°C. Linearity: \pm 0.15% of maximum value.
	AI2
	1 software-configurable voltage or current analog input: <ul style="list-style-type: none"> Voltage analog input 0...10 V $\overline{\text{---}}$, impedance 30 kΩ (max. voltage 24 V) Current analog input X-Y mA by programming X and Y from 0 to 20 mA, with impedance 242 Ω Max. sampling time: 2 ms \pm 0.5 ms. Resolution: 11 bits. Accuracy: \pm 0.6% for a temperature variation of 60°C. Linearity: \pm 0.15% of maximum value.
	Other inputs
	Available on I/O option cards.
Analog output	AO1
	1 analog output software-configurable for voltage or current or as a logic output: <ul style="list-style-type: none"> Voltage analog output 0...10 V $\overline{\text{---}}$, min. load impedance 470 Ω Current analog output X-Y mA by programming X and Y from 0 to 20 mA, max. load impedance 500 Ω Max. sampling time: 2 ms \pm 0.5 ms. Resolution: 10 bits. Accuracy: \pm 1% for a temperature variation of 60°C. Linearity: \pm 0.2%. <ul style="list-style-type: none"> Logic output: 10 V, 20 mA maximum
	Other outputs
	Available on I/O option cards.
Relay outputs	R1A, R1B, R1C
	1 relay logic output, one "N/C" contact and one "N/O" contact with common point. Minimum switching capacity: 3 mA for 24 V $\overline{\text{---}}$. Maximum switching capacity: <ul style="list-style-type: none"> On resistive load ($\cos \phi = 1$): 5 A for 250 V \sim or 30 V $\overline{\text{---}}$ On inductive load ($\cos \phi = 0.4$ and L/R = 7 ms): 2 A for 250 V \sim or 30 V $\overline{\text{---}}$ Max. response time: 7 ms \pm 0.5 ms. Electrical service life: 100,000 operations.
	R2A, R2B
	1 relay logic output, one "N/O" contact. Minimum switching capacity: 3 mA for 24 V $\overline{\text{---}}$. Maximum switching capacity: <ul style="list-style-type: none"> On resistive load ($\cos \phi = 1$): 5 A for 250 V \sim or 30 V $\overline{\text{---}}$ On inductive load ($\cos \phi = 0.4$ and L/R = 7 ms): 2 A for 250 V \sim or 30 V $\overline{\text{---}}$ Max. response time: 7 ms \pm 0.5 ms. Electrical service life: 100,000 operations.
	Other outputs
	Available on I/O option cards.
LI logic inputs	LI1...LI5
	5 programmable logic inputs 24 V $\overline{\text{---}}$, compatible with level 1 PLC, IEC/EN 61131-2 standard Impedance: 3.5 k Ω . Maximum voltage: 30 V. Max. sampling time: 2 ms \pm 0.5 ms. Multiple assignment makes it possible to configure several functions on one input (example: LI1 assigned to forward and preset speed 2, LI3 assigned to reverse and preset speed 3)
	LI6
	1 logic input, switch-configurable as a logic input or as an input for PTC probes. Logic input, characteristics identical to inputs LI1...LI5 Input for a maximum of 6 PTC probes mounted in series: <ul style="list-style-type: none"> Nominal value < 1.5 kΩ Trip resistance 3 kΩ, reset value 1.8 kΩ Short-circuit protection < 50 Ω This logic input must never be used to protect an ATEX motor in applications in explosive atmospheres
	Positive logic (Source)
	State 0 if \leq 5 V or logic input not wired, state 1 if \geq 11 V
	Negative logic (Sink)
	State 0 if \geq 16 V or logic input not wired, state 1 if \leq 10 V
	Other inputs
	Available on I/O option cards.
Safety input	PWR
	1 input for the Power Removal safety function and/or for thermal protection of the ATEX motor in applications in explosive atmospheres. The PWR (Power Removal) safety input, also known as STO (Safe Torque Off) can be used to stop applying power to the motor and/or prevent a motor from restarting unintentionally. The PWR input allows the Altivar 61 to be installed as a part of the safety related system. This function complies with: <ul style="list-style-type: none"> Standard for safety of machinery EN 954-1 category 1 or category 3. Standard for functional safety IEC/EN 61508 Drives system standard IEC/EN 61800-5-2, SIL 2 capability. Standards for functional safety EN ISO 13849-1: category 3PLd Standard IEC/EN 61508 SIL 1, stopping category 0 or IEC/EN 61508 SIL 2, stopping category 1 The PWR (Power Removal) safety input can also be connected to a thermal sensor switch integrated in a motor used in explosive atmospheres to meet ATEX requirements: <ul style="list-style-type: none"> Power supply: 24 V c (max. 30 V) Impedance: 1.5 kΩ State 0 if < 2 V, state 1 if > 17 V Response time: < 100 ms

Modbus protocol

Type of connection		Modbus RJ45 port on face of product	Modbus RJ45 network port
Structure	Physical interface	2-wire RS 485	
	Transmission mode	RTU	
	Transmission speed	Configurable via the display keypad or the SoMove™ PC software: 9600 bps or 19200 bps	Configurable via the display keypad or the SoMove PC software: 4800 bps, 9600 bps, 19200 bps or 38.4 kbps
	Format	Fixed = 8 bits, even parity, 1 stop	Configurable via the display keypad or the SoMove PC software: - 8 bits, odd parity, 1 stop - 8 bits, even parity, 1 stop - 8 bits, no parity, 1 stop - 8 bits, no parity, 2 stop
	Polarization	No polarization impedances These should be provided by the wiring system (for example, in the master)	
	Address	1 to 247, configurable via the terminal or the SoMove PC software. 3 addresses can be configured in order to access the drive data, the "Controller Inside" programmable card and the communication card respectively. These 3 addresses are identical for the connector and network ports.	
Services	Device profiles	2 profiles: CiA 402 ("Device Profile Drives and Motion Control") and I/O profile	
	Messaging	Read Holding Registers (03) 63 words maximum Write Single Register (06) Write Multiple Registers (16) 61 words maximum Read/Write Multiple Registers (23) 63/59 words maximum Read Device Identification (43) Diagnostics (08)	
	Communication monitoring	Can be inhibited. "Time out," which can be set between 0.1 s and 30 s	

CANopen protocol

Structure	Connector	This connects to the Modbus RJ45 Modbus network port.
	Network management	Slave
	Transmission speed	20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps or 1 Mbps
	Address (Node ID)	1 to 127, configurable via the terminal or the SoMove PC software
Services	Number of PDOs	3 receive and 3 transmit (PDO1, PDO2 and PDO3)
	PDO modes	Event-triggered, Time-triggered, Remotely-requested, Sync (cyclic), Sync (acyclic)
	PDO linking	Yes
	PDO mapping	Configurable (PDO1 and PDO2)
	Number of SDOs	1 server
	Emergency	Yes
	CANopen application layer	CiA DS 301, V 4.02
	Functional profiles	2 profiles: CiA 402 ("Device Profile Drives and Motion Control") and I/O profile
Communication monitoring	Node Guarding, Heartbeat	

Additional Application Information

<p>Using Altivar 61 drives with synchronous motors</p>	<p>Altivar 61 drives are also suitable for powering synchronous motors with sinusoidal electromotive force. This drive/motor combination makes it possible to obtain remarkable accuracy and maximum torque.</p> <p>The design and construction of synchronous motors are such that they offer enhanced power density, high efficiency, and high-end torque in a compact footprint.</p> <p>Driving a synchronous motor with sinusoidal electromotive force without speed feedback.</p> <p>The entire range of Altivar 61 variable speed drives can be used to power a synchronous motor with sinusoidal electromotive force without speed feedback. The performance level achieved is then comparable to that obtained with an asynchronous motor in sensorless flux vector control.</p>
<p>Using special motors at high-speed</p>	<p>These motors are designed for constant torque applications with high frequency ranges. The Altivar 61 drive supports operating frequencies of up to 599 Hz, depending on the supply voltage and the rating. Through their design, this type of motor is more sensitive to overvoltages than a standard motor.</p> <p>Various solutions are available:</p> <ul style="list-style-type: none"> ■ Overvoltage limitation function ■ Output filters <p>The drive's 5-point voltage/frequency control ratio is particularly well-suited as it avoids resonance.</p>
<p>Using a motor at overspeed</p>	<p>The maximum output frequency of the drive can be adjusted from:</p> <ul style="list-style-type: none"> ■ 10 to 599 Hz for drives rated less than or equal to 37 kW in 200... 240 V ~ and 380...480 V ~. 0...1600 operation is available in product with specific firmware. Delivery of product requires compliance with Control of Export EU Regulation No 961/2010, Section II.A3. 003 ■ 0 to 500 Hz for all other Altivar 61 drives <p>When using a standardized asynchronous motor at overspeed, check the mechanical overspeed characteristics of the selected motor with the manufacturer. Above its nominal speed corresponding to a frequency of 50/60 Hz, the motor operates with a decreasing flux, and its torque decreases significantly (see curve opposite). The application must be able to permit this type of low-torque, high-speed operation.</p> <ol style="list-style-type: none"> 1. Machine torque (degressive torque) 2. Machine torque (low motor torque) 3. Continuous motor torque <p>Typical applications: wood-working machinery, broaching machines, high-speed hoisting, etc.</p>
<p>Power of self-cooled motor greater than the drive power</p>	<p>This motor-drive combination makes it possible to use a self-cooled motor for a greater speed range in continuous operation. The use of a motor with a higher power rating than that of the drive is only possible if the current drawn by this motor is less than or equal to the nominal drive current.</p> <p>Note: Limit the motor power to the standard rating immediately above that of the drive.</p> <p>Example: On a single machine, the use of a 2.2 kW drive combined with a 3 kW motor means that the machine can operate at its nominal power (2.2 kW) at low speed.</p> <ol style="list-style-type: none"> 1. Motor power = drive power = 2.2 kW 2. 2.2 kW drive combined with a 3 kW motor: greater speed range at 2.2 kW
<p>Connecting motors in parallel</p>	<p>The nominal current of the drive must be greater than or equal to the sum of the currents of the motors to be controlled.</p> <p>In this case, provide external thermal protection for each motor using probes or thermal overload relays. For cable runs over a certain length, taking account of all the tap links, it is advisable either to install an output filter between the drive and the motors or to use the overvoltage limitation function.</p> <p>If several motors are used in parallel, there are two possible scenarios:</p> <ul style="list-style-type: none"> ■ The motors have equal power ratings, in which case the torque characteristics will remain optimized after the drive has been configured ■ The motors have different power ratings, in which case the torque characteristics will not be optimized for all the motors
<p>Using a motor at constant torque up to 87/104 Hz</p>	<p>A 400 V, 50 Hz motor in Δ connection can be used at constant torque up to 87 Hz if it is in Δ connection. In this particular case, the initial motor power and the power of the first associated drive are multiplied by $\sqrt{3}$ (it is therefore important to select a drive with a suitable rating).</p> <p>Example: A 2.2 kW 50 Hz motor in Δ connection supplies 3.8 kW at 87 Hz with a Δ connection.</p> <p>Note: Check the overspeed operating characteristics of the motor.</p>

Altivar 61

variable speed drives

Application Information

Using special motors	Special brake motors: tapered rotor or flux bypass The magnetic field releases the brake. This type of operation with the Altivar 61 drive requires application of the voltage/frequency ratio. Note: The no-load current may be high, and operation at low speed can only be intermittent.
ATEX motors in an explosive atmosphere explosive	Use of the "Power Removal" safety function enables the variable speed drive to provide thermal protection in the event of excessive temperature rise of the ATEX motor, but it does not enable it to control and regulate the temperature of the ATEX motor. All motor types ATEX certified for use in zones 1, 21, 2 or 22, which are equipped with ATEX thermal sensors, can be protected by the Altivar 61 variable speed drive.
Resistive rotor asynchronous motors	Different motor control ratios available on the Altivar 61 drive make it possible to apply specific settings when using high-slip motors.
Switching the motor at the drive output	The drive can be switched when locked or unlocked. If the drive is switched on-the-fly (drive unlocked), the motor is controlled and accelerates until it reaches the reference speed smoothly following the acceleration ramp. This use requires configuration of the automatic catching a spinning load ("catch on the fly") and the motor phase loss on output cut functions. Typical applications: loss of run circuit at drive output, bypass function, switching of motors connected in parallel. On new installations, it is recommended that the Power Removal safety function is used.
Test on a low power motor or without a motor	In a test or maintenance environment, the drive can be tested without having to use a motor with the same rating as the drive (particularly useful in the case of high power drives). This use requires deactivation of the output phase loss function.
Applying the Altivar 61 in normal duty constant torque applications	The ATV 61 drive provides the ability to enable the Sensorless Vector Control voltage mode (labeled SVCV in the firmware) motor-control algorithm. Selecting SVCV motor-control type for the ATV 61 drive improves its starting torque, accelerating torque, and dynamic speed performance. The SVCV motor-control algorithm uses motor modeling, speed reference, real-time current feedback, and input voltage to control the orientation and magnitude (vector) of the motor's magnetic field. This capability enables separate control of magnetizing current and torque-producing current and provides enhanced motor torque characteristics throughout the speed range. See Data Bulletin 8800DB1206 for more details.

The Altivar 61 drive includes as standard a software function used to limit overvoltages at the motor terminals. See the SUL function in the programming manual.

Depending on the cable lengths or the type of application, it may be necessary to add output filters:

- Output load reactors (also called motor chokes or dV/dt filters) can be used to limit the dV/dt
- Sine wave filters (also called sinus filters) that are particularly effective for long cable runs or to reduce electromagnetic motor noise

Cable length ⁽¹⁾	0...10 m	10...30 m	30...50 m	50...100 m	100...150 m	150...250 m	250...300 m	300...400 m	400...600 m
Shielded cable									
ATV61H●●●M3 ATV61H075N4...HD15N4 ATV61W075N4...WD15N4	Software function ⁽²⁾		Output load reactor					–	
ATV61H●●●M3X ATV61HD18N4...HC63N4 ATV61WD18N4...WD90N4	Software function ⁽²⁾		Output load reactor					–	
ATV61HU22S6X...HU75S6X	Software function ⁽²⁾		Output load reactor		2 output load reactors in series		–		
ATV61HU30Y...HD11Y ATV61HD15Y...HD30Y	Software function ⁽²⁾	Output load reactor		–		2 output load reactors in series		–	
ATV61HU37Y...HD90Y ATV61HC11Y...HC80Y		Output load reactor		2 output load reactors in series		–		Sine wave filter	
Unshielded cable									
ATV61H075M3, HU15M3 ATV61H075N4...HU22N4 ATV61W075N4...WU22N4	Software function ⁽²⁾		Output load reactor or sine wave filter					–	
ATV61HU22M3, HU30M3 ATV61HU30N4...HU55N4 ATV61WU30N4...WU55N4	Software function ⁽²⁾		Output load reactor					Sine wave filter	
ATV61HU40M3...HU75M3 ATV61HU75N4...HD15N4 ATV61WU75N4...WD15N4	Software function ⁽²⁾		Output load reactor					Sine wave filter (300...1000 m)	
ATV61HD11M3X...HD45M3X ATV61HD18N4...HD75N4 ATV61WD18N4...WD90N4	Software function ⁽²⁾		Output load reactor					Sine wave filter (300...1000 m)	
ATV61HD55M3X...HD90M3X ATV61HD90N4...HC63N4	Software function ⁽²⁾		Output load reactor					2 output load reactors in series	
ATV61HU22S6X...HU75S6X	Software function ⁽²⁾		Output load reactor		2 output load reactors in series		–		
ATV61HU30Y...HD11Y	Software function ⁽²⁾		Output load reactor (above 20 m)		2 output load reactors in series		–		
ATV61HD15Y...HD30Y	Software function ⁽²⁾		Output load reactor (above 20 m)		2 output load reactors in series		–		
ATV61HU37Y...HD90Y	Software function ⁽²⁾		Output load reactor (above 20 m)		2 output load reactors in series		–		
ATV61HC11Y...HC80Y	Software function ⁽²⁾		Output load reactor		2 output load reactors in series		Sine wave filter		

(1) The cable length varies depending on the combination of variable speed drive/output load reactor or sine wave filter. For an application with several motors connected in parallel, the cable length must include all cabling.

Recommended cable types:

- Shielded cables: "GORSE" cable, type GUOSTV-LS/LH; "PROTOFLEX" cable, type EMV2YSL CY
- Unshielded cables: "GORSE" cable, type H07 RN-F4GXX; "BELDEN" cable, type 2950X

(2) The software function limits the overvoltage at the motor terminals to twice the DC bus voltage. See the SUL function in the programming manual for more information

Altivar 61 variable speed drives

Selection Table Supply voltage 200...240 V 50/60 Hz

IP 20 drives



ATV61H075M3



ATV61HU22M3Z



ATV61HD22M3X

Motor		Line supply				Altivar 61							
Power indicated on rating plate ⁽¹⁾	HP	kW	Line current ⁽²⁾		Apparent power	Maximum prospective line Isc	Maximum continuous current ⁽¹⁾		Max. transient current for 60 s	Part number	Frame size	Weight	
			200 V	240 V			240 V	230 V				A	A
			A	A	kVA	kA	A	A					
Single-phase supply voltage, without line reactor: 200...240 V 50/60 Hz													
0.5	0.37		6.9	5.8	1.4	5	3	3.6		ATV61H075M3	2	6.6	3
1	0.75		12	9.9	2.4	5	4.8	5.7		ATV61HU15M3	2	6.6	3
2	1.5		18.2	15.7	3.7	5	8	9.6		ATV61HU22M3	3	8.8	4
3	2.2		25.9	22.1	5.3	5	11	13.2		ATV61HU30M3	3	8.8	4
-	3		25.9	22	5.3	5	13.7	16.4		ATV61HU40M3 ⁽³⁾	3	8.8	4
5	4		34.9	29.9	7	5	17.5	21		ATV61HU75M3 ⁽³⁾	5A	12.1	5.5
7.5	5.5		47.3	40.1	9.5	5	27.5	33		ATV61HD15M3X ⁽³⁾	5B	15.4	7
10	7.5		-	59.6	16.4	5	33	39.6		ATV61HD18M3X	6	66.1	30
15	11		-	88.4	19	5	54	64.8		ATV61HD30M3X	7B	81.6	37
20	15		-	111.1	25.6	5	66	79.2		ATV61HD37M3X	7B	81.6	37
25	18		-	137.6	28.7	5	75	90		ATV61HD45M3X	7B	81.6	37
Single-phase supply voltage, with 5% line reactor: 200...240 V 50/60 Hz													
-	3		25.9	22	6.8	5	13.7	16.4		ATV61HU40M3	3	8.8	4
5	4		34.9	29.9	9.5	5	17.5	21		ATV61HU55M3	4	12.1	5.5
7.5	6		47.3	40.1	12.8	22	27.5	33		ATV61HU75M3	5A	12.1	5.5
10	8		-	54	16.4	22	33	39.6		ATV61HD15M3X	5B	15.4	7
15	11		-	78.3	19	22	54	64.8		ATV61HD22M3X	6	66.1	30
20	15		-	101.5	25.6	22	66	79.2		ATV61HD30M3X	7B	81.6	37
25	18		-	131	28.7	22	75	90		ATV61HD37M3X	7B	81.6	37
30	22		-	145.9	33.3	22	88	105.6		ATV61HD45M3X	7B	81.6	37
Three-phase supply voltage: 200...240 V 50/60 Hz													
1	0.75		6.1	5.3	2.2	5	4.8	5.7		ATV61H075M3	2	6.6	3
2	1.5		11.3	9.6	4	5	8	9.6		ATV61HU15M3	2	6.6	3
3	2.2		15	12.8	5.3	5	11	13.2		ATV61HU22M3	3	8.8	4
-	3		19.3	16.4	6.8	5	13.7	16.4		ATV61HU30M3	3	8.8	4
5	4		25.8	22.9	9.5	5	17.5	21		ATV61HU40M3	3	8.8	4
7.5	5.5		35	30.8	12.8	22	27.5	33		ATV61HU55M3	4	12.1	5.5
10	7.5		45	39.4	16.4	22	33	39.6		ATV61HU75M3	5A	15.4	7
15	11		53.3	45.8	19	22	54	64.8		ATV61HD11M3X ⁽⁴⁾	5B	48.5	22
20	15		71.7	61.6	25.6	22	66	79.2		ATV61HD15M3X ⁽⁴⁾	5B	48.5	22
25	18.5		77	69	28.7	22	75	90		ATV61HD18M3X ⁽⁴⁾	6	66.1	30
30	22		88	80	33.3	22	88	105.6		ATV61HD22M3X ⁽⁴⁾	6	66.1	30
40	30		124	110	45.7	22	120	144		ATV61HD30M3X ⁽⁴⁾	7B	81.6	37
50	37		141	127	52.8	22	144	172.8		ATV61HD37M3X ⁽⁴⁾	7B	81.6	37
60	45		167	147	61.1	22	176	211.2		ATV61HD45M3X ⁽⁴⁾	7B	81.6	37
75	55		200	173	71.9	35	221	265.2		ATV61HD55M3X ⁽⁴⁾	9	185.2	84
100	75		271	232	96.4	35	285	342		ATV61HD75M3X ⁽⁴⁾	9	185.2	84
125	90		336	288	119.7	35	359	431		ATV61HD90M3X ⁽⁴⁾	10	233.7	106

Dimensions (overall)

Frame size	W x H x D	
	inches	mm
2	5.1 x 9.1 x 6.9	130 x 230 x 175
3	6.1 x 10.2 x 7.4	155 x 260 x 187
4	6.9 x 11.6 x 7.4	175 x 295 x 187
5A	8.3 x 11.6 x 8.4	210 x 295 x 213
5B	9.1 x 15.7 x 8.4	230 x 400 x 213
6	9.4 x 16.5 x 9.3	240 x 420 x 236
7B	12.6 x 21.7 x 10.5	320 x 550 x 266
9	12.6 x 36.2 x 14.8	320 x 920 x 377
10	14.2 x 40.2 x 14.8	360 x 1022 x 377

(1) These values are given for a nominal switching frequency of 12 kHz up to ATV61HD45M3X or 2.5 kHz for ATV61HD55M3X... HD90M3X drives for use in continuous operation. The switching frequency is adjustable from 1...16 kHz up to ATV61HD45M3X, from 2.5...12 kHz for ATV61HD55M3X and from 2.5...8 kHz for ATV61HD75M3X, HD90M3X.

(2) Typical value for the indicated motor power and for the maximum prospective line Isc.

(3) A line choke must be used.

(4) Drive supplied without EMC filter. EMC filters are available as an option.

Altivar 61 variable speed drives

Selection Table Supply voltage 380...480 V 50/60 Hz

IP 20 drives with integrated category C2 or C3 EMC filter



ATV61HU22N4



ATV61HC31N4

Motor		Line supply				Altivar 61						
Power indicated on rating plate ⁽¹⁾	HP	kW	Line current ⁽²⁾		Maximum prospective line Isc	Maximum continuous current ⁽¹⁾	Max. transient current for 60 s	Part number	Frame size	Weight		
			380 V	480 V						380 V	lbs	kg
			A	A						kVA	kA	A
Three-phase supply voltage: 380...480 V 50/60 Hz												
1	0.75		3.7	3	2.4	5	2.3	2.7	ATV61H075N4	2	6.6	3
2	1.5		5.8	5.3	3.8	5	4.1	4.9	ATV61HU15N4	2	6.6	3
3	2.2		8.2	7.1	5.4	5	5.8	6.9	ATV61HU22N4	2	6.6	3
-	3		10.7	9	7	5	7.8	9.3	ATV61HU30N4	3	8.8	4
5	4		14.1	11.5	9.3	5	10.5	12.6	ATV61HU40N4	3	8.8	4
7.5	5.5		20.3	17	13.4	22	14.3	17.1	ATV61HU55N4	4	12.1	5.5
10	7.5		27	22.2	17.8	22	17.6	21.1	ATV61HU75N4	4	12.1	5.5
15	11		36.6	30	24.1	22	27.7	33.2	ATV61HD11N4	5A	15.4	7
20	15		48	39	31.6	22	33	39.6	ATV61HD15N4	5B	48.5	22
25	18.5		45.5	37.5	29.9	22	41	49.2	ATV61HD18N4	5B	48.5	22
30	22		50	42	32.9	22	48	57.6	ATV61HD22N4	6	66.1	30
40	30		66	56	43.4	22	66	79.2	ATV61HD30N4	7A	81.6	37
50	37		84	69	55.3	22	79	94.8	ATV61HD37N4	7A	81.6	37
60	45		104	85	68.5	22	94	112.8	ATV61HD45N4	8	97	44
75	55		120	101	79	22	116	139.2	ATV61HD55N4	8	97	44
100	75		167	137	109.9	22	160	192	ATV61HD75N4	8	97	44
125	90		166	143	109.3	35	179	215	ATV61HD90N4	9	185.2	84
150	110		202	168	133	35	215	236	ATV61HC11N4	9	185.2	84
200	132		239	224	157.3	35	259	285	ATV61HC13N4	10	233.7	106
250	160		289	275	190.2	50	314	345	ATV61HC16N4	11	255.7	116
350	220		396	383	260.6	50	427	470	ATV61HC22N4	12	359.4	163
400	250		444	435	292.2	50	481	529	ATV61HC25N4	13	456.4	207
500	315		555	544	365.3	50	616	678	ATV61HC31N4	13	456.4	207
600	400		709	644	466.6	50	759	835	ATV61HC40N4	14	705.5	320
700	500		876	760	576.6	50	941	1035	ATV61HC50N4	14	727.5	330
900	630		1091	964	718	50	1188	1307	ATV61HC63N4	15	959	435

Dimensions (overall)

Frame size	W x H x D	
	inches	mm
2	5.1 x 9.1 x 6.9	130 x 230 x 175
3	6.1 x 10.2 x 7.4	155 x 260 x 187
4	6.9 x 11.6 x 7.4	175 x 295 x 187
5A	8.3 x 11.6 x 8.4	210 x 295 x 213
5B	9.1 x 15.7 x 8.4	230 x 400 x 213
6	9.4 x 16.5 x 9.3	240 x 420 x 236
7A	9.4 x 21.7 x 10.5	240 x 550 x 266
8	12.6 x 24.8 x 11.4	320 x 630 x 290
9	12.6 x 36.2 x 14.8	320 x 920 x 377
10	14.2 x 40.2 x 14.8	360 x 1022 x 377
11	13.4 x 46.9 x 14.8	340 x 1190 x 377
12	17.3 x 46.9 x 14.8	440 x 1190 x 377
13	23.4 x 46.9 x 14.8	595 x 1190 x 377
14	35 x 54.7 x 14.8	890 x 1390 x 377
15	44.1 x 54.7 x 14.8	1120 x 1390 x 377

(1) These values are given for a nominal switching frequency of 12 kHz up to ATV61HD75N4, 4 kHz for ATV61HD90N4 or 2.5 kHz for ATV61HC11N4...HC63N4 drives for use in continuous operation. The switching frequency is adjustable from 1...16 kHz up to ATV61HD75N4 and from 2...8 kHz for ATV61HD90N4...ATV61HC63N4 drives.

(2) Typical value for the indicated motor power and for the maximum prospective line Isc.

Part number explanation

Power Range (kW)

0●● = 0.01 x ●● (075 = 0.01 x 75 = 0.75 kW)

U●● = 0.1 x ●● (U75 = 0.1 x 75 = 7.5 kW)

D●● = 1 x ●● (D75 = 1 x 75 = 75 kW)

C●● = 10 x ●● (C75 = 10 x 75 = 750 kW)

EMC Filter

Nothing = Class A

EMC filter integrated

X = Without EMC filter

filter

Supply Voltage

M3 = 200-240V 1P or 3P

N4 = 380-480V 3P

S6 = 500-600V 3P

Y = 500-690V 3P

Product Family
Altivar 61
product family

ATV61

H

0●●
U●●
D●●
C●●

M3
N4
S6
Y

-

X

Variation of Platform
Standard product
on heatsink

Altivar 61 variable speed drives

Selection Table Supply Voltage 500...690 V 50/60 Hz



ATV61HU30S6X

IP 20 drives

Motor		Line supply			Altivar 61					
Power indicated on rating plate ⁽¹⁾		Line current ⁽²⁾		Maximum prospective line Isc	Maximum continuous current ⁽¹⁾		Part number	Frame size	Weight	
500 V	575 V	500 V	600 V		500 V	575 V			lbs	kg
kW	HP	A	A	kA	A	A				

Three-phase supply voltage: 500...600 V 50/60 Hz

2.2	3	7.6	6.7	22	4.5	3.9	ATV61HU22S6X	5A	16.5	7.5
3	–	9.9	10	22	5.8	–	ATV61HU30S6X	5A	16.5	7.5
4	5	12.5	10.9	22	7.5	6.1	ATV61HU40S6X	5A	16.5	7.5
5.5	7.5	16.4	14.2	22	10	9	ATV61HU55S6X	5A	16.5	7.5
7.5	10	21.4	18.4	22	13.5	11	ATV61HU75S6X	5A	16.5	7.5

IP 20 drives with integrated category C3 EMC filter

Motor			Line supply				Altivar 61						
Power indicated on rating plate ⁽¹⁾			Line current ⁽²⁾			Maximum prospective line Isc	Maximum continuous current ⁽¹⁾			Part number ⁽⁴⁾	Frame Size	Weight	
500 V	575 V	690 V	500 V	600 V	690 V		500 V	575 V	690 V			lbs	kg
kW	HP	kW	A	A	A	kA	A	A	A				

Three-phase supply voltage: 500...690 V 50/60 Hz

2.2	3	3	5.2	4.4	5.2	22	4.5	3.9	4.5	ATV61HU30Y	6	66.1	30
3	–	4	6.8	–	6.6	22	5.8	–	5.5	ATV61HU40Y	6	66.1	30
4	5	5.5	8.6	7.2	8.6	22	7.5	6.1	7.5	ATV61HU55Y	6	66.1	30
5.5	7.5	7.5	11.2	9.5	11.2	22	10	9	10	ATV61HU75Y	6	66.1	30
7.5	10	11	14.6	12.3	15.5	22	13.5	11	13.5	ATV61HD11Y	6	66.1	30
11	15	15	19.8	16.7	20.2	22	18.5	17	18.5	ATV61HD15Y	6	66.1	30
15	20	18.5	24.6	20.7	24	22	24	22	24	ATV61HD18Y	6	66.1	30
18.5	25	22	29	24	27	22	29	27	27	ATV61HD22Y	6	66.1	30
22	30	30	33	28	34	22	35	32	35	ATV61HD30Y	6	66.1	30
30	40	37	48	41	47	22	47	41	43	ATV61HD37Y	8	149.9	68
37	50	45	62	51	55	22	59	52	54	ATV61HD45Y	8	149.9	68
45	60	55	68	57	63	22	68	62	62	ATV61HD55Y	8	149.9	68
55	75	75	79	67.0	82	22	85	77	84	ATV61HD75Y	8	149.9	68
75	100	90	109	92	101	22	110	99	104	ATV61HD90Y	8	149.9	68
90	125	110	128	113	117	22	136	125	125	ATV61HC11Y ⁽⁴⁾	11	224.9	102
110	150	132	153	133	137	28	165	144	150	ATV61HC13Y ⁽⁴⁾	11	224.9	102
132	–	160	182	158.9	163	28	200	–	180	ATV61HC16Y ⁽⁴⁾	11	224.9	102
160	200	200	218	197	199	35	240	192	220	ATV61HC20Y ⁽⁴⁾	11	224.9	102
200	250	250	277	250	257	35	312	242	290	ATV61HC25Y ⁽⁴⁾	13	399	181
250	350	315	342	311	317	35	390	336	355	ATV61HC31Y ⁽⁴⁾	13	399	181
315	450	400	426	390	394	35	462	412	420	ATV61HC40Y ⁽⁴⁾	13	399	181
400	550	500	547	494	505	35	590	528	543	ATV61HC50Y ⁽⁴⁾	15	844.4	383
500	700	630	673	613	616	42	740	672	675	ATV61HC63Y ⁽⁴⁾	15	844.4	383
630	800	800	847	771	775	42	900	768	840	ATV61HC80Y ⁽⁴⁾	15	844.4	383

ATV61HD45Y



Dimensions (overall)

Frame size	W x H x D	
	inches	mm
5A	8.3 x 11.6 x 8.4	210 x 295 x 213
6	9.4 x 16.5 x 9.3	240 x 420 x 236
8	12.6 x 24.8 x 11.4	320 x 630 x 290
11	13.4 x 46.9 x 14.8	340 x 1190 x 377
13	23.4 x 46.9 x 14.8	595 x 1190 x 377
15	44.1 x 54.7 x 14.8	1120 x 1390 x 377

(1) These values are given for a nominal switching frequency of 4 kHz for ATV61HU●●S6X and for ATV61HU30Y... HD30Y or 2.5 kHz for ATV61HD37Y...HC80Y for use in continuous operation. The switching frequency is adjustable from 2.5...6 kHz for ATV61HU●●S6X and for ATV61HU30Y... HD30Y and from 2.5...4.9 kHz for ATV61HD37Y...HC80Y drives.

(2) Typical value for the indicated motor power and for the maximum prospective line Isc.

(3) The maximum transient current for 60 seconds is equal to 120% of the maximum continuous current.

(4) Line choke mandatory for ATV61HC11Y...HC80Y drives. The line choke must be ordered separately.

IP 54 drives with integrated category C2 EMC filter



ATV61W075N4U



ATV61WD30N4U

Motor		Line supply				Altivar 61					
Power indicated on rating plate ⁽¹⁾		Line current ⁽²⁾		Apparent power	Maximum prospective line Isc	Maximum continuous current ⁽¹⁾	Max. transient current for 60 s	Part number	Frame size	Weight	
HP	kW	380 V	480 V	380 V						A	A
Three-phase supply voltage: 380...480 V 50/60 Hz											
1	0.75	1.8	1.5	1.2	5	2.3	2.5	ATV61W075N4U	A	28.7	13
2	1.5	3.5	3	2.3	5	4.1	4.5	ATV61WU15N4U	A	28.7	13
3	2.2	5	4.1	3.3	5	5.1	5.6	ATV61WU22N4U	A	28.7	13
-	3	6.7	5.6	4.4	5	7.2	7.9	ATV61WU30N4U	A	30.9	14
5	4	8.8	7.4	5.8	5	9.1	10	ATV61WU40N4U	B	35.3	16
7.5	5.5	11.4	9.2	7.5	22	12	13.2	ATV61WU55N4U	B	35.3	16
10	7.5	15.8	13.3	10.4	22	16	17.6	ATV61WU75N4U	C	48.5	22
15	11	21.9	17.8	14.4	22	22.5	24.7	ATV61WD11N4U	C	48.5	22
20	15	30.5	25.8	20	22	30.5	33.5	ATV61WD15N4U	D	61.7	28
25	18.5	37.5	32.3	24.7	22	37	40.7	ATV61WD18N4U	E	79.4	36
30	22	43.6	36.6	28.7	22	43.5	47.8	ATV61WD22N4U	E	79.4	36
40	30	56.7	46.2	37.3	22	58.5	64.3	ATV61WD30N4U	F	112.4	51
50	37	69.5	56.8	45.7	22	71.5	78.6	ATV61WD37N4U	G	141.1	64
60	45	85.1	69.6	56	22	85	93.5	ATV61WD45N4U	G	143.3	65
75	55	104.8	87	69	35	103	113.3	ATV61WD55N4U	H	202.8	92
100	75	140.3	113.8	92.3	35	137	150.7	ATV61WD75N4U	H	202.8	92
125	90	171.8	140.9	113	35	163	179.3	ATV61WD90N4U	H	202.8	92

Dimensions (overall)

Frame size	W x H x D	
	inches	mm
A	9.4 x 19.3 x 10.7	240 x 490 x 272
B	9.4 x 19.3 x 11.3	240 x 490 x 286
C	10.2 x 20.7 x 11.3	260 x 525 x 286
D	11.6 x 22 x 12.4	295 x 560 x 315
E	12.4 x 26.2 x 12.4	315 x 665 x 315
F	11.2 x 28.3 x 12.4	285 x 720 x 315
G	11.2 x 34.6 x 13.5	285 x 880 x 343
H	14.3 x 39.4 x 14.3	362 x 1000 x 364

(1) These values are given for a nominal switching frequency of 8 kHz up to ATV61WD15N4U, or 4 kHz for ATV61WD18N4U...WD90N4U for use in continuous operation. The switching frequency is adjustable from 2...16 kHz for all ratings. Above 4 or 8 kHz, depending on the rating, the drive will reduce the switching frequency automatically in the event of an excessive temperature rise.

(2) Typical value for the indicated motor power and for the maximum prospective line Isc.

Altivar 61

variable speed drives

Short Circuit Current Ratings

Short Circuit Current Ratings and branch circuit protection

The combinations in the tables have been tested per UL508C (Reference UL file E116875). These ratings are in addition to ratings on the nameplate of the product. The values for the overcurrent protection devices are the maximum allowable amp size. Smaller amp ratings may be used. Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes. The devices are provided with software integral overload and over speed protection for the motor. Protection at 110% of the full load motor current. The motor thermal protection current (Ith) must be set to the rated current indicated on the motor nameplate. (For detail see the programming manual). 75°C (167 °F) copper conductor with the AWG wire size for all products, except ATV61HC16N4p to ATV61HC63N4p, ATV61HC11Y to ATV61HC80Y: 60°C (140°F) / 75°C (167 °F) copper conductor with the AWG wire size.

Suitable for use on a circuit capable of delivering not more than ___X___rms symmetrical kiloAmperes, ___Y___Volts maximum, when protected by ___Z1___with a maximum rating of ___Z2___.

Altivar 61				Short Circuit Current Ratings ⁽²⁾																	
Input Voltage 50/60 Hz Y	(HP)	(kW)	(A)	Part number	Input Rating: (kA) ⁽¹⁾	Minimum Inductance (mH)	Line Reactor Reference	with Circuit Breaker ⁽³⁾			with GV●P ⁽³⁾				with Fuses ⁽³⁾			with Fuses and Type 1 kit ⁽⁴⁾			
								PowerPact ⁽⁶⁾ Z1, Z2	SCCR (kA) X	Minimum Enclosure Volume (in ³)	GV●P Type E ⁽⁶⁾ Z1, Z2	GV●P Voltage Rating (V)	GV●P Maximum Power (HP)	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)
Single-phase Input, without line reactor																					
200/240V single-phase	0.5	0.37	3	ATV61H075M3	5	-	-	HJL36015	5	4017	-	-	-	5	1600	15 ⁽⁷⁾	5	1078	15 ⁽⁷⁾	5	1078
	1	0.75	4.8	ATV61HU15M3	5	-	-	HJL36025	5	4017	GV2P14	240	1	5	1600	25 ⁽⁷⁾	5	1078	25 ⁽⁷⁾	5	1078
	2	1.5	8	ATV61HU22M3	5	-	-	HJL36040	5	4017	GV3P18	240	3	5	4017	40 ⁽⁷⁾	5	1550	25 ⁽⁷⁾	5	1550
	3	2.2	11	ATV61HU30M3	5	-	-	HJL36040	5	4017	GV3P18	240	3	5	1920	40 ⁽⁷⁾	5	1550	40 ⁽⁷⁾	5	1550
	5	4	17.5	ATV61HU75M3	5	-	-	HJL36110	5	6528	GV3P50	240	7.5	5	4032	110 ⁽⁷⁾	5	2719	70 ⁽⁷⁾	5	2719
	7.5	6	27.5	ATV61HD15M3X	5	-	-	JJL36175	5	6528	GV3P65	240	10	5	5760	175 ⁽⁷⁾	5	4036	110 ⁽⁷⁾	5	4036
	10	8	33	ATV61HD18M3X	5	-	-	JJL36200	5	13215	-	-	-	-	-	200 ⁽⁷⁾	5	4900	125 ⁽⁷⁾	5	4900
	15	11	54	ATV61HD30M3X	5	-	-	JJL36250	5	13215	-	-	-	-	-	250 ⁽⁷⁾	5	9640	200 ⁽⁷⁾	5	9640
	20	15	66	ATV61HD37M3X	5	-	-	JJL36250	5	13215	-	-	-	-	-	250 ⁽⁷⁾	5	9640	225 ⁽⁷⁾	5	9640
	25	18	75	ATV61HD45M3X	10	-	-	-	-	-	-	-	-	-	-	300 ⁽⁷⁾	10	9640	300 ⁽⁷⁾	10	9640
Single-phase input, with line reactor																					
200/240V Single-phase	-	3	13.7	ATV61HU40M3	5	1	RL02502	HJL36060	5	6528	GV3P25	240	3	5	1920	60 ⁽⁷⁾	5	1550	45 ⁽⁷⁾	5	1550
	5	4	17.5	ATV61HU55M3	5	0.8	RL03502	HJL36080	5	6528	GV3P40	240	5	5	2880	70 ⁽⁷⁾	5	1987	60 ⁽⁷⁾	5	1987
	7.5	6	27.5	ATV61HU75M3	22	0.5	RL05502	HJL36110	22	6528	GV3P50	240	7.5	22	4032	110 ⁽⁷⁾	22	2719	70 ⁽⁷⁾	22	2719
	10	8	33	ATV61HD15M3X	22	0.4	RL08002	JJL36175	22	6528	GV3P65	240	10	22	5760	175 ⁽⁷⁾	22	4036	110 ⁽⁷⁾	22	4036
	15	11	54	ATV61HD22M3X	22	0.3	RL10002	JJL36200	22	13215	-	-	-	-	-	200 ⁽⁷⁾	22	4900	150 ⁽⁷⁾	22	4900
	20	15	66	ATV61HD30M3X	22	0.2	RL13002	JJL36250	22	13215	-	-	-	-	-	250 ⁽⁷⁾	22	9640	200 ⁽⁷⁾	22	9640
	25	18	75	ATV61HD37M3X	22	0.15	RL16002	JJL36250	22	13215	-	-	-	-	-	250 ⁽⁷⁾	22	9640	225 ⁽⁷⁾	22	9640
	30	22	88	ATV61HD45M3X	22	0.185	RL20003B14	LAL36400	22	8640	-	-	-	-	-	300 ⁽⁷⁾	22	9640	300 ⁽⁷⁾	22	9640

(1) This column shows the maximum prospective short circuit current value that cannot be exceeded without adding input impedance.

Electrical distribution systems with a higher prospective short circuit current will cause higher input currents in the front end of the drive.

It is possible for the tested SCCR rating of the drive to be lower than this Input rating. The tested SCCR rating can be higher than this input rating when a line reactor is used.

(2) An ATV61 output short circuit test was performed for 100 kA. In addition to providing a rating based on shorting the output of the drive, these short circuit ratings have been obtained by shorting components internal to the Altivar 61. These ratings allow proper coordination of short circuit protection. The integral solid state short circuit protection in the drive does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any local codes. The listed line reactor or minimum impedance is required to obtain ratings above the Input Rating.

(3) Ratings apply to an Altivar 61 mounted in a non-ventilated Type 1, 3R, 4(X) or 12 rated enclosure. Use noted ratings when using a Type 1 conduit kit. Minimum enclosure volume allows for the specified SCCR. Your application specific thermal requirements may require a larger enclosure.

(4) The fuse ratings in this column are for an Altivar 61 drive installed with a VW3A92pppp Type 1 conduit kit. These fuse ratings in this column can also apply to Altivar 61 drive installed in a Type 1, 3R, 4(X) or 12 rated enclosure that has a minimum volume listed in the table.

(5) Circuit breakers with lower interrupt ratings can be used within the same circuit breaker frame rating. For 200 / 240 Vac, replace with HGL or JGL for 65kA interrupt rating. For 380 / 480 Vac, replace with HGL or JGL

for 35kA or HJL or JJL for 65kA interrupt rating. For 500 / 600 Vac, replace with HJL for 25kA or HGL for 18kA, or HDL for 14kA interrupt rating.

(6) 480 V ratings are for Wye connected electrical distribution systems only.

GV2Ppp self protected manual combination starter must be used with GV2GH7 insulating barrier to meet UL 508 Type E rating

GV3Ppp self protected manual combination starter must be used with GV3G66 + GVAM11 insulating barrier to meet UL 508 Type E rating

(7) Use fast acting fuse or time delay Class J

(8) Fuse type Class CC

Altivar 61

variable speed drives

Short Circuit Current Ratings

Altivar 71				Short Circuit Current Ratings ⁽²⁾																	
				with Circuit Breaker ⁽³⁾						with GV●P ⁽³⁾					with Fuses ⁽³⁾			with Fuses and Type 1 kit ⁽⁴⁾			
Input Voltage 50/60 Hz Y	(HP)	(kW)	(A)	Part number	Input Rating: (kA) ⁽¹⁾	Minimum Inductance (mH)	Line Reactor Reference	PowerPact ⁽⁶⁾ Z1, Z2	SCCR (kA) X	Minimum Enclosure Volume (in ³)	GV●P Type E ⁽⁶⁾ Z1, Z2	GV●P Voltage Rating (V)	GV●P Maximum Power (HP)	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)
Three-phase Input, without line reactor																					
200/240 V Three-phase	1	0.75	4.8	ATV61H037M3	5	-	-	HJL36015	5	4017	GV2P10	240	1.5	5	1600	15 ⁽⁷⁾	5	4017	15 ⁽⁸⁾	5	1078
	2	1.5	8	ATV61HU15M3	5	-	-	HJL36025	5	4017	GV2P14	240	3	5	1600	25 ⁽⁷⁾	5	4017	25 ⁽⁷⁾	5	1078
	3	2.2	11	ATV61HU22M3	5	-	-	HJL36040	5	4017	GV2P18	240	5	5	1920	40 ⁽⁷⁾	5	4017	25 ⁽⁷⁾	5	1550
	-	3	13.7	ATV61HU30M3	5	-	-	HJL36040	5	4017	GV3P18	240	3/5	5	1920	40 ⁽⁷⁾	5	4017	40 ⁽⁷⁾	5	1550
	5	4	17.5	ATV61HU40M3	5	-	-	HJL36060	5	6528	GV3P25	240	7.5	5	1920	60 ⁽⁷⁾	5	6528	45 ⁽⁷⁾	5	1550
	7.5	6	27.5	ATV61HU55M3	22	-	-	HJL36070	22	6528	GV3P40	240	10	5	2880	70 ⁽⁷⁾	22	6528	60 ⁽⁷⁾	5	1987
	10	8	33	ATV61HU75M3	22	-	-	HJL36110	22	6528	GV3P50	240	10	5	4032	110 ⁽⁷⁾	22	6528	70 ⁽⁷⁾	5	2719
	15	11	54	ATV61HD11M3X	22	-	-	HJL36125	22	6528	GV3P50	240	10	5	5760	125 ⁽⁷⁾	22	6528	90 ⁽⁷⁾	5	4036
	20	15	66	ATV61HD15M3X	22	-	-	JLL36175	22	6528	GV3P65	240	15	5	5760	175 ⁽⁷⁾	22	6528	110 ⁽⁷⁾	5	4036
	25	18	75	ATV61HD18M3X	22	-	-	JLL36200	22	13215	-	-	-	-	-	200 ⁽⁷⁾	22	13215	125 ⁽⁷⁾	5	4900
	30	22	88	ATV61HD22M3X	22	-	-	JLL36250	22	13215	-	-	-	-	-	250 ⁽⁷⁾	22	13215	150 ⁽⁷⁾	5	4900
	40	30	120	ATV61HD30M3X	22	-	-	JLL36250	22	13215	-	-	-	-	-	250 ⁽⁷⁾	22	13215	200 ⁽⁷⁾	5	9640
	50	37	144	ATV61HD37M3X	22	-	-	JLL36250	22	13215	-	-	-	-	-	250 ⁽⁷⁾	22	13215	225 ⁽⁷⁾	5	9640
60	45	176	ATV61HD45M3X	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300 ⁽⁷⁾	10	9640
380/480V Three-phase	1	0.75	2.3	ATV61H075N4	5	-	-	HLL36015	5	4017	GV2P08	480Y/277	2	5	1600	15 ⁽⁸⁾	5	4017	6 ⁽⁸⁾	5	1078
	2	1.5	4.1	ATV61HU15N4	5	-	-	HLL36015	5	4017	GV2P10	480Y/277	4	5	1600	15 ⁽⁸⁾	5	4017	12 ⁽⁸⁾	5	1078
	3	2.2	5.8	ATV61HU22N4	5	-	-	HLL36015	5	4017	GV2P14	480Y/277	5	5	1600	15 ⁽⁷⁾	5	4017	15 ⁽⁷⁾	5	1078
	-	3	7.8	ATV61HU30N4	5	-	-	HLL36015	5	4017	GV2P14	480Y/277	5	5	1920	15 ⁽⁷⁾	5	4017	17.5 ⁽⁷⁾	5	1550
	5	4	10.5	ATV61HU40N4	5	-	-	HLL36025	5	4017	GV3P13	480Y/277	7.5	5	1920	25 ⁽⁷⁾	5	4017	25 ⁽⁷⁾	5	1550
	7.5	5.5	14.3	ATV61HU55N4	22	-	-	HLL36035	22	6528	GV3P25	480Y/277	15	5	2880	35 ⁽⁷⁾	22	6528	40 ⁽⁷⁾	5	1987
	10	7.5	17.6	ATV61HU75N4	22	-	-	HLL36050	22	6528	GV3P25	480Y/277	15	5	2880	50 ⁽⁷⁾	22	6528	40 ⁽⁷⁾	5	1987
	15	11	27.7	ATV61HD11N4	22	-	-	HLL36060	22	6528	GV3P40	480Y/277	25	5	4032	60 ⁽⁷⁾	22	6528	60 ⁽⁷⁾	5	2719
	20	15	33	ATV61HD15N4	22	-	-	HLL36080	22	6528	GV3P50	480Y/277	30	5	5760	80 ⁽⁷⁾	22	6528	70 ⁽⁷⁾	5	4036
	25	18	41	ATV61HD18N4	22	-	-	HLL36100	22	6528	GV3P50	480Y/277	30	5	8640	100 ⁽⁷⁾	22	6528	70 ⁽⁷⁾	5	4036
	30	22	48	ATV61HD22N4	22	-	-	HLL36125	22	6528	GV3P50	480Y/277	30	5	8640	125 ⁽⁷⁾	22	6528	80 ⁽⁷⁾	5	4900
	40	30	66	ATV61HD30N4	22	-	-	HLL36150	22	6528	GV3P65	480Y/277	40	5	10368	150 ⁽⁷⁾	22	6528	90 ⁽⁷⁾	5	7230
	50	37	79	ATV61HD37N4	22	-	-	HLL36175	22	13215	-	-	-	-	-	175 ⁽⁷⁾	22	13215	110 ⁽⁷⁾	5	7230
	60	45	94	ATV61HD45N4	22	-	-	JLL36225	22	13215	-	-	-	-	-	225 ⁽⁷⁾	22	13215	150 ⁽⁷⁾	10	12044
	75	55	116	ATV61HD55N4	22	-	-	JLL36250	22	13215	-	-	-	-	-	250 ⁽⁷⁾	22	13215	175 ⁽⁷⁾	10	12044
100	75	160	ATV61HD75N4	22	-	-	JLL36250	22	38250	-	-	-	-	-	250 ⁽⁷⁾	22	38250	225 ⁽⁷⁾	10	12044	
100	75	160	ATV61HD75N4	22	-	-	KCL34250	22	38250	-	-	-	-	-	250 ⁽⁷⁾	22	38250	225 ⁽⁷⁾	10	12044	

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variable speed drives

Short Circuit Current Ratings

Altivar 61							Short Circuit Current Ratings ⁽²⁾														
							with Circuit Breaker ⁽³⁾			with GV _o P ⁽³⁾					with Fuses ⁽³⁾			with Fuses and Type 1 kit ⁽⁴⁾			
Input Voltage 50/60 Hz Y	(HP)	(kW)	(A)	Part number	Input Rating: (kA) ⁽¹⁾	Minimum Inductance (mH)	Line Reactor Reference	PowerPact ⁽⁶⁾ Z1, Z2	SCCR (kA) X	Minimum Enclosure Volume (in ³)	GV _o P Type E ⁽⁶⁾ Z1, Z2	GV _o P Voltage Rating (V)	GV _o P Maximum Power (HP)	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)
Three-phase Input, without line reactor																					
575V Three-phase	3	2.2	3.9	ATV61HU22S6X	22	-	-	-	-	-	-	-	-	-	-	-	-	-	6 ⁽⁷⁾	22	3898
	-	3	5.8	ATV61HU30S6X	22	-	-	-	-	-	-	-	-	-	-	-	-	-	6 ⁽⁷⁾	22	3898
	5	4	6.1	ATV61HU40S6X	22	-	-	-	-	-	-	-	-	-	-	-	-	-	10 ⁽⁷⁾	22	3898
	7.5	5.5	9	ATV61HU55S6X	22	-	-	-	-	-	-	-	-	-	-	-	-	-	15 ⁽⁷⁾	22	3898
	10	7.5	11	ATV61HU75S6X	22	-	-	-	-	-	-	-	-	-	-	-	-	-	20 ⁽⁷⁾	22	3898
500/600 V Three-phase	3	2.2	3.9	ATV61HU30Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	10 ⁽⁷⁾	22	8640
	-	3	5.8	ATV61HU40Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	10 ⁽⁷⁾	22	8640
	5	4	6.1	ATV61HU55Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	15 ⁽⁷⁾	22	8640
	7.5	5.5	9	ATV61HU75Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	20 ⁽⁷⁾	22	8640
	10	7.5	11	ATV61HD11Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	25 ⁽⁷⁾	22	8640
	15	11	17	ATV61HD15Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	35 ⁽⁷⁾	22	8640
	20	15	22	ATV61HD18Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	45 ⁽⁷⁾	22	8640
	25	18.5	27	ATV61HD22Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	60 ⁽⁷⁾	22	8640
	30	22	32	ATV61HD30Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	60 ⁽⁷⁾	22	8640
	40	30	41	ATV61HD37Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	90 ⁽⁷⁾	22	9792
	50	37	52	ATV61HD45Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	100 ⁽⁷⁾	22	9792
	60	45	62	ATV61HD55Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	125 ⁽⁷⁾	22	9792
75	55	77	ATV61HD75Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	150 ⁽⁷⁾	22	9792	
100	75	99	ATV61HD90Y	22	-	-	-	-	-	-	-	-	-	-	-	-	-	175 ⁽⁷⁾	22	9792	
Three-phase Input, with line reactor																					
200/240 V Three-phase	1	0.75	4.8	ATV61H075M3	5	3	RL00401	HJL36015	100	4017	GV2P10	240	1.5	65	1600	15 ⁽⁷⁾	100	4017	15 ⁽⁷⁾	5	1078
	2	1.5	8	ATV61HU15M3	5	1.5	RL00801	HJL36025	100	4017	GV2P14	240	3	65	1600	25 ⁽⁷⁾	100	4017	25 ⁽⁷⁾	5	1078
	3	2.2	11	ATV61HU22M3	5	1.25	RL01201	HJL36040	100	4017	GV3P18	240	5	65	1920	40 ⁽⁷⁾	100	4017	25 ⁽⁷⁾	5	1550
	-	3	13.7	ATV61HU30M3	5	0.8	RL01801	HJL36040	100	4017	GV3P18	240	5	65	1920	40 ⁽⁷⁾	100	4017	40 ⁽⁷⁾	5	1550
	5	4	17.5	ATV61HU40M3	5	0.8	RL01801	HJL36060	100	4017	GV3P25	240	7.5	65	1920	60 ⁽⁷⁾	100	4017	45 ⁽⁷⁾	5	1550
	7.5	6	27.5	ATV61HU55M3	22	0.5	RL02501	HJL36070	100	6528	GV3P40	240	10	65	2880	70 ⁽⁷⁾	100	6528	60 ⁽⁷⁾	5	1987
	10	8	33	ATV61HU75M3	22	0.4	RL03501	HJL36110	100	6528	GV3P50	240	10	65	4032	110 ⁽⁷⁾	100	6528	70 ⁽⁷⁾	5	2619
	15	11	54	ATV61HD11M3X	22	0.3	RL04501	HJL36125	100	6528	GV3P50	240	10	65	5760	125 ⁽⁷⁾	100	6528	90 ⁽⁷⁾	5	4036
	20	15	66	ATV61HD15M3X	22	0.25	RL05501	JJL36175	100	6528	GV3P65	240	15	65	5760	175 ⁽⁷⁾	100	6528	110 ⁽⁷⁾	5	4036
	25	18	75	ATV61HD18M3X	22	0.2	RL08001	JJL36200	100	13215	-	-	-	-	-	200 ⁽⁷⁾	100	13215	125 ⁽⁷⁾	5	4900
	30	22	88	ATV61HD22M3X	22	0.15	RL10001	JJL36250	100	13215	-	-	-	-	-	250 ⁽⁷⁾	100	13215	150 ⁽⁷⁾	5	4900
	40	30	120	ATV61HD30M3X	22	0.1	RL13001	JJL36250	100	13215	-	-	-	-	-	250 ⁽⁷⁾	100	13215	200 ⁽⁷⁾	5	9640
	50	37	144	ATV61HD37M3X	22	0.075	RL16001	JJL36250	100	13215	-	-	-	-	-	250 ⁽⁷⁾	100	13215	225 ⁽⁷⁾	5	9640
60	45	176	ATV61HD45M3X	22	0.055	RL20001	LAL36400	22	8640	-	-	-	-	-	400 ⁽⁷⁾	22	8640	300 ⁽⁷⁾	10	9640	

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variable speed drives

Short Circuit Current Ratings

Altivar 61							Short Circuit Current Ratings ⁽²⁾														
Input Voltage 50/60 Hz Y	(HP)	(kW)	(A)	Part number	Input Rating: (kA) ⁽¹⁾	Minimum Inductance (mH)	Line Reactor Reference	with Circuit Breaker ⁽³⁾			with GV●P ⁽³⁾				with Fuses ⁽³⁾			with Fuses and Type 1 kit ⁽⁴⁾			
								PowerPact ⁽⁶⁾ Z1, Z2	SCCR (kA) X	Minimum Enclosure Volume (in ³)	GV●P Type E ⁽⁶⁾ Z1, Z2	GV●P Voltage Rating (V)	GV●P Maximum Power (HP)	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)
Three-phase Input, with line reactor																					
380/480V Three-phase	1	0.75	2.3	ATV61H075N4	5	12	RL00201	HLL36015	100	4017	GV2P08	480Y/277	2	65	1600	15 ⁽⁶⁾	100	4017	6 ⁽⁶⁾	100	1078
	2	1.5	4.1	ATV61HU15N4	5	6.5	RL00402	HLL36015	100	4017	GV2P10	480Y/277	4	65	1600	15 ⁽⁶⁾	100	4017	12 ⁽⁶⁾	100	1078
	3	2.2	5.8	ATV61HU22N4	5	6.5	RL00402	HLL36015	100	4017	GV2P14	480Y/277	5	65	1600	15 ⁽⁷⁾	100	4017	15 ⁽⁷⁾	100	1078
	-	3	7.8	ATV61HU30N4	5	3	RL00802	HLL36015	100	4017	GV2P14	480Y/277	5	65	1920	15 ⁽⁷⁾	100	4017	17.5 ⁽⁷⁾	100	1550
	5	4	10.5	ATV61HU40N4	5	3	RL00802	HLL36025	100	4017	GV3P13	480Y/277	7.5	65	1920	25 ⁽⁷⁾	100	4017	25 ⁽⁷⁾	100	1550
	7.5	5.5	14.3	ATV61HU55N4	22	2.5	RL01202	HLL36035	100	6528	GV3P25	480Y/277	15	65	2880	35 ⁽⁷⁾	100	6528	40 ⁽⁷⁾	100	1987
	10	7.5	17.6	ATV61HU75N4	22	1.5	RL01802	HLL36050	100	6528	GV3P25	480Y/277	15	65	2880	50 ⁽⁷⁾	100	6528	40 ⁽⁷⁾	100	1987
	15	11	27.7	ATV61HD11N4	22	1.2	RL02502	HLL36060	100	6528	GV3P40	480Y/277	25	65	4032	60 ⁽⁷⁾	100	6528	-	-	-
	20	15	33	ATV61HD15N4	22	0.8	RL03502	HLL36080	100	6528	GV3P50	480Y/277	30	65	5760	80 ⁽⁷⁾	100	6528	70 ⁽⁷⁾	100	4036
	25	18	41	ATV61HD18N4	22	0.8	RL03502	HLL36100	100	6528	GV3P50	480Y/277	30	65	8640	100 ⁽⁷⁾	100	6528	70 ⁽⁷⁾	100	4036
	30	22	48	ATV61HD22N4	22	0.7	RL04502	HLL36125	100	6528	GV3P50	480Y/277	30	65	8640	125 ⁽⁷⁾	100	6528	80 ⁽⁷⁾	100	4900
	40	30	66	ATV61HD30N4	22	0.5	RL05502	HLL36150	100	6528	GV3P65	480Y/277	40	65	10368	150 ⁽⁷⁾	100	6528	90 ⁽⁷⁾	100	7230
	50	37	79	ATV61HD37N4	22	0.4	RL08002	HLL36175	100	13215	-	-	-	-	-	175 ⁽⁷⁾	100	13215	110 ⁽⁷⁾	100	7230
	60	45	94	ATV61HD45N4	22	0.4	RL08002	JLL36225	100	13215	-	-	-	-	-	225 ⁽⁷⁾	100	13215	150 ⁽⁷⁾	100	12044
	75	55	116	ATV61HD55N4	22	0.3	RL10002	JLL36250	100	13215	-	-	-	-	-	250 ⁽⁷⁾	100	13215	175 ⁽⁷⁾	100	12044
100	75	160	ATV61HD75N4	22	0.2	RL13002	JLL36250	100	38250	-	-	-	-	-	250 ⁽⁷⁾	100	38250	225 ⁽⁷⁾	100	12044	
100	75	160	ATV61HD75N4	22	0.2	RL13002	KCL34250	100	38250	-	-	-	-	-	250 ⁽⁷⁾	100	38250	225 ⁽⁷⁾	100	12044	
575V Three-phase	3	2.2	3.9	ATV61HU22S6X	22	9	RL00403	HLL36015	50	3898	-	-	-	-	-	6 ⁽⁷⁾	100	3898	6 ⁽⁷⁾	22	3898
	-	3	5.8	ATV61HU30S6X	22	9	RL00403	HLL36015	50	3898	-	-	-	-	-	6 ⁽⁷⁾	100	3898	6 ⁽⁷⁾	22	3898
	5	4	6.1	ATV61HU40S6X	22	5	RL00803	HLL36015	50	3898	-	-	-	-	-	10 ⁽⁷⁾	100	3898	10 ⁽⁷⁾	22	3898
	7.5	5.5	9	ATV61HU55S6X	22	3	RL01203	HLL36020	50	3898	-	-	-	-	-	15 ⁽⁷⁾	100	3898	15 ⁽⁷⁾	22	3898
	10	7.5	11	ATV61HU75S6X	22	2.5	RL01203	HLL36025	50	3898	-	-	-	-	-	20 ⁽⁷⁾	100	3898	20 ⁽⁷⁾	22	3898
500/600V Three-phase	2	1.5	2.7	ATV61HU22Y	22	9	RL00403	-	-	-	-	-	-	-	-	10 ⁽⁷⁾	100	8640	10 ⁽⁷⁾	100	8640
	-	3	5.8	ATV61HU40Y	22	5	RL00803	-	-	-	-	-	-	-	-	10 ⁽⁷⁾	100	8640	10 ⁽⁷⁾	100	8640
	5	4	6.1	ATV61HU55Y	22	5	RL00803	-	-	-	-	-	-	-	-	15 ⁽⁷⁾	100	8640	15 ⁽⁷⁾	100	8640
	7.5	5.5	9	ATV61HU75Y	22	3	RL00802	-	-	-	-	-	-	-	-	20 ⁽⁷⁾	100	8640	20 ⁽⁷⁾	100	8640
	10	7.5	11	ATV61HD11Y	22	2.5	RL01202	-	-	-	-	-	-	-	-	25 ⁽⁷⁾	100	8640	25 ⁽⁷⁾	100	8640
	15	11	17	ATV61HD15Y	22	1.5	RL01802	-	-	-	-	-	-	-	-	35 ⁽⁷⁾	100	8640	35 ⁽⁷⁾	100	8640
	20	15	22	ATV61HD18Y	22	1.2	RL02502	-	-	-	-	-	-	-	-	45 ⁽⁷⁾	100	8640	45 ⁽⁷⁾	100	8640
	25	18.5	27	ATV61HD22Y	22	1.2	RL02502	-	-	-	-	-	-	-	-	60 ⁽⁷⁾	100	8640	60 ⁽⁷⁾	100	8640
	30	22	32	ATV61HD30Y	22	0.8	RL03502	-	-	-	-	-	-	-	-	60 ⁽⁷⁾	100	8640	60 ⁽⁷⁾	100	8640
	40	30	41	ATV61HD37Y	22	0.7	RL04502	-	-	-	-	-	-	-	-	90 ⁽⁷⁾	100	9792	90 ⁽⁷⁾	100	9792
	50	37	52	ATV61HD45Y	22	0.5	RL05502	-	-	-	-	-	-	-	-	100 ⁽⁷⁾	100	9792	100 ⁽⁷⁾	100	9792
	60	45	62	ATV61HD55Y	22	0.4	RL08002	-	-	-	-	-	-	-	-	125 ⁽⁷⁾	100	9792	125 ⁽⁷⁾	100	9792
	75	55	77	ATV61HD75Y	22	0.4	RL08002	-	-	-	-	-	-	-	-	150 ⁽⁷⁾	100	9792	150 ⁽⁷⁾	100	9792
100	75	99	ATV61HD90Y	22	0.3	RL10002	-	-	-	-	-	-	-	-	175 ⁽⁷⁾	100	9792	175 ⁽⁷⁾	100	9792	

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Short Circuit Current Ratings

Altivar 61							Short Circuit Current Ratings ⁽²⁾														
Input Voltage 50/60 Hz Y	(HP)	(kW)	(A)	Part number	Input Rating: (kA) ⁽¹⁾	Minimum Inductance (mH)	Line Reactor Reference	with Circuit Breaker ⁽³⁾			with GV●P ⁽³⁾				with Fuses ⁽³⁾			with Fuses and Type 1 kit ⁽⁴⁾			
								PowerPact ⁽¹⁰⁾ Z1, Z2	SCCR (kA) X	Minimum Enclosure Volume (in ³)	GV●P Type E ⁶ Z1, Z2	GV●P Voltage Rating (V)	GV●P Maximum Power (HP)	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)	Fuse Ampere Rating (A) Z1, Z2	SCCR (kA) X	Minimum enclosure Volume (in ³)
Three-phase Input, without line reactor																					
200/240V Three-phase	75	55	221	ATV61HD55M3X	35	-	-	-	-	-	-	-	-	-	-	350 ⁽⁶⁾	10	22749	350 ⁽⁶⁾	10	22749
	100	75	285	ATV61HD75M3X	35	-	-	-	-	-	-	-	-	-	-	350 ⁽⁶⁾	10	22749	350 ⁽⁶⁾	10	22749
	125	90	359	ATV61HD90M3X	35	-	-	-	-	-	-	-	-	-	-	450 ⁽⁶⁾	10	28416	450 ⁽⁶⁾	10	28416
380/480V Three-phase	125	90	179	ATV61HD90N4	35	-	-	-	-	-	-	-	-	-	-	-	-	-	250 ⁽⁶⁾	10	22749
	150	110	215	ATV61HC11N4	35	-	-	-	-	-	-	-	-	-	-	-	-	-	300 ⁽⁶⁾	10	22749
	200	132	259	ATV61HC13N4	35	-	-	-	-	-	-	-	-	-	-	-	-	-	350 ⁽⁶⁾	10	28416
	250	160	314	ATV61HC16N4	50	-	-	-	-	-	-	-	-	-	-	-	-	-	400 ⁽⁶⁾	18	31117
	300	200	387	ATV61HC22N4	50	-	-	-	-	-	-	-	-	-	-	-	-	-	500 ⁽⁶⁾	18	40250
	400	250	481	ATV61HC25N4	50	-	-	-	-	-	-	-	-	-	-	-	-	-	600 ⁽⁶⁾	18	54450
	500	315	616	ATV61HC31N4	30	-	-	-	-	-	-	-	-	-	-	600 ⁽⁷⁾	30	53550	800 ⁽⁷⁾	30	54450
	600	400	759	ATV61HC40N4	30	-	-	-	-	-	-	-	-	-	-	900 ⁽⁸⁾	30	95579	-	-	-
	700	500	941	ATV61HC50N4	42	-	-	-	-	-	-	-	-	-	-	2 x 600 ^(6, 10)	42	95579	-	-	-
900	630	1188	ATV61HC63N4	42	-	-	-	-	-	-	-	-	-	-	2 x 800 ^(7, 10)	42	120265	-	-	-	
Three-phase input, with line reactor																					
200/240V Three-phase	75	55	221	ATV61HD55M3X● ⁽⁹⁾	35	0.045	RL25001	-	-	-	-	-	-	-	-	350 ⁽⁶⁾	10	22749	350 ⁽⁶⁾	10	22749
	100	75	285	ATV61HD75M3X● ⁽⁹⁾	35	0.04	RL32001	-	-	-	-	-	-	-	-	350 ⁽⁶⁾	10	22749	350 ⁽⁶⁾	10	22749
	125	90	359	ATV61HD90M3X● ⁽⁹⁾	35	0.03	RL40001	-	-	-	-	-	-	-	-	450 ⁽⁶⁾	10	28416	450 ⁽⁶⁾	10	28416
380/480V Three-phase	125	90	179	ATV61HD90N4● ⁽⁹⁾	35	0.15	RL16002	JLL36250	100	43200	-	-	-	-	-	300 ⁽⁶⁾	100	43200	250 ⁽⁶⁾	10	22749
	150	110	215	ATV61HC11N4● ⁽⁹⁾	35	0.11	RL20002	LLL36400	100	43200	-	-	-	-	-	400 ⁽⁶⁾	100	43200	300 ⁽⁶⁾	10	22749
	200	132	259	ATV61HC13N4● ⁽⁹⁾	35	0.09	RL25002	LLL36400	100	43200	-	-	-	-	-	400 ⁽⁶⁾	100	43200	350 ⁽⁶⁾	10	28416
	250	160	314	ATV61HC16N4● ⁽⁹⁾	50	0.075	RL32002	MHL36600/ LLL36600/ LLL36400	100	43200	-	-	-	-	-	600 ⁽⁵⁾	100	43200	400 ⁽⁶⁾	18	31117
	300	200	387	ATV61HC22N4● ⁽⁹⁾	50	0.05	RL50002	-	-	-	-	-	-	-	-	600 ⁽⁵⁾	100	53550	500 ⁽⁶⁾	18	40250
	400	250	481	ATV61HC25N4● ⁽⁹⁾	50	0.05	RL50002	-	-	-	-	-	-	-	-	600 ⁽⁵⁾	100	53550	600 ⁽⁶⁾	18	54450
	500	315	616	ATV61HC31N4● ⁽⁹⁾	50	0.04	RL60002	-	-	-	-	-	-	-	-	600 ⁽⁷⁾	100	53550	800 ⁽⁷⁾	30	54450
	600	400	759	ATV61HC40N4● ⁽⁹⁾	50	0.029	RL75002	-	-	-	-	-	-	-	-	900 ⁽⁸⁾	100	95579	-	-	-
	700	500	941	ATV61HC50N4● ⁽⁹⁾	50	0.025	2 x RL50002	-	-	-	-	-	-	-	-	2 x 600 ^(6, 11)	100	95579	-	-	-
900	630	1188	ATV61HC63N4● ⁽⁹⁾	50	0.02	2 x RL60002	-	-	-	-	-	-	-	-	2 x 800 ^(7, 11)	100	120265	-	-	-	
500/600V Three-phase	125	110	125	ATV61HC11Y	28	0.2	RL13002	-	-	-	-	-	-	-	160 ⁽⁶⁾	100	31117	160 ⁽⁶⁾	28	31117	
	150	132	150	ATV61HC13Y	28	0.15	RL16002	-	-	-	-	-	-	-	200 ⁽⁶⁾	100	31117	200 ⁽⁶⁾	28	31117	
	-	160	180	ATV61HC16Y	35	0.11	RL20002	-	-	-	-	-	-	-	250 ⁽⁶⁾	100	31117	250 ⁽⁶⁾	35	31117	
	200	200	220	ATV61HC20Y	35	0.11	RL20002	-	-	-	-	-	-	-	300 ⁽⁶⁾	100	31117	300 ⁽⁶⁾	35	31117	
	250	250	290	ATV61HC25Y	35	0.09	RL25002	-	-	-	-	-	-	-	400 ⁽⁶⁾	100	54450	400 ⁽⁶⁾	35	54450	
	350	315	355	ATV61HC31Y	35	0.06	RL40002	-	-	-	-	-	-	-	500 ⁽⁶⁾	100	54450	500 ⁽⁶⁾	35	54450	
	450	400	420	ATV61HC40Y	42	0.05	RL50002	-	-	-	-	-	-	-	600 ⁽⁶⁾	100	54450	-	-	-	
	550	500	543	ATV61HC50Y	42	0.038	2 x RL32002B14	-	-	-	-	-	-	-	2 x 400 ^(6, 11)	100	120265	-	-	-	
700	630	675	ATV61HC63Y	42	0.03	2 x RL40002B14	-	-	-	-	-	-	-	2x 500 ^(6, 11)	100	120265	-	-	-		
800	800	840	ATV61HC80Y	42	0.03	2 x RL40002B14	-	-	-	-	-	-	-	2x 600 ^(6, 11)	100	120265	-	-	-		

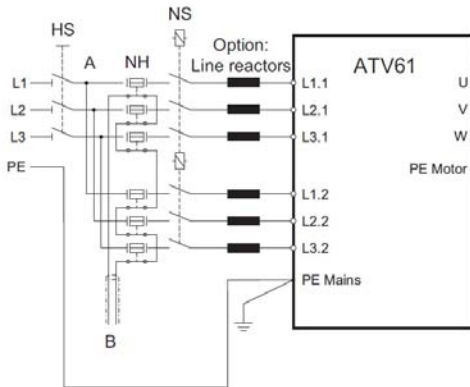
Footnotes page 28

Altivar 61

variable speed drives

Short Circuit Current Ratings

1. This column shows the maximum prospective short circuit current value that cannot be exceeded without adding input impedance. Electrical distribution systems with a higher prospective short circuit current will cause higher input currents in the front end of the drive. It is possible for the tested SCCR rating of the drive to be lower than this Input rating. The tested SCCR rating can be higher than this input rating when a line reactor is used. Add the inductance referred in the table at the input of the drive if installing the drive on a system with higher prospective short circuit current. A 3% (minimum) input line reactor or equivalent inductance is required for the 500..600 Vac Altivar 61s and provides the listed value with the listed fuse protection.
 2. An ATV61 output short circuit test was performed for 100 kA. In addition to providing a rating based on shorting the output of the drive, these short circuit ratings have been obtained by shorting components internal to the Altivar 61. These ratings allow proper coordination of short circuit protection. Note: The integral solid state short circuit protection in the drive does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any local codes.
- The listed line reactor or minimum impedance is required to obtain ratings above the Input Rating.
3. Ratings apply to an Altivar 61 mounted in a non-ventilated Type 1, 3R, 4(X) or 12 rated enclosure. Use noted ratings when using a Type 1 kit. Minimum enclosure volume allows for the specified SCCR. Your application specific thermal requirements may require a larger enclosure
 4. The fuse ratings in this column are for an Altivar 61 drive installed with a VW3A92pppp Type 1 conduit kit. Fuse type must be fast acting Class J fuses unless otherwise noted. These fuse ratings in this column can also apply to Altivar 61 drives installed in a Type 1, 3R, 4(X), or 12 rated enclosure that has a minimum volume listed in the table
 5. Use Bussmann fuses Class J ref. LPJ600SP, 600V max.
 6. Fuse Class J / fast acting, 600V max.
 7. Fuse Class T / fast acting, 600V max
 8. Semi-conductor fuses Ferraz Shawmut A070UD32KI900 or A070UD32TTI900.
 9. Can be ordered without a DC Choke for connections to the DC BUS or when using a line choke by adding D at the end of the reference.
 10. Circuit breakers with lower interrupt ratings can be used within the same circuit breaker frame rating. For 380 / 480 Vac, replace LLL with LDL for 18kA or LGL for 35kA or LjL for 65kA interrupt rating. For 380 / 480 Vac, replace JLL with JDL for 18kA or JGL for 35kA or JLL for 65kA interrupt rating.
 11. The following diagram shows how to address drives with two rectifiers:



A: The ATV61 supply must be split up in front of the line reactors, if they are used.

B: The monitoring of the fuses is necessary to protect the inverter against unbalanced load. It must act on mains contactor or pulse inhibit (e.g. digital input "External fault", see Programming guide)

HS: Main switch (to be used if required according to the local regulations)

NH: Mains fuses considering table "Fuse Ampere Rating" (absolutely necessary)

NS: Mains contactor (to be used if required according to the local regulations)



ATV61H075M3S337



ATV61HU22M3Z

Product variant options

The Altivar 61 is available in several variations for unique applications and needs. Mounting in dusty and corrosive environments and without a graphic display keypad are mutually exclusive.

For mounting the drive in dusty and corrosive environments

This variant enables variable speed drives to be installed in a higher level of ambient pollution conditions and complies with standard IEC60721-3-3 class 3C2 by tinning any exposed copper.

To order this option for ATV61H●●●M3 and ATV61H075N4...HD75N4 variable speed drives, add **S337** at the end of the part number.

Example: ATV61H075M3 becomes **ATV61H075M3S337**.

To order this option for ATV61HD11M3X...HD45M3X drives, add **337** at the end of the part number.

Example: ATV61HD11M3X becomes **ATV61HD11M3X337**.

The following list of drives already have exposed copper tinned and comply with IEC 60721-3-3 class 3C2:

- ATV61HD55M3X, HD75M3X
- ATV61HD90N4...HC63N4
- All ATV61H...Y

This variant is supplied with the graphic display keypad.

Ordering without the graphic display keypad

All Altivar 61 drives come with a graphic display keypad and an integrated keypad display as standard.

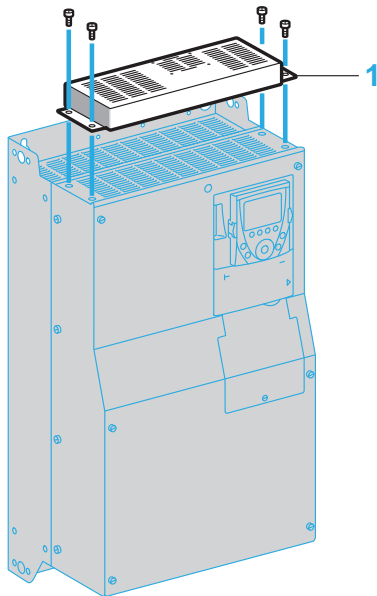
ATV61H037M3...HD15M3X and ATV61H075N4...HD75N4 drives can be ordered without the graphic display keypad. They will then have the integrated keypad display only.

Without the graphic display keypad installed, a 4 button keypad and 4 digit, 7 segment display is visible. To order this option, add **Z** at the end of the reference. Example: ATV61H075M3 becomes **ATV61H075M3Z**.

Order the drive without a DC choke

ATV61HD90N4...HC63N4 drives are supplied as standard with a DC choke which must be field mounted when installing drives to the three-phase supply.

These drives can be ordered without a DC choke for connections to the DC bus or when using a line choke, by adding **D** at the end of the reference. Example: ATV61HD90N4 becomes **ATV61HD90N4D**.



Control card fan kit

Control card fan kit (for ATV61H●●●● drives on heatsink)

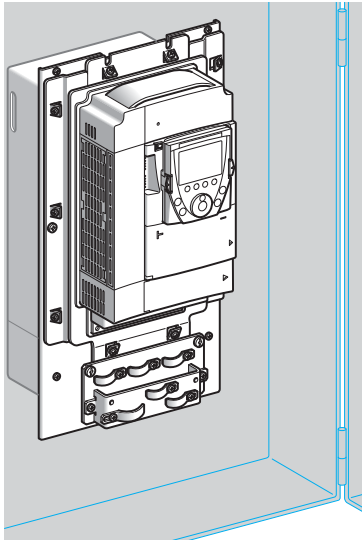
This kit is for use on ATV61HD18M3X...HD45M3X, ATV61HD22N4...HD75N4 and ATV61HU22Y...HD90Y drives so that they can operate at ambient temperatures between 50°C and 60°C. The circulation of air around the electronic cards prevents the formation of hot spots.

To determine the derating to be applied to the drive nominal current, please refer to the curves in the Installation Manual.

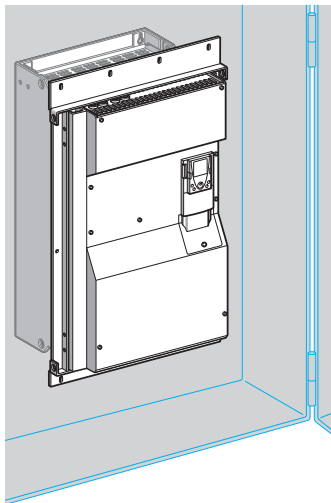
The kit (1) is mounted on the top part of the drive. It is powered by the drive and includes:

- A fan subassembly
- Mounting screws
- A manual

For drives	Part number	Weight	
		lbs	kg
ATV61HD18M3X, HD22M3X ATV61HD22N4 ATV61HU30Y...HD30Y	VW3A9404	1.5	0.7
ATV61HD30N4, HD37N4	VW3A9405	1.5	0.7
ATV61HD30M3X...HD45M3X	VW3A9406	1.8	0.8
ATV61HD45N5...HD75N4 ATV61HD37Y...HD90Y	VW3A9407	2	0.9



ATV61HU75N4 flush-mounted drive



ATV61HC28N4D flush-mounted drive

Kit for flush-mounting in a dust and damp proof enclosure (for ATV61H●●●● drives on heatsink)

This kit can be used to mount the power section of the drive outside the enclosure, which reduces the power dissipated into the enclosure ⁽¹⁾.

It is available for ATV61H●●●M3, ATV61H●●●M3X, ATV61H075N4...HC31N4, ATV61HD90N4D...HC31N4D and ATV61HU22Y...HC40Y drives.

With this type of mounting, the maximum internal temperature in the enclosure can then reach 60°C without it being necessary to derate the drive. Between 50°C and 60°C, a control card fan kit must be used for ATV61HD18M3X...HD45M3X, ATV61HD22N4...HD75N4, ATV61H●●●S6X and ATV61HU22Y...HD90Y drives to prevent hot spots.

The back of the enclosure must be drilled and cut out for this type of mounting.

The kit includes:

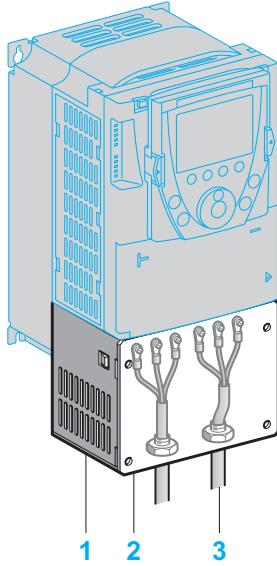
- A metal frame of the right size for the drive rating
- Corner pieces
- Seals
- A fan support (this can be used to move the fans so that they can be accessed from the front of the enclosure)
- Mounting screws
- A manual

For drives	Part number	Weight	
		lbs	kg
ATV61H075M3, HU15M3 ATV61H075N4...HU22N4	VW3A9501	6	2.7
ATV61HU22M3...HU40M3 ATV61HU30N4, HU40N4	VW3A9502	6.8	3.1
ATV61HU55M3 ATV61HU55N4, HU75N4	VW3A9503	8.2	3.7
ATV61HU75M3 ATV61HD11N4 ATV61HU22S6X...HU75S6X	VW3A9504	10.1	4.6
ATV61HD11M3X, HD15M3X ATV61HD15N4, HD18N4	VW3A9505	10.8	4.9
ATV61HD18M3X, HD22M3X ATV61HD22N4 ATV61HU30Y...HD30Y	VW3A9506	8.6	3.9
ATV61HD30N4, HD37N4	VW3A9507	9.3	4.2
ATV61HD30M3X...HD45M3X	VW3A9508	10.8	4.9
ATV61HD45N4...HD75N4 ATV61HD37Y...HD90Y	VW3A9509	11.5	5.2
ATV61HD55M3X, HD75M3X ATV61HD90N4, HC11N4 ⁽²⁾ ATV61HD90N4D, HC11N4D	VW3A9510	11.2	5.1
ATV61HD90M3X ATV61HC13N4 ⁽²⁾ ATV61HC13N4D	VW3A9511	7.9	3.6
ATV61HC16N4 ⁽²⁾ ATV61HC16N4D ATV61HC11Y...HC20Y ⁽³⁾	VW3A9512	9.5	4.3
ATV61HC22N4 ⁽²⁾ ATV61HC22N4D	VW3A9513	10.4	4.7
ATV61HC25N4, HC31N4 ⁽²⁾ ATV61HC25N4D, HC31N4D ATV61HC25Y...HC40Y ⁽³⁾	VW3A9514	10.4	4.7

(1) Power dissipated in the enclosure for dust and damp proof flush-mounting.

(2) Drives supplied as standard with a DC choke: when mounting, cut out and drill the enclosure for the choke.

(3) Drives supplied as standard with a transformer for the fan: when mounting, cut out and drill the enclosure for the transformer.



UL Type 1 conformance kit

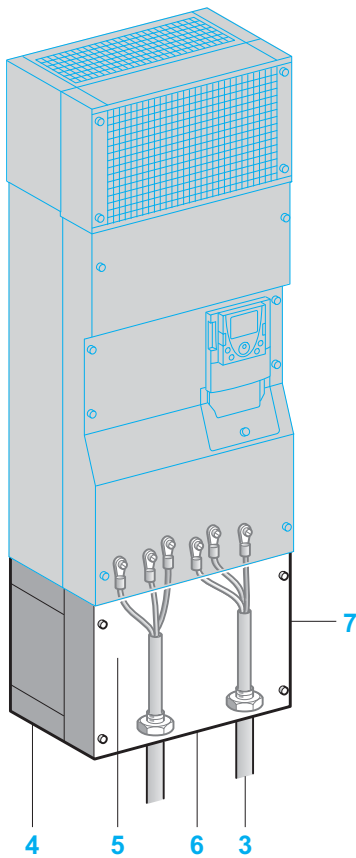
When the drive is mounted directly on a wall outside the enclosure, this kit can be used to provide UL Type 1 conformance when connecting the cables and conduit. The shielding is connected inside the kit.

For ATV61H●●●M3, ATV61HD11M3X...HD90M3X, ATV61H075N4...HC31N4, ATV61H●●●S6X and ATV61HU22Y...HC40Y drives, the kit includes:

- All the mechanical fittings (1) including a pre-cut plate (2) for conduit entrance (3)
- Mounting screws
- A manual

For ATV61HD55M3X, HD75M3X, ATV61HD90N4...HC28N4, ATV61HD90N4D...HC28N4D and ATV61HC11Y...HC31Y drives, the kit includes:

- A casing (4) used to maintain the Type 12/IP 54 degree of protection for the power section
- An EMC plate (5)
- A UL Type 1 cover (7)
- A pre-drilled plate (6) for connecting the tubes (3)
- Mounting screws
- A manual



UL Type 1 conformity kits

For drives	Part number	Weight	
		lbs	kg
ATV61H075M3, HU15M3 ATV61H075N4...HU22N4	VW3A9201	2.9	1.3
ATV61HU22M3...HU40M3 ATV61HU30N4, HU40N4	VW3A9202	3.3	1.5
ATV61HU55M3 ATV61HU55N4, HU75N4	VW3A9203	4	1.8
ATV61HU75M3 ATV61HD11N4 ATV61HU22S6X...U75S6X	VW3A9204	4.4	2
ATV61HD11M3X, HD15M3X ATV61HD15N4, HD18N4	VW3A9205	6.2	2.8
ATV61HD18M3X, HD22M3X ATV61HD22N4 ATV61HU30Y...HD30Y	VW3A9206	8.8	4
ATV61HD30N4, HD37N4 ATV61HD30M3X...HD45M3X	VW3A9207	11	5
ATV61HD45N4...HD75N4 ATV61HD37Y...HD90Y	VW3A9208	15.4	7
ATV61HD55M3X, HD75M3X ATV61HD90N4, HC11N4 (1) ATV61HD90N4D, HC11N4D (2)	VW3A9209	20.7	9.4
ATV61HD90M3X ATV61HC13N4 (1) ATV61HC13N4D (2)	VW3A9210	26	11.8
ATV61HC16N4 (1) ATV61HC16N4D (2) ATV61HC11Y...HC20Y (3)	VW3A9211	25.6	11.6
ATV61HC22N4 (1) ATV61HC22N4D (2)	VW3A9212	25.6	14.6
ATV61HC25N4, HC31N4 (1) ATV61HC25N4, HC31N4D (2) ATV61HC25Y...HC40Y (3)	VW3A9213	43	19.5

(1) Drives supplied as standard with a DC choke.

(2) Drives supplied without DC choke.

(3) Drives supplied as standard with a transformer for the fan.



SoMove setup software with Modbus-Bluetooth® adaptor for PC

SoMove setup software

SoMove™ setup software is user-friendly software for PC designed for configuring multiple Schneider Electric motor control devices, including the Altivar 61 drives. SoMove is available as a free download through the button to the left.

SoMove software incorporates various functions for the device setup phases, such as:

- Configuration preparation
- Start-up
- Maintenance

To facilitate setup and maintenance of devices, SoMove software can use a direct USB/RJ45 cable link or a Bluetooth® wireless link to connect to the motor control device and communicate directly to it.

SoMove software is also compatible with the Multi-Loader configuration tool. These tools can save a significant amount of time when loading, duplicating or editing configurations on a device.

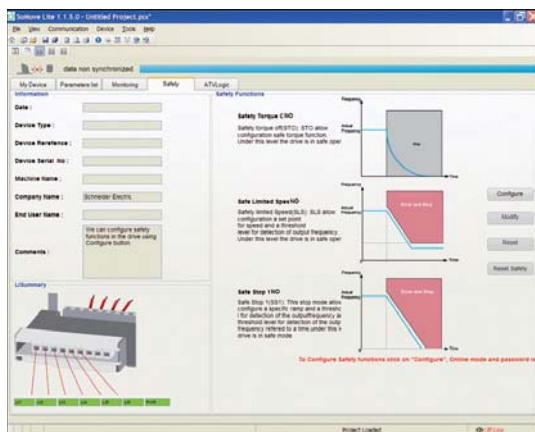
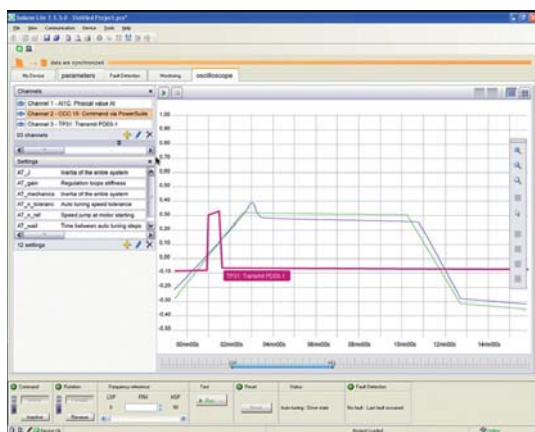
User Interface

SoMove software provides fast, direct access to information on the device via five tabs:

- My Device: Displays the device information (type, reference, software versions, option cards, etc.).
- Parameters: Displays the device adjustment parameters, shown in a table or in the form of diagrams.
- Faults: Displays a list of the faults that may be encountered with the device, the fault log and any current faults or alarms.
- Monitoring: Provides a real time display of the device status, its I/O and the monitoring parameters. It is possible to create your own control panel by selecting your parameters and how they are to be represented.
- Oscilloscope: Provides a high-speed oscilloscope (for recording traces in the device) or low-speed oscilloscope (for recording traces in the software for devices that do not have an integrated oscilloscope).

SoMove's user interface automatically adapts to the specific configured device by offering additional tabs:

- Display the I/O
- Compile and print a report
- Develop a program and transfer it to the drive
- Display and debug the program already on the drive
- Automatic mode for quick setup, designed for simple applications
- Expert mode for optimizing the adjustment parameters, designed for complex applications





Configuration with the Multi-Loader tool connected to the Altivar 61 drive

Simple-Loader configuration tool

The Simple Loader tool enables one powered-up drive's configuration to be duplicated on another powered-up drive. It is connected to the drive's RJ45 communication port.

Description	For drives	Part number	Weight
Simple Loader configuration tool The tool is supplied with a preassembled cordset with 2 RJ45 connectors.	ATV61●●●●●●	VW3A8120	–

Multi-Loader configuration tool

The Multi-Loader tool enables a number of configurations from a PC or drive to be copied and duplicated on another drive; the Altivar 61 drives must be powered up.

Description	For drives	Part number	Weight
Multi-Loader configuration tool Includes: - 1 preassembled cordset with 2 RJ45 connectors - 1 preassembled cordset with a USB type A connector and a USB Mini-B type connector - 1 x SD memory card - 1 x female/female RJ45 adaptor - 4 AA/LR6 1.5 V batteries - 1 anti-shock protection - 1 carrying handle	ATV61●●●●●●	VW3A8121	–

List of options common to Altivar 61 drives

Description	Part number
Logic input adaptor	
Adaptor for 115 V ~ logic inputs	VW3A3101
Graphic Display Keypad	
Graphic display keypad	VW3A1101
Encoder interface cards ⁽¹⁾	
With RS 422 compatible differential outputs	VW3A3401, 402
With open collector outputs	VW3A3403, 404
With push-pull outputs	VW3A3405...407
With RS 422 compatible differential outputs with encoder emulation	VW3A3411
I/O expansion cards ⁽¹⁾	
Basic I/O option card 4 logic inputs, 2 logic outputs, 1 form C relay output, PTC probe input 24Vdc output	VW3A3201
Extended I/O option card 4 logic inputs, 2 logic outputs, 1 form C relay output, 2 analog inputs, 2 analog outputs, PTC probe input, 1 Hz pulse input, 24Vdc output	VW3A3202
Programmable card ⁽¹⁾	
IMC programmable card	VW3A3521S0
Water Solutions card	
Option card contains a variety of pre-programmed functions for single pump and multi pump installations.	VW3A3503

List of communication cards ⁽¹⁾

Description	Part number
Modbus TCP Daisy chain	VW3A3310D
EtherNet/IP	VW3A3316
DeviceNet	VW3A3309
Modbus/Uni-Telway	VW3A3303
PROFIBUS DP V0	VW3A3307
PROFIBUS DP V1	VW3A3307S371
LonWorks® card	VW3A3312
Apogee FLN P1 card	VW3A3314
Metasys® N2 card with removable 4 position screw connector	VW3A3318
BACnet card with removable 4 position screw connector	VW3A3319

⁽¹⁾ The Altivar 61 can accept one encoder card. The Altivar 61 can accept up to 2 of any combination of I/O expansion cards, communication cards, water solutions card, and the programmable card. Two cards of the same part number is not allowed.



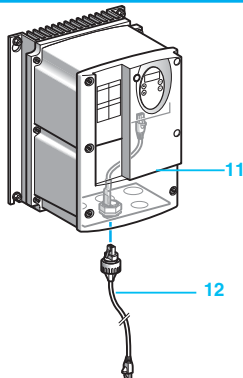
LCD graphic display keypad



Remote mounting accessories for graphic display keypad



Remote location of the graphic display keypad on enclosure door: 6 + 7 + 9 if IP 54, 6 + 7 + 9 + 10 if IP 65



Remote mounting accessories for RJ45 connection with IP 55 degree of protection

LCD graphic display keypad

This LCD graphic display keypad provides a user-friendly interface for configuration, diagnostics and maintenance. In addition, it can be used to transfer and store up to 4 configuration files. It can be mounted on an enclosure door and used to connect up to 8 drives using the accessories below. The LCD graphic display keypad comes with the Altivar 61, unless it is ordered without it.

It is supplied with six languages installed (Chinese, English, French, German, Italian and Spanish).

Its maximum operating temperature is 60°C, and it features IP 54 protection; this can be increased to IP 65 when remotely mounted on an enclosure door.

Graphic display (1):

- Plain text display on 8 lines of 24 characters, 240 x 160 pixels, large digit display

Assignable function (2): keys F1, F2, F3, F4:

- Dialogue functions: direct access, help screens, navigation
- Application functions: "Local Remote," preset speed

ESC key (3): aborts a value, a parameter or a menu to return to the previous selection

Motor local control keys (4):

- RUN: starts the motor
- STOP/RESET : stops the motor/resets drive faults
- FWD/REV: reverses the direction of rotation of the motor

Navigation button (5): for quick, easy access to the drop-down menus

- Rotate ±: goes to the next/previous line, increases/decreases the value
- Press: saves the current value (ENT)

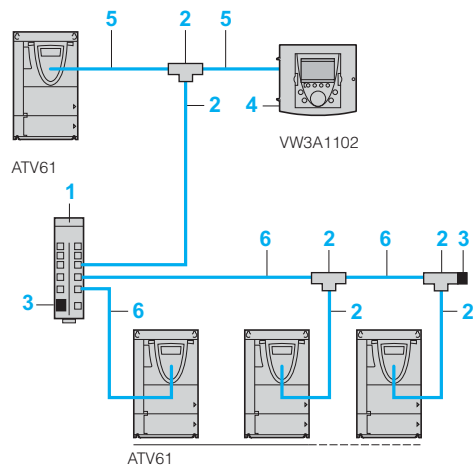
Description	Item no.	Length		Part number	Weight	
		ft	m		lbs	kg
LCD graphic display keypad A remote-mounting cable VW3 A1 104 R●●● and an RJ45 adaptor VW3 A1 105 must be provided when mounting remotely.	(6)	-	-	VW3 A1 101	0.4	0.2

Accessories for mounting the graphic display keypad remotely

Description	Item no.	Length		Part number	Weight	
		ft	m		lbs	kg
Remote cables equipped with 2 RJ45 connectors	(7)	3.3	1	VW3A1104R10	0.1	0.1
		9.8	3	VW3A1104R30	0.3	0.2
		16.4	5	VW3A1104R50	0.6	0.3
		32.8	10	VW3A1104R100	1.1	0.5
Female/female RJ45 adaptor	(8)	-	-	VW3A1105	0.02	0.1
Remote mounting kit for mounting on an enclosure door IP 54 degree of protection	(9)	-	-	VW3A1102	0.3	0.2
Door for remote mounting kit VW3 A1 102 Can be used to provide IP 65 degree of protection	(10)	-	-	VW3A1103	0.1	0.4

Remote mounting accessories for RJ45 connection with IP 55 degree of protection

Description	Item no.	Length		Part number	Weight	
		ft	m		lbs	kg
Internal IP 55 cables equipped with an RJ45 connector and an IP 55 RJ45 base. For remote location of the drive's RJ45 port while maintaining IP 55 protection	(11)	1.0	0.3	VW3A01500	0.1	0.1
		2.0	0.6	VW3A01502	0.2	0.1
IP 55 cable equipped with an RJ45 connector and an IP 55 RJ45 connector. For connecting an drive equipped with a VW3 A0 150● cable	(12)	9.8	3	VW3A01501	0.3	0.1



Example of connection via multidrop link

Multidrop connection accessories

These accessories enable a graphic display terminal to be connected to several drives via a multidrop link. This multidrop link is connected to the Modbus terminal port on the front of the drive.

Connection accessories

Description	Item no.	Sold in lots of	Unit part number	Weight	
				lbs	kg
Modbus splitter box 10 RJ45 connectors and 1 screw terminal block	1	-	LU9GC3	1.1	0.5
Modbus T-junction boxes	With integrated cable (0.3 m)	2	VW3A8306TF03	-	-
	With integrated cable (1 m)	2	VW3A8306TF10	-	-
Modbus line terminator For RJ45 connector	3	2	VW3A8306RC	0.02	0.01
Remote mounting kit For graphic display terminal VW3A1101	4	-	VW3A1102	0.3	0.15

Cordsets (equipped with 2 RJ45 connectors)

Used for	Item no.	Length		Part number	Weight	
		ft	m		lbs	kg
Remote operation of the Altivar 61 and the graphic display terminal VW3A1101	5	3.3	1	VW3A1104R10	0.1	0.05
		9.8	3	VW3A1104R30	0.3	0.15
		16.4	5	VW3A1104R50	0.6	0.25
		32.8	10	VW3A1104R100	1.1	0.5
Modbus serial link	6	1	0.3	VW3A8306R03	0.06	0.03
		3.3	1	VW3A8306R10	0.13	0.06
		9.8	3	VW3A8306R30	0.29	0.13



Encoder interface card VW3A3401

Encoder interface cards

The Altivar 61 can use an encoder interface card for speed feedback with asynchronous motors.

They improve drive performance irrespective of the motor load state:

- Accurate speed regulation
- Shorter response times on a torque surge verification of motor shaft rotation
- Improved dynamic performance in transient state

For asynchronous motors, in the other control modes (voltage vector control, voltage/frequency ratio), encoder interface cards improve static speed accuracy.

Encoder interface cards can also be used for:

- Overspeed detection

They can also transmit a reference provided by the encoder input to the Altivar 61. This use is specific to synchronizing the speed of several drives. These two functions are available for encoder interface cards VW3A3401 to VW3A3407.

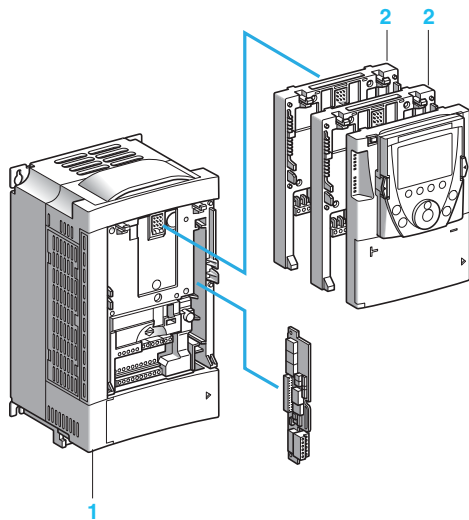
Three types of card are available depending on the encoder technology:

- RS 422 compatible differential outputs
- Open collector outputs (NPN)
- Push-pull outputs

The Altivar 61 variable speed drive can only take one encoder interface card.

The interface encoder card is inserted in a dedicated slot. It is protected against short circuits and overloads. For more information about the encoders, see the OsiSense Catalog.

Description	Used with encoder	Voltage		Maximum cable length		Maximum operating frequency	Part number	Weight	
		V	mA	ft	m			lbs	kg
Encoder interface card with RS422 compatible differential outputs	XCC1●●●●●●X	5	200	164	50	300	VW3A3401	0.4	0.2
	XCC1●●●●●●R								
	XCC1●●●●●●RN								
	XCC1●●●●●●X	15	175	328.1	100	300	VW3A3402	0.4	0.2
Encoder interface cards with open collector outputs	–	12	175	1640.4	500	300	VW3A3403	0.4	0.2
		15	175	1640.4	500	300	VW3A3404	0.4	0.2
Encoder interface cards with push-pull outputs	XCC1●●●●●●Y	12	175	1640.4	500	300	VW3A3405	0.4	0.2
	XCC1●●●●●●K	15	175	1640.4	500	300	VW3A3406	0.4	0.2
	XCC1●●●●●●KN	24	100	1640.4	500	300	VW3A3407	0.4	0.2



I/O extension cards

The Altivar 61 drive can integrate up to three different option cards simultaneously including:

- Two of the following cards:
 - I/O extension cards (two versions available)
 - Communication card
 - Integrated Machine Controller programmable card to adapt the variable speed drive to specific applications
- One encoder interface cards: RJ45

These options cards can be installed under the front panel of the variable speed drive. They have been designed to be integrated without adding to the width or height of the installation. Adding an I/O extension card or communication card will add 1 inch (25 mm) to the depth dimension.

Both I/O extension cards can be added to adapt the I/O needs for the application. Adding two of the same option card (I/O option card or communication card) is not possible.

Description	Type of I/O							Part number	Weight	
	Logic input	Logic output	Relay logic output	Analog input	Analog output	Input for PTC probes ⁽¹⁾	Frequency control input		lbs	kg
Basic I/O card	4	2	1	–	–	1	–	VW3A3201	0.7	0.3
Extended I/O card	4	2	1	2	2	1	1	VW3A3202	0.7	0.3

(1) This PTC probe input must never be used to protect an ATEX motor in applications in explosive atmospheres.

Adaptor for 115 V ~ logic inputs

This adaptor is used to connect 115 V ~ logic signals to the logic inputs on the drive or an I/O extension card.

7 logic inputs with capacitive impedance at 60 Hz of 0.22 µF are available for connecting the logic signals:

- Max. current: 200 mA
- Response time: 5 ms to change from state 0 to state 1, 20 ms to change from state 1 to state 0
- Logic state 0 for a voltage below 20 V, logic state 1 for a voltage between 70 V and 132 V

The power supply must be provided by a 115 V external power supply (min. 70 V, max. 132 V).

Description	Part number	Weight
Adaptor for 115 V ~ logic inputs	VW3A3101	–

Specifications of Option Card VW3A3201 Control Terminals

Designation	Terminal	Specification
Relay output 3 (R3A N.O. contact, R3B N.C. contact)	R3A R3B R3C	<ul style="list-style-type: none"> ■ Switching capacity min. 3 mA at 24 Vdc ■ Switching capacity max. 5 A at 250 Vac (cos φ = 1) or 30 Vdc, max. 2 A at 250 Vac (cos φ = 0.4) or 30 Vdc (L/R = 7 ms) ■ Reaction time 7 ms 0.5 ms, typical life cycle of 100.000 switching cycles at max. switching capability ■ Sampling voltage must correspond to overvoltage category II so that the PELV conditions for the remaining control terminals are fulfilled.
Voltage supply for potentiometer 1–10 kΩ	-10	<ul style="list-style-type: none"> ■ -10 Vdc (-10.5 V±0.5 V) ■ max. 10 mA; short circuit protected
Sampling voltage for logic inputs (Sink/Source-switching is selected with selector switch SW3.)	+24	<ul style="list-style-type: none"> ■ Selector switch SW3 in position Source or Sink Int.: +24 Vdc (min. 21 V, max. 27 V), short circuit protected max. 50 mA (for basic device and options) ■ Selector switch SW3 in position Sink Ext.: Input for external voltage supply +24 Vdc of the logic inputs
Logic inputs LI7–LI10 (Usage can be specified with parameter settings. Sink/Source-switching is selected with selector switch SW1.)	LI7	■ +24 Vdc (max. 30 V), impedance 3.5 kΩ, reaction time 2 ms ±0.5 ms
	LI8	■ Positive logic (Source) or negative logic (Sink)
	LI9	■ Compatible with Level 1 PLC Standard IEC 65A-68
	LI10	■ SW3 at Source (factory setting): High > 11 Vdc, Low < 5 Vdc SW3 at Sink Int. or Sink Ext.: High < 10 Vdc, Low > 16 Vdc
Ground	0 V	0 V reference potential for logic inputs
Thermistor input 2	TH2+ TH2-	<ul style="list-style-type: none"> ■ For a maximum of 6 PTC thermistors in series⁽¹⁾ ■ Thermistor nominal value < 1.5 kΩ, threshold value 3 kΩ ■ Disengaging value 1.8 kΩ, short-circuit monitoring at < 50 Ω
Logic output LO1 (Usage can be specified with parameter settings.)	LO1	<ul style="list-style-type: none"> ■ +24 Vdc open collector outputs, floating ground ■ Positive logic (Source) or negative logic (Sink) ■ Compatible with Level 1 PLC Standard IEC 65A-68
Logic output LO2 (Usage can be specified with parameter settings.)	LO2	<ul style="list-style-type: none"> ■ Switching capacity max. 200 mA at 12–30 Vdc ■ Reaction time: 2 ms ±0.5 ms
Common	CLO	Reference potential of the logic outputs
Ground	0 V	0 V general use

(1) Shield the wiring and lay the cables separate from the motor cable.

Specifications of Option Card VW3A3202 Control Terminals

Designation	Terminal	Specification
Relay output 4 (R4A N.O. contact, R4B N.C. contact)	R4A R4B R4C	Switching capacity min. 3 mA at 24 Vdc Switching capacity max. 5 A at 250 Vac ($\cos \phi = 1$) or 30 Vdc, max. 2 A at 250 Vac ($\cos \phi = 0.4$) or 30 Vdc ($L/R = 7$ ms) Reaction time 10 ms \pm 0.5 ms, typical life cycle of 100.000 switching cycles at max. switching capability Sampling voltage must correspond to overvoltage category II so that the PELV conditions for the remaining control terminals are fulfilled.
Voltage supply for potentiometer 1–10 k Ω	-10	<ul style="list-style-type: none"> ■ -10 Vdc (-10.5 V \pm 0.5 V) ■ max. 10 mA; short circuit protected
Analog input AI3 (Usage and limits can be adjusted with parameter settings.)	AI3+ AI3-	0(4)–20 mA, differential amplifier, impedance 250 Ω , Reaction time 5 ms \pm 1 ms, resolution 11 bits + 1 sign bit, accuracy \pm 0.6% at $\Delta\theta = +60$ °C (+140 °F), linearity \pm 0.15%
Analog input AI4 (Selection, usage, and limits can be adjusted with parameter settings.)	AI4	<ul style="list-style-type: none"> ■ 0 to +10 Vdc (floating up to max. 24 V), impedance 30 kΩ¹ or ■ 0(4)–20 mA, impedance 250 Ω Reaction time 5 ms \pm 1 ms, resolution 11 bits, Accuracy \pm 0.6 % at $\Delta\theta = +60$ °C (+140 °F), linearity \pm 0.15%
Ground	COM	0 V reference potential for analog in-/outputs
Analog output AO2	AO2	<ul style="list-style-type: none"> ■ 0–10 Vdc or -10/+10 Vdc according to software configuration, min. load impedance 500 Ω¹ or
Analog output AO3	AO3	<ul style="list-style-type: none"> ■ 0(4)–20 mA, max. load impedance 500 Ω Resolution 10 bits, reaction time 5 ms \pm 1 ms, accuracy \pm 1% at $\Delta\theta = +60$ °C (+140 °F), linearity \pm 0.2%
Sampling voltage for logic inputs (Sink/Source-switching is selected with selector switch SW4.)	+24	<ul style="list-style-type: none"> ■ Selector switch SW4 in position Source or Sink Int.: +24 Vdc (min. 21 V, max. 27 V), short circuit protected max. 50 mA (for basic device and options) ■ Selector switch SW4 in position Sink Ext.: Input for external voltage supply +24 Vdc of the logic inputs
Logic inputs LI11–LI14 (Usage can be specified with parameter settings. Sink/Source-switching is selected with selector switch SW4.)	LI11 LI12 LI13 LI14	+24 Vdc (max. 30 V), impedance 3.5 k Ω , reaction time 5 ms \pm 1 ms Positive logic (Source) or negative logic (Sink) Compatible with Level 1 PLC Standard IEC 65A-68 SW4 at Source (factory setting): High > 11 Vdc, Low < 5 Vdc SW4 at Sink Int. or Sink Ext.: High < 10 Vdc, Low > 16 Vdc
Ground	0 V	0 V reference potential for logic inputs
Thermistor input 3	TH3+ TH3-	For a maximum of 6 PTC thermistors in series ⁽¹⁾ Thermistor nominal value < 1.5 k Ω , threshold value 3 k Ω Disengaging value 1.8 k Ω , short circuit monitoring at < 50 Ω
Frequency input FP	FP	Frequency range 0–30 kHz, 1:1 \pm 10 %, reaction time 5 ms \pm 1 ms Input voltage 5 Vdc, 15 mA Series resistor for 12 V = 510 Ω , for 15 V = 910 Ω , for 24 V = 1.3 k Ω (max. 30 V); High > 3.5 V, Low < 1.2 V
Logic output LO3 (Usage can be specified with parameter settings.)	LO3	+24 Vdc open collector outputs, floating ground Positive logic (Source) or negative logic (Sink) Compatible with Level 1 PLC Standard IEC 65A-68
Logic output LO4 (Usage can be specified with parameter settings.)	LO4	Switching capacity max. 200 mA at 12–30 Vdc Reaction time: 2 ms \pm 0.5 ms
Common	CLO	Reference potential of the logic outputs
Ground	0 V	0 V general use

(1) Shield the wiring and lay the cables separate from the motor cable.

Introduction

The Altivar 61 drive provides an automation solution that is ideal for the requirements of pump applications:

- It incorporates all the application functions for managing your pumps, such as sleep, wake-up, zero flow detection, fluid absence detection, underload or overload detection and PID regulator.
- It is used to adjust the operating point of pumps using control profiles.
- It protects your pump installation by providing:
motor thermal protection, PTC management, low speed detection and time delay

The Water Solutions option card can adapt drive operation to the specific requirements of a pump installation. They reduce costs and increase the service life of equipment by intelligently managing the operating time of each pump. Various predefined configurable applications are sold by Schneider Electric and its partners.

In order to protect our know-how, it is not possible to transfer the program from the card to a PC.

A single multi-pump card can be installed in the Altivar 61. It can be combined with another option card (I/O expansion or communication).

Each multi-pump card consists of

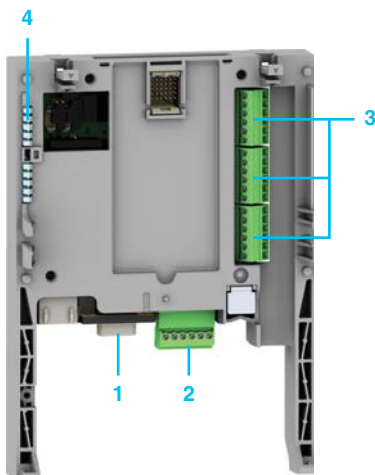
- 10 x 24 V $\overline{\text{V}}$ logic inputs, 2 of which can be used for 2 counters or 4 of which can be used for 2 incremental encoders
- 2 x 0...20 mA current analog inputs, impedance 250 Ω
- 6 x 24 V $\overline{\text{V}}$ positive logic (Source) open collector outputs
- 2 x 0...20 mA current analog outputs, impedance 500 Ω
- A master port for the CANopen machine bus

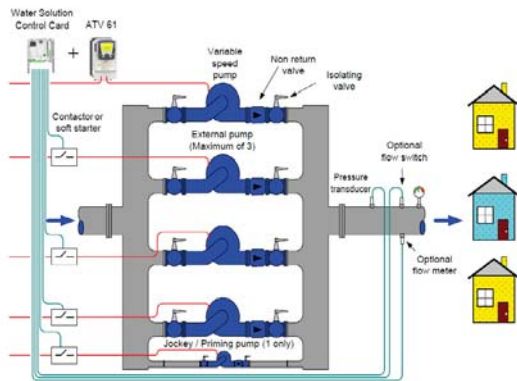
If the power consumption does not exceed 200 mA, this card can be powered by ATV61H●●●●● drives. Otherwise, an external 24 V $\overline{\text{V}}$ power supply must be used.

Note: It is recommended that an OsiSense XM electronic pressure sensor, type XML F or XML G, is added to the installation. Please consult our "Detection for automation solutions - OsiSense" catalog.

Description

- (1) 9-way male SUB-D connector for connection to the CANopen machine bus
- (2) Connector with removable screw terminals, 6 contacts at intervals of 3.81 for the 24 V $\overline{\text{V}}$ power supply and 4 logic inputs
- (3) 3 connectors with removable screw terminals, 6 contacts at intervals of 3.81 for 6 logic inputs, 6 logic outputs, 2 analog inputs, 2 analog outputs and 2 commons
- (4) 5 LEDs:
 - 1 to indicate the presence of the 24 V $\overline{\text{V}}$ power supply
 - 1 to indicate a program execution fault
 - 2 to indicate the CANopen machine bus communication status
 - 1 controlled by the application program





VW3A3503 Water solution card

The **VW3A3503** Water Solution card provides pump management and control for a pumping installation. Up to 4 pumps can be controlled with a single drive, providing constant pressure.

It incorporates the single variable function as well as the Jockey pump management function which is primarily used to manage booster or priming pumps. It also compensates for losses in installations.

The variable speed pump is controlled by the Altivar 61 with the Water Solution card installed. The system can support up to three additional external pumps, either direct on line or, preferably, under soft starter control. One of the external pumps can be set up as a jockey/priming pump.

The Water Solutions card determines how many external pumps need to be operating for the present demand, and operates the variable speed pump at a variable speed to make up the demand requirement.

The control algorithm provides a PID function for the variable speed pump reference. The pressure setpoint can either be entered through the keypad / display, or can be sourced from one of the analog inputs. The pressure feedback is connected to one of the analog inputs.

Under normal operating conditions, the control algorithm responds to an increase in demand by initially increasing the speed of the variable speed pump. If the pump is unable to fulfill the demand and has already reached full capacity, the control algorithm switches in one of the external pumps. The variable speed pump will then decrease its speed, as it shares with the external pump to take up the demand. T

he control algorithm responds to a decrease in demand by initially decreasing the speed of the variable speed pump. If the demand decreases further, the control algorithm will switch out one of the external pumps. The variable speed pump will then increase its speed to take up the demand.

Applications

It is specially designed for applications such as:

- Irrigation stations
- Sprinkling stations
- Constant pressure water distribution and pumping systems
- Booster stations

Continuity of service for your installation

The Water Solution can respond to a detected abnormal conditions in various ways, determined by the nature of the condition to minimize downtime.

The Water Solutions card records the following for each pump:

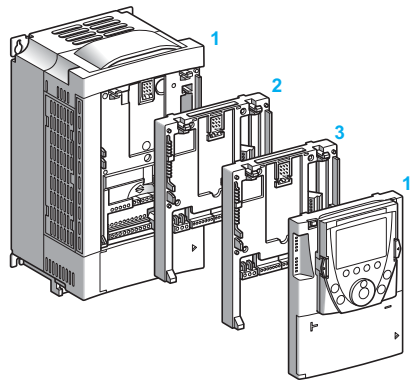
- Display the operating time
- Reset the counter
- Save the operating times

The card also incorporates an OFF mode, used during maintenance operations. The Water Solutions card has a non-volatile RAM (NVRAM) for storing variable values. A lithium battery is included and used to prevent the data from being lost when the card is turned off.

Description	Part number	Weight		
		lbs	kg	
Water solution multi-pump card	Equipped with one 9-way male SUB-D connector	VW3A3503	0.7	0.3



Altivar IMC integrated controller card



Altivar IMC integrated controller

The Altivar IMC integrated controller card forms a part of Flexible Machine Control approach, a key component of MachineStruxure™, which brings you maximum flexibility and provides the most optimized control solution.

The Altivar IMC integrated controller card **VW3A3521S0** is a compact optimized solution developed for Altivar 61 and 71 variable speed drives. When equipped with the ATV IMC card, Altivar 61 and 71 drives become controllers capable of meeting the needs of machine manufacturers (OEMs) in applications such as textiles, hoisting, pumping or woodworking, etc.

The Altivar IMC integrated controller card **VW3A3521S0** is configured and programmed using SoMachine software.

The Altivar IMC card boosts the expansion capability of machines and allows us to meet the OEM market's requirements in terms of performance, simplicity of use and openness.

Installation

The Altivar IMC card is designed for integration on Altivar 61 variable speed drives in conjunction with other Altivar 61-specific cards, such as I/O expansion cards and communication cards.

- 1 Altivar 61 drive and graphic display keypad
- 2 Altivar IMC card **VW3A3521S0**, or Water Solutions card **VW3A3503**
- 3 I/O expansion card **VW3A32●●** or communication card **VW3A33●●**

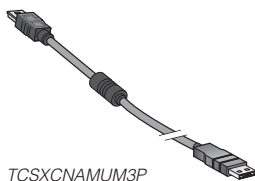
Note: Only one I/O expansion card or communication card can be mounted simultaneously with the Altivar IMC card on an Altivar 61 drive.

Altivar IMC integrated controller card

Designation	Voltage	Part number	Weight	
			lbs	kg
Altivar IMC integrated controller card	24 V ~	VW3A3521	0.4	0.2

Connection cable

Designation	Use	Length		Part number	Weight	
		ft	m		lbs	kg
Programming cable	From the mini USB-B port on the Altivar IMC integrated controller card to the type A USB port on the PC terminal for programming and updating firmware	9.8	3	TCSXCNAMUM3P	0.2	0.1



TCSXCNAMUM3P

Special features

User memory	RAM	2 MB
	Flash	2 MB
Data storage memory FRAM (Ferroelectric RAM)		64 KB
Typical time (for 1000 Boolean instructions)		942 μs
User program size		1 MB
Power supply		24 V ~
Inputs	Digital	10 x 24 V ~ inputs, 4 of which can be used for 2 high-speed counter inputs (100 kHz) or 2 incremental encoders (A/B) (100 kHz)
	Analog	2 x 0...20 mA inputs
Outputs	Digital	6 transistor outputs (2 A) - source
	Analog	2 x 0...20 mA outputs
Built-in communication ports	RJ45 port	Ethernet Modbus TCP, Web/FTP Server
	SUB-D connector (male 9-way)	Master CANopen bus (16 slaves)
	USB Mini-B port	SoMachine software programming
Real-time clock		Integrated

Performance

Reduce the time it takes to develop your machines

- The use of a single SoMachine programming software environment offers a number of advantages:
 - A single project file
 - A single software program
 - A single download for the whole application
- The ease of use of PLCopen function blocks significantly reduces the time needed to program motion control and independent axis control on machines.

A more powerful machine

The Altivar IMC integrated controller card has 8 tasks to suit different machine requirements (cyclic, event-triggered, free). A task can be synchronized with the task of the drive in which it is embedded. This task manages the speed reference, the torque reference, the speed feedback, the torque feedback, the number of encoder pulses feedback in order to increase machine performance.

A more intelligent drive

- Performs more complex operations (2 MB memory)
- Reduces program loading time (Mini-B USB connectors)
- Communication with all the other system devices (built-in Ethernet and CANopen connection ports)

Transparency of your machines

Access to all the other devices in the system architecture via CANopen is totally transparent due to FDT/DTM technology.

Development and technology

The Altivar IMC integrated controller card has been developed with two criteria in mind: low cost and practicality.

- Low cost because the standard equipment for the Altivar IMC card comprises:
 - Sixteen discrete I/O
 - A built-in Ethernet port
 - Two analog inputs
 - Two analog outputs
 - And a CANopen master
- Practicality because the Altivar IMC card is ideal for integration in Altivar 61 drives, and can therefore use:
 - Their inputs/outputs
 - Their communication cards
 - Their parameters: speed, current, torque, etc.
 - Their remote graphic display keypad
 - And also the inputs/outputs in their I/O expansion cards
 - Plus the speed feedback counter in the encoder interface cards

Software configuration

Configuration and programming of the Altivar IMC integrated controller card and equipment in Schneider Electric's "Flexible Machine Control" concept are both designed to cut costs and optimize your machine performance. Schneider Electric's SoMachine™ software platform can be used to program Altivar IMC integrated controller card using:

- IEC 61131-3 programming languages: Instruction List (IL), Ladder Diagram (LD), Function Block Diagram (FBD), Sequential Function Chart/Grafset (SFC) and Structured Text (ST)
- CFC (Continuous Function Chart) language.

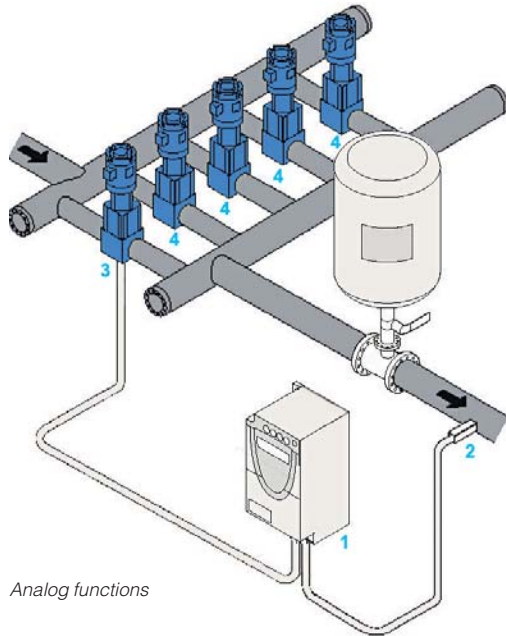
PLCopen function blocks are used for managing motion control and axis control on your machines.

Integration in the Schneider Electric product offer

Combined with other OEM products in the Schneider Electric offer, such as Altivar variable speed drives, Lexium™ servo drives, Magelis™ HMI terminals, TeSys™ motor starters and contactors, the Altivar IMC integrated controller card can be integrated transparently in a number of architectures.



SoMachine software platform



Analog functions

Functions

Analog functions

For machines that require functions to process data issued by analog sensors/actuators (voltage or current), temperature sensors, pressure or PID control sensors, the Altivar IMC card has, as standard, 2 analog inputs (voltage or current) with 10-bit resolution and 2 analog outputs (current) with 10-bit resolution.

- 1 Altivar IMC integrated controller card installed on Altivar 61
- 2 Pressure sensor
- 3 Variable speed pump
- 4 Fixed speed pumps

HSC high-speed counting and/or incremental encoder function

In order to meet requirements for machine productivity, the Altivar IMC has 2 embedded high-speed counters with a counting frequency of 100 kHz for each channel as well as 4 reflex outputs. The availability of these embedded counters and also the presence of the master CANopen link makes it quick and easy to create low-cost, high-performance multi-axis functions that suit the machine's limitations. With the availability of "PLCopen" function blocks specific to the motion control functions in the SoMachine software, application development is quick and repeatable. In addition, these high-speed counting inputs can be used as an incremental encoder (A/B) with a frequency of 100 kHz in order to adapt to the machine's specific requirements.

Functions (continued)

Communication function

Ethernet

The Altivar IMC integrated controller card has a built-in RJ45 Ethernet port (10/100 Mbps, MDI/MDIX) with Ethernet TCP Modbus, SoMachine on Ethernet, UDP, TCP and SNMP protocols. In addition, the Altivar IMC card has an embedded Web Server and FTP Server. As well as the default address based on the MAC address, it is possible to assign a controller IP address via a DHCP server or via a BOOTP server.

CANopen

The Altivar IMC integrated controller card has an embedded CANopen master which can be used to control devices on a communication bus with ease. The link can be configured between 20 kbps and 1 Mbps and supports up to 16 slaves. Architectures based on CANopen can be used to distribute I/O modules as close to the sensors and actuators as possible, thus reducing wiring costs and times, and to communicate with different devices such as variable speed drives, servo drives, etc. The CANopen configurator is integrated in the SoMachine software and can also be used to import standard description files in EDS format.

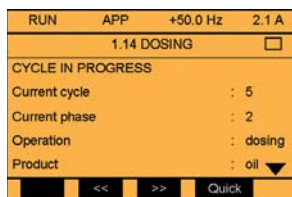
Customization function on the graphic display keypad

Menu 1.14

The remote graphic display keypad on Altivar 61 drives includes a menu dedicated to the Altivar IMC integrated controller card. The user is offered a graphic display of 8 lines of 24 characters. This menu can be customized simply and directly using the SoMachine software. The user can define the language, name, unit, decimal point, and the type of parameter he wishes to customize for his own application. The user can also define alarms and error messages for his application.

Clock function

A time and date-stamping function combined with a clock backed up by a lithium battery makes it possible to keep a log of events that have occurred. When the Altivar IMC integrated controller card is installed in the drive, drive faults are automatically time and date-stamped without the need for any special programming.



Menu 1.14

Communication

The Altivar IMC integrated controller card has the following built-in communication ports:

Communication ports	Use
1 x RJ45 (MDI/MDIX port)	<input type="checkbox"/> FTP server <input type="checkbox"/> Web server <input type="checkbox"/> Modbus TCP server <input type="checkbox"/> Modbus TCP client <input type="checkbox"/> Manager SoMachine <input type="checkbox"/> SNMP <input type="checkbox"/> Modbus device
1 x mini-USB	Programming port (480 Mbps)
1 x 9-way male SUB-D	Master CANopen connection

Embedded Ethernet

The Altivar IMC integrated controller card has an embedded Ethernet link via a direct connection to its RJ45 port.

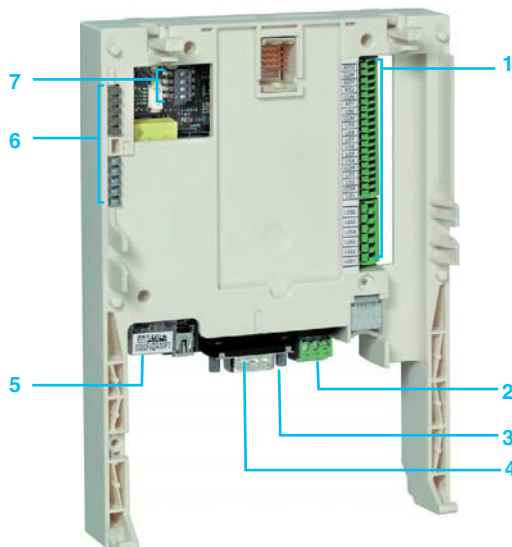
- Speed: "10 BaseT" and "100 BaseTX" with auto-negotiation
- RJ45 port (MDI/MDIX): automatic adaptation to a straight or crossed cable

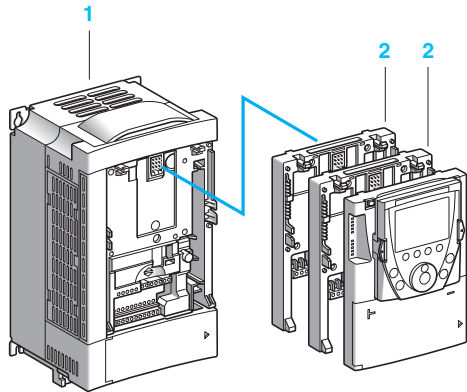
Protocols	Number of connections
Modbus server	8
Modbus device	2
FTP server	4
Web server	10

Description

The Altivar IMC integrated controller card comprises:

- 1 Three spring connectors for:
 - 10 digital inputs
 - 6 digital outputs
 - 2 analog inputs
 - 2 analog outputs
 - 2 commons
- 2 A connector with removable screw terminals, 3 contacts at intervals of 3.81 for the 24 V \pm power supply
- 3 A mini USB-B connector for programming using SoMachine software
- 4 A 9-way SUB-D connector for connection to the CANopen machine bus
- 5 An RJ45 connector for connection of the SoMachine software workshop and/or connection to an Ethernet Modbus TCP network
- 6 Five LEDs:
 - 1 green/yellow ETH LED for Ethernet activity
 - 1 green/red NS (Network status) LED
 - 1 green/red MS (Module status) LED
 - 1 green/red CAN (CANopen activity) LED
 - 1 green/red LED programmable by the user
- 7 Four configuration selector switches





Extended functions using option cards

Communication buses and networks

The Altivar 61 has been designed to meet all the configuration requirements encountered within the context of industrial and building communication installations.

Integrated communication protocols

It includes Modbus and CANopen communication protocols as standard.

Two integrated communication ports enable direct access to the Modbus protocol:

- One RJ45 Modbus terminal port (1), located on the drive front panel, which is used to connect a Human Machine Interface or one of the following configuration tools:
 - Remote graphic display keypad
 - Magelis industrial HMI terminal
 - SoMove setup software
 - Simple Loader and Multi-Loader configuration tools

- One RJ45 Modbus network port (2), located on the drive's control keypads which is assigned to control and signaling by a PLC or by another type of controller. It can also be used to connect a terminal or the SoMove setup software.

The CANopen protocol can be accessed from the Modbus network port (2) via the daisy chain tap or the CANopen adaptor (3). In this case, the terminal port (1) must be used to access the Modbus protocol.

Optional communication cards

By adding one of the communication cards available as options, the Altivar 61 drive can also be connected to other communication networks and buses used in various application areas, such as industry and building management (HVAC) (1).

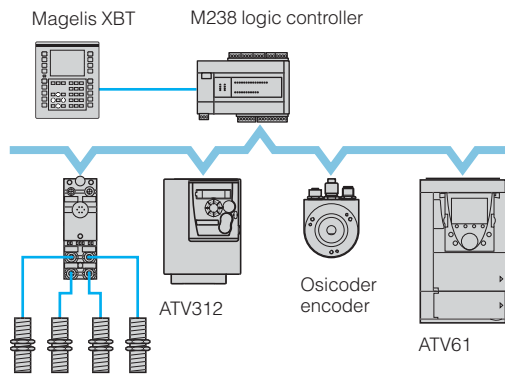
Communication cards for industrial applications:

- Modbus TCP Daisy Chain
- Modbus/Uni-Telway (this card provides access to additional functions, which complement those of the integrated ports (Modbus ASCII and 4-wire RS 485))
- EtherNet/IP
- DeviceNet
- PROFIBUS DP V0 and V1

Communication cards for building applications (HVAC):

- LON WORKS
- METASYS N2
- APOGEE FLN
- BACnet

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.



Sensors

Configuration example on CANopen machine bus

(1) Heating, Ventilation and Air Conditioning.

Functions

All drive functions can be accessed via the network:

- Configuration
- Adjustment
- Control
- Monitoring

The Altivar 61 drive's advanced functions provide excellent interfacing flexibility. They enable the different control sources (I/O, communication networks, communication cards and graphic display keypad) to be assigned to control functions that satisfy the requirements of numerous, complex applications. Network configuration is simplified through the provision of configuration software (configurator for SyCon® networks, etc.).

For the integrated Modbus and CANopen ports and the communication cards for industrial applications, the Altivar 61 drive can be controlled:

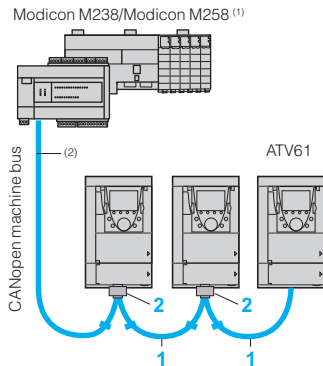
- According to the CiA 402 profile
- According to the I/O profile, where control is as simple and adaptable as control via the I/O terminals.

The DeviceNet card also supports CIP AC Drive and Allen-Bradley drive profiles; PROFIBUS DP V0 and V1 cards also support the PROFIdrive profile.

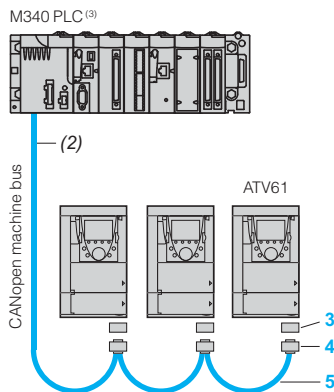
Communication is monitored according to the specific criteria for each protocol. However, regardless of the protocol, it is possible to configure how the drive responds to a communication fault:

- Freewheel stop, stop on ramp, fast stop or braked stop
- Maintain the last command received
- Fallback position at a predefined speed
- Ignore the fault

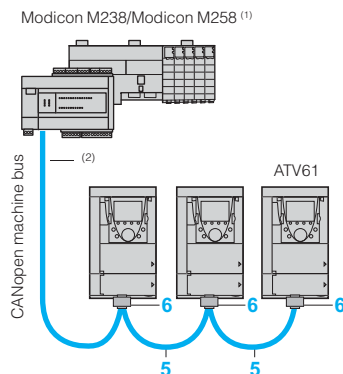
A command from the CANopen machine bus is processed with the same priority as one of the drive terminal inputs. This results in excellent response times on the network port via the CANopen adaptor.



Optimized solution for daisy chain connection to the CANopen machine bus



Example of CANopen diagram with SUB-D connector



Example of CANopen diagram with daisy chain tap

CANopen machine bus

Description	Item no.	Length		Part number	Weight	
		ft	m		lbs	kg
Connection via RJ45 connector (optimized solution for daisy chain connection to the CANopen machine bus)						
CANopen cordsets equipped with 2 RJ45 connectors	1	1	0.3	VW3CANCARR03	0.1	0.05
		3.3	1	VW3CANCARR1	1.1	0.5
Daisy chain tap equipped with: ■ 2 RJ45 connectors for connecting the CANopen bus in a daisy chain ■ 1 cordset equipped with an RJ45 connector for connecting the drive	2	1	0.3	TCSCTN023F13M03	-	-
Connection via SUB-D connector						
CANopen adaptor for mounting on the RJ45 port on the drive control terminals. The adaptor provides a 9-way male SUB-D connector conforming to the CANopen standard (CIA DRP 303-1).	3	-	-	VW3CANA71	-	-
CANopen connector ⁽⁴⁾ 9-way female SUB-D with line terminator (can be disabled). 180° cable outlet for 2 CANopen cables. CAN-H, CAN-L, CAN-GND connection.	4	-	-	VW3CANKCDF180T	-	-
CANopen cables ⁽¹⁾⁽²⁾ Standard cable, CE marking Low smoke zero halogen Flame retardant (IEC 60332-1)	5	164	50	TSXCANCA50	10.8	4.9
		328.1	100	TSXCANCA100	19.4	8.8
		984.3	300	TSXCANCA300	54.2	24.6
CANopen cables ⁽¹⁾⁽²⁾ UL certified, CE marking Flame retardant (IEC 60332-2)	5	164	50	TSXCANCB50	7.9	3.6
		328.1	100	TSXCANCB100	17.2	7.8
		984.3	300	TSXCANCB300	48.3	21.9
CANopen cables ⁽¹⁾⁽²⁾ Cable for harsh environments ⁽⁵⁾ or mobile installations, CE marking Low smoke zero halogen Flame retardant (IEC 60332-1)	5	164	50	TSXCANCD50	7.7	3.5
		328.1	100	TSXCANCD100	17.2	7.8
		984.3	300	TSXCANCD300	47.8	21.7
Connection via terminals						
Daisy chain tap equipped with: ■ 2 spring terminal blocks for connecting the CANopen bus in a daisy chain ■ 1 cordset equipped with an RJ45 connector for connecting the drive	6	2	0.6	TSCCTN026M16M	-	-

(1) Please refer to the "Modicon M238 Logic Controller" and "M258 Logic Controller" catalogs.

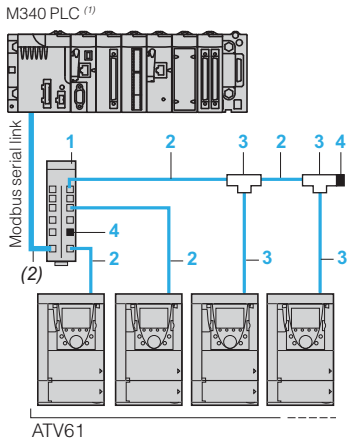
(2) Cable dependent on the type of controller or PLC.

(3) Please refer to the "Modicon M340 Automation Platform" catalog.

(4) For ATV61H●●●M3, ATV61HD11M3X, HD15M3X, ATV61H075N4...HD18N4, and ATV61HU22Y...HC63Y drives, this connector can be replaced by the TSXCANKCDF180T connector.

(5) Harsh environments:

- Resistance to hydrocarbons, industrial oils, detergents, solder splashes
- Relative humidity up to 100%
- Saline atmosphere
- Significant temperature variations
- Operating temperature between - 10°C and + 70°C.



Example of Modbus diagram with connection via splitter box and RJ45 connectors

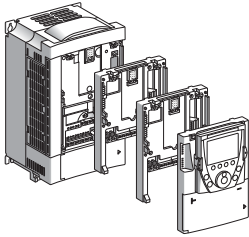
Modbus serial link- Connection accessories

Description	Item no.	Length		Part number	Weight		
		ft	m		lbs	kg	
Modbus splitter box 10 RJ45 connectors and 1 screw terminal	1	-	-	LU9GC3	1.1	0.5	
Cables for Modbus serial link equipped with 2 RJ45 connectors	2	1	0.3	VW3A8306R03	0.07	0.03	
		3.3	1	VW3A8306R10	0.2	0.1	
		9.8	3	VW3A8306R30	0.2	0.1	
Modbus T-junction boxes (with integrated cable)	3	1	0.3	VW3A8306TF03	0.4	0.2	
		3	1	VW3A8306TF10	0.4	0.2	
Line terminators for RJ45 connector ⁽³⁾	4	R = 120 Ω	-	-	VW3A8306RC	0.02	0.01
		C = 1 nf	-	-	VW3A8306R	0.02	0.01
	4	R = 150 Ω	-	-	VW3A8306R	0.02	0.01

(1) Please refer to the "Modicon M340 Automation Platform" catalog.

(2) Cable dependent on the type of controller or PLC.

(3) Order in lots of 2.



Modbus TCP Daisy Chain and EtherNet/IP network ⁽¹⁾⁽²⁾

Description		Length		Part number	Weight	
		ft	m		lbs	kg
Communication cards						
Modbus TCP Daisy Chain	Equipped with 2 RJ45 connectors Modbus TCP 10/100 Mbps class C20	-	-	VW3A3310D	0.7	0.3
EtherNet/IP	Equipped with 2 RJ45 connectors	-	-	VW3A3316	0.7	0.3
ConneXium Modbus TCP (VW3A3310D) or EtherNet/IP (VW3A3316 and VW3A3320) cordsets						
Straight shielded twisted pair cordsets	Equipped with 2 RJ45 connectors To be connected on a hub or on a switch	6.6	2	490NTW00002	-	-
		16.4	5	490NTW00005	-	-
		39.4	12	490NTW00012	-	-
		131.2	40	490NTW00040	-	-
		262.5	80	490NTW00080	-	-

DeviceNet bus ⁽¹⁾⁽²⁾

Description		Part number	Weight	
			lbs	kg
Communication card				
DeviceNet	Equipped with a 5-way removable screw terminal block	VW3A3309	0.7	0.3

INTERBUS bus ⁽¹⁾⁽²⁾

Description		Part number	Weight	
			lbs	kg
Communication card				
INTERBUS	Equipped with one 9-way male SUB-D connector and one 9-way female SUB-D connector To be connected using cordset 170MCI●●●00 ⁽³⁾	VW3A3304	0.7	0.3

Modbus/Uni-Telway network ⁽¹⁾⁽²⁾

Description		Length		Part number	Weight	
		ft	m		lbs	kg
Communication card						
Modbus/Uni-Telway	Equipped with a 9-way female SUB-D connector	-	-	VW3A3303	0.7	0.3
Connection accessories for Modbus/Uni-Telway card (VW3A3303)						
Subscriber socket	Equipped with two 15-way female SUB-D connectors and two screw terminal blocks. For 2-channel junction box, trunk cable extension and line terminator	-	-	TSXSACA62	1.3	0.6
Cordset for TSXSACA62 subscriber socket	Equipped with two 9-way and 15-way male SUB-D connectors	9.8	3	VW3A83062	0.4	0.2

(1) The Altivar 61 drive can only take one communication card.

(2) User manuals can be downloaded from our website www.schneider-electric.com. For the PROFIBUS DP, DeviceNet cards, the description files in gsd, eds or xif format can also be downloaded from our website www.schneider-electric.com.

(3) For a v5.7ie70#6 and above software version.

PROFIBUS DP V0/V1 ⁽¹⁾⁽²⁾

Description		Length		Part number	Weight	
		ft	m		lbs	kg
Communication cards						
PROFIBUS DP V0	Equipped with a 9-way female SUB-D connector	-	-	VW3A3307	0.7	0.3
PROFIBUS DP V1	Equipped with a 9-way female SUB-D connector	-	-	VW3A3307S371	0.7	0.3
Connection accessories for PROFIBUS DP V0 (VW3A3307) or V1 (VW3A3307S371) card						
Connectors: 9-way male SUB-D	For middle of line	-	-	490NAD91104	-	-
	For end of line	-	-	490NAD91103	-	-
Cable for connector 490NAD911●●		328.1	100	TSXPBSCA100	-	-
		1312.3	400	TSXPBSCA400	-	-

(1) The Altivar 61 drive can only take one communication card.

(2) User manuals can be downloaded from our website www.schneider-electric.com. For the PROFIBUS DP, DeviceNet cards, the description files in gsd, eds or xif format can also be downloaded from our website www.schneider-electric.com.

Communication cards for building applications

LONWORKS bus ⁽¹⁾⁽²⁾

Description		Part number	Weight	
			ft	kg
Communication card				
LONWORKS	Equipped with a 3-way removable screw terminal block	VW3A3312	0.7	0.3

METASYS N2 bus ⁽¹⁾⁽²⁾

Communication card				
METASYS N2	Equipped with a 4-way removable screw terminal block	VW3A3318	0.7	0.3

APOGEE FLN bus ⁽¹⁾⁽²⁾

Communication card				
APOGEE FLN	Equipped with a 4-way removable screw terminal block	VW3A3314	0.7	0.3

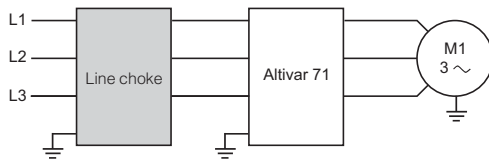
BACnet bus ⁽¹⁾⁽²⁾

Communication card				
BACnet	Equipped with a 4-way removable screw terminal block	VW3A3319	0.7	0.3

(1) The Altivar 61 drive can only take one communication card.

(2) For the PROFIBUS DP and LONWORKS cards, the description files in gsd, eds or xif format can also be downloaded from our website www.schneider-electric.com.

(3) Please refer to the "Automation Platform Modicon Premium and Unity - PL7 Software" catalog.



Line reactors

Line reactors (also referred to as line chokes) are used to provide improved protection against overvoltages on the line supply to reduce input currents to the drive and to reduce harmonic distortion of the current produced by the drive. Line reactors (or some form of additional impedance) are recommended when the impedance of the power distribution system is low, such as when the power of the system transformer is ten times larger than the power rating of the drive.

Line reactors are mandatory:

- For ATV61HC11Y...HC80Y drives

They can also be used with:

- ATV61H...M3 drives powered by a 200...240 V 50/60 Hz three-phase supply and with ATV61H...M3X and ATV61...N4 drives
- ATV61...Y variable speed drives in order to reach a total rate of distortion in current in conformity with the IEC 61000-3-12 standard

Note: ATV61HD90N4...HC63N4, supplied as standard with a DC choke, can be ordered without a choke by adding the letter D at the end of the reference.

Line chokes must be installed upstream of the drive.

Applications

The use of line chokes is recommended in particular under the following circumstances:

- Close connection of several drives in parallel
- Line supply with significant disturbance from other equipment (interference, overvoltages)
- Line supply with voltage imbalance between phases that is more than 1.8% of the nominal voltage
- Drive supplied by a line with very low impedance (in the vicinity of power transformers 10 times more powerful than the drive rating)
- Installation of a large number of frequency inverters on the same line
- Reduction of overloads on the $\cos \varphi$ correction capacitors, if the installation includes a power factor correction unit

Altivar 61 variable speed drives

Input Power Options Line Reactors



VW3A4572

For drives	Quantity required per drive	Part number	Weight		Line supply lsc	Line choke				UL recognized CSA certified Part number ⁽¹⁾	Weight	
			lbs	kg		Inductance value	Nominal current	Saturation current	Loss		lbs	kg
Single-phase supply voltage: 200...240 V 50/60 Hz												
ATV61HU40M3X	1	-	-	-	-	-	-	-	-	RL02502	14	6.3
ATV61HU55M3X	1	-	-	-	-	-	-	-	-	RL03502	16	7.3
ATV61HU75M3X	1	-	-	-	-	-	-	-	-	RL05502	27	12
ATV61HD15M3X	1	-	-	-	-	-	-	-	-	RL08002	51	23
ATV61HD22M3X	1	-	-	-	-	-	-	-	-	RL10002	51	23
ATV61HD30M3X	1	-	-	-	-	-	-	-	-	RL13002	57	26
ATV61HD37M3X	1	-	-	-	-	-	-	-	-	RL16002	50	23
ATV61HD45M3X	1	-	-	-	-	-	-	-	-	RL20003B14	100	45
Three-phase supply voltage: 200...240 V 50/60 Hz												
ATV61H037M3	1	VW3A4551	3.3	1.5	5	10	4	-	45	RL00401	4	1.8
ATV61H075M3	1	VW3A4551	3.3	1.5	5	10	4	-	45	RL00401	4	1.8
ATV61HU15M3	1	VW3A4552	6.6	3	5	4	10	-	65	RL00801	7	3.2
ATV61HU22M3	1	VW3A4552	6.6	3	5	4	10	-	65	RL01201	9	4.1
ATV61HU30M3	1	VW3A4553	7.7	3.5	5	2	17	-	75	RL01801	9	4.1
ATV61HU40M3	1	VW3A4554	13.2	6	5	1	31	-	90	RL01801	9	4.1
ATV61HU55M3	1	VW3A4554	13.2	6	22	1	31	-	90	RL02501	11	5
ATV61HU75M3	1	VW3A4555	24.3	11	22	0.5	60	-	94	RL03501	14	6.3
ATV61HD11M3X	1	VW3A4555	24.3	11	22	0.5	60	-	94	RL04501	23	10
ATV61HD15M3X	1	-	-	-	-	-	-	-	-	RL08001	43	20
ATV61HD18M3X	1	-	-	-	-	-	-	-	-	RL010001	47	21
ATV61HD22M3X	1	-	-	-	-	-	-	-	-	RL10001	47	21
ATV61HD30M3X	1	-	-	-	-	-	-	-	-	RL13001	50	23
ATV61HD37M3X	1	-	-	-	-	-	-	-	-	RL13001	57	26
ATV61HD45M3X	1	-	-	-	-	-	-	-	-	RL16001	67	30
ATV61HD55M3X	1	-	-	-	-	-	-	-	-	RL20001B14	68	31
ATV61HD75M3X	1	-	-	-	-	-	-	-	-	RL25001B14	110	50
ATV61HD90M3	1	-	-	-	-	-	-	-	-	RL32001B14	80	36.3
Three-phase supply voltage: 380...480 V 50/60 Hz												
ATV61H075N4	1	VW3A4551	3.3	1.5	5	10	4	-	45	RL00201	4	1.8
ATV61HU15N4	1	VW3A4551	3.3	1.5	5	10	4	-	45	RL00402	5	2.3
ATV61HU22N4	1	VW3A4552	6.6	3	5	4	10	-	65	RL00803	11	5
ATV61HU40N4	1	VW3A4552	6.6	3	5	4	10	-	65	RL00802	11	5
ATV61HU55N4	1	VW3A4553	7.7	3.5	22	2	17	-	75	RL01202	18	8.2
ATV61HU75N4	1	VW3A4553	7.7	3.5	22	2	17	-	75	RL01802	16	7.3
ATV61HD11N4	1	VW3A4554	13.2	6	22	1	31	-	90	RL02502	20	9.1
ATV61HD15N4	1	VW3A4554	13.2	6	22	1	31	-	90	RL03502	30	14
ATV61HD18N4	1	VW3A4555	24.3	11	22	0.5	60	-	94	RL03502	30	14
ATV61HD22N4	1	VW3A4555	24.3	11	22	0.5	60	-	94	RL04502	39	18
ATV61HD30N4	1	-	-	-	-	-	-	-	-	RL05502	41	19
ATV61HD37N4	1	-	-	-	-	-	-	-	-	RL08002	61	28
ATV61HD45N4	1	-	-	-	-	-	-	-	-	RL08002	61	28
ATV61HD55N4	1	-	-	-	-	-	-	-	-	RL10002	74	34
ATV61HD75N4	1	-	-	-	-	-	-	-	-	RL13002	64	29
ATV61HD90N4	1	-	-	-	-	-	-	-	-	RL16002	67	30
ATV61HC11N4	1	-	-	-	-	-	-	-	-	RL20002B14	54	24.5
ATV61HC13N4	1	-	-	-	-	-	-	-	-	RL25002B14	80	36.3
ATV61HC16N4	1	-	-	-	-	-	-	-	-	RL32002B14	102	46.3
ATV61HC22N4	1	-	-	-	-	-	-	-	-	RL50002	200	91
ATV61HC25N4	1	-	-	-	-	-	-	-	-	RL50002	290	132
ATV61HC31N4	1	-	-	-	-	-	-	-	-	RL60002	290	132
ATV61HC40N4	1	-	-	-	-	-	-	-	-	RL75002	160	72.6
ATV61HC50N4	1	-	-	-	-	-	-	-	-	RL85002B14	180	82
ATV61HC63N4	2	-	-	-	-	-	-	-	-	2 x RL6002	290	132

(1) See Short Circuit Current Ratings on page 23 for more information about UL recognized line reactors.

Altivar 61 variable speed drives

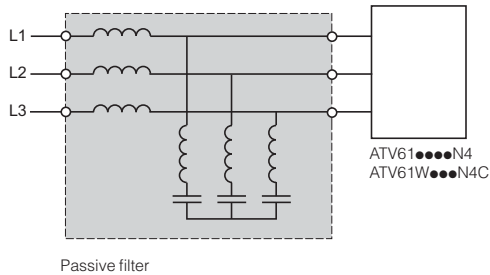
Input Power Options

Line Reactors

For drives	Quantity re-quired per drive	Part number	Weight		Line supply Isc	Line choke				UL recognized CSA certified part number ⁽²⁾	Weight	
			lbs	kg		Inductance value	Nominal current	Saturation current	Loss		lbs	kg
Three-phase supply voltage: 500...600 V 50/60 Hz												
ATV61HU22S6X	1	VW3A4551	3.3	1.5	22	10	4	-	45	RL00403	5	2.3
ATV61HU30S6X	1	VW3A4551	3.3	1.5	22	10	4	-	45	RL00403	11	5
ATV61HU40SX6	1	VW3A4552	6.6	3	22	4	10	-	65	RL00803	11	5
ATV61HU55S6X	1	VW3A4552	6.6	3	22	4	10	-	65	RL01203	18	8.2
ATV61HU75S6X	1	VW3A4553	7.7	3.5	22	2	17	-	75	RL01203	18	8.2
Three-phase supply voltage: 500...690 V 50/60 Hz												
ATV61HU30Y	1	VW3A4551	3.3	1.5	22	10	4	-	45	RL00403	5	2.3
ATV61HU40Y	2	VW3A4552	6.6	3	22	4	10	-	65	RL00803	11	5
ATV61HU55Y	2	VW3A4552	6.6	3	22	4	10	-	65	RL00803	11	5
ATV61HU75Y	2	VW3A4552	6.6	3	22	4	10	-	65	RL01202	10	4.5
ATV61HD11Y	1	VW3A4553	7.7	3.5	22	2	17	-	75	RL01202	10	4.5
ATV61HD15Y	1	VW3A4553	7.7	3.5	22	2	17	-	75	RL01802	14	6.3
ATV61HD18Y	1	VW3A4554	13.2	6	22	1	31	-	90	RL02502	14	6.3
ATV61HD22Y	1	VW3A4554	13.2	6	22	1	31	-	90	RL02502	20	9.1
ATV61HD30Y	1	VW3A4555	24.3	11	22	0.5	60	-	94	RL03502	16	7.3
ATV61HD37Y	1	VW3A4555	24.3	11	22	0.5	60	-	94	RL04502	26	11.8
ATV61HD45Y	1	VW3A4555	24.3	11	22	0.5	60	-	94	RL05502	27	12
ATV61HD55Y	1	VW3A4556	35.3	16	22	0.3	107	-	260	RL08002	51	23
ATV61HD75Y	1	-	-	-	-	-	-	-	-	RL08002	51	23
ATV61HD90Y	1	-	-	-	-	-	-	-	-	RL10002	51	23
ATV61HC11Y ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL13002	57	26
ATV61HC13Y ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL16002	50	23
ATV61HC16Y ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL20002B14	67	30
ATV61HC20Y ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL20002B14	67	30
ATV61HC25Y ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL25002B14	106	48
ATV61HC31Y ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL40002B14	155	70
ATV61HC40Y ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL50002B14	118	
ATV61HC50Y ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL60002B14	175	
ATV61HC63Y ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL75002B14	190	
ATV61HC80HY ⁽¹⁾	1	-	-	-	-	-	-	-	-	RL85002B14	215	

(1) Use of a line choke is mandatory.

(2) See Short Circuit Current Ratings on page 23 for more information about UL recognized line reactors.



Passive filters

A passive filter is used to reduce current harmonics with total harmonic distortion factors of less than 16% or 10%.

These performance levels can be improved still further and the harmonic distortion reduced to less than 10% or 5% if the filter is used with a DC choke.

The reactive power increases at no load or low load. To eliminate this reactive power, the filter capacitors can be disconnected via the drive.

The degree of protection of the passive filters is IP 20.

ATV61H●●●M3, ATV61H●●●Y and ATV61H●●●S6X drives are not compatible with the use of these passive filters. It is recommended or mandatory, depending on the rating, to use a line choke.

Applications

Reduction of current harmonics in order to use drives in the first environment (restricted distribution, for domestic use, sale conditional on the competence of the user and the distributor in terms of reduction of current harmonics).

Motor rating		For ATV61 drives	Line Supply	Filter		Filter	Quantity per Drive	Part Number ⁽²⁾	Packaging Size		Weight	
kw	HP			Line Current	Input Current				Output Current	L x L x H		Net
			A	A	A	inches	cm	lbs	kg			
THDI 16% ⁽¹⁾												
0.75	1	ATV61H075N4	2.5	6	6.2	1	VW3A46139	23.6 x 15.7 x 20.1	60 x 40 x 51	22	10	
1.5	2	ATV61HU15N4	3	6	6.2	1	VW3A46139	23.6 x 15.7 x 20.1	60 x 40 x 51	22	10	
2.2	3	ATV61HU22N4	5	6	6.2	1	VW3A46139	23.6 x 15.7 x 20.1	60 x 40 x 51	22	10	
3	-	ATV61HU30N4	6	6	6.2	1	VW3A46139	23.6 x 15.7 x 20.1	60 x 40 x 51	22	10	
4	5	ATV61HU40N4	7	10	10.4	1	VW3A46140	23.6 x 15.7 x 20.1	60 x 40 x 51	29.8	13.5	
5.5	7.5	ATV61HU55N4	10	10	10.4	1	VW3A46140	23.6 x 15.7 x 20.1	60 x 40 x 51	29.8	13.5	
7.5	10	ATV61HU75N4	13	14	14.5	1	VW3A46141	23.6 x 15.7 x 20.1	60 x 40 x 51	35.9	16.3	
11	15	ATV61HD11N4	19	19	19.5	1	VW3A46142	23.6 x 15.7 x 20.1	60 x 40 x 51	48.5	22	
15	20	ATV61HD15N4	24	25	26	1	VW3A46143	23.6 x 15.7 x 20.1	60 x 40 x 51	50.7	23	
18	25	ATV61HD18N4	32	31	32	1	VW3A46144	31.5 x 23.6 x 24	80 x 60 x 61	72.8	33	
22	30	ATV61HD22N4	35	36	37.5	1	VW3A46145	31.5 x 23.6 x 24	80 x 60 x 61	81.6	37	
30	40	ATV61HD30N4	44	48	50	1	VW3A46146	31.5 x 23.6 x 24	80 x 60 x 61	83.8	38	
37	50	ATV61HD37N4	58.7	60	62.5	1	VW3A46147	31.5 x 23.6 x 24	80 x 60 x 61	94.8	43	
45	60	ATV61HD45N4	68	73	76	1	VW3A46148	31.5 x 23.6 x 24	80 x 60 x 61	121.3	55	
55	75	ATV61HD55N4	82.6	95	99	1	VW3A46149	31.5 x 23.6 x 24	80 x 60 x 61	136.7	62	
75	100	ATV61HD75N4	108	118	122.5	1	VW3A46150	31.5 x 23.6 x 24	80 x 60 x 61	163.1	74	

(1) Adding a DC choke can reduce THDI to <5%.

(2) Filters are rated for 460V 60Hz three phase power supply.

Altivar 61

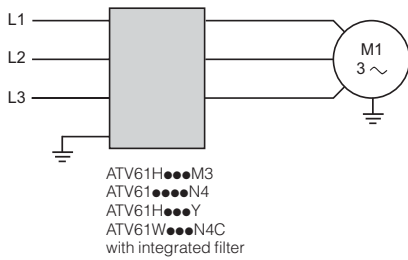
variable speed drives

Input Power Options

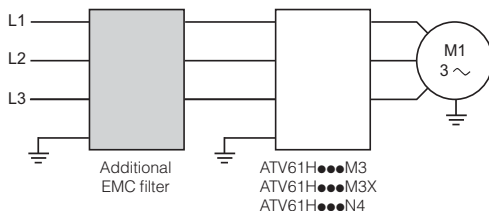
Passive filters

Motor rating		For ATV61 drives	Line Supply	Filter	Filter	Quantity per Drive	Part Number ⁽¹⁾	Packaging Size		Weight	
kw	HP		Line Current	Input Current	Output Current			L x L x H		Net	
		A	A	A			inches	cm	lbs	kg	
THDI 10%											
0.75	1	ATV61HU75N4	2.5	6	6.2	1	VW3A46158	23.6 x 15.7 x 20.1	60 x 40 x 51	39.7	18
1.5	2	ATV61HU15N4	3	6	6.2	1	VW3A46158	23.6 x 15.7 x 20.1	60 x 40 x 51	39.7	18
2.2	3	ATV61HU22N4	4.2	6	6.2	1	VW3A46158	23.6 x 15.7 x 20.1	60 x 40 x 51	39.7	18
3	-	ATV61HU30N4	6	6	6.2	1	VW3A46158	23.6 x 15.7 x 20.1	60 x 40 x 51	39.7	18
4	5	ATV61HU40N4	7	10	10.4	1	VW3A46159	23.6 x 15.7 x 20.1	60 x 40 x 51	39.7	18
5.5	7.5	ATV61HU55N4	10	10	10.4	1	VW3A46159	23.6 x 15.7 x 20.1	60 x 40 x 51	39.7	18
7.5	10	ATV61HU75N4	13	14	14.5	1	VW3A46160	23.6 x 15.7 x 20.1	60 x 40 x 51	44.1	20
11	15	ATV61HD11N4	19	19	19.5	1	VW3A46161	23.6 x 15.7 x 20.1	60 x 40 x 51	66.1	30
15	20	ATV61HD15N4	24	25	26	1	VW3A46162	23.6 x 15.7 x 20.1	60 x 40 x 51	75	34
18	25	ATV61HD18N4	32	31	32	1	VW3A46163	31.5 x 23.6 x 24	80 x 60 x 61	114.6	52
22	30	ATV61HD22N4	35	36	37.5	1	VW3A46164	31.5 x 23.6 x 24	80 x 60 x 61	116.8	53
30	40	ATV61HD30N4	44	48	50	1	VW3A46165	31.5 x 23.6 x 24	80 x 60 x 61	125.7	57
37	50	ATV61HD37N4	58.7	60	62.5	1	VW3A46166	31.5 x 23.6 x 24	80 x 60 x 61	165.3	75
45	60	ATV61HD45N4	68	73	76	1	VW3A46167	31.5 x 23.6 x 24	80 x 60 x 61	213.8	97
55	75	ATV61HD55N4	82.6	95	99	1	VW3A46168	31.5 x 23.6 x 24	80 x 60 x 61	229.3	104
75	100	ATV61HD75N4	108	118	122.5	1	VW3A46169	31.5 x 23.6 x 24	80 x 60 x 61	233.7	106
THDI 10%											
90	125	ATV61HD90N4	134	154	160	1	VW3A46151	31.5 x 23.6 x 24	80x60x61	187.4	85
110	150	ATV61HC11N4	163	183	190	1	VW3A46152	31.5 x 23.6 x 24	80x60x61	224.9	102
132	200	ATV61HC13N4	192	231	240	1	VW3A46153	47.2 x 31.5 x 28.3	120x80x72	257.9	117
160	250	ATV61HC16N4	235	231	240	1	VW3A46153	47.2 x 31.5 x 28.3	120x80x72	257.9	117
220	350	ATV61HC22N4	330	355	369	1	VW3A46155	47.2 x 31.5 x 28.3	120x80x72	357.1	162
250	400	ATV61HC25N4	400	436	450	1	VW3A46157	47.2 x 31.5 x 28.3	120x80x72	451.9	205
315	500	ATV61HC31N4	470	231	240	2	VW3A46153	47.2 x 31.5 x 28.3	120x80x72	257.9	117
400	600	ATV61HC40N4	590	291	316	2	VW3A46154	47.2 x 31.5 x 28.3	120x80x72	313.1	142
500	700	ATV61HC50N4	730	380	395	2	VW3A46156	47.2 x 31.5 x 28.3	120x80x72	379.2	172
630	900	ATV61HC63N4	964	355	369	3	VW3A46155	47.2 x 31.5 x 28.3	120x80x72	379.2	172
THDI 5%											
90	125	ATV61HD90N4	134	154	160	1	VW3A46170	31.5 x 23.6 x 24	80x60x61	277.8	126
110	150	ATV61HC11N4	163	183	190	1	VW3A46171	31.5 x 23.6 x 24	80x60x61	297.6	135
132	200	ATV61HC13N4	192	231	240	1	VW3A46172	47.2 x 31.5 x 28.3	120x80x72	374.8	170
160	250	ATV61HC16N4	235	231	240	1	VW3A46172	47.2 x 31.5 x 28.3	120x80x72	374.8	170
220	350	ATV61HC22N4	330	355	369	1	VW3A46174	47.2 x 31.5 x 28.3	120x80x72	504.9	229
250	400	ATV61HC25N4	400	436	450	1	VW3A46176	47.2 x 31.5 x 28.3	120x80x72	595.2	270
280	450	ATV61HC28N4	440	436	450	1	VW3A46176	47.2 x 31.5 x 28.3	120x80x72	595.2	270
315	500	ATV61HC31N4	470	231	240	2	VW3A46172	47.2 x 31.5 x 28.3	120x80x72	374.8	170
400	600	ATV61HC40N4	590	291	316	2	VW3A46173	47.2 x 31.5 x 28.3	120x80x72	504.9	229
500	700	ATV61HC50N4	730	380	395	2	VW3A46175	47.2 x 31.5 x 28.3	120x80x72	584.2	265
630	900	ATV61HC63N4	964	355	369	3	VW3A46174	47.2 x 31.5 x 28.3	120x80x72	584.2	265

(1) Filters are rated for 460V 60Hz three phase power supply.



Altivar 61 drive with integrated EMC filter



Altivar 61 drive with additional EMC filter



Mounting the EMC filter beside the Altivar 61 drive



Mounting the EMC filter under the Altivar 61 drive

Integrated EMC filters

Altivar 61 drives, except for the ATV61H●●●M3X and ATV61H●●●S6X, have built-in radio interference input filters to meet the EMC standard for variable speed electrical power drive "products" IEC/EN 61800-3, edition 2, category C2 or C3 in environment 1 or 2 and to comply with the European directive on EMC (electromagnetic compatibility).

IP 20 drives

Drives	Maximum length of shielded cable ⁽¹⁾ according to							
	EN 55011 class A Gr1				EN 55011 class A Gr2			
	IEC/EN 61800-3 cat. C2				IEC/EN 61800-3 cat. C3			
	LF ⁽²⁾ ⁽³⁾		HF ⁽²⁾ ⁽³⁾		LF ⁽²⁾ ⁽³⁾		HF ⁽²⁾ ⁽³⁾	
	ft	m	ft	m	ft	m	ft	m
ATV61H075M3...HU22M3	32.8	10	16.4	5	-	-	-	-
ATV61HU30M3...HU75M3	-	-	-	-	32.8	10	16.4	5
ATV61H075N4...HU40N4	32.8	10	16.4	5	-	-	-	-
ATV61HU55N4...HD15N4	-	-	-	-	32.8	10	16.4	5
ATV61HD18N4...HC63N4	-	-	-	-	164	50	82	25
ATV61HU30Y...HD90Y	-	-	-	-	82	25	82	25
ATV61HC11Y...HC80Y	-	-	-	-	164	50	82	25

IP 54 drives

Drives	Maximum length of shielded cable ⁽¹⁾ according to											
	EN 55011 class A Gr1						EN 55011 class B Gr1					
	IEC/EN 61800-3 cat. C2						IEC/EN 61800-3 cat. C1					
	LF ⁽²⁾		HF ⁽²⁾		LF ⁽²⁾		HF ⁽²⁾		LF ⁽²⁾		HF ⁽²⁾	
	2 kHz		8 kHz		16 kHz		2 kHz		8 kHz		16 kHz	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
ATV61W●●●N4	262.5	80	164	50	164	50	-	-	-	-	-	-

Additional EMC input filters

Applications

When used with ATV61H●●●M3, H●●●M3X and ATV61H●●●N4 drives, additional EMC input filters can be used to meet more stringent requirements and are designed to reduce conducted emissions on the line supply below the limits of standards EN 55011 group 1, class A or B and IEC/EN 61800-3 category C1 or C2. For ATV61H075M3...HD45M3X and ATV61H075N4...HD75N4 drives, the additional EMC filters can be mounted beside or under the device. They act as a support for the drives and are attached to them via tapped holes. For ATV61HD55M3X...HD90M3X and ATV61HD90N4...HC63N4 drives, the additional EMC filters can only be mounted beside the drive.

Use according to the type of line supply

These additional filters can only be used on TN (neutral connection) and TT (neutral to ground) type systems.

Standard IEC/EN 61800-3, appendix D2.1, states that on IT systems (isolated or impedance grounded neutral), filters can cause permanent insulation monitors to operate in a random manner.

If a machine has to be installed on an IT system, one solution is to insert an isolation transformer and connect the machine locally on a TN or TT system.

(1) If motors are connected in parallel, it is the total length that should be taken into account.

(2) LF: low switching frequency. HF: high switching frequency.

(3) See note (5) on the next page.



VW3A4400

Additional EMC input filters for ATV61H●●●M3, H●●●M3X and H●●●N4 drives

Drives	Maximum length of shielded cable (1)								In (2)	If (3)	Loss (4)	Part number	Weight	
	EN 55011 class A Gr1				EN 55011 class B Gr1								lbs	kg
	IEC/EN 61800-3 category C2				IEC/EN 61800-3 category C1									
	LF (5)		HF (5)		LF (5)		HF (5)		A	mA	W			
	ft	m	ft	m	ft	m	ft	m						
Three-phase supply voltage: 200...240 V 50/60 Hz														
ATV61H075M3, HU15M3	328.1	100	164	50	164	50	65.6	20	12	4	10	VW3A4401	4.9	2.2
ATV61HU22M3...HU40M3	328.1	100	164	50	164	50	65.6	20	26	4.4	18	VW3A4402	8.8	4
ATV61HU55M3	328.1	100	164	50	164	50	65.6	20	35	3	24	VW3A4403	12.8	5.8
ATV61HU75M3	328.1	100	164	50	164	50	65.6	20	46	10	19	VW3A4404	15.4	7
ATV61HD11M3X, HD15M3X	656.2	200	328.1	100	164	50	82	25	72	33	34	VW3A4405	26.5	12
ATV61HD18M3X, HD22M3X	656.2	200	328.1	100	164	50	82	25	90	33	34	VW3A4406	33.1	15
ATV61HD30M3X...HD45M3X	656.2	200	328.1	100	164	50	82	25	180	80	58	VW3A4408	88.2	40
ATV61HD55M3X, HD75M3X	328.1	100	164	50	164	50	82	25	273	285	60	VW3A4410	48.5	22
ATV61HD90M3X	328.1	100	164	50	164	50	82	25	336	500	125	VW3A4411	48.5	22
Three-phase supply voltage: 380...480 V 50/60 Hz														
ATV61H075N4...HU22N4	328.1	100	164	50	164	50	65.6	20	12	7	5	VW3A4401	4.9	2.2
ATV61HU30N4, HU40N	328.1	100	164	50	164	50	65.6	20	26	8	6	VW3A4402	8.8	4
ATV61HU55N4, HU75N4	328.1	100	164	50	164	50	65.6	20	35	7	14	VW3A4403	12.8	5.8
ATV61HD11N4	328.1	100	164	50	164	50	65.6	20	46	14	13	VW3A4404	15.4	7
ATV61HD15N4 (6), HD18N4	984.3	300	656.2	200	328.1	100	328.1	100	72	60	14	VW3A4405	26.5	12
ATV61HD22N4	984.3	300	656.2	200	328.1	100	328.1	100	90	60	11	VW3A4406	33.1	15
ATV61HD30N4, HD37N4	984.3	300	656.2	200	328.1	100	328.1	100	92	60	30	VW3A4407	37.5	17
ATV61HD45N4...HD75N4	984.3	300	656.2	200	328.1	100	328.1	100	180	140	58	VW3A4408	88.2	40
ATV61HD90N4...HC16N4	984.3	300	492.1	150	164	50	82	25	273	500	60	VW3A4410	48.5	22
ATV61HC22N4...HC31N4	984.3	300	492.1	150	164	50	82	25	546	500	125	VW3A4411	48.5	25
ATV61HC40N4, HC50N4	984.3	300	492.1	150	164	50	82	25	728	500	210	VW3A4412	48.5	25
ATV61HC63N4	984.3	300	492.1	150	164	50	82	25	1456	200	380	VW3A4413	75	34

- (1) The maximum lengths are given as examples only, as they vary depending on the stray capacitance of the motors and the cables used. If motors are connected in parallel, the sum of the cable lengths must be taken into account.
- (2) Filter nominal current.
- (3) Maximum leakage current to ground at 230 V and at 400 V 50 Hz on a TT system.
- (4) Via thermal dissipation.
- (5) LF: low switching frequency. HF: high switching frequency. These frequencies depend on the drive rating.

For drives	Switching frequency with integrated EMC filter		Switching frequency with additional EMC filter	
	LF	HF	LF	HF
	kHz	kHz	kHz	kHz
ATV61H●●●M3 ATV61H075N4...HD11N4	4	4.1...16	4	4.1...16
ATV61HD15N4...HD30N4	4	4.1...16	3.5...4	4.1...12
ATV61HD11M3X, HD15M3X	-	-	3.5...4	4.1...12
ATV61HD18M3X...HD45M3X	-	-	2...2.5	2.6...12
ATV61HD37N4...HD75N4	2...2.5	2.6...12	2...2.5	2.6...12
ATV61HD55M3X...HD90M3X	-	-	2.5...4	4.1...8
ATV61HD90N4...HC63N4	2...4	4.1...8	2...4	4.1...8
ATV61HU30Y...HD30Y	2.5...4	4.1...6	-	-
ATV61HD37Y...HC80Y	2.5	2.6...4.9	-	-

(6) It is possible to use a special filter **VW3A4409** with a leakage current If (3) of 14 mA which enables a maximum motor cable length of 100 m.

dV/dt output filters

In applications where the impedance on either end of the motor cable run does not match, voltage pulses may be reflected back. As these reflected waves encounter other waves, their values add, causing high peak voltages. Voltage wave reflection and peak voltages increase with longer cable lengths, increased drive switching frequency, and faster voltage rise times, (dV/dt).

When installed, dV/dt filters increase the time it takes the voltage to rise, slowing the pulse transitions, reducing dV/dt, reducing voltage peaks, and protecting motor and cable insulation.

For drives	Nominal current	UL Recognized Part Number	Weight	
	A		lbs	kg
Three-phase supply voltage: 380...480 V 50/60 Hz				
ATV61HO75N4	3	V1K3A00	8	4
ATV61HU15N4	4	V1K4A00	8	4
ATV61HU22N4	6	V1K6A00	8	4
ATV61HU30N4	8	V1K8A00	8	4
ATV61HU40N4	12	V1K12A00	8	4
ATV61HU55N4	16	V1K16A00	12	5
ATV61HU75N4	18	V1K18A00	12	5
ATV61HD11N4	27	V1K27A00	12	5
ATV61HD15N4	35	V1K35A00	12	5
ATV61HD18N4	45	V1K45A00	17	8
ATV61HD22N4	55	V1K55A00	16	7
ATV61HD30N4	80	V1K80A00	23	10
ATV61HD37N4	80	V1K80A00	23	10
ATV61HD45N4	110	V1K110A00	40	18
ATV61HD55N4	130	V1K130A00	55	25
ATV61HD75N4	160	V1K160A00	60	27
ATV61HD90N4	200	V1K200A00	60	27
ATV61HC11N4	250	V1K250A00	65	29
ATV61HC13N4	305	V1K305A00	80	36
ATV61HC16N4	362	V1K362A00	80	36
ATV61HC20N4	420	V1K420A00	95	43
ATV61HC25N4	480	V1K480A00	100	45
ATV61HC28N4	600	V1K600A00	130	59
ATV61HC31N4	750	V1K750A00	135	61



Introduction

Schneider Electric's Square D brand E-Flex AC drives provide the optimum combination of efficiency and economy for HVAC and pump applications in both commercial and industrial environments. Well suited for commercial buildings, hospitals, airports, schools, and water/wastewater facilities HVAC pump and fan applications, the Square D brand E-Flex™ enclosed drive controller provides an efficient and economical AC drive solution.

Designed to withstand harsh environments in demanding commercial buildings, the E-Flex™ Enclosed Drive Controller meets building code seismic specifications for ground level and roof mounted applications.

Square D E-Flex enclosed drive controllers can meet both indoor and outdoor application requirements with Type 1, Type 12/12K and Type 3R enclosures.

Applications

AC drives help increase the energy efficiency of HVAC equipment by reducing motor speeds, thereby reducing electricity usage in:

- Air handling units
- Supply and return fans
- Ventilation fans
- Cooling tower pumps and fans
- Hot water pumps
- Chilled water pumps

Features

The E-Flex™ Enclosed Drive Controller is available in:

- 1 to 50 hp at 208 Vac and 230 Vac
- 1 to 100 hp at 460 Vac

Built to provide an efficient and economical application solution, the E-Flex™ Enclosed Drive Controller offers:

Performance under pressure

- UL 508C Listed to exceed minimum UL short-circuit requirements
- 100,000 AIC short circuit protection without current limiting fuses
- Advanced technology platform increases reliability and uptime; reducing the number of components needed on hand.
- Industrial-rated control operators and pilot devices

Easy to Control

- Large backlit LCD graphic screen with customizable display
- Clear text in six languages
- Navigation wheel for easy scrolling through menus
- Pre-programmed for HVAC variable torque operation
- Light indicators for Power, Fault, Run, and Bypass
- Test-Normal selector switch permits testing of the drive controller

Fully Protected

- Circuit breaker disconnect provides short circuit protection
- 3% line reactor provides transient protection from surge and overvoltage conditions, and minimizes line harmonics
- Enclosure designed to reduce radio frequency interference
- Meets International Building Code and ASCE1 standards for seismic specifications
- Thermal management system for operation in extreme temperatures 14 °F to 122 °F (-10 °C to 50 °C) for Type 3R enclosures

Expandable Capabilities

- LonWorks®, BACnet, Modbus®, Unitelway, Ethernet TCP/IP, Apogee P1, Profibus, and Metasys® N2 communications capability
- HVAC controls provide end damper, smoke purge relays, and fire/freeze stat for full speed fire safety override

Enclosure Styles

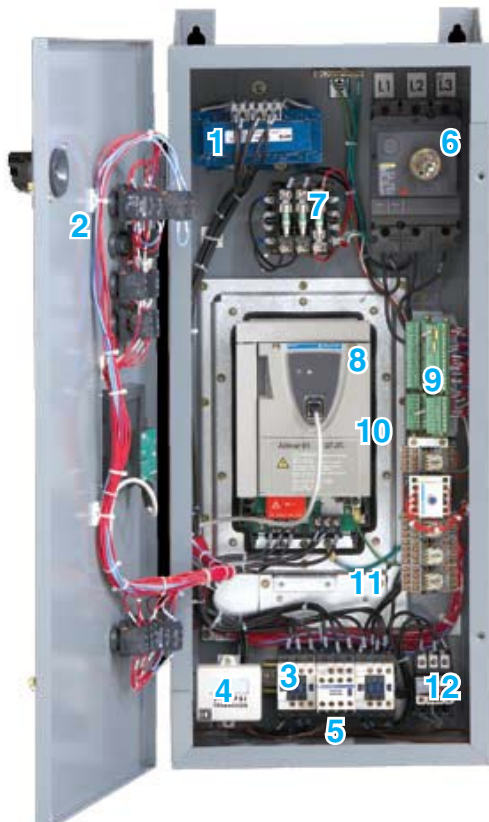
- Type 1 enclosures are designed specifically for indoor, non-dusty environments
- Type 12/12K enclosures are designed for protection from dust and dripping liquid
- Type 3R enclosures permit installation on rooftops or other outdoor locations to free up space in mechanical equipment rooms, and allow operations in temperature ranges from +14 to +122 degrees F (-10 to +50 degrees C).

Altivar 61 variable speed drives

E-Flex Introduction



- [1](#) Red power light
- [2](#) Yellow AFC detected fault light
- [3](#) Green AFC run light
- [4](#) Yellow bypass light
- [5](#) Graphic screen with customizable display in plain text
- [6](#) Navigation wheel for easy surfing through the menus
- [7](#) Test normal selector switch allows drive testing
- [8](#) Pre-punched top and bottom conduit entry knock-outs simplify electrical installation and prevent metal filings from getting inside the enclosure (Type 3R enclosures have bottom conduit entry only)
- [9](#) Disconnect means with lock out/tag out provisions
- [10](#) Hand off auto selector switch
- [11](#) Start push button
- [12](#) Stop push button
- [13](#) AFC off bypass switch
- [14](#) Side air vents (Type 1 only)



- [1](#) A 3% equivalent DC choke is included as standard minimizes line harmonic currents 5% line reactor (shown) is optional
- [2](#) Type 2B wiring simplifies wiring identification and termination to industrial-rated terminals
- [3](#) Drive output and bypass contactors for emergency full-speed operation
- [4](#) 3-15PSI pressure transducer input for pneumatic applications (optional)
- [5](#) UL 508C listed and coordinated with NEMA ICS 7.1 standards 100ka symmetrical exceeds UL short-circuit requirements
- [6](#) Circuit breaker disconnect (L1, L2, L3) provides short circuit protection without current limiting fuses
- [7](#) Control transformer
- [8](#) Altivar 61 drive power converter with 6-pulse bridge rectifier input and IGBT inverter with pulse width modulated output
- [9](#) Customer interface terminal blocks
- [10](#) Integrated Modbus and CANopen port; Serial communication card options include LonWorks, BACnet, Ethernet, Profibus, Modbus Unitelway, Apogee P1 and Metasys N2 protocols
- [11](#) Front removable heat sink fan assembly eliminates rear access requirements, improving maintenance and minimizing downtime
- [12](#) Motor terminal connection (T1, T2, T3)

Electrical Specifications

Input Voltage	208V \pm 10%, 230V \pm 10%, 460V \pm 10%
Short Circuit Current Rating	100,000A symmetrical
Displacement Power Factor	98% through speed range
Input Frequency	60Hz \pm 5%
Output Voltage	Three-phase output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency Range of Power Converter	0.1 to 500Hz (factory setting of 60Hz)
Torque/Overtorque	VT: 110% of nominal motor torque for 60s
Current (Transient)	VT: 110% of controller rated current for 60s
Switching Frequency	Selectable from 0.5 to 16 kHz. ^[1] Factory setting: VT: 8 kHz for 208 V, 230 V, and 1–100 hp @460 V 2 kHz for 125–500 hp @ 460 V The drive reduces the switching frequency automatically in the event of excessive heatsink temperature.
Speed Reference	AI1: 0 to +10V, Impedance = 30k Ω Can be used for speed potentiometer, 1–10k Ω AI2: Factory setting: 4 to 20mA, Impedance = 242 Ω (reassignable, X–Y range with graphic display terminal). Factory modification J10 allows 0–10 Vdc reference signal to AI2, Z= 30 k Ω .
Factory Resolution in Analog Reference	0.1 for 100 Hz (11 bits)
Speed Regulation	V/f control: equal to the motor's rated slip SLFV (sensorless flux vector): 10% of motor's rated slip from 20% to 100% of nominal motor torque
Efficiency	Varies from 93% to 97% full load typical
Reference Sample Time	2ms \pm 0.5ms
Acceleration and Deceleration Ramps	0.1 to 999.9s (definition in 0.1s increments)
Drive Controller Protection	Thermal protection of power converter Phase loss of AC mains' enclosure short circuit protection rated at 100kAIC
Motor Protection	Class 10 electronic overload protection Class 20 electromechanical overload protection with bypass ^[2]
Graphic Display Terminal	Self diagnostics with status messages in three languages. Plain user language with ability to customize the display
Codes and Standards	UL Listed per UL 508C under category NMMS Conforms to applicable NEMA ICS, NFPA and IEC standards Manufactured under ISO 9001 standards

Environmental Specifications

Temperature	Storage for all enclosures: -13 to +149 °F (-25 to +65 °C). Operation: NEMA Type 1, 12, 12K: +14 to +104 °F (-10 to 40 °C); NEMA Type 3R: +14 to +122 °F (-10 to 50 °C). For 1–100 hp drives (208, 230 & 460 V) operating between 40 and 50 °C, derate the current 2% per °C above 40°C.
Humidity	95% with no condensation or dripping water, conforming to IEC 60068-2-3.
Altitude	3,300 ft. (1,000m) maximum without derating; derating of current by 1% for each additional 330ft. (100m) up to 3000m
Enclosure	Type 1, Type 12/12K, and Type 3R Plenum rated: suitable for placement in a compartment handling conditioned air
Polution Degree	Type 1: Pollution degree 2 per NEMA ICS-1 Annex A and IEC 60664-1 Type 12/12K: Pollution degree 3 per NEMA ICS-1 and IEC17.560664-1
Operational Test Vibration	Conforming to IEC 60721-3-3-3M3 amplitude 1.5 peak to peak from 3Hz to 13Hz 1g from 13Hz to 200Hz
Transit Test to Shock	Conforming to National Safe Transit Association and International Safe Transit Association test for packages
Operational Shock	15g, 11ms conforming to IEC/EN 60068-2-27
Seismic Qualification	2003 IBC, NFPA 5000, and ASCE 7 ICC ES AC156 acceptance criteria test protocol with importance factor of 1.5
Certifications	American Bureau of Ship Building (ABS) Type Approval in compliance with marine specifications

1. On 1–100 hp VT controllers, above 8 kHz, select the next largest size drive. If the duty cycle does not exceed 60% (36 s maximum for a 60 s cycle), this is not necessary.

2. Class 10 electromechanical for 1 hp at 460 V.

8839 EFD N G 4 V W A07 A08 A09
 1 2 3 4 5 6 7 8 9 10

Class
1 Combination device
8839 = Circuit breaker disconnect

Type
2 Design
EFD = E-Flex™ controller

3 Horsepower rating
C = 1 **L** = 25
D = 2 **M** = 30
E = 3 **N** = 40
F = 5 **P** = 50
G = 7.5 **Q** = 60 (460 V only)
H = 10 **R** = 75 (460 V only)
J = 15 **S** = 100 (460 V only)
K = 20

4 Enclosure environmental rating
A = Type 12K
G = Type 1
H = 3R
Replace ● with desired enclosure rating

5 Voltage code
2 = 208 V, 60 Hz
3 = 230 V, 60 Hz
4 = 460 V, 60 Hz

6 Application type
V = Variable torque

7 Power circuit type
W = Without bypass
Y = Bypass

8 **Mods**
Control Option
A07 = Hand-Off-Auto, Speed Potentiometer
B07 = Hand-Off-Auto, Start-Stop, Speed Potentiometer
C07 = Start-Stop, Speed Potentiometer
D07 = Hand-Off-Comm, Speed Potentiometer
E07 = Hand-Off-Comm, Start-Stop, Speed Potentiometer
N07 = None

9 **Light Option**
A08 = Red Power On, Green AFC Run, Yellow AFC Detected Fault, Yellow Bypass
B08 = Red Power On, Green AFC Run, Yellow AFC Detected Fault, Yellow Bypass
C08 = Red Power On, Green AFC Run, Yellow AFC Detected fault
N08 = No lights

10 **Miscellaneous Option**
A09 = Line Reactor, 5%
B09 = Line Contactor
C09 = 3-15PSI Transducer
D09 = Omit Keyboard
E09 = Smoke Purge (Fireman's override)
F09 = Profibus
H09 = I/O Extension Card, 0-20mA
J09 = 0-10Vdc Differential input
K09 = cUL Listing certification
L09 = LonWorks
M09 = Modbus Unitelway
O09 = Apogee P1
P09 = Metasys N2
Q09 = Ethernet TCP/IP
R09 = BACnet
S09 = End Damper Control
T09 = Service entrance
U09 = Seismic qualification
V09 = Ethernet IP
X09 = Line Reactor, 3%

E-Flex *Replace ● with desired enclosure rating*

HP Reference Code	HP Ratings	Controller Output Current	Enclosure Frame Size	Power Circuits	
				Variable Torque - Duty Rating (110% current Limit)	
				Power Circuit W	Power Circuit Y

208V, 60 Hz					
C	1	4.6 A	C	C●2VW	C●2VY
D	2	7.5 A		D●2VW	D●2VY
E	3	10.6 A		E●2VW	E●2VY
F	5	16.7 A		F●2VW	F●2VY
G	7.5	24.2 A	D	G●2VW	G●2VY
H	10	30.8 A		H●2VW	H●2VY
J	15	46.2 A	E	J●2VW	J●2VY
K	20	59.4 A		K●2VW	K●2VY
L	25	74.8 A		L●2VW	L●2VY
M	30	88 A	F	M●2VW	M●2VY
N	40	114 A		N●2VW	N●2VY
P	50	143 A		P●2VW	P●2VY

230 V, 60 Hz					
C	1	4.2 A	C	C●3VW	C●3VY
D	2	6.8 A		D●3VW	D●3VY
E	3	9.6 A		E●3VW	E●3VY
F	5	15.2 A		F●3VW	F●3VY
G	7.5	22 A	D	G●3VW	G●3VY
H	10	28 A		H●3VW	H●3VY
J	15	42 A	E	J●3VW	J●3VY
K	20	54 A		K●3VW	K●3VY
L	25	68 A		L●3VW	L●3VY
M	30	80 A	F	M●3VW	M●3VY
N	40	104 A		N●3VW	N●3VY
P	50	130 A		P●3VW	P●3VY

460 V, 60 Hz					
C	1	2.1 A	C	C●4VW	C●4VY
D	2	3.4 A		D●4VW	D●4VY
E	3	4.8 A		E●4VW	E●4VY
F	5	7.6 A		F●4VW	F●4VY
G	7.5	11 A		G●4VW	G●4VY
H	10	14 A		H●4VW	H●4VY
J	15	21 A		J●4VW	J●4VY
K	20	27 A		K●4VW	K●4VY
L	25	34 A		L●4VW	L●4VY
M	30	40 A	E	M●4VW	M●4VY
N	40	52 A		N●4VW	N●4VY
P	50	65 A		P●4VW	P●4VY
Q	60	77 A	F	Q●4VW	Q●4VY
R	75	96 A		R●4VW	R●4VY
S	100	124 A		S●4VW	S●4VY

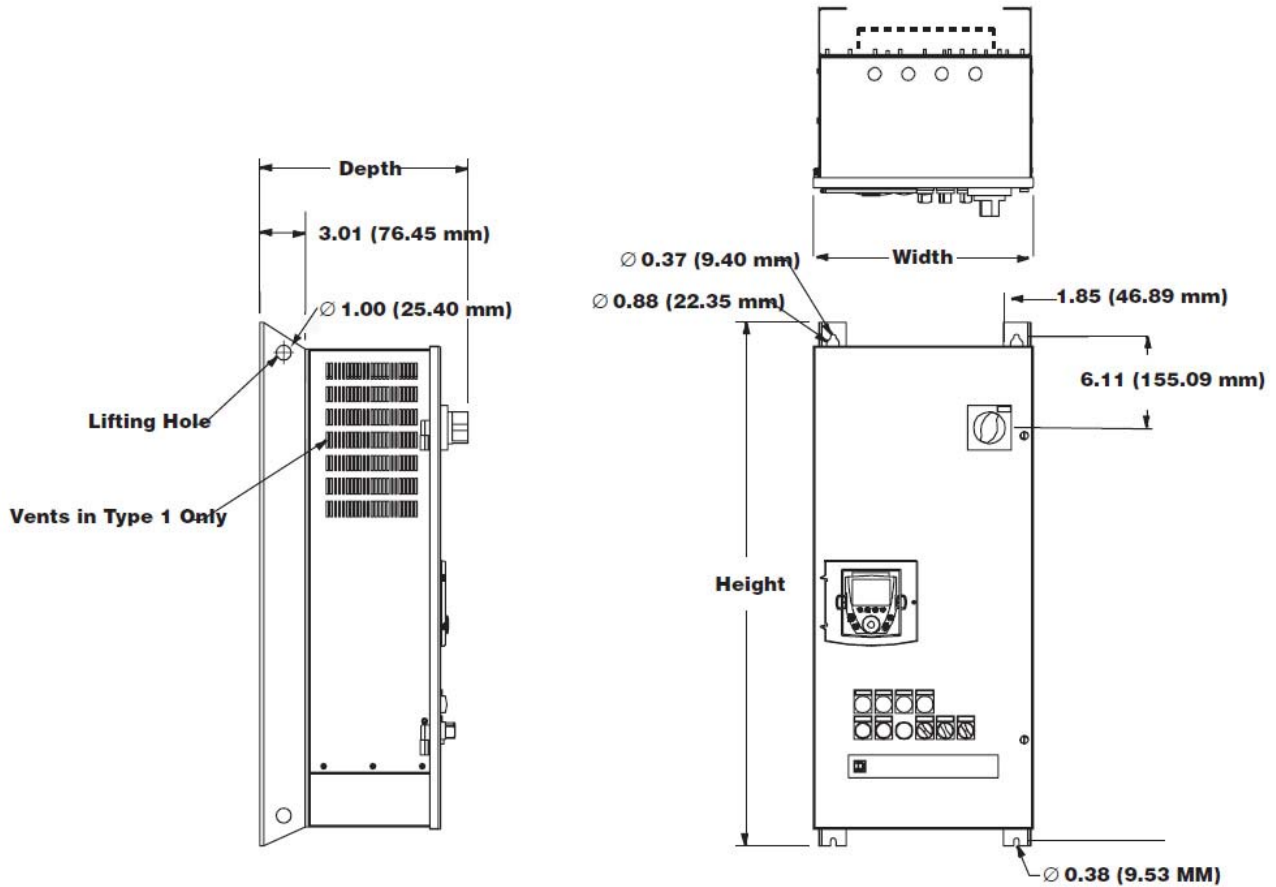
Modifications

Control Options		
A07	Hand-Off-Auto Selector Switch	ZB5AD3 Three-position selector switch ZB5AZ009 mounting collar ZBE205 Additional contact block (1 N.O., 1 N.C.) (2) ZBE102 Additional contact block (1 N.C.) ZBE203 Additional contact block (2 N.O.) ZBZ32 Legend plate holder
	Speed Potentiometer	ATVPOT25K Speed potentiometer assembly
B07	Hand-Off-Auto Selector Switch	ZB5AD3 Three-position selector switch ZB5AZ009 mounting collar ZBE205 Additional contact block (1 N.O., 1 N.C.) (2) ZBE102 Additional contact block (1 N.C.) ZBE203 Additional contact block (2 N.O.) ZBZ32 Legend plate holder
	Stop/Start Push Buttons	ZB5AA2 Black push button w/ mounting base ZB5AA4 Red push button w/ mounting base ZB5AZ101 Mounting collar w/ additional contact block (1 N.O.) ZB5AZ102 Mounting collar w/ additional contact block (1 N.C.) (2) ZBZ32 Legend plate holder
C07	Speed Potentiometer	ATVPOT25K Speed potentiometer assembly
	Stop/Start Push Buttons	ZB5AA2 Black push button w/ mounting base ZB5AA4 Red push button w/ mounting base ZB5AZ101 Mounting collar w/ additional contact block (1 N.O.) ZB5AZ102 Mounting collar w/ additional contact block (1 N.C.) (2) ZBZ32 Legend plate holder
D07	Speed Potentiometer	ATVPOT25K Speed potentiometer assembly
	Hand-Off-Comm Selector Switch	ZB5AD3 Three-position selector switch ZB5AZ009 mounting collar ZBE205 Additional contact block (1 N.O., 1 N.C.) (2) ZBE102 Additional contact block (1 N.C.) ZBE203 Additional contact block (2 N.O.) ZBZ32 Legend plate holder
E07	Speed Potentiometer	ATVPOT25K Speed potentiometer assembly
	Hand-Off-Comm Selector Switch	ZB5AD3 Three-position selector switch ZB5AZ009 Mounting collar ZBE205 Additional contact block (1 N.O., 1 N.C.) (2) ZBE102 Additional contact block (1 N.C.) ZBE203 Additional contact block (2 N.O.) ZBZ32 Legend plate holder
N07	Stop/Start Push Buttons	ZB5AA2 Black push button w/ mounting base ZB5AA4 Red push button w/ mounting base ZB5AZ101 Mounting collar w/ additional contact block (1 N.O.) ZB5AZ102 Mounting collar w/ additional contact block (1 N.C.) (2) ZBZ32 Legend plate holder
	Speed Potentiometer	ATVPOT25K Speed potentiometer assembly
N07	No operators; wired for remote operation	No drive control options are supplied on the front door of the drive. For use in remote-mounted operator applications. Refer to Section 3, Power Circuit Descriptions, for remote mounting information.

Light Options		
A08 Pilot Light Option #1 Cluster	Red Power On	ZB5AV04 Red pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
	Green AFC Run	ZB5AV03 Green pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
	Yellow Detected Fault	ZB5AV05 Amber pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
	Yellow Auto	ZB5AV05 Amber pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
B08 Pilot Light Option #2 Cluster	Red Power On	ZB5AV04 Red pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
	Green AFC Run	ZB5AV03 Green pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
	Yellow Detected Fault	ZB5AV05 Amber pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
	Yellow Bypass	ZB5AV05 Amber pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
C08 Pilot Light Option # 3 Cluster	Red Power On	ZB5AV04 Red pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
	Green AFC Run	ZB5AV03 Green pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder
	Yellow Detected Fault	ZB5AV05 Amber pilot light head ZB5AV6 Mounting collar with light module ZBZ32 Legend plate holder

Miscellaneous Options		
A09	Line Reactor	Factory-mounted line reactor within enclosure. Standard = 3% DC Choke Mod A09 = 5% Line Reactor
B09	Line Contactor	A line contactor can be added between the circuit breaker and the drive (Type 1 and 12K only).
C09	3–15 PSI Transducer	Allows the controller to follow a user-supplied 3–15 PSI input.
D09	Omit Door-Mounted Graphic Display Terminal	The graphic display terminal is not supplied. The user must buy the terminal as a separate device to program the drive.
E09	Smoke Purge	Provides a smoke purge operating mode controlled by a user-supplied 120 Vac signal wired to customer's terminal block.
F09	Profibus Serial Communication	Provides a factory-installed plug-in Profibus card, VW3A3307.
H09	I/O Extension	0–20 mA analog output for customer use. Factory programmed for motor frequency. Includes I/O extension card VW3A3202. Reassignable x–y range with keypad display. Also includes logic inputs, logic outputs, analog inputs, analog outputs, configurable relay outputs, PTC probe input, and frequency control input.
J09	0–10 Vdc Auto Speed Reference	Provides for a 0–10 Vdc user-supplied auto speed reference signal to the AI2 input.
K09	cUL Listing	Provides Canadian cUL certification when required by local code requirements.
L09	LonWorks® Serial Communication	Provides a factory installed LonWorks card, VW3A3312.
M09	Modbus® Serial Communication	Provides a factory installed plug-in Modbus card VW3A3303.
P09	Metasys® N2 Serial Communication	Provides a factory installed plug-in Metasys N2 card VW3A3313.
O09	P1 Serial Communication	Provides a factory installed plug-in Apogee™ P1 card VW3A3314.
Q09	Ethernet Serial Communication	Provides a factory installed plug-in Ethernet card VW3A3310D.
R09	BACnet Serial Communication	Provides a factory installed plug-in BACnet card VW3A3315.
S09	End Damper Control	Provides a circuit to delay drive operation until the damper is fully open.
T09	Service Entrance Rating	Provides a factory-installed insulated ground neutral assembly with ground wire and label for use as service entrance rated equipment.
U09	Seismic Qualified	Provides a certification label and hardware qualified to seismic rating ICC ES AC156 acceptance criteria test protocol with an importance factor of 1.5.
V09	Ethernet IP	Provides a factory installed plug-in Ethernet IP card VW3A3316.
X09	Line Reactor	Factory-mounted line reactor within enclosure Standard = 3% DC Choke Mod X09 = 3% Line Reactor

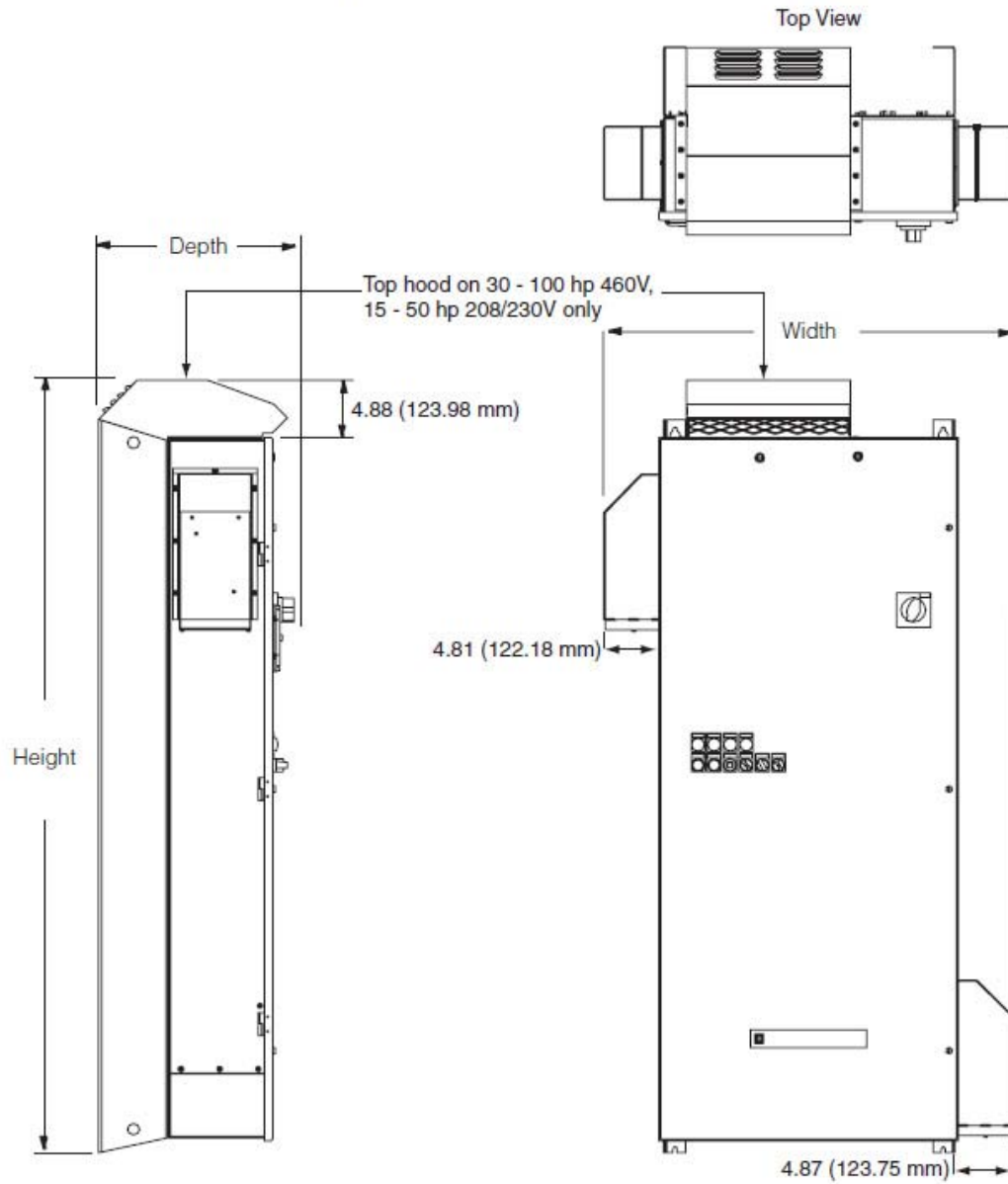
**Figure 1: Type 1 or Type 12/12K Enclosure
Dimensions (mm and inches) and Weights (kg and lbs)**



Note: Provide at least 3 inches (76.2 mm) of mounting clearance on each side of the drive controller and at least 6 inches (152.4 mm) of mounting clearance at the top and bottom of the drive controller.

hp		Height		Width		Depth		Weight	
		in	mm	in	mm	in	mm	lbs	kg
208/230 Vac	460 Vac								
1-5	1-7.5	35	889	14.8	374.9	13.9	353.9	83	37.7
7.5-10	1-25	41	1041.4	20.5	521.2	13.9	353.9	126	57.2
15-25	30-50	49	1244.6	20.7	524.5	16.8	427.5	177	80.5
30-50	60-100	63	1600.2	25.7	651.5	16.8	427.5	211	95.9

Figure 2: Type 3R Enclosure
Dimensions (mm and inches) and Weights (kg and lbs)



Note: Provide at least 2 inches (50.8 mm) of mounting clearance from each side hood, at least 6 inches (152.4 mm) of mounting clearance at the top and at least 12 inches (304.8mm) of mounting clearance at the bottom of the drive controller.

hp		Height		Width		Depth		Weight	
208/230 Vac	460 Vac	in	mm	in	mm	in	mm	lbs	kg
1-5	1-7.5	35	889	24.4	620.5	13.7	347.7	115	52.3
7.5-10	1-25	41	1041.4	30.2	766.8	13.7	347.7	163	74.1
15-25	30-50	52.2	1326.4	30.3	770.1	16.3	415	213	96.8
30-50	60-100	66.2	1682	35.3	897.1	16.3	415	247	112.3



Integrated construction

Barriered construction

Introduction

Schneider Electric has offered packaged drive solutions for industry for over 30 years. The M-Flex™ enclosed drive features the Altivar 61 adjustable frequency power converters to provide a robust, packaged adjustable-speed solution for industrial and municipal process applications where high functionality of features are required. M-Flex enclosed drive controllers offer a platform of standard, engineered and special features to meet the most demanding application and specification requirements. M-Flex enclosed drive controllers are low-voltage products available in the following ratings:

Variable torque (Normal-duty ratings - 110% current limit):

- Altivar 61 power converter
- 1 hp to 500 hp, 460 V
- 1 hp to 50 hp, 208 V/230 V

M-Flex enclosed drive controllers are available in Type 1 general purpose or Type 12/12K drip-/dust-proof enclosures in integrated or barriered designs. Integrated enclosures can be wall or floor mounted, depending on size. They provide a circuit breaker disconnect and enough room for power peripherals, including isolation and bypass contactors, all within the same enclosure. Barriered enclosures separate power and control circuits, such as bypass, from drive control. The separate compartments allow for maximum flexibility if servicing a drive in bypass operation.

Applications

The M-Flex enclosed offer is well suited to applications requiring a heavy duty enclosed drive in the following market segments:

MMM

- Slurry pumps
- Shaft ventilation
- Oil and Gas
- Pumping
- Compressors
- Booster stations

WWW

- Pumps for lift stations, influent, effluent, sludge and de-watering
- Blowers
- Centrifuges

OTHER

- Irrigation
- Cooler tower
- Normal duty applications requiring 110% overload and not running continuously below 5 Hz

The Altivar 61 drive's advanced functions boost performance levels and make machines more versatile so they can be used for a large number of applications.



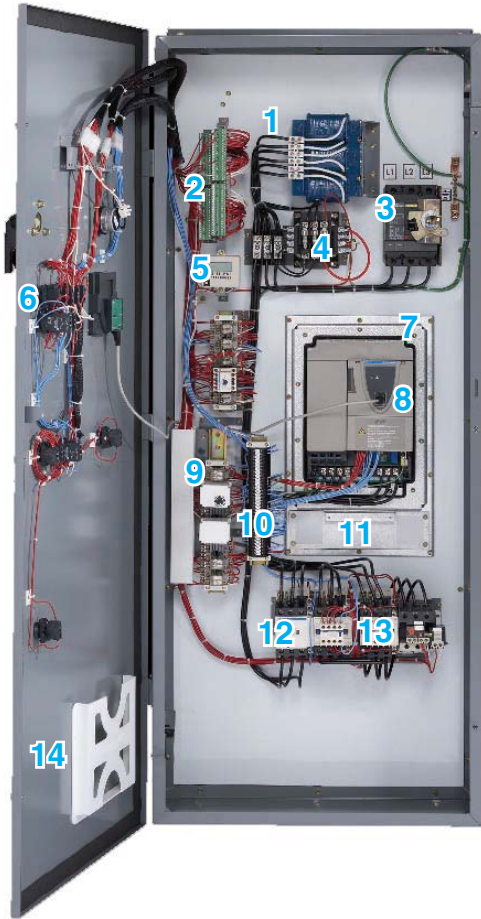
MMM



WWW



Oil and Gas



- 1** 3% AC line reactor
- 2** Customer interface terminal blocks (TB1)
- 3** Circuit breaker disconnect
- 4** 120 VAC control transformer
- 5** 3-15 PSI input (if used)
- 6** 22 mm dedicated door mounted operators
- 7** Heatsink/flange assembly
- 8** Altivar 61 or 71 power converter
- 9** Control relay/logic rail
- 10** Customer interface terminal blocks (TB2)
- 11** Fan assembly with front access (for maintenance and replacement)
- 12** Line contactor (if used)
- 13** Isolation and bypass contactors (if used)
- 14** Document pocket

Product

Key benefits

- Custom performance – customized to provide optimal performance to meet specific industrial, municipal and high-end commercial application requirements.
- Ease of use – features easy-to-use graphic terminal display and operators mounted on enclosure doors, which are pre-programmed by the factory to save set-up time and money when commissioning.
- Simple installation – available with either pre-punched conduit knockouts or top and bottom removable conduit plates to save time and prevent metal filings inside enclosure during installation.
- Structural integrity – UL 508C listed to exceed minimum UL short circuit requirements and enhance personnel safety under short circuit conditions for both drive and bypass mode.
- Increased functionality – offered with both integral and barriered enclosures for flexibility in meeting specific application needs. A circuit breaker disconnect provides coordinated short circuit rating at 100,000 A.
- Reliable operation – fully-rated (AC3 duty) motor isolation and bypass contactors with electrical and mechanical and electrical interlocks prevent accidental voltage feedback. An integrated AC line reactor provides transient protection from surge and over voltage conditions while minimizing line harmonics.

Seismic qualification for new generation of building codes

All M-Flex enclosed drive controllers meet IBC and ASCE 7 seismic qualification requirements in accordance with the ICC ES AC156 shaker table testing protocol. Many states and jurisdictions are beginning enforcement of the seismic guidelines for installed equipment contained in the IBC. The M-Flex enclosed drive controllers were subjected to actual shaker table tests, not just theoretical calculations for seismic ratings or obsolete requirements of the UBC. The M-Flex enclosed drive controller meets the structural integrity when installed to our published guidelines, and can be specified for use in applications that require an $I_p = 1.5$, which means operational status can be restored subsequent to a seismic event.

Construction methodology

- Assembled in the U.S.
- 100,000 A symmetrical SCCR
- ANSI #49 powder-coat steel enclosures
- Dedicated plenum for air flow
- White back panels for improved visibility
- Seismic qualification

Components used

- Altivar 61
- Powerpact™ H and J-Frame circuit breakers
- AC line reactor – 3% standard (5% optional)
- XB5 22 mm push buttons and operators
- TeSys™ D-Line contactors
- Type R industrial control relays
- PowerLogic™ power circuit monitors

Altivar 61

variable speed drives

M-Flex

Specifications

Input voltage	460 V \pm 10%, 230 V \pm 10%, 208 V \pm 10%
Displacement power factor	98% through speed range
Input frequency	60 Hz \pm 5%
Output voltage	Three-phase output Maximum voltage equal to input voltage
Galvanic isolation	Galvanic isolation between power and control (input, output, and power supplies)
Frequency range of power converter	0.1 Hz to 500 Hz (factory setting of 60 Hz)
Torque/overtorque	VT: 110% of nominal motor torque for 60 s
Current (transient)	VT: 110% of controller rated current for 60 s
Switching frequency	Selectable from 0.5 kHz to 16 kHz ⁽¹⁾ Factory setting: VT: 8 kHz for 208 V, 203 V, and 1 hp to 100 hp @ 460 V 2 kHz for 125 hp to 500 hp @ 460 V CT: 4 kHz (2 kHz for 100 hp to 450 hp @ 460 V) The drive reduces the switching frequency automatically in the event of excessive heatsink temperature
Speed reference	AI1: 0 V to +10 V, Impedance = 30 k Ω . Can be used for speed potentiometer, 1k Ω to 10 k Ω AI2: Factory setting: 4 mA to 20 mA. Impedance = 242 Ω (reassignable, x-y range with graphic display keypad). Factory modification J10 allows 0 Vdc to 10 Vdc reference signal to AI2, Z = 30 k Ω
Frequency resolution in analog reference	0.1 for 100 Hz (11 bits)
Speed regulation	V/f control: equal to the motor's rated slip SFVC: 10% of the motor's rate slip from 20% to 100% of nominal motor torque
Efficiency	97% at full load typical
Reference sample time	2 ms \pm 0.5 ms
Acceleration and deceleration ramps	0.1 s to 999.9 s (definition in 0.1 s increments)
Drive controller protection	<ul style="list-style-type: none"> ■ Thermal protection of power converter ■ Phase loss of AC mains ■ Circuit breaker rated at 100 kAIC ■ Conforming to ANSI/IEEE C62.41 Category A and B
Motor protection	Class 10 electronic overload protection Class 20 electromechanical overload protection with bypass ⁽²⁾
Graphic display keypad	8 lines, 240 pixels by 160 pixels. Supports display of bar charts. Save and download up to 4 configuration files. Display is rated up to 60° C (140° F) Maximum operating temperature with IP54 protection
Temperature	Storage for all enclosures: -13° F to +149° F (-25° C to +65° C). Operation: +14° F to +104° F (-10° C to 40° C). For 1 hp to 100 hp drives (208 V, 230 V & 460 V) operating between 40° C and 50° C, derate the current 2% per °C above 40° C. For 125 hp to 500 hp (460 V) operating between 40° C and 50° C, derate the current 3.3% per °C above 40° C
Humidity	95% with no condensation or dripping water, conforming to IEC60068-2-78
Altitude	3,300 ft (1000 m) maximum without derating Derating of the current by 1% for each additional 330 ft (100 m)
Enclosure	Type 1: all controllers Type 1G: 125 hp to 500 hp VT @ 460 V only Type 12/12K: all except 125 hp to 500 hp VT @ 460 V
Pollution degree	Type 1, 1G: Pollution degree 2 per NEMA ICS-1 Annex A and IEC 60664-1 Type 12/12K: Pollution degree 3 per NEMA ICS-1 and IEC 60664-1
Operational test vibration	Conforming to IEC 60721-3-3-3M3 amplitude 1.5 mm peak to peak from 3 Hz to 13 Hz 1 g from 13 Hz to 200 Hz
Transit test to shock	Conforming to National Safe Transit Association and International Safe Transit Association test for packages
Operational shock	15 g, 11 ms
Seismic qualification	IBC, ASCE 7 ICC ES AC 156 shaker table acceptance protocol, ground and roof top applications with an importance factor of 1.5
Codes and standards	UL listed per UL 508C under category NMMS (Power Conversion Equipment) Conforms to applicable NEMA ICS, NFPA, and IEC standards Manufactured under ISO 9001 standards Factory modification G10 provides Canadian cUL certification

(1) On 1 hp to 100 hp VT controllers, above 4 kHz CT/8 kHz VT, select the next largest size drive controller. If the duty cycle does not exceed 60% (36 s maximum for a 60 s cycle), this is not necessary.

(2) Class 10 electromechanical for 1 hp @ 460 V.

Altivar 61

variable speed drives

M-Flex

Selection table

8839 MFD N G 4 V W A07 A
 1 2 3 4 5 6 7 8 9

Class
 1 Combination device
 8839 = Circuit breaker disconnect

Type
 2 Design
 MFD = M-Flex™ controller

3 Horsepower rating
 C = 1 L = 25 U = 150
 D = 2 M = 30 W = 200
 E = 3 N = 40 X = 250
 F = 5 P = 50 Y = 300
 G = 7.5 Q = 60 Z = 350
 H = 10 R = 75 4 = 400
 J = 15 S = 100 5 = 450
 K = 20 T = 125 6 = 500

4 Enclosure environmental rating
 G = Type 1 general purpose
 A = Type 12/12K dust/drip proof
 B = Type 1 with gasket/fan filter
 Replace ● with desired enclosure rating

5 Voltage code
 2 = 208 V, 60 Hz
 3 = 230 V/240 V, 60 Hz
 4 = 460 V/480 V, 60 Hz

6 Application type
 V = Variable torque (110% current limit)

7 Power circuit type
 R = Barriered bypass – RVAT
 S = Barriered bypass – soft start
 T = Isolation & transfer
 W = Combination device (drive only)
 Y = Integrated bypass (IEC)
 Z = Barriered bypass – full voltage

Mods
 8 Modifications
 (120+ options are available)
 A07 = Hand-Off-Auto selector switch with manual speed potentiometer
 H10 = Seismic qualified
 E301 = ANSI #61 enclosure paint
 SPL = Special features (specified)

Series
 9 Series designation
 A = Altivar® 61 power converter platform

M-Flex

HP Reference Code	HP Ratings	Control-ler Output Current	Enclo-sure Frame Size	Power Circuits						
				Variable Torque - Normal Duty Rating (110% current Limit)						
				Power Circuit W	Power Circuit Y	Power Circuit S	Power Circuit Z	Power Circuit T	Power Circuit R	
208V, 60 Hz										
C	1	4.6 A	C	C●2VW	C●2VY	-	C●2VZ	C●2VT	-	
D	2	7.5 A		D●2VW	D●2VY	-	D●2VZ	D●2VT	-	
E	3	10.6 A		E●2VW	E●2VY	-	E●2VZ	E●2VT	-	
F	5	16.7 A	D	F●2VW	F●2VY	-	F●2VZ	F●2VT	-	
G	7.5	24.2 A		G●2VW	G●2VY	-	G●2VZ	G●2VT	-	
H	10	30.8 A		H●2VW	H●2VY	-	H●2VZ	H●2VT	-	
J	15	46.2 A	E	J●2VW	J●2VY	-	J●2VZ	J●2VT	-	
K	20	59.4 A		K●2VW	K●2VY	-	K●2VZ	K●2VT	-	
L	25	74.8 A		L●2VW	L●2VY	-	L●2VZ	L●2VT	-	
M	30	88 A	F	M●2VW	M●2VY	-	M●2VZ	M●2VT	-	
N	40	114 A		N●2VW	N●2VY	-	N●2VZ	N●2VT	-	
P	50	130 A		P●2VW	P●2VY	-	P●2VZ	P●2VT	-	
230V, 60 Hz										
C	1	4.2 A	C	C●3VW	C●3VY	-	C●3VZ	C●3VT	-	
D	2	6.8 A		D●3VW	D●3VY	-	D●3VZ	D●3VT	-	
E	3	9.6 A		E●3VW	E●3VY	-	E●3VZ	E●3VT	-	
F	5	15.2 A	D	F●3VW	F●3VY	-	F●3VZ	F●3VT	-	
G	7.5	22 A		G●3VW	G●3VY	-	G●3VZ	G●3VT	-	
H	10	28 A		H●3VW	H●3VY	-	H●3VZ	H●3VT	-	
J	15	42 A	E	J●3VW	J●3VY	-	J●3VZ	J●3VT	-	
K	20	54 A		K●3VW	K●3VY	-	K●3VZ	K●3VT	-	
L	25	68 A		L●3VW	L●3VY	-	L●3VZ	L●3VT	-	
M	30	80 A	F	M●3VW	M●3VY	-	M●3VZ	M●3VT	-	
N	40	104 A		N●3VW	N●3VY	-	N●3VZ	N●3VT	-	
P	50	130 A		P●3VW	P●3VY	-	P●3VZ	P●3VT	-	
460V, 60 Hz										
C	1	2.1 A	C	C●4VW	C●4VY	-	C●4VZ	C●4VT	-	
D	2	3.4 A		D●4VW	D●4VY	-	D●4VZ	D●4VT	-	
E	3	4.8 A		E●4VW	E●4VY	-	E●4VZ	E●4VT	-	
F	5	7.6 A	D	F●4VW	F●4VY	-	F●4VZ	F●4VT	-	
G	7.5	11 A		G●4VW	G●4VY	-	G●4VZ	G●4VT	-	
H	10	14 A		H●4VW	H●4VY	-	H●4VZ	H●4VT	-	
J	15	21 A	E	J●4VW	J●4VY	-	J●4VZ	J●4VT	-	
K	20	27 A		K●4VW	K●4VY	-	K●4VZ	K●4VT	-	
L	25	34 A		L●4VW	L●4VY	-	L●4VZ	L●4VT	-	
M	30	40 A	F	M●4VW	M●4VY	-	M●4VZ	M●4VT	-	
N	40	52 A		N●4VW	N●4VY	N●4VS	N●4VZ	N●4VT	N●4VR	
P	50	65 A		P●4VW	P●4VY	P●4VS	P●4VZ	P●4VT	P●4VR	
Q	60	77 A	F	Q●4VW	Q●4VY	Q●4VS	Q●4VZ	Q●4VT	Q●4VR	
R	75	96 A		R●4VW	R●4VY	R●4VS	R●4VZ	R●4VT	R●4VR	
S	100	124 A		S●4VW	S●4VY	S●4VS	S●4VZ	S●4VT	S●4VR	
T	125	156 A	H	T●4VW	T●4VY	T●4VS	T●4VZ	T●4VT	T●4VR	
U	150	180 A		I	U●4VW	U●4VY	U●4VS	U●4VZ	U●4VT	U●4VR
W	200	240 A			W●4VW	W●4VY	W●4VS	W●4VZ	W●4VT	W●4VR
X	250	302 A	X●4VW		-	X●4VS	X●4VZ	X●4VT	X●4VR	
Y	300	361 A	J	Y●4VW	-	Y●4VS	Y●4VZ	Y●4VT	Y●4VR	
Z	350	414 A		Z●4VW	-	Z●4VS	Z●4VZ	Z●4VT	Z●4VR	
4	400	477 A		4●4VW	-	4●4VS	4●4VZ	4●4VT	4●4VR	
5	450	515 A	5●4VW	-	5●4VS	5●4VZ	5●4VT	5●4VR		
6	500	590 A	6●4VW	-	6●4VS	6●4VZ	6●4VT	6●4VR		

Modifications

The M-Flex enclosed drive can be customized to meet your exact requirements. The options below are a portion of over 120 options available to integrate into your M-Flex. For a more detailed description of the options below and information on additional options, follow the link on the button to the M-Flex Instruction Bulletin.

Selecting some options excludes other options. For assistance in selecting and configuring your device, please contact your nearest Schneider Electric representative.

A07	Hand-Off-Auto selector switch with manual speed potentiometer	D10	Omit door mounted graphic display keypad
B07	Hand-Off-Auto selector switch, Start/Stop push-buttons with manual speed potentiometer	E10	Smoke purge relay
C07	Start/Stop push-buttons with manual speed potentiometer	F10	Additional control power VA
D07	Start/Stop push-buttons, Forward-Reverse selector switch with manual speed potentiometer	G10	CSA / cUL certification
E07	Hand-Off-Auto selector, Local-Remote selector switch with manual speed potentiometer	H10	Seismic qualified
F07	Communication-Hand-Off-Auto selector switch with manual speed potentiometer	I10	Permanent wire markers (sleeve type)
N07	No Door Mounted Operators (wired for remote operation)	J10	0–10 Vdc Auto speed reference (programming)
A08	Power On, Fault, AFC Run, Auto pilot lights	K10	1 Additional N.O. auxiliary drive run contact
B08	Power On, Fault, AFC Run, Bypass pilot lights	L10	1 Additional N.C. auxiliary drive fault contact
C08	Power On, Fault, AFC Run pilot lights	M10	1 N.O. Auxiliary bypass run contact
D08	Power On, Fault, AFC Forward, AFC Reverse pilot lights	N10	
E08	Power On, Fault, AFC Run, Hand, Auto pilot lights	O10	1 N.O. Auxiliary auto mode contact
F08	Power On, Fault, AFC Run, Communication pilot lights	P10	AFC Fault reset push-button
B09	Modbus/Uni-Telway™ communication card	Q10	Push-to-Test pilot lights
D09	Ethernet TCP/IP communication card	R10	Auto transfer to bypass
F09	DeviceNet™ communication card	S10	Motor elapsed time meter
G09	Profibus DP communication card	T10	Emergency stop mushroom head push-button
H09	I/O Extension card	U10	Motor space heater sequencing circuit (light duty)
A10	5% AC line reactor	V10	Seal water solenoid
B10	Line contactor	W10	Check valve sequencing circuit (gravity type)
C10	3–15 PSI transducer	X10	ID engraved nameplates
		Y10	Harmonic filter provisions
		Z10	24 Vdc power supply

Altivar 61

variable speed drives

M-Flex

Dimensions

M-Flex™ Enclosed AC Drives Class 8839 Type MFD with or without options			Dimensions			Weights	Construction Data		
HP/Voltage (VT)	Power Circuit Configuration	Enclosure Size	Height (in)	Width (in)	Depth (in)	lbs.	Wall or Floor Mount	Environment	Operating Handle
1 hp to 25 hp @ 460 V 1 hp to 5 hp @ 208 V/230 V	Power circuit W combination device or power circuit Y integrated bypass	C	49	20	14.81	175	Wall	Type 1 or Type 12/12K	3" metal rotary
7.5 hp to 10 hp @ 208 V/230 V		D	63	25	14.81	243	Wall		6" metal rotary
30 hp to 50 hp @ 460 V 15 hp to 25 hp @ 208 V/230 V		E	93.87	20	20.38	170.5	Floor		3" metal rotary
60 hp to 100 hp @ 460 V 30 hp to 50 hp @ 208 V/230 V		F	93.87	25	20.38	249.1	Floor		6" metal rotary
1 hp to 50 hp @ 460 V 1 hp to 10 hp @ 208 V/230 V	Power circuits Z, S, T or R barriered designs with 2 disconnects	Barriered C/D	93.87	20	20.38	379	Floor		3" metal rotary
30 hp to 50 hp @ 460 V 15 hp to 25 hp @ 208 V/230 V		Barriered E	93.87	25	20.38	512	Floor		6" metal rotary
60 hp to 100 hp @ 460 V 30 hp to 50 hp @ 208 V/230 V		Barriered F	93.87	30	20.38	684	Floor	Flange	
125 hp @ 460 V	Power circuit W ⁽¹⁾	H	94.58	25	20	489	Floor	Type 1 or Type 1A filtered	Flange
150 hp to 250 hp @ 460 V	Power circuit W ^(2,3)	I	94.58	30	20	657	Floor		
300 hp to 500 hp @ 460 V	Power circuit W ^(4,5)	J	94.58	35	20	969	Floor		

(1) Integrated bypass for 125 hp offered in 20 in. wide section adder (45 in. total width). Barriered bypass offered in 25 in. wide section adder (50 in. total width) – standard product configuration

(2) Integrated bypass for 150 hp to 200 hp offered in 20 in. wide section adder (50 in. total width). Barriered bypass offered in 25 in. wide section adder (55 in. total width) – standard configuration

(3) Integrated bypass for 250 hp offered in 20 in. wide section adder (50 in. total width). Barriered bypass offered in 30 in. wide section adder (60 in. total width) – factory engineered configuration

(4) Integrated bypass for 300 hp to 400 hp not available. Barriered bypass offered in 30 in. wide section adder (65 in. total width) – factory engineered configuration

(5) Integrated bypass for 450 hp to 500 hp not available. Barriered bypass offered in 35 in. wide section adder (70 in. total width) – factory engineered configuration

Power Circuit – Description

R – Barriered bypass with autotransformer reduced voltage starter

S – Barriered bypass with soft start

T – Isolation and transfer (separate starter)

W – Combination drive with disconnect means only

Y – Integrated-bypass drive with full-voltage starter in same enclosure compartment

Z – Barriered-bypass drive with full-voltage starter in separate enclosure compartment

Altivar 61 variable speed drives

Altivar Plus Introduction



Introduction

Schneider Electric Altivar Plus enclosed drives feature the Altivar 61 adjustable frequency drives providing a robust, packaged, adjustable speed solution for commercial, industrial, and municipal applications. These drives combine the reliability and ease of use of the Altivar drives family with proven, validated, and tested drive system designs.

Variable torque

- 125-900 hp, 460 Vac
- 125-800 hp, 600 Vac

Altivar Plus enclosed drives are:

- Pre-engineered, ready-to-use solutions in highly efficient designs
- Tested and validated before shipment to provide smooth installation
- Modular and compact to maximize space utilization
- Easy to set up and commission with intuitive operator interface
- UL Type 12 enclosures
- Reliable: proven Altivar drives technology maximized productivity and quality
- Flexible for programming and communication requirements: graphic display keypad with customizable display and many field-bus option for easy integration into existing automation systems
- Flexible for control systems: large swiveling control panel for customization of drive controls
- Easy to maintain: inverter mounted on rails
- Flexible for application requirements: incoming/outgoing section configurable to your needs
- Equipped with technical support: global expertise combined with a responsive local support and service for unsurpassed reliability

Applications

Altivar Plus enclosed drives are designed for a variety of applications including:

Mining, Minerals, & Metals

- Feeders/conveyors
- Crushers, slurry pumps
- Tunnel ventilation

Oil & Gas

- Drilling rigs
- Jack and slurry pumps
- Oil-line and submersible pumps

Water/Wastewater

- Distribution and chemical pumps
- Blowers
- Compressors

Other

- Marine
- Energy

Altivar 61 variable speed drives

Altivar Plus 125-900 hp



- 1** Schneider Electric enclosure
- 2** Swiveling control panel
- 3** Fused disconnect
- 4** Line contactor (optional)
- 5** Top mount ventilation
- 6** Control transformer
- 7** Altivar power converter
- 8** Power converter mounted on rail system
- 9** Motor connection
- 10** dV/dt motor filter (optional)
- 11** Bottom entry

Product

Standard features

Altivar Plus enclosed drives include:

- Pre-engineered, ready-to-use solutions in highly efficient designs
- UL Type 12 enclosures
- Large swiveling control panel for customization of drive controls
- Rail-mounted inverter for easy maintenance
- Altivar Plus enclosed drive with ATV61
 - 125–900 hp, 460 Vac
 - 125–800 hp, 575 Vac
- Fused disconnect with current limiting fuses
- Slide out inverters
- Bottom wire entry

List of standard features:

- UL/cUL Listed per UL508A
- 100 kA short circuit rating (460 V)
- Disconnect handle with lock/out tag-out provisions
- Non bypass
- 3% line reactor
- Hand-Off-Auto selector switch and manual speed potentiometer
- 0–10 Vdc or 4–20 mA speed reference input
- 0–10 Vdc or 4–20 mA programmable output
- Door mounted graphic display keypad
- Auto-Start relay (120 Vac control)
- One form “C” AFC RUN mode contact
- One form “C” AFC TRIP mode contact
- Permanent wire markers
- 4 in. Plinth

Additional options

- 5% Line Reactor
- Surge Suppressor
- dV/dt Filter
- Harmonic Filter
- Softstart Bypass
- Full Voltage Bypass
- Line Contactor
- Top Entry Cubicle
- 8 in. plinth

Altivar 61

variable speed drives

Altivar Plus

125-900 hp Specifications

Electrical Specifications

Input mains voltage	480 Vac \pm 10%, 600 Vac \pm 10% (other voltages on request)
Short circuit current rating (AC symmetrical)	100 kA (some selected power options may reduce the short circuit rating, consult Schneider Electric for details)
Control voltage	24 Vdc (regulated, supplied by drive); 115 Vac +10%/-15% (control power transformer included)
Displacement power factor	98% through speed range (in AFC operation mode)
Input frequency	50/60 Hz \pm 5%
Output voltage	Three-phase output; maximum voltage equal to input voltage
Galvanic isolation	Galvanic isolation between power and control (inputs, outputs, and power supplies)
Output frequency range of drive	0.1 to 500 Hz (factory setting of 60 Hz)
Torque/over-torque	VT: 110% of nominal motor torque for 60 s
Current (transient)	VT: 110% of drive rated current for 60 s
Switching frequency	Selectable from 0.5 to 8 kHz. Factory setting: 2.5 kHz The drive reduces the switching frequency automatically in the event of excessive heat sink temperature.

Environmental Specifications

Storage temperature	-13 to +149 °F (-25 to +70 °C).
Operating temperature	+14 to +104 °F (-10 to 40 °C). For 125 hp and higher (460 V) operating between 40 and 50 °C, derate the current 3.3% per °C above 40 °C.
Humidity	95% with no condensation or dripping water, conforming to IEC 60068-2-78.
Altitude	Class 10 electronic overload protection Class 20 electromechanical overload protection with bypass ⁽²⁾
Graphic display keypad	8 lines, 240 pixels by 160 pixels. Supports display of bar charts. Save and download up to 4 configuration files. Display is rated up to 60° C (140° F) Maximum operating temperature with IP54 protection
Temperature	Storage for all enclosures: -13° F to +149° F (-25° C to +65° C). Operation: +14° F to +104° F (-10° C to 40° C). For 1 hp to 100 hp drives (208 V, 230 V & 460 V) operating between 40° C and 50° C, derate the current 2% per °C above 40° C. For 125 hp to 500 hp (460 V) operating between 40° C and 50° C, derate the current 3.3% per °C above 40° C
Humidity	95% with no condensation or dripping water, conforming to IEC60068-2-78
Altitude	3,300 ft (1000 m), without derating and: <ul style="list-style-type: none"> ■ All 460 V equipment, derate the current by 1% for each additional 330 ft (100 m) up to 9,842 ft. (3000 m) maximum ■ All 575 V equipment, derate the current by 1% for each additional 330 ft (100 m) up to 6,560 ft. (2000 m) maximum ■ When an integral softstart bypass (D08) is selected, derate the current by 2.2% for each additional 330 ft (100 m) up to 6,560 ft. (2000 m) maximum
Enclosure	UL Type 12: Dust-tight (ventilated)
Pollution degree	Pollution degree 2 or 3 per NEMA ICS-1 Annex A and IEC 60664-1
Operational test vibration	Conforming to IEC 60721-3-3-3M3 amplitude; 1.5 mm peak to peak from 3 to 13 Hz; 1 g from 13 to 200 Hz
Transit test to shock	Conforming to National Safe Transit Association and International Safe Transit Association test for packages.
Operational shock	15 g, 11 ms
Codes and standards	UL/cUL Listed per UL 508A; IEEE519 Compliant (harmonic input filter required); Conforms to applicable NEMA ICS, NFPA, and IEC standards; Manufactured under ISO 9001 standards.

Operation and Control

Speed reference	A11: 0 to +10 V, Impedance = 30 k Ω . Can be used for speed potentiometer, 1–10 k Ω . A12: Factory setting: 4 to 20 mA. Impedance = 242 Ω (reassignable, X–Y range with graphic display keypad).
Frequency resolution in analog reference	0.1 for 100 Hz (11 bits)
Speed regulation	V/f control: equal to the motor's rated slip. SFVC: 10% of the motor's rate slip from 20% to 100% of nominal motor torque.
Efficiency	95% (or greater) at full load typical
Reference sample time	2 ms \pm 0.5 ms
Acceleration and deceleration ramps	Drive: 0.1 to 999.9 s (definition in 0.1 s increments); Softstarter: 1 to 60 s (definition in 1 s increments)
Graphic display keypad	Self diagnostics with trip indication messages in three languages; also refer to the Programming Manual(s) available online at www.schneider-electric.com .

Protection

System protection	<ul style="list-style-type: none"> ■ Thermal protection of drive, input passive filter, and starter ■ Phase loss of AC mains ■ Fuse protected
Motor protection	Class 10 electronic overload protection (drive) Class 20 bypass overload protection (with bypass)

Altivar 61

variable speed drives

Altivar Plus

125-900 hp Selection Table

ATV 61 EXC5 C16 N4 E7 U W A09 A10 B11

1 2 3 4 5 6 7 8 9 10 11

1 Drive Style
ATV = Altivar Plus

2 Product Line
61 = Altivar 61

3 Drive System
EXC5 = Compact drive system

4 Power Rating

Code	kW	HP at 460 V	HP at 575 V
D90	90	125	-
C11	110	150	125
C13	130	200	150
C16	160	250	175
C20	200	300	200
C22	220	350	-
C25	250	400	250
C28	280	450	-
C31	315	500	350
C40	400	600	450
C50	500	700	550
C63	630	900	700
C80	800	-	800

5 Voltage
N4 = 460 V
Y6 = 575 V

6 Cubicle
E7 = Type 12

7 Design
U = Design for UL/cUL

8 Power Circuit⁽¹⁾
W = Without bypass
Y = Integrated bypass
(1) Up to 250 HP

9 Control
A09 = Hand-Off-Auto selector switch; manual speed potentiometer.
B09 = Hand-Off-Auto selector switch; Start-Stop push buttons; manual speed potentiometer
F09 = Comm-Auto-Off-Hand switch; manual speed potentiometer

10 Lights

A10 = Power On (Red), AFC Run (Green), AFC Trip (Yellow)
B10 = Power On (Red), AFC Run (Green), AFC Trip (Yellow)
F10 = Power On (Red), AFC Run (Green), AFC Trip (Yellow), Comm (Yellow)

11 Option Card

B11 = Modbus/Uni-Telway communication card
D11 = Ethernet TCP/IP communication card
F11 = DeviceNet communication card
G11 = Profibus DP communication card
L11 = Interbus S communication card
R11 = Ethernet IP communication card

12 Miscellaneous Options

A12 = 5% line reactor
B12 = Surge arrestor
C12 = 8 in. (200 mm) plinth
D12 = I/O extension card
E12 = dV/dt motor filter
F12 = Passive filter
L12 = Lune contactor
M12 = Top entry cubicle

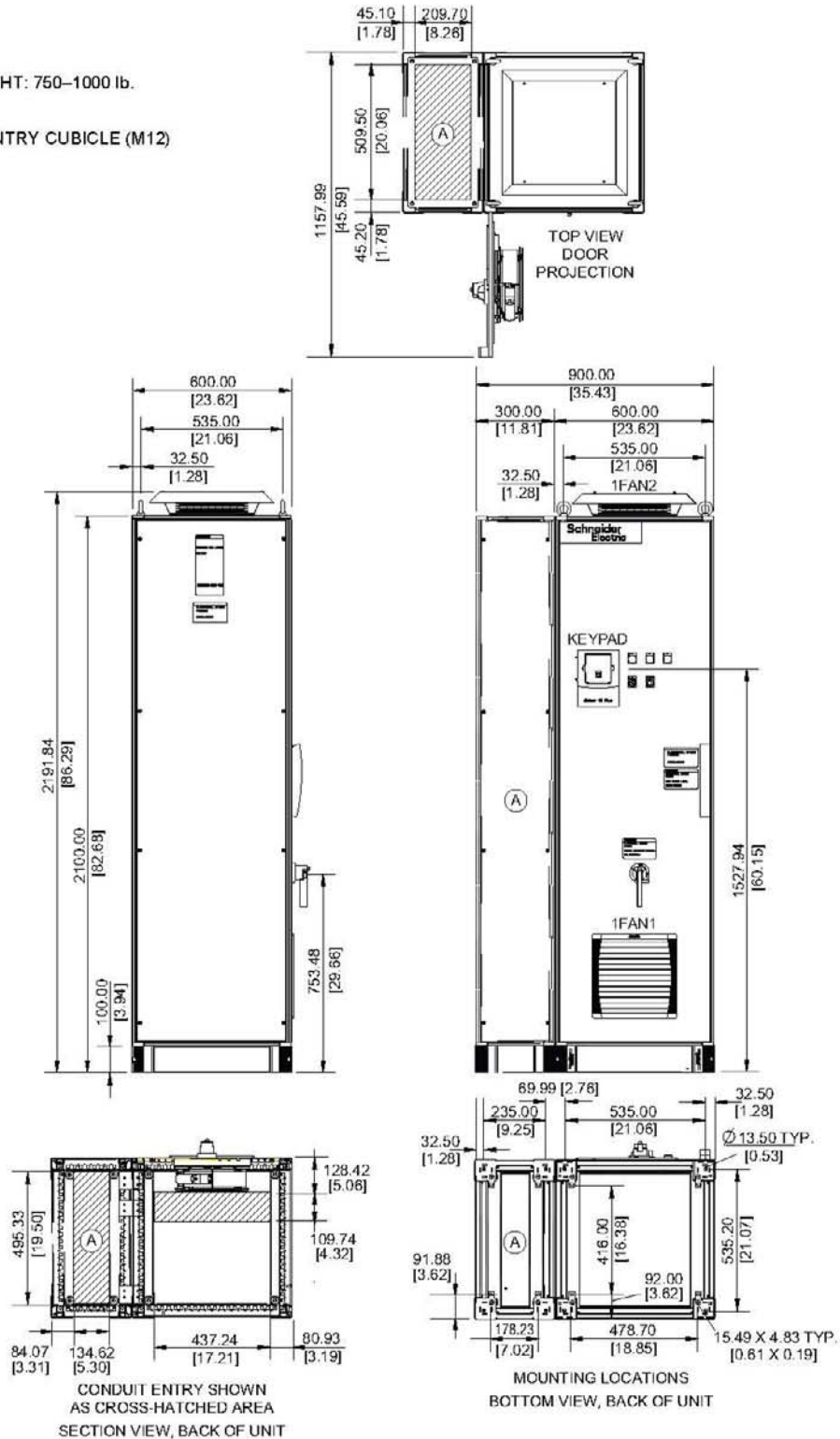
HP Reference Code	HP Ratings	Enclosure Frame Size	Power Circuits		
			Variable Torque - Normal Duty Rating (110% current limit)		
			Power Circuit W	Power Circuit Y	Power Circuit S
460 V, 60 Hz					
D90	125	A	D90N4E7UW	D90N4E7UY	D90N4E7US
C11	150	A	C11N4E7UW	C11N4E7UY	C11N4E7US
C13	200		C13N4E7UW	C13N4E7UY	C13N4E7US
C16	250		C16N4E7UW	C16N4E7UY	C16N4E7US
C22	350	B	C22N4E7UW	C22N4E7UY	C22N4E7US
C25	400		C25N4E7UW	C25N4E7UY	C25N4E7US
C31	500		C31N4E7UW	C31N4E7UY	C31N4E7US
C40	600	C	C40N4E7UW	C40N4E7UY	C40N4E7US
C50	700		C50N4E7UW	C50N4E7UY	C50N4E7US
C63	900		C63N4E7UW	C63N4E7UY	C63N4E7US
575 V, 60 Hz					
C11	125	A	C11Y6E7UW	C11Y6E7UY	C11Y6E7US
C13	150		C13Y6E7UW	C13Y6E7UY	C13Y6E7US
C16	175		C16Y6E7UW	C16Y6E7UY	C16Y6E7US
C20	200	B	C20Y6E7UW	C20Y6E7UY	C20Y6E7US
C25	250		C25Y6E7UW	C25Y6E7UY	C25Y6E7US
C31	350		C31Y6E7UW	C31Y6E7UY	C31Y6E7US
C40	450	C	C40Y6E7UW	C40Y6E7UY	C40Y6E7US
C50	550		C50Y6E7UW	C50Y6E7UY	C50Y6E7US
C63	700		C63Y6E7UW	C63Y6E7UY	C63Y6E7US
C80	800		C80Y6E7UW	C80Y6E7UY	C80Y6E7US

Figure 5: Frame Size A Enclosure:
125–250 HP VT and 125–200 HP CT @ 460 V, 125–200 HP VT and 125–175 HP CT @ 575 V
Circuit Breaker for 460 V, Fusible Disconnect for 575 V

DIMENSIONS: $\frac{\text{mm}}{[\text{in.}]}$

APPROXIMATE WEIGHT: 750–1000 lb.

Ⓐ OPTIONAL TOP ENTRY CUBICLE (M12)



Altivar 61 variable speed drives

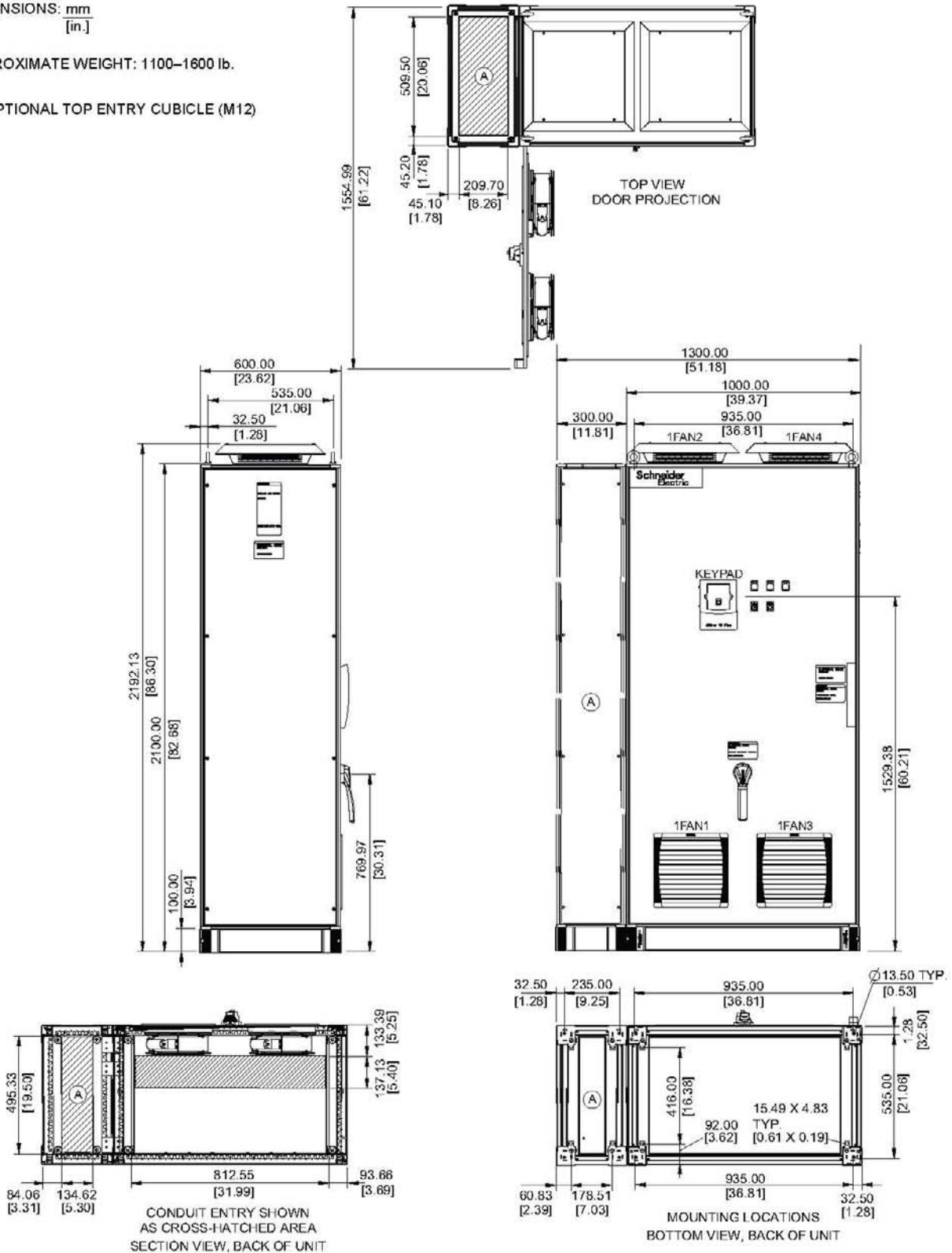
Altivar Plus 125-900 hp Dimensions

Figure 7: Frame Size B Enclosure:
 350–500 HP VT and 250–450 HP CT @ 460 V, 250–450 HP VT and 200–350 HP CT @ 575 V
 Fusible Disconnect for 460 V and 575 V

DIMENSIONS: mm
[in.]

APPROXIMATE WEIGHT: 1100–1600 lb.

Ⓐ OPTIONAL TOP ENTRY CUBICLE (M12)



Altivar 61 variable speed drives

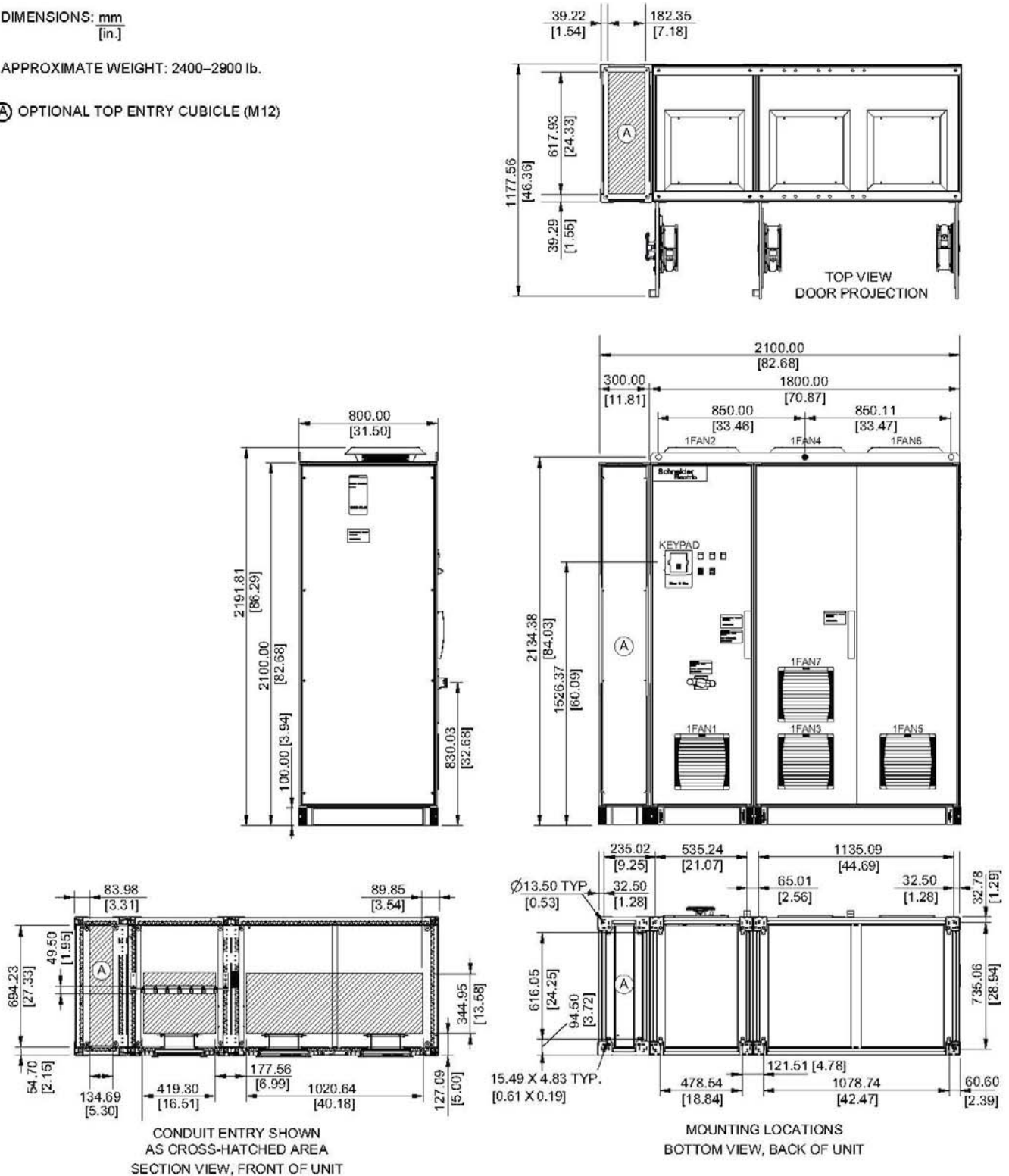
Altivar Plus 125-900 hp Dimensions

Figure 9: Frame Size C Enclosure:
600–900 HP VT and 500–700 HP CT @ 460 V, 550–800 HP VT and 450–700 HP CT @ 575 V
Circuit Breaker for 460 V and 575 V

DIMENSIONS: mm
[in.]

APPROXIMATE WEIGHT: 2400–2900 lb.

Ⓐ OPTIONAL TOP ENTRY CUBICLE (M12)



Altivar 61 variable speed drives

Altivar Plus 900-2500 hp



- 1** Line reactor
- 2** Operator interface
- 3** Swiveling control panel
- 4** Circuit breaker
- 5** Line connection
- 6** Plinth
- 7** Cubicle fans
- 8** Heat exchanger
- 9** Motor connection
- 10** Cooling

Product

Standard features

- 5 % line reactor
- 100,000 amps SCCR
- dV/dt motor filter
- Bottom wire entry
- Push button control options
- Pilot light combinations
- Communication cards
- I/O extension cards
- Encoder cards
- Controller inside card

Altivar 61

variable speed drives

Altivar Plus

900-2500 hp Specifications

Input

Voltage 400 V, 500 V, 690 V	380–480 V -15/+10% for TT, TN or IT mains 500 V -15%, 690 V +10% for TT, TN or IT mains (500–690 V not qualified for Corner Grounded Networks)
Frequency	50/60 Hz±5%
Overvoltage class	Class III according to EN 61800-5-1

Output

Control method	Sensorless vector control, V/f characteristic
Voltage	Three-phase AC 0–100% mains voltage, dynamic voltage stabilization
Overload	Power 1 (ATV61): 50% for 60 s per 10 minutes, 65% for 2 s
Pulse frequency	2.5 kHz, adjustable from 2–4.9 kHz
Frequency / base frequency	0–300 Hz / 25–300 Hz, adjustable (up to 500 Hz) ²
Short circuit protection	All poles protected against short circuit and ground fault by means of overcurrent switch-off
Design	Floor-standing cubicle
Frequency resolution, digital	0.01 Hz / 50 Hz, frequency stability: ±0.01% / 50 Hz
Speed accuracy	V/f mode: Slip frequency VC without feedback: 0.3 x slip frequency VC with feedback: 0.01% of maximum frequency

Cooling liquid

Coolant	Liquid mixture consisting of 99.75% deionized water and 0.25% Nalcotrac 100 with a freezing point of 0 °C (+32 °F).
Temperature of coolant	Maximum +70 °C (+158 °F)
Pressure of the cooling circuit	Operating pressure: 2.0 bar (29.4 psi) at a pressure drop of 1.2 bar (17.6 psi) Maximum pressure: 4.0 bar (58.8 psi) filling pressure

Cooling

Mechanical strength

Mechanical vibration	According to IEC/EN 60068-2-6 1.5 mm at 3–10 Hz, 0.6 g at 10–200 Hz (3M3 according to IEC/EN 60721-3-3)
Shock	According to IEC/EN 60068-2-27 4 g for 11 ms (3M2 according to IEC/EN 60721-3-3)

Ambient conditions

Operating temperature	> 0 to +40 °C (> +32 to +104 °F) 3K3 according to IEC/EN 60721-3-3 up to +50 °C (+122 °F) with derating
Storage / transport temperature	-25 to +70 °C (-13 to +158 °F) with cooling circuit evacuated.
Protection degree of the incoming and outgoing cubicles	IP23/IP54 with internal cooling circuit and air cooling IP55 with internal cooling circuit and water cooling IP23/IP54 with internal cooling circuit and air cooling IP55 with internal cooling circuit and water cooling
Environmental class / humidity	Class 3K3 in accordance with IEC/EN 60721-3-3 / no condensation Maximum 95% relative humidity
Altitude 400 V, 500 V, 690 V	Up to 1000 m (3,281 ft), no derating necessary 1% decrease per 100 m (328.1 ft) up to 3000 m (9,843 ft) 1% decrease per 100 m (328.1 ft) up to 2400 m (7,874 ft)
Allowed pollution	Pollution degree 3 according to EN 61800-5-1 3C2 and 3S2 according to EN 60721-3-3
Protection class	Class 1 according to EN 61800-5-1

Safety functions

Safety features	The function "Safe Torque Off STO" (Power Removal) allows a controlled shut-down and switch-off of the power supply when at standstill. It helps prevent any unintended start of the motor according to ISO 13849-1, category 3, and IEC/EN 61800-5-2.
Protection of the machine	The function "Safe Torque Off STO" (Power Removal) allows a controlled shut-down and switch-off of the power supply when at standstill. It helps prevent any unintended start of the motor according to IEC/EN 61508, SIL2 capability, and IEC/EN 61800-5-2.
Response time	≤ 100 ms in STO (Safe Torque Off)

Standards

Basic standard	The devices are constructed in accordance with the requirements of UL 508A and CSA C22 2 No. 14.
Insulation	Galvanic insulation from the control electronics in accordance with EN 61800-5-1 PELV (Protective Extra Low Voltage)
Standards	UL Listed under UL 508A; cUL Listed under CSA C22 2 No. 14

Altivar 61

variable speed drives

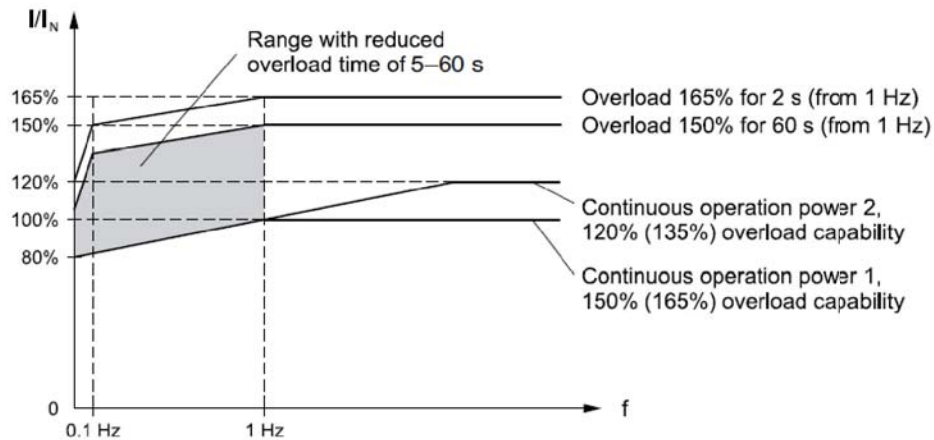
Altivar Plus

900-2500 hp Specifications

To protect the power semiconductors (IGBTs) against thermal overloads, the carrier frequency is automatically reduced at operation below 3 Hz. If the overload time exceeds 60 seconds, the drive will trip.

During operation at output frequencies < 1 Hz, the overload capability is restricted and the overload time is lower than 60 s.

- at 0.0 Hz, the overload time is only 5 s
- at 0.5 Hz, overload time is approximately 32 s
- from 1.0 Hz, overload time is 60 s



Altivar 61

variable speed drives

Altivar Plus

900-2500 hp Selection Table

ATV61 EXA1 C50 N4 E4 U

1 2 3 4 5 6

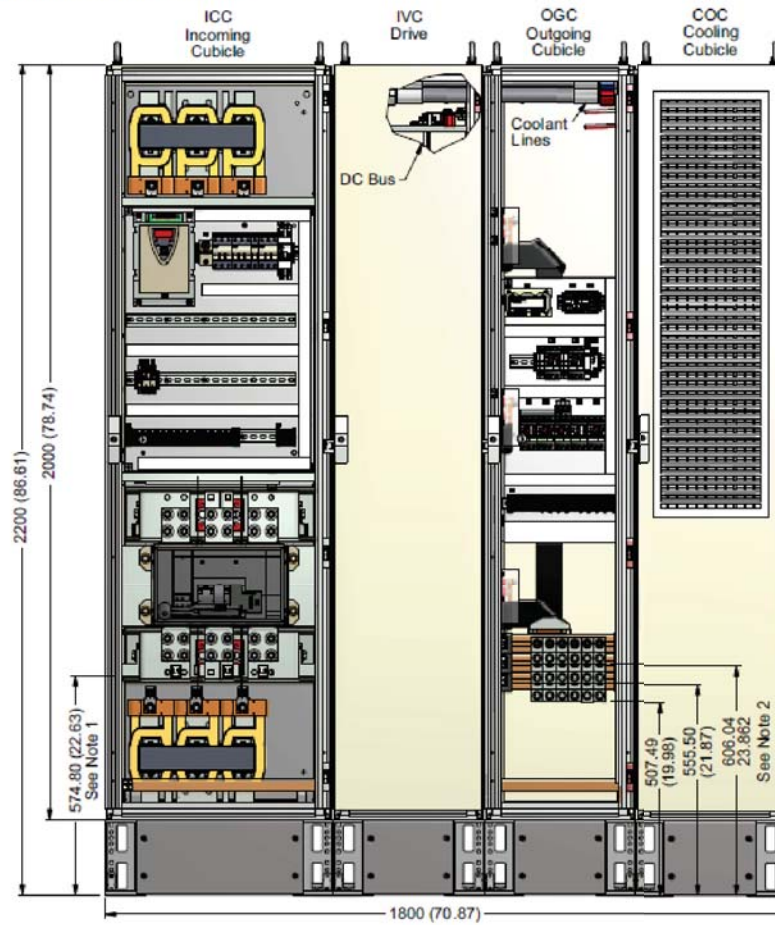
- 1** Drive Style
ATV 61= Altivar 61 Plus
- 2** Drive System
EXA2 = Type 1
EXA5 = Type 12
- 3** Power Rating
C = Multiplier 10
M = Multiplier 100
- 4** Voltage
N4 = 460 V
Y = 575V
- 5** Cubicle
E1 = Sarel S 6000, standard design with air cooling, size 23 & 24 (size 23 also has external water cooling in IP55)
E4 = Rittal TS8, standard design with air cooling, size 23 & 24 (size 23 also has external water cooling in IP55)
- 6** Design
U = Design for U.S. market

HP Reference Code	HP Ratings	Controller Output Current	Enclosure Frame Size	Power Circuit	
				Power Circuit E1	Power Circuit E4
460 V					
C	900	1100 A	23	C63N4E1	C63N4E4
	1000	1230 A		C71N4E1	C71N4E4
	1250	1580 A		C90N4E1	C90N4E4
M	1550	1860 A	24	M11N4E1	M11N4E4
	1800	2200 A		M13N4E1	M13N4E4
	2000	2430 A		M14N4E1	M14N4E1
575 V					
C	700	675 A	23	C63YE1	C63YE4
	800	840 A		C80YE1	C80YE4
M	1000	1050 A	24	M10YE1	M10YE4
	1250	1230 A		M12YE1	M12YE4
	1600	1580 A		M15YE1	M15YE4
	1900	1860 A		M18YE1	M18YE4
	2100	2020 A		M20YE1	M20YE4

Altivar 61 variable speed drives

Altivar Plus 900-2500 hp Dimensions

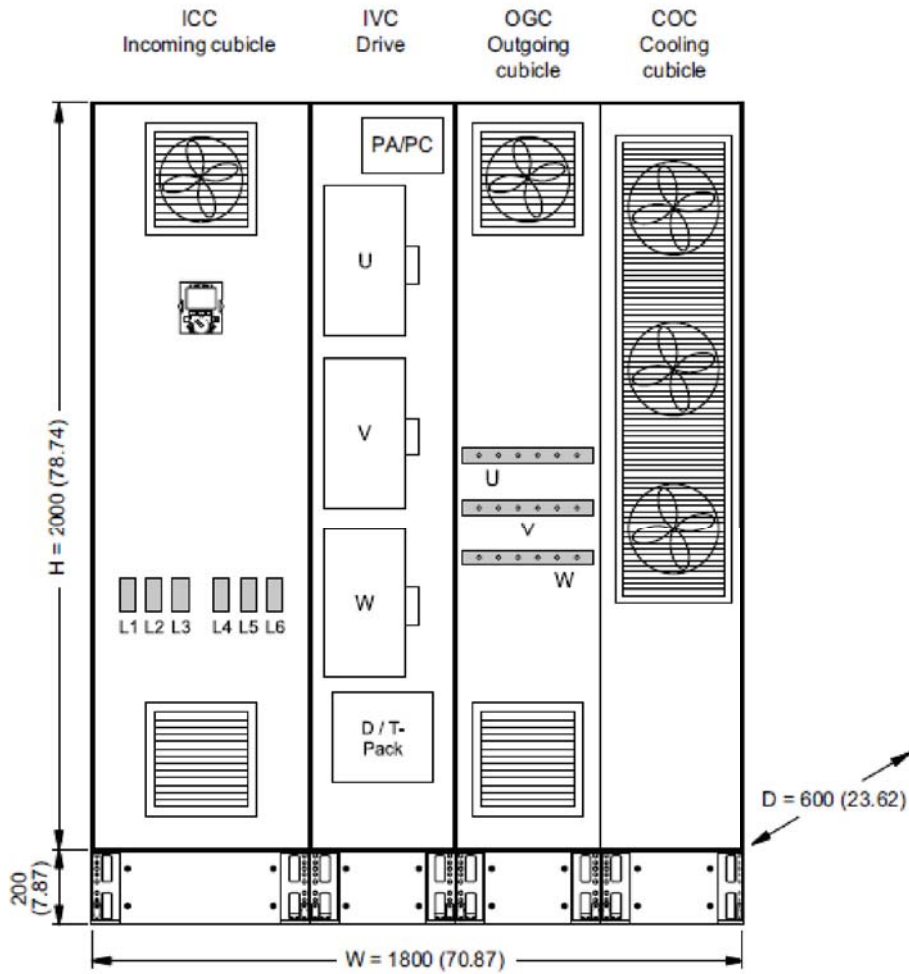
Dimensions are in mm (in.).



Altivar 61
variable speed drives

Altivar Plus
900-2500 hp Dimensions

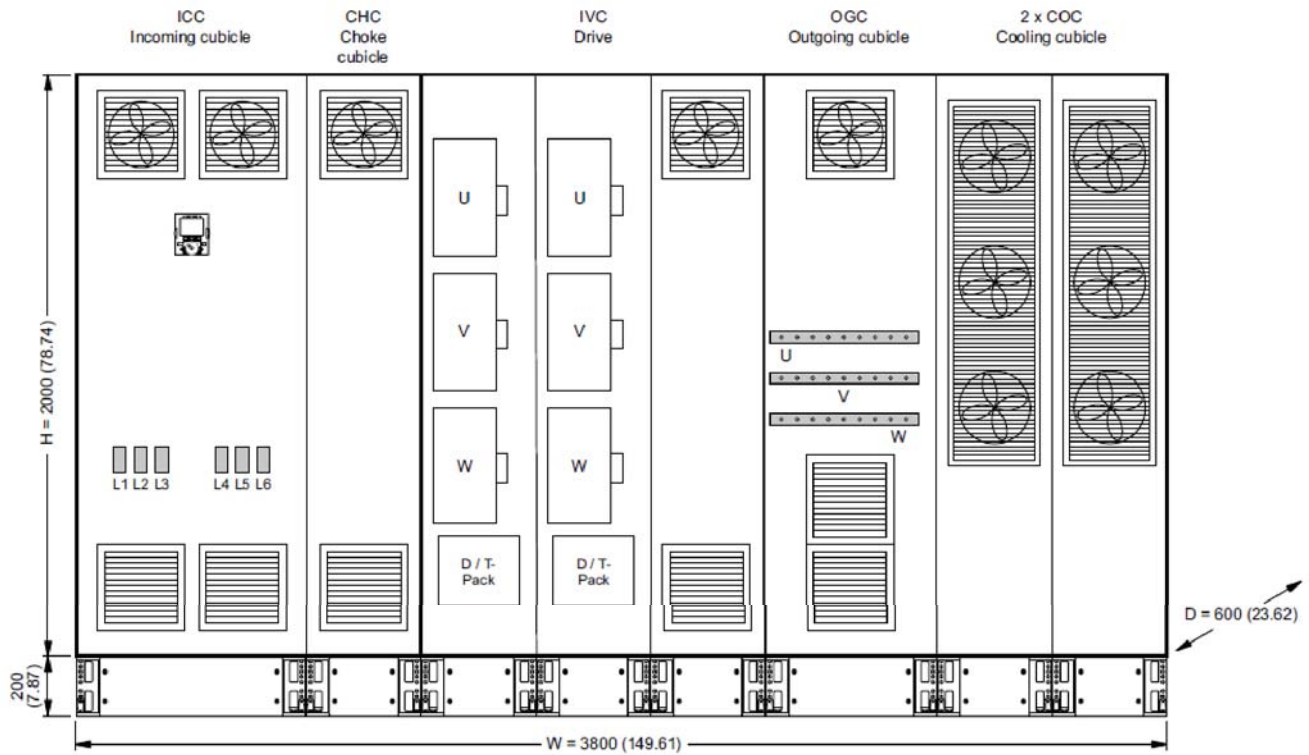
Dimensions are in mm (in.).



Altivar 61 variable speed drives

Altivar Plus 900-2500 hp Dimensions

Frame Size 24





Quality Assurance

This document communicates a summary of the processes, procedures and quality assurance that are in place for the manufacturing of the Altivar 61. Altivar 61 drives are produced in ISO certified facilities. Customers can be assured that these processes and procedures are followed. Audits conducted by third party representatives verify documented processes and procedures are followed and provide certification to ISO 14001. Schneider Electric utilizes quality assurance processes and procedures to verify the integrity of components and the assembly process. Data is gathered on each unit and tracked via the unique serial number of each unit during the manufacturing process. The document was not intended to imply this data is available in a format that could be easily communicated externally nor that a written report is generated for each product.



Outline of Test Process and Procedures

Printed circuit board testing, dielectric testing, preliminary memory and functional test, unit operation with burn-in testing, and final verification testing are conducted at various points in the manufacturing process for each drive. All aspects of these tests during the assembly are logged electronically for internal tracking purposes. Each unit is checked and product conformance status is recorded at each test station. Appropriate conformance information is carried in nonvolatile memory within each unit. The sequence of testing is monitored. Each test station requires a successful bar code scan on entry to validate that each drive has successfully completed any prerequisite test stations.

In addition to the processes and procedures detailed below, each test station has a visual quality inspection check list. This check list includes a physical inspection for proper connections, power component polarities, proper assembly torques, mechanical integrity, and proper documentation.

Printed Circuit Board Testing

Printed circuit boards used in the assembly of the ATV61 undergo testing as a part of the board assembly. These tests include:

- In-circuit, component level testing
- Functional power-on testing
- Thermal-cycle stress testing
- High-potential test applied to high voltage boards

Dielectric Testing (Hi Pot Test)

This test verifies the dielectric withstand between customer connection points and ground to validate that required isolation barriers are intact. Isolation barriers are typically tested for a duration of one (1) second during which a high voltage is applied according to IEC 61800-5-1 standard. This station is also used to verify placement of the power circuit connections.

Preliminary memory and functional testing

During this test, the unit's on-board communication port is utilized to read internal memory and set aside a portion of memory to track the processes performed on the drive and its main components. Each tracked process must have been completed successfully to proceed. These include:

- Supplier performed tests of printed circuit boards with on-board memory.
- Successful drive hi-pot test.

A preliminary test is run to verify:

- Heatsink ground screw presence
- RFI filter jumper setting
- DC bus jumper presence
- EEPROM test
- Product rating verification
- Initial rating verification
- Analog input calibration
- Analog output calibration
- Self test (verification of the display board and control terminal board.)
- Pre-motor test

Unit operation and burn-in testing

Burn-in testing involves four aspects - (I) sample plan, (II) thermal profile, (III) electrical cycling, and (IV) load cycling. Each will vary slightly by the equipment available at each production facility and by the current quality results experienced by each production facility.

(I) Sample Plan

Burn-in is sampled at a rate that varies from 5% to 100%. The rate is based on current quality results for each production facility. Each production facility is required to burn-in at sample rates determined by the model to the left.

(II) Thermal Profile

Constant elevated temperature of 60 °C for two hours during which the drive is subjected to electrical cycling for the entire duration of the thermal profile.

(III) Electrical Cycles

The electrical cycle runs concurrently with the thermal profile. An electrical cycle energizes and de-energizes the drive by connecting and removing AC input power. The drive is energized for the duration of a load cycle (typically 4 minutes) and de-energized to allow the drive power supply to shut down (typically 40 seconds). This cycle repeats continuously during the portions of the thermal profile indicated above. This cycle is repeated continuously during the thermal profile.

(IV) Load Cycles

Drives are connected to an inertial motor load during burn-in. When the drive is energized, the drive is cycled between high speed forward and reverse operations. Load cycles are made at a minimum interval of 10 seconds. Acceleration and deceleration rates are 0.1s (minimum). The rates are selected to maximize transition stress.

Monitoring during burn-in cycle

The drive fault register and drive speed are monitored conditions during the load cycle. A detected fault or failure to attain commanded speed results in a test failure.

Final verification testing

This test validates proper operation after burn-in and prepares the drive settings for customer shipment. The following checks are made:

- DC bus pre-charge check
- Communication port test
- Product model verification
- 7 segment LED display check
- DC charge LED check I
- CPU version check
- DC bus level check
- Fan operation test
- Nominal load characteristic check
- Over current test
- Ground fault trip test
- Brake transistor off check
- Brake transistor on check
- Set factory default configuration

This document provides information regarding the quality assurance processes and procedures that are in place for the manufacturing of Altivar 61. These are in place to monitor and confirm the quality of the product line that has been designed in from the outset.



Solutions for every stage of your equipment's life cycle

Schneider Electric™ provides services far beyond meeting your immediate needs for application or equipment repair. We take a long-term, holistic approach to determine your facility and operational needs and develop a strategy for improving the performance of your people, systems, and processes.

Schneider Electric provides services from system design and consulting, to maintenance support, modernization of your installation, and project delivery. Schneider Electric provides the people, tools, and processes to help maximize your business's infrastructure.

Our expertise enables you to cut costs, reduce energy consumption, and keep your systems up and running through routine maintenance, added enhancements, and migrations to new state-of-the-art functionality.

> Start-up and commissioning

Expert installation support to provide assistance in the start-up of your new system. Service includes a comprehensive power-up and diagnostic check on system components to minimize risk and optimize operation.

> Technical training

Training offered on-site, off-site, or online for Schneider Electric automation products taught by professional instructors with up-to-date knowledge of our latest hardware and software.

> Remote technical support

Comprehensive online and phone support from experts specially trained on Schneider Electric drive products, helping to reduce downtime and costs and optimize your system's life cycle.

> On-site technical support

Support service to perform regular maintenance, upgrades, and conversion assistance, small application and programming assistance, on-the-job training, equipment repair, support and troubleshooting, even in emergency situations.

> Preventative maintenance

Maintenance programs to scan for, and proactively detect, potential issues or problems with your automation system to help you avoid the costs of unscheduled downtime and short equipment service life. Also serves to extend the life of your installed base by using our services to properly maintain your equipment.

> Industrial repair services

Repair capabilities for over 400,000 part numbers from more than 2,500 manufacturers at our Greensboro, NC repair facility. Repair is available for both Schneider Electric and non-Schneider Electric equipment.

> Spare parts management

Save money and reduce downtime through our parts management program. An on-site assessment is performed to determine parts and inventory levels needed to ensure proper system operation and reduce downtime and inventory costs.

> Migration and modernization

Realize the productivity benefits of the latest Schneider Electric automation technology by using our assessment tools to identify and implement replacement of your legacy automation products, regardless of brand. We make extensive use of existing hardware and wiring for a cost-effective solution with minimal downtime.

> Software renewals

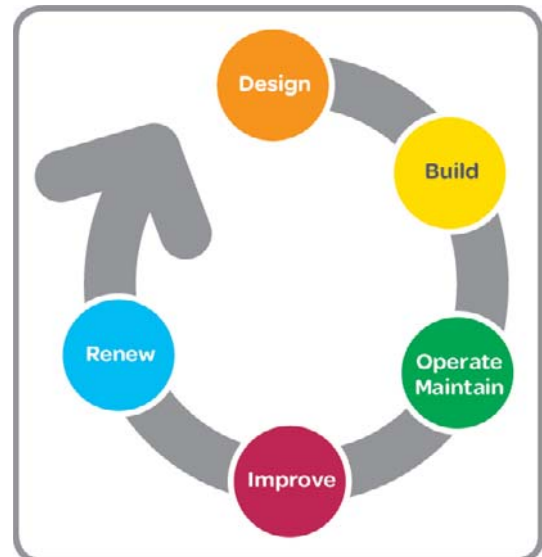
Access the latest software, firmware, and custom options to ensure you always have the latest functionality available to optimize your system's life cycle.

> Extended warranty

Extend your Schneider Electric standard manufacturer warranty from one year to five years. Protection plans are tailored to your needs reducing costs and out-of-service time.

> When it comes to your automation equipment, we can help you

- Increase productivity
- Improve reliability and safety
- Mitigate risk and limit downtime
- Keep equipment up to date
- Extend the life of your installed base
- Cut costs and increase savings
- Improve your return on investment



Talk to someone you can trust

The Altivar family of variable speed AC drives and the Altistart family of soft starts presents the most advanced and user-friendly solutions in the marketplace. Featuring proprietary motor control algorithms to achieve optimal reaction times and complete scalability to match your application requirements for speed, size, and protection, the complete line of Altivar and Altistart products provides the flexibility and performance to:

- Meet the needs of a broad range of industries, including HVAC, pump, material handling, hoisting, packaging and many more.
- Reduce your energy costs using proprietary energy-saving technologies available only from Schneider Electric.
- Improve your up-time by simplifying installation, commissioning and maintenance by providing advanced diagnostics, industry-leading voltage ride thru capability and seismic qualified products.

We also work with you to deliver the benefits of a global service and support of a global service and support organization to further increase the value of working with Schneider Electric. Our product specialists, industry experts, distributors, partners, and the countless other members of the Schneider Electric family are dedicated to helping you make the most of your energy everyday. Contact your local sales representative today to learn how Schneider Electric can improve operational performance and help your business to achieve a competitive advantage. Or visit www.schneider-electric.com

>Drive Product Support Group

For support and assistance, contact the Drive Product Support Group. The Drive Product Support Group is staffed from 8:00 am until 8:00 pm Eastern time to assist with product start-up and diagnosis of product or application problems.

EMERGENCY Technical phone support is available 24 hours a day, 365 days a year.

Toll Free **1-888-778-2733**

E-mail **drive.products.support@us.schneider-electric.com**

Fax **919-217-6508**

>Schneider Electric Service (On-Site)

The Schneider Electric Services division is committed to providing quality on-site service that consistently meets customer expectations. Services responds to your requests, seven days a week, 24 hours a day.

Phone **1-888-778-2733**

>Schneider Electric Customer Training

Schneider Electric offers a variety of instructor-led skill enhancing and technical product training programs for customers. For a complete list of drives/soft start training with dates, locations, and pricing please call:

Phone **978-975-9306**

Fax **978-975-2821**

>Customer Care Center

(Assist with stock checks, claims, and order management)

To provide additional support, Schneider Electric has rolled out new Technical Service Representatives in local offices which have the strongest needs.

Due to time zone changes and different time operation requirements business operation times vary.

Phone **888-778-2733**

Fax **888-329-9773**



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Knightdale, NC 27545

USA Customer Care Center
Tel: 888-778-2733

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