Variable speed drives Altivar Process 600

e-Catalog

January 2015

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Altivar Process 600 variable speed drives

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Schneider Electric

# Altivar Process 600 variable speed drives

Introduction

Altivar™ Process drives deliver added value services in the Water/Wastewater; Oil & Gas; Mineral, Mining, and Metals; and Food & Beverage industries to enable business and process optimization through improved life-cycle asset management and optimized energy consumption. The new drives are aimed at improving overall process performance and enabling full information and operational technology convergence.

Operational Intelligence

Applications need to run at optimum efficiency for your success. Making informed decisions, easily, at a moment's notice is foundational to this. Embedded process knowledge in the Altivar Process drive brings you the information you need.
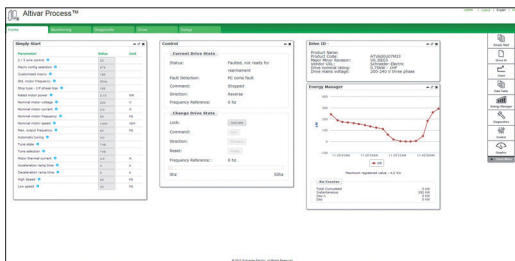
Custom Information
> Pump language
> Graphical keypad
> Configurable dashboard

Energy Management
> Export energy data
> Energy dashboards
> Motor power measurement

Embedded Ethernet and Web Server
> Local or remote access
> Achilles level 2 security
> Web server on any device using HTML5

Process Monitoring
> Real-time clock
> Predictive maintenance
> Operating data feedback
> Stop & go energy savings
> Compare to expected values

Customizable widgets

Embedded Guidance

Avoid getting lost with startup, integration of your drives, and maintenance needs. New and intuitive built-in functions simplify support and diagnostics, allowing issues to be solved quickly and comprehensively.
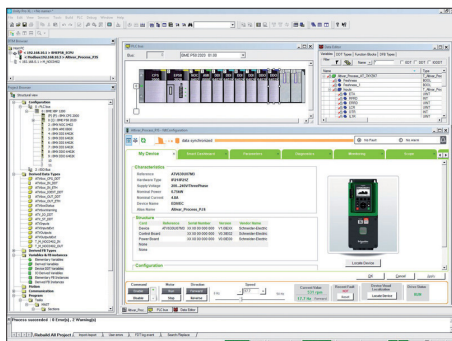
Startup
> Simply start
> Pump specific functions
> QR code access to product information and technical support

Maintenance Excellence
> Fast device replacement
> Troubleshooting message
> Dynamic QR code assistance

Integration
> FDT/DTM ready
> PlantStruxure™ optimized
> Industry standard communications

Altivar Process DTM in Unity

Reliable and Sustainable

Long operating life and reliability have been the hallmarks of the Altivar drives family for over 30 years. The tradition continues. Schneider Electric is ready to help you solve your challenges.

> TUV, CSA
> 50 degree C rating
> Integrated Impedance
> UL508C, UL50, IEC 61800-5
> Safe torque off inputs, SIL3/PLE
> Normal duty & heavy duty ratings

> Green Premium rating
> 70% recyclable content
> RoHS and REACH compliant
> Conformal coated to resist chemical pollution
> Conformal coated to resist air borne pollution

Product Webpage

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Applications

The Altivar Process 600 series of variable speed drives has over 30 functions dedicated to pumping applications as well as functions for fan and simple material handling applications.

The Altivar Process was designed for the following markets and applications.

Water & Wastewater applications

■	Water Intake	- surface pumps - borehole pumps
■	Treatment	- aeration blowers - disinfection dosing pumps - ventilation fans
■	Storage & Transportation	- distribution pumps - pressure booster pumps
■	Lift Station	- submersible pumps
■	Plant Influent	- submersible pumps - screw pumps
■	Treatment	- aeration blowers - sludge conveying - gas compression - dosing pumps - odor ventilation

Oil & Gas applications

■	Extraction	- submersible pumps - liquid injection pumps
■	Treatment	- liquid treatment pumps - refinery pumps - ventilation fans
■	Storage	- distribution pumps - pressure booster pumps
■	Transport	- pipeline booster pumps - compressors

Mineral, Mining & Metals applications

■	Extraction	- ventilation fans - de-watering pumps - mine shaft pumps
■	Treatment	- filtration pumps - refinery pumps - cooling fans - induced draft fans - mixers - exhaust fans

Food & Beverage applications

■	Material receiving	- ventilation fans - simple conveying
■	Processing	- mixing pumps - boiler pumps - condensate pumps - solids handling - ventilation fans - liquid pumps - cooling tower fan - dryer fans
■	Transport	- pipeline booster pumps - compressors

Altivar Process 600 variable speed drives

Introduction
Product Range


200-240 Vac three phase
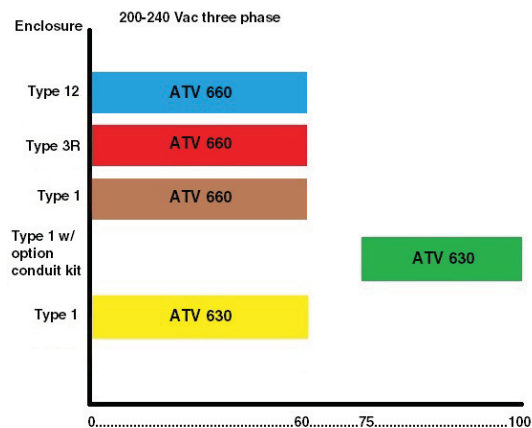
Product range

The Altivar Process 600 series of variable speed drives are available in a variety of enclosures and cover a wide range of motor power ratings.

The Altivar Process 630 range, packaged in 6 frame sizes, is a global offer available worldwide and designed to meet worldwide standards and certifications.
The range includes:

■ 200 - 240Vac, 1-60 HP, UL Type 1 rating

■ 200 - 240Vac, 75-100 HP, IP00 rating, UL Type 1 rating with option conduit kit

■ 400 - 480Vac, 1-125 HP, UL Type 1 rating

■ 400 - 480Vac, 150 - 250 HP, IP00 rating, UL Type 1 rating with option conduit kit

400-480 Vac three phase
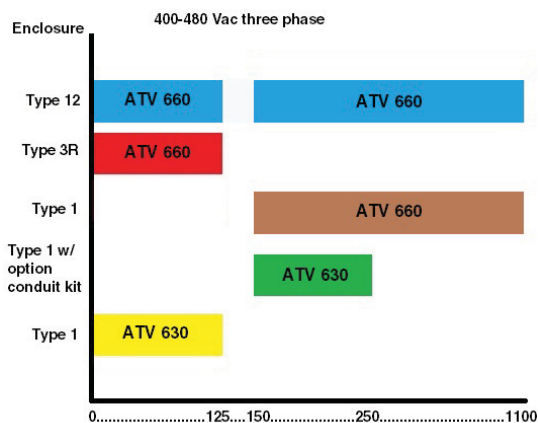
The Altivar Process 660 range, with availability beginning in 3rd quarter 2015, is a regional offer designed to meet standards and certifications applicable in the USA. The range includes:

■ 200 - 240Vac, 1-60 HP, available with
    - UL Type 1, UL Type 12, or UL Type 3R enclosures

■ 400 - 480Vac, 1-125 HP, available with
    - UL Type 1, UL Type 12, or UL Type 3R enclosures

■ 400 - 480Vac, 150 - 1100 HP
    - UL Type 1, UL Type 12

Options for the Altivar Process 660 range include circuit breaker disconnects, service entrance ratings, options for push buttons, pilot lights, and other items required for the targeted markets.

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Presentation of the offer

The Altivar Process 600 series of variable speed drives are designed for the control of three-phase asynchronous and synchronous motors in pump, fan and other normal duty applications requiring 110% overload rating and heavy duty applications requiring 150% overload rating.

The user has access to embedded intelligent services such as the Dynamic QR codes providing instant information about the product and troubleshooting assistance, as well as the built-in Ethernet and web server to improve plant integration and remote access.

The Altivar Process 600 series has over 30 functions dedicated to pumping applications as well as functions for fan applications. In addition to pump and fan applications, the Altivar Process 600 series can also be applied on augers, compressors, conveyers, mixers and positive displacement pumps that do not require continuous operation below 5 Hz.

- □ Some of these applications may use a normal duty rated Altivar Process 600 series drive if they require up to 130% transient torque for up to 2 seconds, and up to 110% overload for up to 60 seconds.
- □ For applications that require up to 170% transient torque for up to 2 seconds and up to 150% overload for 60 seconds, select the Altivar Process 600 series drive by using the heavy duty ratings.

The Altivar Process variable speed drive includes an LCD Graphic display keypad with an easy-to-read display and capacitive navigation wheel that allows users to scroll through easy to read drop-down menus. Error codes can be signaled with red backlighting to annunciate a process error.

Embedded dynamic QR codes for contextual, instantaneous access to online help

Remote graphic display terminal (example shows dynamic pump operation in relation to its optimum operation)

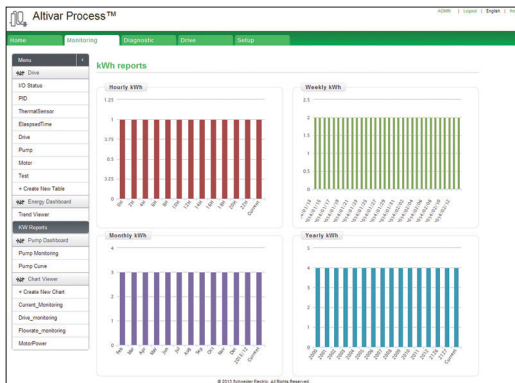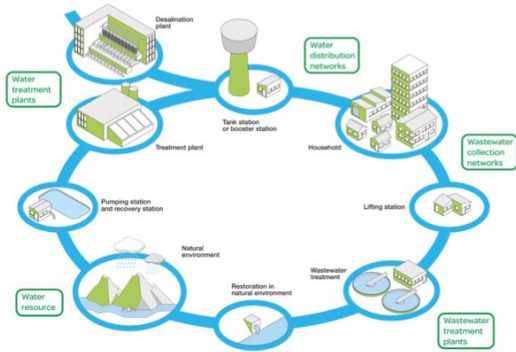*Detected fault: the screen's red backlight is activated automatically*

The Altivar Process 630 Comes With:

- UL Type 1 rating with multiple conduit entrances to separate line power, motor cables, control wiring and network cabling in frames sizes 1-5.
  Frame 6 requires a field installed conduit kit to obtain UL Type 1 rating.
- UL Type 12 rated LCD graphic keypad, eight lines of 24 characters, and four assignable function keys
- Coated printed circuit boards for protection against dust and chemicals
- Real time clock for date stamping error codes and process monitoring
- Integrated RJ45 Modbus™ port on the face of the product for connection to the keypad, Magelis™ HMI, SoMove™ PC software or Unity set-up software
- Integrated RJ45 Modbus port for Modbus network connection
- Integrated RJ45 Ethernet Modbus TCP port for network connection
- Color coded removable control terminal blocks with the following I/O:
  - □ Two Safe Torque Off (STO) inputs
  - □ Six digital inputs
  - □ Three analog inputs
  - □ Two analog outputs
  - □ Three relay outputs (1NO/NC, 1NO, 1 NO)

Options for the Altivar Process 630:

VW3A3720

The Altivar 630 can be field equipped with the following options to create a solution with just the right functionallity:

- Connectivity can be extended without taking additional panel space
  - □ communication option cards
  - □ I/O extension cards

- External options such as
  - □ kits to mount the heatsink and power section out the back of an enclosure
  - □ line reactors
  - □ output filters

VW3A3203

PF130914A

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Altivar Process 600 variable speed drives

Introduction
Presentation

Energy dashboard

Two-thirds of current Schneider Electric sales come from products labelled with the Green Premium eco-mark. The company has already made significant headway in bringing the eco-mark's benefits to a broad spectrum of industries and enterprises.

Integrated Functions

Operational Intelligence delivers value through process visibility.

The Altivar Process incorporates features that provide process monitoring and visibility.
- Power measurement capable of 5% accuracy for energy management.
- Advanced integrated web server.
- Web server secured with Achilles Level 2 certification.
- Web pages can be quickly customized with ready-to-use-widgets to create different dashboards.
- Process data and status tables, charts and graphs can be accessible with any HTML5 browser.
- Data can be logged for export in .csv formatted files.
- Accepts 5 operating points and the BEP (Best Efficiency Point) of a pump curve to provide feedback on operating efficiency.

Through system and equipment condition monitoring, Altivar Process can help ensure applications are performing at optimum efficiency.

Embedded Guidance provides direction that improves uptime

Built-in functions simplify set-up and provide quick understanding.
- A Simply Start menu guides the operator through the initial set-up.
- 'My Menu' allows users to select their key parameters to store in this menu.
- A 'Modified Parameters' menu stores the last 10 parameters that have been modified.
- Parameters are grouped by application configuration, motor parameters, communcation setting parameters and display parameters. Any single or multiple parameter group can be copied into the keypad to be downloaded into other drives.
- Integrated pump functions and pump protection features can be quickly configured.
- Error codes can be date and time stamped to aid in diagnostics.
- QR code access to technical documentation, and diagnostic information on mobile devices.
- A static QR code located on the drive provide part number specific information.
- The drive's ability to dynamically generate QR codes based on error conditions helps solve issues immediately by directing operators to specific technical information and support information.
- These QRs can also assist in making contact with a Schneider Electric Customer Care center when needed.

This embedded guidance can speed up start-up, troubleshooting and maintenance while reducing downtime and its related costs.

A Reliable and Sustainable platform for long-term dependable service

The Altivar Process represents the latest in reliable and sustainable design technology. The drive complies with all aspects of Schneider Electric's industry leading "Green Premium™" standard for sustainable and eco conscious product design, incorporating 70 percent or greater of recyclable materials and is in compliance with RoHS 2 and REACH standards. Other key aspects are:
- Conformal coatings to provide resistance to chemical pollution. This provides resistance against: sea salts, sulphur dioxide, hydrogen sulphide, chlorine, hydrogen chloride, hydrogen fluoride, ammonia, ozone, and nitrogen oxides.
- Conformal coatings to provide resistance to air born pollution. This provides resistance against debris such as dust and sand.
- Stop and Go capability: Power consumption can be reduced up to 60%, depending on the power size, while the drive is in standby, waiting for a run command. This is accomplished by powering down cooling fans, display backlighting, and the power section of the drive.
- Integrated safety inputs minimize external components and wiring.
- Ability of the drive to continuously operate at 50 degrees Celsius.

Long operating life and reliable service have been lasting hallmarks of the Altivar drives family for more than 30 years. That tradition continues with the Altivar Process drive.

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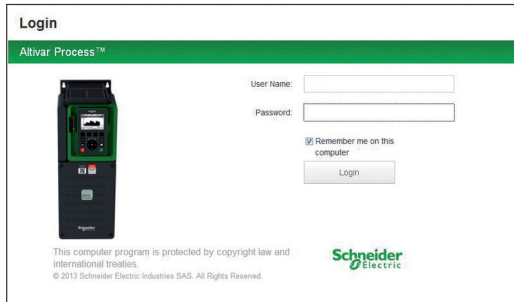
Login screen
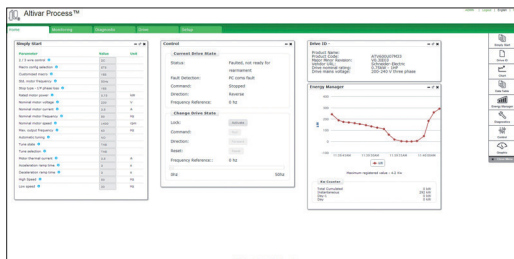
Customizable widgets

Pump curves

Web Server

Presentation

The Web server can be accessed:

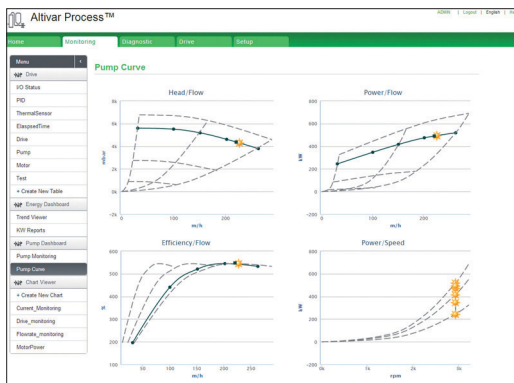■ For a drive not connected to an Ethernet network:
- Direct connection via an Ethernet cable or the Schneider Electric™ WiFi dongle (the drive then appears as a network device)

■ For a drive connected to an Ethernet network:
- from any point on the network by entering the drive IP address

■ The Web server is used for::
- Commissioning the drive (setting configuration parameters and enabling the main functions)
- Monitoring energy and process data, as well as drive and motor data
- Diagnostics (drive status, file transfer, detected errors and warnings logs)

Description

The Web server is structured around 5 tabs.
■ "My dashboard" tab:
- Configurable using a wide choice of widgets; groups all the information selected by the user on one page

■ "Display" tab:
- Monitors energy indicators, efficiency, and performance
- Displays process data such as optimum pump operation
- Monitors drive parameters and status
- Shows the I/O state and assignment

■ "Diagnostics" tab:
- Drive status
- Time and date-stamped warning and detected errors logs
- Network diagnostics
- Access to drive self-tests

■ "Drive" tab:
- Access to the main drive adjustment parameters with contextual help

■ "Setup" tab:
- Network configuration
- Access management
- Transferring and retrieving drive configurations
- Exporting data acquisition files and logs
- Customizing pages (colors, logos, etc.)

■ Other characteristics:
- Ease of connection via the RJ45 port or WiFi connection
- Password-protected authentication (modifiable password; access rights can be configured by administrator)
- No downloads or installation necessary
- Web server can be disabled

■ Works in a similar way on PCs, iPhones, iPads, Android systems, and the main web browsers:
- Internet Explorer® (version 8 or higher)
- Google Chrome® (version 11 or higher)
- Mozilla Firefox® (version 4 or higher)
- Safari® (version 5.1.7 or higher)
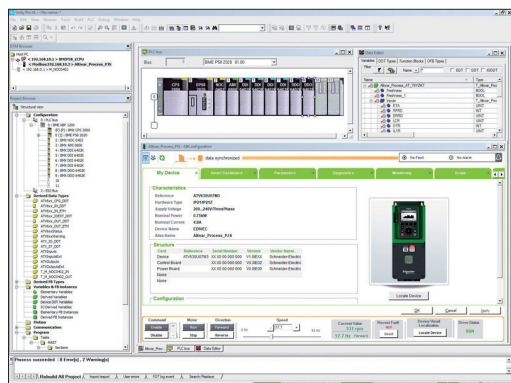
Altivar Process DTM in Unity


SoMove software

DTM

Presentation

Using FDT/DTM technology it is possible to configure, control, and diagnose Altivar Process drives directly in Unity Pro and SoMove software by means of the same software brick (DTM).

FDT/DTM technology standardizes the communication interface between field devices and host systems. The DTM contains a uniform structure for managing drive access parameters.

Specific functions of the Altivar Process DTM

- Offline or online access to drive data
- Drive firmware updates
- Transfer of configuration files from and to the drive
- Customization (dashboard, My Menu, etc.)
- Acces to drive parameters and option cards
- Oscilloscope function
- Graphic interface to assist with configuration of the Altivar Process pump functions
- Energy and process dashboards
- Graphic display of system operation and comparison with optimum operation (pump curves)
- Detected errors and warnings logs (with timestamping)

- Advantages of the DTM library in Unity Pro:
    - Single tool for configuration, commissioning, and diagnostics
    - Network scan for automatic recognition of network configuration
    - Ability to add/remove, copy/paste configuration files from other drives in the same architecture
    - Single input point for all parameters shared between the ePAC (programmable automation controller) and the Altivar Process drive
    - Creation of drive profiles for implicit communication with the ePAC as well as dedicated profiles for programs with DFBs (derived function blocks)
    - Integration in the fieldbus topology
    - Drive configuration is an integral part of the Unity Pro project file (STU) and the archive file (STA)
    - Advantages of the DTM library in SoMove:
    - Drive-oriented software environment
    - Wired connection to the Ethernet communication port
    - Standard cable (file transfer performance)
    - Third-party software and downloads:
    - The Altivar Process DTM library is a flexible, open, and interactive tool that can be used in a third-party FDT.
    - DTMs can be downloaded from our website www.schneider-electric.com.

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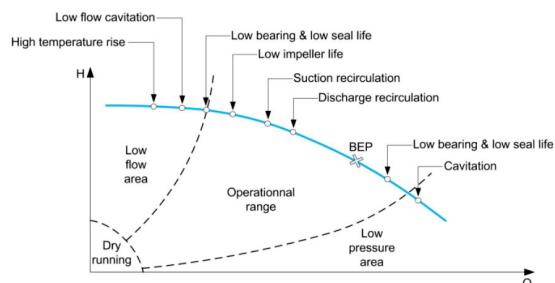
Flow Limitation

Allows user to limit the flow of the system to a configured value.

Sleep/Wake Up

Manages periods where demand is low and main pumps do not need to remain running. It saves energy and prevents premature aging. The user can select the sleep mode activation: on sensor value, on switch or external condition, on speed, or on power level.

Sleep Boost

When entering in Sleep mode, a boosting phase allows increasing pressure just before stopping the pump. It prevents from quick restart in case of low demand.

Low Demand

Define periods of the application where water demand is low in order to save energy.

Jockey Pump Control

During Sleep mode, a Jockey pump can be started to maintain emergency service pressure or to meet a low demand.

Anti-Jam

Removes clogging substances from the pump impellers with quick forward and reverse operation. It can be triggered automatically or manually.

Advance Sleep Checking

Used to periodically monitor demand when pump curve is flat and flow switch or meter isn't installed

Pipe Cleaning

Used to start the pump periodically to avoid sedimentation in the pump housing.

Centrifugal Pump Start & Stop

Defines speed profile & control the start & stop of the pump.

Multi-Pump Control (Booster) Drive to Drive

Define control of several pumps

Sensor Management

Define how the drive I/O will be used to manage pressure sensor or flow sensor inputs.

Process Control (PID)

Maintains a process at a given pressure or flow reference in the water network.

Level Control

Used to manage an upper level limit or lower level limit of a liquid in a tank.

Friction Loss Compensation

Helps to maintain constant pressure by monitoring flow in order to compensate pressure losses over pipes by estimating the pressure drop due to friction.

Application Modes

Define running modes of the application, control inputs and monitoring outputs related to application.

Priming Pump Control

The priming pump maintains a supply to the inlet of the main pump by running before the lead pump starts.

Pipe Fill

Used on the start cycle to prevent water hammer and associated mechanical stresses in pipes when a system is filled in too quickly.

Outlet Pressure Protection

Min Pressure (detection of Pipe Burst, low outlet pressure while pump is loaded) Max Pressure (prevention of Pipe Burst, detect running outside normal working area)

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Altivar Process 600 variable speed drives

Introduction

Pump Functionality
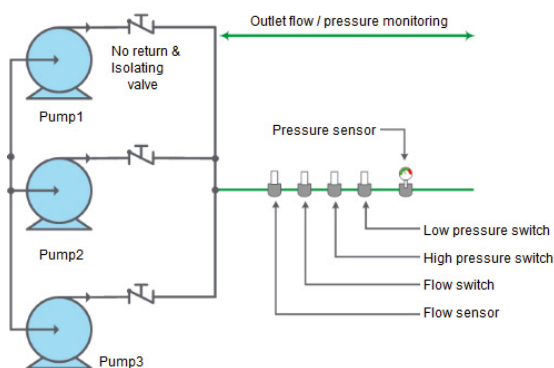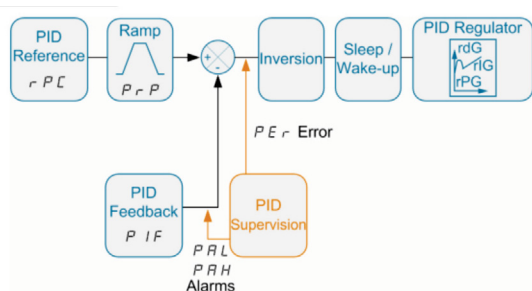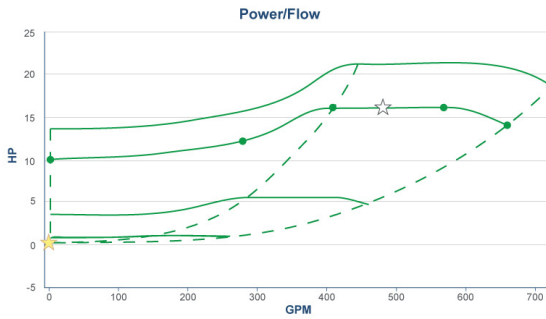
Application Units

Define units used in applications, including pressure, flow rate, temperature, and currency.

Centrifugal Pump Characteristics

Define characteristics & configuration of a centrifugal pump

Sensorless Flow Estimation

Provides flow estimation using predefined pump curves HQ (head vs flow) or PQ (power vs flow) entered by the user. It's designed to work on single pump systems without external sensor input.

PID Auto Tuning

Auto tuning of PID parameters.

Pump Cyclic Start Protection/ Pump Cycle Monitoring

Limits the number of restarts in a dedicated time period in order to avoid excess wear to the pump.
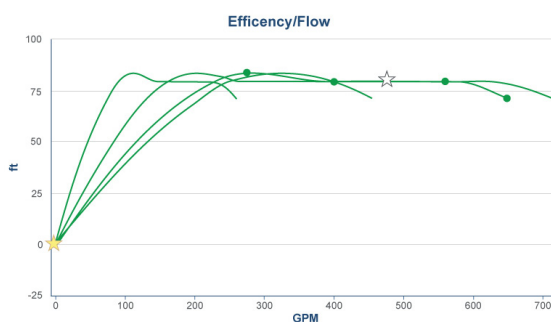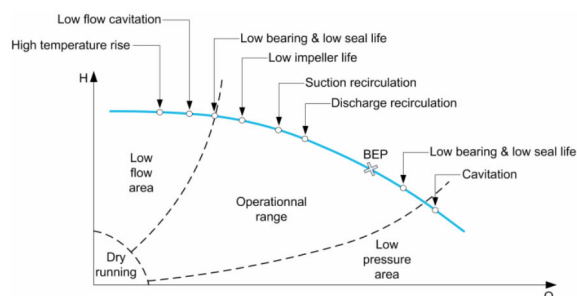
Cavitation Pump Protection

Functions used to prevent cavitation which can damage the pump impeller, reduce flow, create vibration, and increase energy consumption.

Dry Running Pump Protection

Detects pump operation in a dry running condition to avoid severely damaging or destroying the pump.

No Flow/ Low Flow Pump Protection

Detects pump operation at no flow or low flow to avoid severely damaging or destroying the pump by overheating

PID Feedback Supervision

Keep pump running point in right running area. Prevention of burst pipe

High Flow Protection

Detection of Pipe Burst. Detect running outside normal working area

Inlet Pressure Protection

Protects the pump against low inlet pressure. When the inlet pressure goes below the settable pressure, the applied pressure setpoint is decreased by the drive itself to prevent cavitation. If the pressure setpoint is reduced, the pump speed will also decrease.

Outlet Pressure Protection

This protection provides outlet "high pressure" and "low pressure" alarms. Used to prevent pipe system damage or to detect burst pipes.

Low Pressure Pump Protection

Detects pump operation at low pressure in order to avoid pump damage due to cavitation.

Altivar Process 600 variable speed drives

Introduction
Pump Functionality
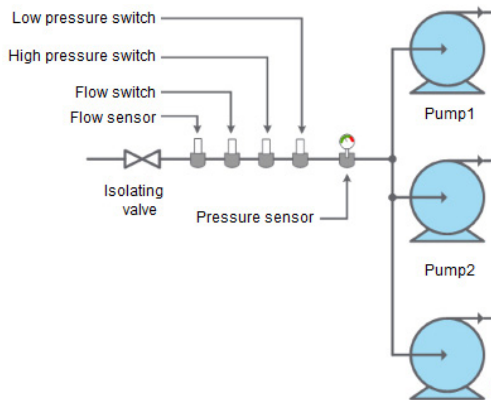
Total Quantity

The estimated total cumulated quantity (volume or mass) when a flow rate sensor is used. Installation related Cumulated Values & Counts are recorded for the full life of the installation and can be reset or modified (e.g. in case of device replacement) by customer.

Outlet Pressure

The measured pressure at outlet/discharge of the pump system or installation.

Inlet Pressure

The measured pressure at inlet/suction of the pump system or installation.

Level

The measured level of the installation when level control is activated.

Installation Flow Rate

The measured total flow rate of the installation.

Pump Status

Status of the pump controlled by VSD (Running, Stopped, Anti-Jam, Fault detected)

Pump Curves

User has the possibility to input 6 points from a pump curve (including BEP) for better control and monitoring of the process. Curves can be in Head vs Flow, Power vs. Flow, or Power vs Speed

Energy Consumption

Allows the display of several values: Instantaneous input power, Input energy consumed, Instantaneous output power, Cumulated output energy consumed. They can be logged and viewed by hour, week, month, and year. It can also estimate the energy bill based on usage and rate as input by the user.

Power Drift Detection

Can manage alarms to alert user when power consumed is either too low or too high compared to expected value

Energy Saved

The drive will display energy saved while the motor is running.

Pump Thermal Monitoring

Helps prevent equipment damage due to high temperature by monitoring the real temperature by the drive.

Motor Thermal Monitoring

Helps prevent motor damage from overheating by an estimation of the thermal state of the motor.

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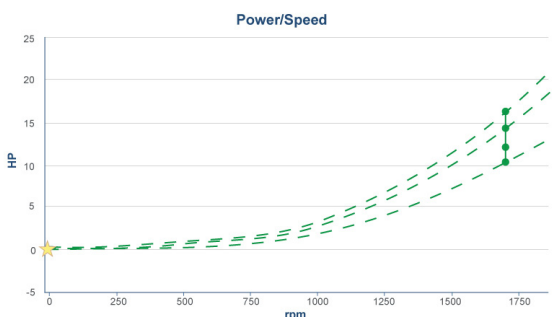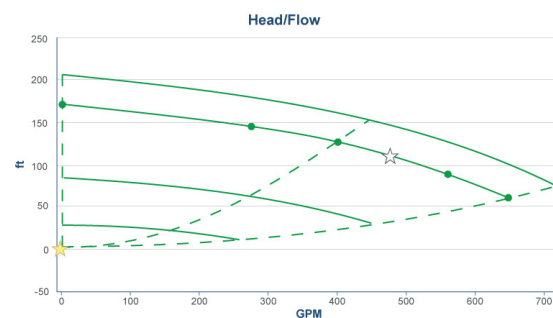
Electrical Specifications

Input power	Voltage	V	200 - 15%...240 + 10% three-phase for ATV 630●●●M3 380 - 15%...480 + 10% three-phase for ATV 630●●●●N4 500 - 15%…690 + 10% three-phase for ATV●●●Y
	Frequency	Hz	50 - 5%...60 + 5%
Drive output voltages		V	Maximum three-phase voltage equal to line supply voltage
Output frequency range	ATV630U07M3...D45M3 ATV630075N4…D75N4	Hz	0.1...500 Hz
Configurable switching frequency	ATV630U07M3...D22M3 ATV630U07N4...D45N4	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.
	ATV630D30M3...D45M3 ATV630D55N4...D90N4	kHz	Nominal switching frequency: 2.5 kHz without derating in continuous operation. Adjustable during operation from 1…8 kHz Above 2.5 kHz, see the derating curves in the Installation Manual.
	ATV630D55M3...D75M3 ATV630C11N4...C16N4	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.
Speed range			Asynchronous motor: ■ 1…100 in open-loop mode without encoder feedback Synchronous motor: ■ 1…50 in open-loop mode without encoder feedback
Speed accuracy	For a torque variation of 0.2 Tn to Tn		± 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)
Maximum transient current	Normal Duty Rating		110% of the nominal drive current for 60 s (typical value) with a minimum duty cycle of 10 minutes. 130% of the nominal drive current for 2 s (typical value)
	Heavy Duty Rating		150% of the nominal drive current for 60 s (typical value) with a minimum duty cycle of 10 minutes. 170% of the nominal drive current for 2 s (typical value)
Motor control profiles			Asynchronous motor: ■ Voltage/frequency: quadratic, or 2 point or 5 points ■ Voltage/frequency optimized for energy savings Synchronous motor: ■ Vector control for permanent magnet motors

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Electrical Specifications (continued)

Slip compensation			Automatic. Can be suppressed or adjusted.
Drive noise level			Conforming to directive 86-188/EEC
	ATV630D11M3	dBA	65
	ATV630D15M3...D22M3	dBA	75
	ATV630D30M3...D45M3	dBA	78
	ATV630D55M3...D75M3	dBA	76
	ATV630D15N4...D22N4	dBA	65
	ATV630D30N4...D45N4	dBA	75
	ATV630D55N4...D90N4	dBA	78
	ATV630C11N4...C16N4	dBA	76
Indicator			1 LED red for presence of voltage 4 LEDs dual color for communication module status 3 LEDs dual color for embedded communication status 3 LEDs for local diagnostic
Electrical impedance	ATV630U07M3...U55M3 ATV630U07N4...C13N4		Integrated DC Choke Inductance of approximately 1.5-2%
	ATV630U75M3...D55M3 ATV630C16N4		Integrated DC choke Inductance of approximately 2.5-3%
	ATV630D75M3		Integrated DC choke Inductance of approximately 4%
	Electrical isolation		Between power and control (inputs, outputs, power supplies)
	Acceleration and deceleration ramps		Ramp profiles: ■ Linear, can be adjusted separately from 0.01 to 9000 s ■ S, U or customized Automatic adaptation of deceleration ramp time if braking capacities exceeded, programmable inhibition of this adaptation.
	Braking to a standstill		By DC injection: ■ 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 1.1 In. for normal duty rating and 0 to 1.4 In. for heavy duty rating.
	Main drive protection and protection features		Thermal protection: ■ Drive overtemperature ■ On the power stage Protection against: ■ Internal short-circuits between motor phases ■ Overcurrents between output phases and ground ■ Overvoltages on the DC bus ■ Loss of follower signal ■ Exceeding maximum speed setting ■ Line supply overvoltage and undervoltage ■ Input phase loss, with three-phase input
Motor protection			Class 10 motor thermal protection integrated in drive via continuous calculation of I^2t taking speed into account: ■ The motor thermal state is saved when the drive is powered down. ■ Function can be modified depending on the type of motor (force-cooled or self-cooled). Protection against motor phase loss Protection with user supplied PTC probes Safe Torque Off
Dielectric strength	ATV630●●●M3		Between ground and power terminals: 2830 V $=$
	ATV630●●●●N4		Between ground and power terminals: 3535 V $=$
			Between ground and power terminals: 3110 V $=$
Insulation resistance to ground			> 1 MΩ (electrical isolation) 500 V $=$ for 1 minute
Frequency resolution	Display units	Hz	0.1
	Analog inputs	Hz	0.012/50 Hz (12 bits)

Altivar Process 600 variable speed drives

Specifications
Environmental

Environmental Specifications

Vibration resistance	ATV630U07M3...D45M3 ATV630U07N4...D90N4		1.5 mm peak to peak from 2…13 Hz, 1 gn from 13…200 Hz, conforming to IEC/EN 60068-2-6
	ATV630D55M3...D75M3 ATV630C11N4...C16N4		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	ATV630U07M3...D45M3 ATV630U07N4...D90N4		15 gn for 11 ms conforming to IEC/EN 60068-2-27
	ATV630D55M3...D75M3 ATV630C11N4...C16N4		7 gn for 11 ms conforming to IEC/EN 60068-2-27
Maximum ambient pollution Definition of insulation	ATV630U07M3...D75M3 ATV630U07N4...C16N4		Degree 2 conforming to IEC/EN 61800-5-1 Degree 3 in accordance with UL marking conforming to UL840
Environmental conditions Around the device	ATV630U07M3...D75M3, ATV630U07N4...C16N4		Chemical pollution resistance to class 3C3 per EN/IEC 60721-3-3. This provides resistance against: sea salts, sulphur dioxide, hydrogen sulphide, chlorine, hydrogen chloride, hydrogen fluoride, ammonia, ozone, and nitrogen oxides.
	ATV630U07M3...D75M3 ATV630U07N4...C16N4		Air borne debris pollution resistance to class 3S3 per EN/IEC 60721-3-3. This provides resistance against air borne debris such as dust and sand.
Relative humidity		%	5…95% without condensation or dripping water conforming to IEC 60068-2-3
Ambient air temperature around the device	Operation	°C	- 10…+ 50 without derating Up to 60 with derating per the derating curves in the Installation Manual.
	Storage	°C	- 40…+ 70
Maximum operating altitude	ATV630U07M3...D75M3 ATV630U07N4...C16N4	m	1000 without derating 1000…4800 derating the current by 1% per additional 100 m. Limited to 2000 m for the "Corner Grounded" distribution network
Operating position			Vertical position +/- 10 degrees

Certifications and Compliance

Conformity to standards		Altivar Process drives have been developed to conform to the strictest standards and the recommendations relating to electrical industrial control devices (UL,IEC, EN), in particular: UL508C, UL50, IEC/EN 61800-5-1, and IEC/EN 61800-3.
	Protection	UL508C (Standard for Power Conversion Equipment) UL 50 (Standard for Enclosures for Electrical Equipment) IEC 61000-3-12 (Harmonic standard) 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	EN/IEC 61800-5-1 (Standard for Adjustable Speed Electrical Power Drive Systems) EN/IEC 62061 EN ISO 13849-1 (functional safety) IEC 61508 (functional safety) IEC 60721-3 (classification of environmental conditions) IEC/EN 61800-3, environments 1 and 2, categories C2 and C3
	ATV630U07M3...D75M3	No integrated EMC filter
	ATV630U07N4...C16N4	Integrated EMC filter meets IEC/EN 61800-3: ■ Category C3 with up to 150 m of cable
CE marking		The drives are marked CE according to the European low voltage (2006/95/EC) and EMC (89/336/EEC) directives
Product certifications		UL 508C, UL File E116875, CSA, TUV, REACH
Degree of protection	ATV630U07M3...D45M3 ATV630U07N4...D90N4 ATV630D55M3...D75M3 w/ optional conduit kit ATV630C11N4...C16N4 w/ optional conduit kit	UL Type 1 conforming to UL 50: Standard for enclosures for Electrical Equipment. IP 21 conforming to IEC 60529 IP21 conforming to IEC 61800-5-1
	ATV630D55M3...D75M3 ATV630C11N4...C16N4	IP 00 conforming to IEC 60529 IP 00 conforming to IEC 61800-5-1

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I/O and Control Specifications

Description	Terminal	Electrical Characteristics
Available internal supplies for analog inputs	10 V, 24 V	Output supply for Analog Input: **10 V** ■ **1**0.5 Vdc ■ Tolerance ± 5% ■ Current: maximum 10 mA ■ Short circuit protected **24 V** ■ +24 Vdc ■ Tolerance: minimum 20.4 Vdc, maximum 27 Vdc ■ Current: maximum 200 mA for both 24 Vdc terminals ■ Terminal protected against overload and short-circuit ■ In Sink Ext position, this supply is powered by external PLC supply
For external + 24 V power supply	P24	External input supply +24 Vdc ■ Tolerance: minimum 19 Vdc, maximum 30 Vdc ■ Current: maximum 1.25 A
	0 V	0 V for P24
Analog input	AI1, AI2, AI3	Software-configurable V/A : voltage or current analog input ■ Voltage analog input 0...10 Vdc, impedance 30 kΩ, ■ Current analog input X-Y mA by programming X and Y from 0...20 mA, with impedance 250 Ω ■ Maximum sampling time: 5 ms ± 1 ms ■ Resolution 12 bits ■ Accuracy: ± 0.6% for a temperature variation of 60°C ■ Linearity ± 0.15% of maximum value Software-configurable for sensor inputs: PT1000 or KTY84 or PTC or Water level sensor ■ **PT100** □ 1 or 3 thermal sensors mounted in series (configurable by software) □ Sensor current: 5 mA □ Range −20/200°C □ Accuracy +/− 4°C for a temperature variation of 60°C ■ **PT1000** □ 1 or 3 thermal sensors mounted in series (configurable by software) □ Thermal sensor current: 1 mA □ Range −20/200°C □ Accuracy +/− 4°C for a temperature variation of 60°C ■ **KTY84** □ 1 thermal sensor □ Thermal sensor current: 1 mA □ Range −20/200°C □ Accuracy +/− 4°C for a temperature variation of 60°C ■ **PTC** □ 6 sensors maximum mounted in series □ Sensor current: 1 mA □ Nominal value: < 1.5 kΩ □ Overheat trigger threshold: 3 kΩ □ Overheat reset threshold: 1.8 kΩ □ Protected for low impedance < 50 Ω ■ **Water Level Sensor** □ Sensitivity: 0...1 MΩ, adjustable by software □ Water level sensor current: 0.3 mA...1 mA maximum □ Adjustable delay: 0...10 s
Analog I/O Common	COM	0 V for analog inputs
	Other inputs	Available on I/O option cards
Analog output	AQ1, AQ2	AQ: Analog output software-configurable for voltage or current ■ Voltage analog output 0...10 Vdc, minimum. Minimum load impedance 470 Ω, ■ Current analog output X-Y mA by programming X and Y from 0...20 mA, maximum load impedance 500 Ω ■ Maximum sampling time: 10 ms ± 1 ms ■ Resolution 10 bits ■ Accuracy: ± 1% for a temperature variation of 60°C ■ Linearity ± 0.2%
Analog I/O Common	COM	0 V for analog outputs

Relay outputs	R1A: NO contact R1B: NC contact R1C: Common point contact	**Output Relay 1** Minimum switching current: 5 mA for 24 V ⎓. Maximum switching current: ■ On resistive load (cos φ = 1): 3 A for 250 V ∿ or 30 V ⎓ ■ On inductive load (cos φ = 0.4 and L/R = 7 ms): 2 A for 250 V ∿ or 30 V ⎓ Refresh time: 5 ms ± 0.5 ms. Electrical service life: 100,000 operations at max. switching current.
	R2A: NO contact R2C: NC contact	**Output Relay 2** Minimum switching current: 5 mA for 24 V ⎓ Maximum switching current: ■ On resistive load (cos φ = 1): 3 A for 250 V ∿ or 30 V ⎓ ■ On inductive load (cos φ = 0.4 and L/R = 7 ms): 2 A for 250 V ∿ or 30 V ⎓ Refresh time: 5 ms ± 0.5 ms. Electrical service life: 100,000 operations at max. switching power.
	R3A: NO contact R3C: NC contact	**Output Relay 3** Minimum switching current: 5 mA for 24 V ⎓ Maximum switching current: ■ On resistive load (cos φ = 1): 3 A for 250 V ∿ or 30 V ⎓ ■ On inductive load (cos φ = 0.4 and L/R = 7 ms): 2 A for 250 V ∿ or 30 V ⎓ Refresh time: 5 ms ± 0.5 ms. Electrical service life: 100,000 operations at max. switching power.
	Other outputs	Available on I/O option cards.
Digital logic inputs	DI1-DI6	6 programmable logic inputs 24 V ⎓, compatible with IEC/EN 61131-2 logic type 1 ■ Positive logic (Source): State 0 if ≤ 5 Vdc or logic input not wired, state 1 if ≥ 11 Vdc ■ Negative logic (Sink):State 0 if ≥ 16 Vdc or logic input not wired, state 1 if ≤ 10 Vdc ■ Impedance: 3.5 kΩ. ■ Maximum voltage: 30 V. ■ Max. sampling time: 2 ms ± 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)
	DI5-DI6	Programmable for Pulse input ■ Comply with level 1 PLC, IEC 65A-68 standard ■ State 0 if < 0.6 Vdc, state 1 if > 2.5 Vdc ■ Pulse counter 0...30 kHz ■ Frequency range: 0…30 kHz ■ Cyclic ratio: 50 % ± 10 % ■ Maximum input voltage 30 Vdc, < 10 mA ■ Maximum sampling time: 5 ms ± 1 ms
	Positive logic (Source)	State 0 if ≤ 5 V or logic input not wired, state 1 if ≥ 11 V
	Negative logic (Sink)	State 0 if ≥ 16 V or logic input not wired, state 1 if ≤ 10 V
	Other inputs	Available on I/O option cards.
Safety Function STO Inputs	STOA, STOB	Input Signals Safety Function: ■ Current: 11 mA ■ Low voltage (Logic 0): <5 Vdc ■ High voltage (Logic 1): >11 Vdc ■ Response time of safety functions: <10ms The defined safety function is: ■ SIL 3 capability in compliance with IEC 61800-5-2 and IEC 61508 series Ed. 2 ■ Performance Level **e** in compliance with ISO 13849-1 ■ Compliant with the Category 3 and 4 of European standard ISO 13849-1

Safety Functions Manual

Schneider Electric

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	Physical Interface	RJ45
	Application	Modbus TCP
	Transport	TCP/UDP
	Network	IP protocol V4 and V6
	Link	Ethernet
	Transmission Speed	10/100 Mbits/s
	Connections	Up to 32 concurrent TCP/IP and/or TCP/UDP connections
Services	Operating Modes	Fixed, BOOTP, or DHCP
	Messages	DHCP?
	I/O Scanning	32 in, 32 out, configurable contiguous memory locations
	Profiles	Native CiA402 - IEC61800-7, I/O profile
	FDR	Automatic data configuration for replaced devices
	Web Server	Configuration and diagnostics via defined page: My Dashboard: allows customer defined views Display: data views in table and graphical formats Diagnostics: error code and self-evaluation Drive: parameter configuration Set-up: guided set-up configurations

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Additional Application Information

Using Altivar Process 600 drives with synchronous motors	Altivar Process 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. 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. **Driving a synchronous motor with sinusoidal electromotive force without speed feedback.** The entire range of Altivar Process 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.
Using special motors at high-speed	These motors are designed for constant torque applications with high frequency ranges. The Altivar Process drive supports operating frequencies of up to 500 Hz. Through their design, this type of motor is more sensitive to overvoltages than a standard motor. Various solutions are available: ■ Overvoltage limitation function ■ Output filters The drive's 5-point voltage/frequency control ratio is particularly well-suited as it avoids resonance.
Using a motor at overspeed	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. The application must be able to permit this type of low-torque, high-speed operation. 1. Machine torque (degressive torque) 2. Machine torque (low motor torque) 3. Continuous motor torque **Typical applications**: wood-working machinery, polishing and cutting machines.
Power of self-cooled motor greater than the drive power	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. Note: Limit the motor power to the standard rating immediately above that of the drive. 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. 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
Connecting motors in parallel	The nominal current of the drive must be greater than or equal to the sum of the currents of the motors to be controlled. 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. If several motors are used in parallel, there are two possible scenarios: ■ 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
Using a motor at constant torque up to 87/104 Hz	A 400 V, 50 Hz motor in $\curlywedge$ connection can be used at constant torque up to 87 Hz if it is in $\triangle$ connection. In this particular case, the initial motor power and the power of the first associated drive are multiplied by (it is therefore important to select a drive with a suitable rating). Example: A 2.2 kW 50 Hz motor in $\curlywedge$ connection supplies 3.8 kW at 87 Hz with a $\triangle$ connection. Note: Check the overspeed operating characteristics of the motor.

Using special motors	**Special brake motors: tapered rotor or flux bypass** The magnetic field releases the brake. This type of operation with the Altivar Process 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 STO 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 Process variable speed drive.
Resistive rotor asynchronous motors	Different motor control ratios available on the Altivar Process 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 STO 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.

Motor Cable Length

Impact of Long Motor Cable Lengths

Long motor cable lengths between a drive and motor may cause over current conditions, causing the drive to trip on short circuit or ground fault errors or cause over voltage conditions that cause premature wear on the motor. These phenomenon are often underestimated at the design and installation stage. Left un-checked, this neglect can lead to motor breakdown and unexpected down time.

Over current conditions may be caused by capacitive coupling between motor cables, generating enough current flow to ground, which causes the drive to trip on ground fault errors. Also capacitive coupling between motor cable may cause the drive to detect and trip on short circuit errors.

Over voltage conditions may be caused by the mismatched impedance of the cable and the motor. This mismatch of impedences causes the switching frequency pulsed output voltage from the drive to reflect back from the motor terminals. The result can be voltages at twice the level of the DC bus or higher, which can stress the drive, cable, motor windings and motor bearings.

Generally, longer motor cables yield higher voltages. This effect is amplified when by using shielded cable.

Preventative Measures

There are several steps provided below, beginning with the least costly, that can be taken to reduce nuisance trip errors and improve the life of the motor.
- Reduce the switching frequency of the drive to 2.5kHz or less.
- Use un-shielded motor cables.
- Specifiy a drive, like the Altivar Process, that has software functionality to help manage voltage wave reflection.
- Specify motors that are NEMA MG1 Part 31 or IEC60034-25 compliant.
- Specify output load reactors (also known as motor chokes) to limit voltage rise time
- Specify dV/dt filters to further limit voltage rise time
- Specify Sine wave filters (also known as sinus filters) that allow a smooth, lower voltage output wave form to the motor

Recommendations Additional Filters

The following table provides guidelines when to specify additional filters

Motor Cable Length (unshielded cable)	Motor Conforming to NEMA MG1 Part 31	Motor Not Conforming to NEMA MG1 Part 31
1 m (3.3 ft.) < Lm <50 m (164 ft.)	Filter not required	dV/dt filter
50 m (164 ft.) < Lm < 100 m (328.1 ft.)	Filter not required	Sinus filter
100 m (328.1 ft.) < Lm < 300 m (984.3 ft.)	Filter not required	Sinus filter
300 m (984.3 ft.) < Lm < 500 m (1640.4 ft.)	dV/dt filter	Sinus filter
500 m (1640.4 ft.) < Lm < 1000 m (3280.8 ft.)	Sinus filter	Sinus filter

Note: When calculating cable lengths for the purpose of guarding against these overvoltage situations, a shielded cable should count as twice the length of an unshielded cable. For example, if a shielded cable is 100 meters in actual length, it should be considered to be equal to a 200 meter length standard cable in the calculation.

Note: In applications where one drive is used to power multiple motors in parallel, the appropriate cable length should be calculated based on the sum of all the cables. For example, if three motors in parallel are connected to a single drive, each with a 20 meter (66 foot) cable, the total length that should be calculated in not 20 meters, but should be 60 meters (197 feet). Precautions must be taken to protect the VSD from any unexpected tripping.

ATV630U07M3

ATV630D15M3

ATV630D30M3

UL Type 1/IP 21

Motor		Line supply				Altivar Process					
Power indicated on rating plate [2]		Line current [3]		Apparent power	Maximum prospective line Isc	Maximum continuous current [2]	Maximum transient current for 60 s	Part number [1]	Frame size	Power dissipated	Power dissipated in enclosures w/ heat sink kit	Weight
ND: Normal Duty [4]		200 V	240 V									
HD: Heavy Duty [5]												
HP	kW	A	A	kVA	kA	A	A			w	w	lbs	kg
Three-phase supply voltage: 200...240 V drives													
ND	1	0.75	3	2.6	1.1	5	4.6	5.1	ATV630U07M3	1	28	27	9.5	4.3
HD	0.5	0.4	1.7	1.5	0.6	5	3.3	5						
ND	2	1.5	5.9	5	2.1	5	8	8.8	ATV630U15M3	1	53	29	9.5	4.3
HD	1	0.8	3.3	3	1.2	5	4.6	6.9						
ND	3	2.2	8.4	7.2	3.0	5	11.2	12.3	ATV630U22M3	1	74	32	9.9	4.5
HD	2	1.5	6	5.3	2.2	5	8	12						
ND	-	3	11.5	9.9	4.1	5	13.7	15.1	ATV630U30M3	1	104	34	9.9	4.5
HD	3	2.2	8.7	7.6	3.2	5	11.2	16.8						
ND	5	4	15.1	12.9	5.4	5	18.7	20.6	ATV630U40M3	1	141	38	10.1	4.6
HD	-	3	11.7	10.2	4.2	5	13.7	20.6						
ND	7.5	5.5	20.2	17.1	7.1	5	25.4	27.9	ATV630U55M3	2	179	47	17	7.7
HD	5	4	15.1	13	5.4	5	18.7	28.1						
ND	10	7.5	27.1	22.8	9.5	5	32.7	36	ATV630U75M3	2	254	53	17	7.7
HD	7.5	5.5	20.2	17.1	7.1	5	25.4	38.1						
ND	15	11	39.3	32.9	13.7	5	46.8	51.5	ATV630D11M3	3	452	62	30.4	13.8
HD	10	7.5	27.2	23.1	9.6	5	32.7	49.1						
ND	20	15	52.6	45.5	18.9	5	63.4	69.7	ATV630D15M3	4	486	87	60.19	27.3
HD	15	11	40.1	34.3	14.3	5	46.8	70.2						
ND	25	18.5	66.7	54.5	22.7	5	78.4	86.2	ATV630D18M3	4	595	97	60.19	27.3
HD	20	15	53.1	44.9	18.7	5	63.4	95.1						
ND	30	22	76.0	64.3	26.7	5	92.6	101.9	ATV630D22M3	4	707	107	60.19	27.3
HD	25	18.5	64.8	54.5	22.7	5	78.4	117.6						
ND	40	30	104.7	88.6	36.8	5	123	135.3	ATV630D30M3	5	862	129	124.78	56.6
HD	30	22	78.3	67.1	27.9	5	92.6	138.9						
ND	50	37	128.0	107.8	44.8	5	149	163.9	ATV630D37M3	5	1141	156	124.78	56.6
HD	40	30	104.7	88.6	36.8	5	123	184.5						
ND	60	45	155.1	130.4	54.2	10	176	193.6	ATV630D45M3	5	1367	175	124.78	56.6
HD	50	37	128.5	108.5	45.1	10	149	223.5						
ND	75	55	189	161	61.1	10	211	232.1	ATV630D55M3	6	1820	200	176.4	80
HD	60	45	156	134	50	10	176	264						
ND	100	75	256	215	83.7	10	282	310.2	ATV630D75M3	6	2660	240	176.4	80
HD	75	55	189	161	61.1	10	211	316.5						

(1) Altivar Process ATV630D11M3...D45M3 drives have been designed without an EMC filter. An additional filter can be added to help meet more stringent requirements and reduce electromagnetic emissions.
(2) These values are given for a nominal switching frequency of 4 kHz up to ATV630D22M3, or 2.5 kHz for ATV630D30M3...D45M3 for use in continuous operation.
The switching frequency is adjustable from 1…16 kHz for all ratings.
Above 2.5 or 4 kHz (depending on the rating), the drive will automatically reduce the switching frequency in the event of an excessive temperature rise. For continuous operation above the nominal switching frequency, derate the nominal drive current (see the derating curves on our website www. schneider-electric.com).
(3) Typical value for the indicated motor power and for the maximum prospective line Isc.
(4) Normal duty applications requiring an overload up to 110% for 60 seconds. Also known as variable torque loads
(5) Heavy duty applications requiring an overload up to 150% for 60 seconds. Also known as constant torque loads

Part number explanation

Product Family
Altivar 630 product family

Power Range (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)

ATV630

U●●
D●●
C●●

M3
N4

Supply Voltage
M3 = 200-240V 3P
N4 = 380-480V 3P

Dimensions

Frame size	W x H x D	
	inches	mm
1	5.67 x 12.58 x 7.98	144 x 319.6 x 202.7
2	6.8 x 15.93 x 9.1	173 x 404.7 x 231.1
3	8.3 x 21.5 x 9.13	211 x 545.9 x 232
4	8.6 x 26.5 x 10.7	226 x 673 x 271
5	11.42 x 36.3 x 12.7	290 x 922 x 322.5
6	11.8 x 33.46 x 15	300 x 850 x 380
6 with conduit box	11.8 x 45.47 x 15	300 x 1160 x 380

Programming Manual ATV 600

Installation Manual ATV 600

UL Type 1/IP 21

Motor						Line supply				Altivar Process					
Power indicated on rating plate (1) ND: Normal Duty (3) HD: HeavyDuty (4)		Line current (2)		Apparent power	Maximum prospective line Isc	Maximum continuous current (1)	Maximum transient current for 60 s			Part number (1)	Frame size	Power dissipated	Power dissipated in enclosures w/ heat sink kit	Weight	
		380 V	480 V												
HP	kW	A	A	kVA	kA	A	A					w	w	lbs	kg
Three-phase supply voltage: 380…480 V															
ND	1	0.75	1.5	1.3	1.1	5	2.2	2.4		ATV630U07N4	1	26	21	9.9	4.5
HD	0.5	0.37	0.9	0.8	0.7	5	1.5	2.3							
ND	2	1.5	3	2.6	2.2	5	4	4.4		ATV630U15N4	1	41	28	9.9	4.5
HD	1	0.75	1.7	1.5	1.2	5	2.2	3.3							
ND	3	2.2	4.3	3.8	3.2	5	5.6	6.2		ATV630U22N4	1	60	30	9.9	4.5
HD	2	1.5	3.1	2.9	2.4	5	4	6							
ND	-	3	5.8	5.1	4.2	5	7.2	7.9		ATV630U30N4	1	78	31	10.1	4.6
HD	3	2.2	4.5	4.0	3.3	5	5.6	8.4							
ND	5	4	7.6	6.7	5.6	5	9.3	10.2		ATV630U40N4	1	97	33	10.1	4.6
HD	-	3	6.0	5.4	4.5	5	7.2	10.8							
ND	7.5	5.5	10.4	9.1	7.6	5	12.7	14		ATV630U55N4	1	145	36	10.4	4.7
HD	5	4	8	7.2	6.0	5	9.3	14							
ND	10	7.5	13.8	11.9	9.9	5	16.5	18.2		ATV630U75N4	2	172	44	17	7.7
HD	7.5	5.5	10.5	9.2	7.6	5	12.7	19.1							
ND	15	11	19.8	17	14.1	5	23.5	25.9		ATV630D11N4	2	255	51	17	7.7
HD	10	7.5	14.1	12.5	10.4	5	16.5	24.8							
ND	20	15	27	23.3	19.4	5	31.7	34.9		ATV630D15N4	3	366	59	29.98	13.6
HD	15	11	20.6	18.1	15.0	5	23.5	35.3							
ND	25	18.5	33.4	28.9	24	5	39.2	43.1		ATV630D18N4	3	460	67	31.31	14.2
HD	20	15	27.7	24.4	20.3	5	31.7	47.6							
ND	30	22	39.6	34.4	28.6	5	46.3	50.9		ATV630D22N4	3	505	68	31.53	14.3
HD	25	18.5	34.1	29.9	24.9	5	39.2	58.8							
ND	40	30	53.3	45.9	38.2	5	61.5	67.7		ATV630D30N4	4	640	93	61.73	28.0
HD	30	22	40.5	35.8	29.8	5	46.3	69.5							
ND	50	37	66.2	57.3	47.6	5	74.5	82		ATV630D37N4	4	796	106	62.17	28.2
HD	40	30	54.8	48.3	40.2	5	61.5	92.3							
ND	60	45	79.8	69.1	57.4	10	88	96.8		ATV630D45N4	4	943	121	63.27	28.7
HD	50	37	67.1	59.0	49.1	10	74.5	111.8							
ND	75	55	97.2	84.2	70	10	106	116.6		ATV630D55N4	5	917	131	124.56	56.5
HD	60	45	81.4	71.8	59.7	10	88	132.0							
ND	100	75	131.3	112.7	93.7	10	145	159.5		ATV630D75N4	5	1369	174	127.87	58.0
HD	75	55	98.9	86.9	72.2	10	106	159.0							
ND	125	90	156.2	135.8	112.9	10	173	190.3		ATV630D90N4	5	1585	196	128.97	58.5
HD	100	75	134.3	118.1	98.2	10	145	217.5							
ND	150	110	201	165	121.8	10	211	232		ATV630C11N4	6	2060	230	176.4	80
HD	125	90	170	143	102.6	10	173	259.5							
ND	200	132	237	213	161.4	10	250	275		ATV630C13N4	6	2620	260	176.4	80
HD	150	110	201	165	121.8	10	180	270							
ND	250	160	284	262	201.3	18	302	332		ATV630C16N4	6	3410	300	176.4	80
HD	200	132	237	213	161.4	18	240	360							

(1) These values are given for a nominal switching frequency of 4 kHz up to ATV630D45N4, or 2.5 kHz for ATV630D55N4...D90N4 for use in continuous operation.
The switching frequency is adjustable from 1…16 kHz for all ratings.
Above 2.5 or 4 kHz (depending on the rating), the drive will automatically reduce the switching frequency in the event of an excessive temperature rise. For continuous operation above the nominal switching frequency, derate the nominal drive current (see the derating curves on our website www.schneider-electric.com).
(2) Typical value for the indicated motor power and for the maximum prospective line Isc.
(3) Normal duty applications requiring an overload up to 110% for 60 seconds. Also known as variable torque loads.
(4) Heavy duty applications requiring an overload up to 150% for 60 seconds. Also known as constant torque loads.

ATV630U75N4

ATV630D15N4

ATV630C11N4

Part number explanation

Product Family
Altivar 630 product family

Power Range (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)

ATV630

U●●
D●●
C●●

M3
N4

Supply Voltage
M3 = 200-240V 3P
N4 = 380-480V 3P

Dimensions

Frame size	W x H x D	
	inches	mm
1	5.67 x 12.58 x 7.98	144 x 319.6 x 202.7
2	6.8 x 15.93 x 9.1	173 x 404.7 x 231.1
3	8.3 x 21.5 x 9.13	211 x 545.9 x 232
4	8.6 x 26.5 x 10.7	226 x 673 x 271
5	11.42 x 36.3 x 12.7	290 x 922 x 322.5
6	11.8 x 33.46 x 15	300 x 850 x 380
6 with conduit box	11.8 x 45.47 x 15	300 x 1160 x 380

Programming Manual ATV 600

Installation Manual ATV 600

Schneider Electric

Remote graphic display terminal (example shows dynamic pump operation in relation to its optimum operation)
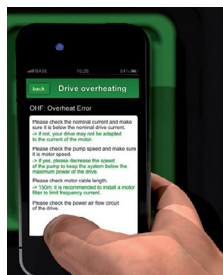

Detected fault: the screen's red backlight is activated automatically

Embedded dynamic QR codes for contextual, instantaneous access to online help

Scanning the QR code from a smartphone or tablet

Instant access to online help

Graphic display Keypad

This graphic display keypad is supplied with the Alivar Process drive. This keypad can be:

- Connected and mounted on the front of the drive
- Connected and mounted on an enclosure door using a remote mounting accessories
- Connected to a PC to exchange files via a Mini USB/USB connection
- Connected to several drives in multidrop mode

This keypad is used to:

- Control, adjust, and configure the drive
- Display current values (motor, I/O, and process data)
- Display graphic dashboards such as the energy consumption monitoring dashboard

- Store and download configurations (several configuration files can be stored in the 16 MB memory)
- Duplicate the configuration of one powered-up drive to another powered-up drive

- Copy configurations from a PC or drive and duplicate them on another drive (the drives must be powered on for the duration of the duplication operations)

Other keypad characteristics:

- Integrated languages covering many countries around the world
- 2-color backlit display (white and red); if an error is detected, the red backlight is activated automatically (This function can be disabled if needed)
- Operating range: -15...50 °C/*+5...122 °F*
- Type 12/ IP 65 protection
- Trend curves: graphic display of changes over time in monitoring variables, energy data, and process data
- Graphic display of a pump's dynamic operation in relation to its optimum operation
- Embedded dynamic QR codes for providing contextual, instantaneous access to online help (diagnostics and settings, etc.) using a smartphone or tablet
- Real-time clock with backup battery for providing data acquisition and event timestamping functions even when the drive is stopped
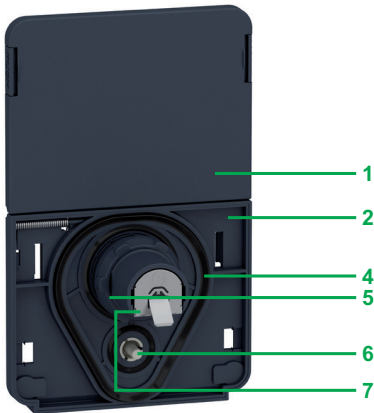
Description

Display:

- 8 lines, 240 x 160 pixels
- Displays bar charts, gauges, and trend charts
- 4 function keys to facilitate navigation and provide contextual links for enabling functions
- "STOP/RESET" button: local control of motor stop command/clearing detected faults
- "RUN" button: local control of motor run command
- Navigation buttons:
  - □ OK button: saves the current value (ENT)
  - □ Capacitive wheel dial ±: increases or decreases the value, goes to the next or previous line
  - □ "ESC" button: aborts a value, parameter, or menu to return to the previous selection
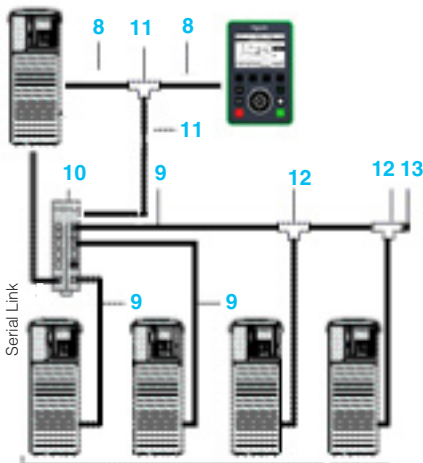 - □ home: root menu
  - □ information (*i*): contextual help

Part Number

Description	Part Number	Weight kg/lb
Graphic display keypad (supplied with drive)	**VW3A1111**	**0.200/0.441**

For remote mounting graphic display

VW3A1112 remote mounting kit for mounting graphic display terminal on enclosure door (front view)

This remote mounting kit is used to mount the graphic display keypad on an enclosure door and will provide Type 12/ IP65 degree rating.
The kit comprises:
1 Cover plate folds to close to maintain Type 12/ IP 65 rating when there is no terminal keypad mounted
2 Mounting plate
3 RJ45 port for the graphic display keypad
4 Seal
5 Fixing nut
6 Anti-rotation pin
7 RJ45 port for connecting the remote-mounting cordset
Cordsets must be ordered separately depending on the length required.
Drilling a hole with a standard Ø 22 tool, as used for a pushbutton, allows the unit to be mounted without needing a cut-out in the enclosure (Ø 22.5 mm/*Ø 0.89 in.* drill hole).

VW3A1112 remote mounting kit for mounting graphic display terminal on enclosure door (rear view)

Part Numbers

Description	Item no.	Length		Degree of Protection	Part Number	Weight		Price
		m	ft			lb	kg	
Remote mounting kit. Order with remote mounting cordset VW3A1104R●●●	-	-	-	Type 12 IP 65	VW3A1112	-	-	
Tightening tool for remote mounting kit	-	-	-	-	ZB5A1112	0.04	0.02	
Cordsets for use with remote mounting kit. Cords equipped with 2 RJ45 connectors	8	1	3.28	-	VW3A1104R10	0.11	0.05	
		3	9.84	-	VW3A1104R30	0.33	0.15	
		5	16.40	-	VW3A1104R50	0.55	0.25	
		10	32.81	-	VW3A1104R100	1.10	0.50	
USB/Mini B USB cable for connecting the display terminal to a PC	-	-	-	-	TCSXCNAMUM3P	-	-	
Enclosure mounting kit for Ethernet port Ø 22 RJ45 female/female adapter with seal	-	-	-	Type 12 IP 65	VW3A1115	0.44	0.20	
Modbus-Bluetooth Interface for serial Bluetooth connectivity via RJ45 Modbus port	-	-	-	-	TCSWAAC13FB	6.61	3	
Cordsets for Modbus serial link connections. Cords equipped with 2 RJ45 connectors	9	0.3	0.98	-	VW3A8306R03	0.06	0.03	
		1	3.28	-	VW3A8306R10	0.13	0.06	
		3	9.84	-	VW3A8306R30	0.29	0.13	

Multidrop connection accessories

These accessories are used to connect a graphic display terminal to several drives via a multidrop link. This multidrop connection uses the RJ45 terminal port on the front of the drive.

Connection accessories

Description		Item no.	Sold in lots of	Unit Part Number	Weight		Price
					lb	kg	
Modbus splitter box 10 RJ45 connectors and 1 screw terminal block		10	-	LU9GC3	1.10	0.50	
Modbus T-junction boxes	*With 0.3 m/0.98 ft integrated cable*	11	-	VW3A8306TF03	0.42	0.19	
	With 1 m/ 3.28 ft integrated cable	12	-	VW3A8306TF10	0.46	0.21	
Modbus line terminator	*For RJ45 connector*	*R=120 ● C= 1 nf*	13	2	VW3A8306RC	0.02	0.01

Altivar Process
Example of serial link architecture

Schneider Electric

SoMove setup software with Modbus-Bluetooth® adaptor for PC

SoMove Software
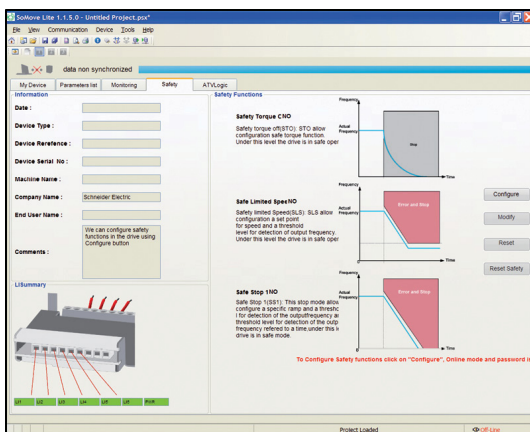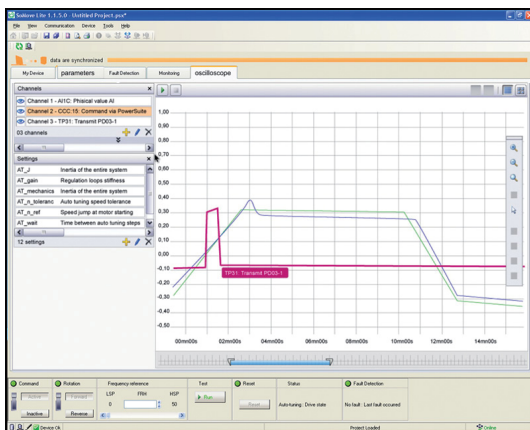
SoMove setup software

SoMove setup software is user-friendly software for PC designed for configuring multiple Schneider Electric motor control devices, including the Altivar Process drives. SoMove software 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 commissioning
- 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.

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

Kit for mounting heat sink & power section external to enclosure

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

Kits are available for frame sizes 1-5:
ATV630U07M3...ATV630D45M3
ATV630U07N4...ATV630D90N4

With this type of mounting, the enclosure size can be reduced as the enclosure surface area needed to dissipate the heat in the enclosure is minimized. See the selection tables for dissipated power of the drive and power dissipated in the enclosure when using this kit to mount the heat sink and power section out the back of the enclosure.

The back of the enclosure must be cut to accept the metal frame that comes with the kit.
The kit includes:
- A metal frame of the right frame size for the drive rating
- Seals
- Mounting screws
- Instruction sheet

For drives	Frame Size	Part number	Weight	
			lbs	kg
ATV630U07M3...ATV630U40M3 ATV630U07N4...ATV630U55N4	1	**NSYPTDS1**	6	2.7
ATV630U55M3...ATV630U75M3 ATV630U75N4...ATV630D11N4	2	**NSYPTDS2**	6.8	3.1
ATV630D11M3 ATV630D15N4...ATV630D22N4	3	**NSYPTDS3**	8.2	3.7
ATV630D15M3...ATV630D22M3 ATV630D30N4...ATV630D45N4	4	**NSYPTDS4**	10.1	4.6
ATV630D30M3...ATV630D45M3 ATV630D55N4...ATV630D90N4	5	**NSYPTDS5**	10.8	4.9

UL Type 1 Conduit Kit

This kit can be used with the frame size 6 Altivar Process 630 to obtain a UL Type 1 rated enclosure installation. This is kit is field installed. Frame sizes 1-5 of the Altivar 630 range come standard with a UL Type 1 rated enclosure.

This kit is available for:
ATV630D55M3…ATV630D75M3
ATV630C11N4…ATV630C16N4.

This kit provides numerous conduit entrance knockouts to properly separate incoming line power cables, output motor cables, control wiring, and any communication cabling.

The kit includes:
- Metal casing to fit up to the bottom of the frame size 6 Altivar Process 630
- Conduit knock-outs on the bottom of the casing
- Mounting screws
- Instruction sheet

For drives	Frame Size	Part number	Weight	
			lbs	kg
ATV630D55M3...ATV630D75M3 ATV630C11N4...ATV630C16N4	6	VW3A9704	-	-

Schneider Electric

Altivar Process 600 variable speed drives

Accessories & Options

Options Common to Altivar Process

VW3A1111

VW3A1112

VW3A3720

VW3A3203

List of options common to Altivar Process drives

Description	Part number
Graphic Display Keypad	
Graphic display keypad	**VW3A1111**
Remote Mounting Kit	**VW3A1112**
I/O expansion cards [1]	
I/O expansion option card 6 logic inputs, 2 logic outputs, 1 analog input	**VW3A3203**
Relay out card 3 Relay outputs with NO contacts	**VW3A3204**

Communication cards [1]

Description	Part number
CANopen daisy chain card w/ 2 RJ45 connectors	**VW3A3608**
CANopen SUB-D card	**VW3A3618**
CANopen card w/ 1x5-way screw terminal block	**VW3A3628**
EtherNet/IP and Modbus TCP dual port card	**VW3A3720**
ProfiNet card w/ 2 RJ45 connectors	**VW3A3627**
PROFIBUS DP V1 card	**VW3A3607**
DeviceNet card	**VW3A3609**

I/O extension cards

Presentation

By installing I/O expansion cards Altivar Process drives can be adapted to meet the needs of applications that manage additional sensors or specific sensors.

2 expansion cards are available:
- Logic and analog I/O card
- Relay output card

These cards insert into slots A and B on Altivar Process drives:
1 Slot A for I/O expansion or communication cards
2 Slot B for I/O expansion cards only

VW3A3203

Logic and analog I/O card

- 2 differential analog inputs configurable via software as current (0-20 mA/4-20 mA) or probe (PTC, PT100, or 2-wire or 3-wire PT1000) inputs
- 14-bit resolution
- 6 x 24 V ⎓ positive or negative logic inputs
- sampling: 1 ms max.
- 2 assignable logic outputs
- 2 removable spring terminal blocks

Relay output card

- 3 relay outputs with NO contacts
- 1 fixed screw terminal block

Note: Logic and analog I/O cards and relay output cards can go in either slot A or slot B on Altivar Process drives.
However, the drives cannot take 2 cards of the same type (e.g., 2 logic and analog I/O cards or 2 relay output cards).

VW3A3204

Description	Type of I/O				Part number	Weight
	Logic input	Logic output	Relay output	Analog input		lbs/kg
Logic and analog I/O card	6	2	–	2[1]	**VW3A3203**	-
Relay output card	–	–	3[2]	–	**VW3A3204**	-

(1) Differential analog inputs configurable via software as current (0-20 mA/4-20 mA) or probe (PTC, PT100, or 2-wire or 3-wire PT1000) inputs. When configured as PTC probe inputs, they must never be used to protect an ATEX motor for applications in explosive atmospheres. Please refer to the ATEX guide on our website www.schneider-electric.com.
(2) NO contacts

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VW3A3203

Maximum Wire Size: 1.0 mm2 (AWG 16)

Pin	Terminal	Function	Electric Characteristics
1	SHLD	Shield connection AI4	**Soe-configurable Voltage, current, PT100, PT1000, KTY84,** **PTC measurement: Voltage differential input circuit:** ■ Range: -10 Vdc...+10Vdc
2	AI4+		■ Impedance: 20kΩ ■ Resolution: 11 bit + sign bit ■ Accuracy: +/- 0.6% for a temperature variation of 60°C ■ Linearity: +/- 0.15% of max. value
3	AI4-	Differential Analog Input 4 Depending on SW configuration Differential Voltage measurement PTx measurement 0...20mA measurement AI4- reference potential for AI4+	**Current measurement:** ■ Range: X-Y mA by programming X and Y from 0 to 20 mA ■ Impedance: 250Ω ■ Resolution: 10 bit ■ Accuracy: +/- 0.6% for a temperature variation of 60°C ■ Linearity: +/- 0.15% of max. value ■ Sampling period: 1 ms
4	AI4+L	3 wire PTx compensation connection	**PTx measurement:** Type of PTx and mode selected via parameter PT100, PT1000, PTC, KTY84
5	SHLD	Shield connection AI5	■ **PT100:** □ 1 or 3 thermal sensors mounted in series (configurable by software) □ Thermal sensor current: 7,5 mA max □ Range: -20...200°C □ Accuracy: +/- 3°C final for a temperature variation of 60°C
6	AI5+		■ **PT1000, KTY84:** □ 1 or 3 thermal sensors mounted in series (configurable by software) □ Thermal sensor current: 1 mA max □ Range: -20...200°C □ Accuracy: +/- 3°C final for a temperature variation of 60°C
7	AI5-	Differential Analog Input 5 Depending on SW configuration Differential Voltage measurement PTx measurement 0...20 mA measurement AI5- reference potential for AI5+	■ **PTC:** □ 3 or 6 thermal sensors mounted in series (configurable by software) □ Thermal sensor current: 1 mA max □ Nominal value: <1.5 kΩ
8	AI5+L	3 wire PTx compensation connection	□ Overheat trigger threshold: 3 kΩ □ Overheat reset threshold: 1.8 kΩ □ protected for low impedance: <50 Ω □ detection of high impedance: >100kΩ
9	DQ12	Digital output 12	The levels of the digital 24 Vdc output signals DQ, comply with IEC/EN61131-2 standard ■ Logic Type selected via DQCOM wiring ■ Output voltage: ≤ 30Vdc ■ Switching current: ≤ 100mA ■ Voltage drop at 100 mA load: ≤ 3Vdc ■ Sampling period: 1 ms
10	DICOM	Digital input common Reference potential for the digital inputs	The levels of the digital 24 Vdc input signals DI, comply with IEC/EN61131-2 standard ■ Logic Type selected via DICOM wiring ■ Positive logic (Source): State 0 if ≤ 5Vdc, state 1 if ≥11Vdc
11	DI11	Digital input 11	
12	DI12	Digital input 12	■ Negative logic (Sink): State 0 if ≥16Vdc, state 1 if ≤ 10Vdc
13	DI13	Digital input 13	■ Maximum voltage: 30 Vdc
14	DI14	Digital input 14	■ Input current (typical): 2.5 mA
15	DI15	Digital input 15	■ Sampling period: 1 ms
16	DI16	Digital input 16	
17	DQCOM	Digital output common Reference potential for the digital outputs	The levels of the digital 24 Vdc output signals DQ, comply with IEC/EN61131-2 standard ■ Logic Type selected via DQCOM wiring ■ Output voltage: ≤ 30Vdc
18	DQ11	Digital output 11	■ Switching current: ≤ 100mA ■ Voltage drop at 100 mA load: ≤ 3Vdc ■ Sampling period: 1 ms

Note: Only one VW3A3203 can be installed for one drive

Schneider Electric

VW3A3204

Maximum Wire Size: 1.5 mm2 (AWG 16)

Pin	Terminal	Function	Electric Characteristics
1	R4A		**Programmable Output Relay 4:** ■ Min. switching current: 5 mA for 24 Vdc ■ Max. switching current on resistive load: (cos =1): 3 A for 250 Vac and 30 Vdc ■ Max. switching current on inductive load: (cos =0.4 and L/R= 7 ms): 2 A for 250 Vac and 30 Vdc ■ Refresh time: 5 ms +/- 0.5 ms ■ Service life: 100,000 operations at max switching power
2	R4C	NO contact of relay R4	
3	R5A		**Programmable Output Relay 5:** ■ Min. switching current: 5 mA for 24 Vdc ■ Max. switching current on resistive load: (cos =1): 3 A for 250 Vac and 30 Vdc ■ Max. switching current on inductive load: (cos =0.4 and L/R= 7 ms): 2 A for 250 Vac and 30 Vdc ■ Refresh time: 5 ms +/- 0.5 ms ■ Service life: 100,000 operations at max switching power
4	R5C	NO contact of relay R5	
5	R6A		**Programmable Output Relay 6:** ■ Min. switching current: 5 mA for 24 Vdc ■ Max. switching current on resistive load: (cos =1): 3 A for 250 Vac and 30 Vdc ■ Max. switching current on inductive load: (cos =0.4 and L/R= 7 ms): 2 A for 250 Vac and 30 Vdc ■ Refresh time: 5 ms +/- 0.5 ms ■ Service life: 100,000 operations at max switching power
6	R6C	NO contact of relay R6	

Note: Only one VW3A3204 can be installed for one drive

Communication buses and networks

Altivar Process drives have 3 built-in RJ45 communication ports as standard:
■ 1 Ethernet port
■ 2 serial ports

Integrated communication protocols

Altivar Process drives integrate the Modbus TCP and Modbus serial link communication protocols as standard.

■ Ethernet port
This offers standard services regularly used in industrial networks:
  □ Modbus TCP message handling is based on the Modbus protocol and is used to exchange process data with other network devices (e.g., a PLC). It provides Altivar Process drives with access to the Modbus protocol and to the high performance of the Ethernet network, which is the communication standard for numerous devices.
  □ SNMP (Simple Network Management Protocol) offers standard diagnostics services for network management tools.
  □ The FDR (Fast Device Replacement) service allows automatic reconfiguration of a new device installed to replace an existing device.
  □ Possibility to reinforce device security by disabling some unused services as well as managing a list of authorized devices.
  □ Setup and adjustment tools (SoMove, Unity with DTM) can be connected locally or remotely.
  □ The embedded Web server is used to display operating data and dashboards as well as configure and diagnose process elements from any web browser.
     - These numerous services offered by the Ethernet port mean that Altivar Process drives can be integrated into Schneider Electric solutions.
■ Serial ports
  □ One port dedicated to field network operation for exchanging data with other devices via the Modbus protocol
  □ A second dedicated port for the multidrop connection of the following HMIs and configuration tools:
     - the remote graphic display terminal supplied with the drive
     - a Magelis industrial HMI terminal
     - a PC with SoMove or Unity setup software

The detailed specifications for the Ethernet or serial communication ports, and the Modbus and Modbus TCP protocols are available on our website www.schneider-electric.com.

Description

1 RJ45 Ethernet port
2 RJ45 serial port
3 Slot A for I/O expansion or communication cards
4 Slot B for I/O expansion cards
5 Removable screw terminal blocks for 24 V c power supply and integrated I/O
6 RJ45 serial link for HMI (remote graphic display terminal, Magelis terminal, etc.)

Altivar Process drives can only take one communication card, in slot A 3 only.
They cannot take 2 cards of the same type (e.g., 2 logic and analog I/O cards or 2 relay output cards).
The drives can take one logic and analog I/O card and one relay output card in either slot A 3 or slot B 4.

Note: The user manuals and description files (gsd, eds, xif) for devices on the communication buses and networks are available on our website www.schneider-electric.com.

PF140354
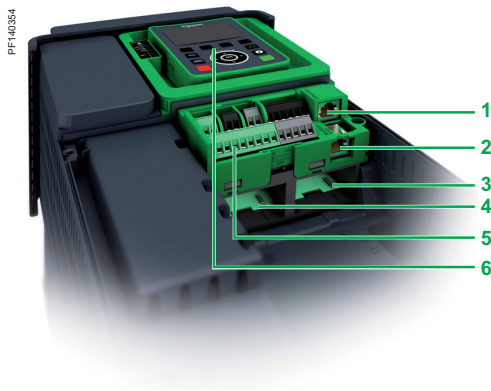
Optional communication cards

Altivar Process drives can also be connected to other industrial communication buses and networks using one of the communication cards available as an option. Communication cards are supplied in "cassette" format for ease of mounting/removal.

Dedicated communication cards:
■ EtherNet/IP and Modbus TCP dual port
■ CANopen:
  □ RJ45 daisy chain
  □ SUB-D
  □ Screw terminals
■ ProfiNet
■ PROFIBUS DP V1
■ DeviceNet

ProfiNet and PROFIBUS DP V1 cards also support the Profidrive and CiA402 profiles. It is possible to maintain communication using a separate power supply for the control and power sections. Monitoring and diagnostics are possible via the network even if there is no power supply to the power section.

Functions

All drive functions can be accessed via the various communication networks:
■ Configuration
■ Adjustment
■ Control
■ Monitoring

Altivar Process drives offer a high degree of interfacing flexibility with the possibility to assign, by configuration, the different control sources (I/O, communication networks, and HMI terminal) to control functions in order to meet the requirements of complex applications.

Network services and parameters are configured using the SoMove drive setup software, or in Unity software if the drive is being integrated into a PlantStruXure architecture.

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 detected communication interruption, as follows:
■ Define the type of stop when a communication interruption is detected
■ Maintain last command received
■ Fallback position at preset speed
■ Ignore the detected communication interruption
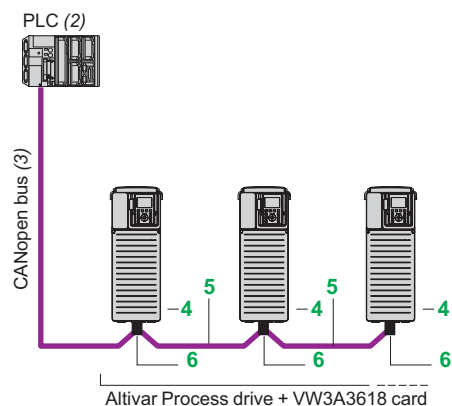
Schneider Electric
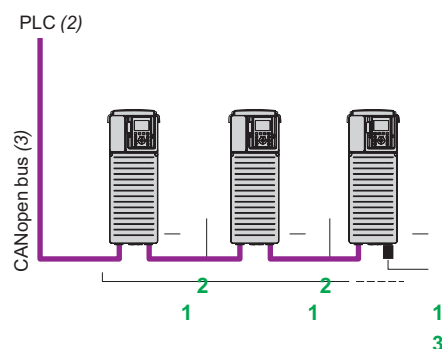
VW3A3608

VW3A3618

Altivar Process drive + VW3A3608 card

Optimized solution for daisy chain connection to the CANopen bus

Altivar Process drive + VW3A3618 card

Example of connection to the CANopen bus via SUB-D connector

CANopen machine bus [4]

Description	Item no.	Length		Part number	Weight	
		ft	m		lbs	kg
Communication card						
CANopen daisy chain card Ports: 2 RJ45 connectors	1	–	–	VW3A3608	–	–
		–	–		–	–
Connection to RJ45 connector (optimized solution for daisy chain connection on CANopen bus)						
CANopen cordsets equipped with 2 RJ45 connectors	2	0.98	0.3	VW3CANCARR03	0.11	0.05
		3.28	1	VW3CANCARR1	1.10	0.50
CANopen line terminator for RJ45 connector	3	–	–	TCSCAR013M120	–	–
Communication card						
CANopen SUB-D card Ports: 1 x 9-way male SUB-D connector	4	–	–	VW3A3618	–	–
Connection to SUB-D connector						
CANopen cables [3][4] Standard cable, CE mark Low smoke zero halogen Flame-retardant (IEC 60332-1)	5	164.04	50	**TSXCANCA50**	10.87	4.93
		328.08	100	**TSXCANCA100**	19.40	8.80
		984.25	300	**TSXCANCA300**	54.15	24.56
CANopen cables [3][4] UL certification, CE mark Flame-retardant (IEC 60332-2)	5	164.04	50	**TSXCANCB50**	7.89	3.58
		328.08	100	**TSXCANCB100**	17.28	7.84
		984.25	300	**TSXCANCB300**	48.22	21.87
CANopen cables [3][4] Cable for harsh environments or mobile installments, CE mark Low stroke zero halogen Flame retardant (IEC 60332-1)	5	164.04	50	**TSXCANCD50**	7.74	3.51
		328.08	100	**TSXCANCD100**	17.13	7.77
		984.25	300	**TSXCANCD300**	17.13	7.77
IP 20 straight CANopen connector [5] 9-way female SUB-D connector with line terminator that can be deactivated. For connecting CAN-H, CAN-L, and CAN-GND	6	–	–	TSXCANKCDF180T	0.11	0.05

(1) Altivar Process drives can only take one communication card.
(2) Please refer to the "Modicon™ automation platform" catalogs on our website www.schneider-electric.com.
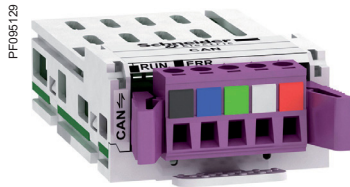*(3) Cable depends on the PLC.*
(4) Standard environment:
  - no particular environmental constraints
  - operating temperature between +5 and +60 °C/+41 and +140 °F
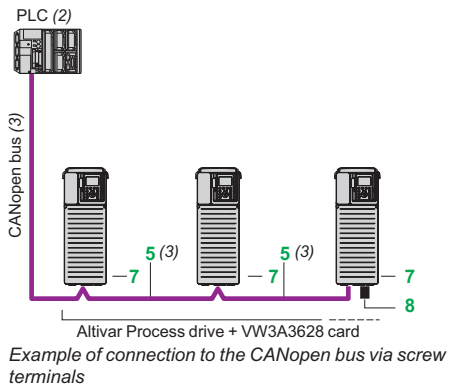 *- fixed installation*
  Harsh environment:
  - resistance to hydrocarbons, industrial oils, detergents, solder splashes
  - relative humidity up to 100%
  - saline atmosphere
  - operating temperature between -10 and +70 °C/+14 and +158 °F
  - significant temperature variations
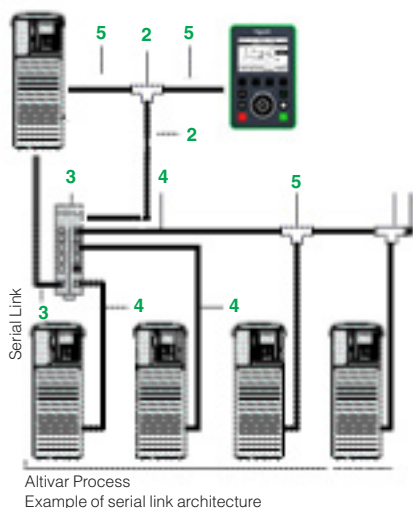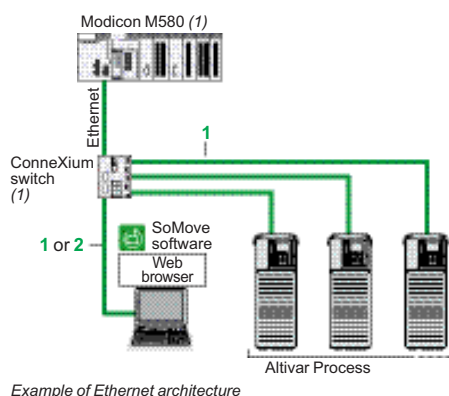*(5) Only straight connectors are compatible with Altivar Process drives.*

Schneider Electric

VW3A3628

Example of connection to the CANopen bus via screw terminals

CANopen bus (continued) [1]

Description	Item no.	Length		Part number	Weight	
		ft	m		lbs	kg
CANopen card Port: 1 x 5-way screw terminal block	**7**	–	–	**VW3A3628**	–	–
Connection to screw terminals						
IP 20 CANopen cordsets [3] equipped with 2 x 9-way female SUB-D connectors. Standard cable, CE mark, low smoke zero halogen, flame retardant (IEC 60332-1)	**5**	0.98	0.3	**TSXCANCADD03**	0.20	0.09
		3.28	1	**TSXCANCADD1**	0.32	0.14
		9.84	3	**TSXCANCBDD3**	0.59	0.27
		16.40	5	**TSXCANCBDD5**	0.88	0.40
IP 20 CANopen junction boxes equipped with: ■ 4 x 9-way male SUB-D connectors + screw terminal block for trunk cable tap link ■ line terminator	–	–	–	**TSXCANTDM4**	0.43	0.20
IP 20 CANopen junction boxes equipped with: ■ 2 screw terminal blocks for trunk cable tap link ■ 2 RJ45 connectors for connecting drives ■ 1 RJ45 connector for connecting a PC	–	–	–	**VW3CANTAP2**	–	–
CANopen line terminator for screw terminal connector [4]	**8**	–	–	**TCSCAR01NM120**	–	–

(1) Altivar Process drives can only take one communication card.
(2) Please refer to the "Modicon automation platform" catalogs on our website
  www.schneider-electric.com.
(3) Cable depends on the PLC.
(4) Order in multiples of 2.

Modicon M580 *(1)*

ConneXium switch *(1)*

SoMove software

Web browser

Altivar Process

Example of Ethernet architecture

Serial Link

Altivar Process
Example of serial link architecture

Integrated Ethernet port

Description	Item	Length		Part number	Weight	
		ft	**m**		**lbs**	**kg**
ConneXium cordsets [2]						
Straight shielded twisted pair cables equipped with 2 RJ45 connectors conforming to EIA/TIA-568 category 5 and IEC 11801/EN 50173-1 class D	1	6.56	2	**490NTW00002**	-	-
		16.40	5	**490NTW00005**	-	-
		39.37	12	**490NTW00012**	-	-
Crossover shielded twisted pair cables equipped with 2 RJ45 connectors conforming to EIA/TIA-568 category 5 and IEC 11801/EN 50173-1 class D	2	16.40	5	**490NTC00005**	-	-
		49.21	15	**490NTC00015**	-	-
Straight shielded twisted pair cables equipped with 2 RJ45 connectors conforming to UL and CSA 22.1	1	6.56	2	**490NTW00002U**	-	-
		16.4	5	**490ntw00005U**	-	-
		39.37	12	**490NTW00012U**	-	-
Crossover shielded twisted pair cables equipped with 2 RJ45 connectors conforming to UL and CSA 22.1	2	16.4	5	**490NTC00005U**	-	-
		49.21	15	**490NTC00015U**	-	-

Integrated serial port

Description		Item	Length		Part number	Weight	
			ft	**m**		**lbs**	**kg**
Connection accessories							
Splitter box 10 RJ45 connectors and 1 screw terminal block		3	-	-	**LU9GC3**	1.10	0.50
Modbus T-junction boxes	With 0.3 m/0.98 ft integrated cable	5	0.98	0.3	**VW3A8306TF03**	0.42	0.19
	With 1 m/3.28 ft. integrated cable	5	3.28	1	**VW3A8306TF10**	0.46	0.21
Modbus line terminator [4] equipped with 2 RJ45 connectors conforming to UL and CSA 22.1	For RJ45 connector R=120 Ω C= 1 nf	6	-	-	**VW3A8306RC**	0.02	0.01
Cordsets equpped with 2 RJ45 connectors		4	0.98	0.3	**VW3A8306R03**	0.06	0.03
			3.28	1	**VW3A8306R10**	0.13	0.06
			9.84	3	**VW3A8306R30**	0.29	0.13

(1) Please refer to the "Modicon automation platform" catalogs on our website www.schneider-electric.com.
(2) Also exist in 40 and 80 m/131 and 262 ft. lengths. For other ConneXium connection accessories, please consult our website www.schneider-electric.com.
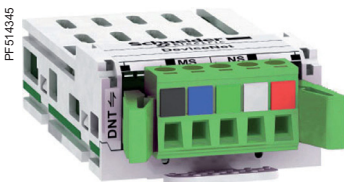*(3) Cable depends on the PLC.*
(4) Order in multiples of 2.
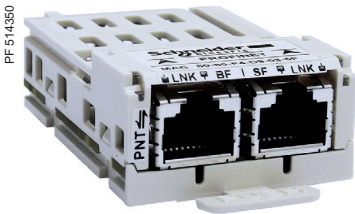
VW3A3627

VW3A3607

VW3A3609

ProfiNet bus [1]

Description	Length		Part number	Weight	
	ft	m		lbs	kg
Communication cards					
ProfiNet card equipped with 2 RJ45 connectors	-	–	**VW3A3627**	0.64	0.29

PROFIBUS DP V1 bus [1]

Communication cards					
PROFIBUS DP V1 card Port: 1x9-way female SUB-D connector, conforming to PROFIBUS DP V1 Profiles supported: ■ CiA 402 drive ■ Profidrive Offers several message-handling modes based on DPV1	-	-	**VW3A3607**	0.31	0.14
SUB-D connection					
IP 20 straight connectors [2] for Profibus card	-	-	**LU9AD7**	-	-

DeviceNet bus [3]

Description	Length		Part number	Weight	
	ft	m		lbs	kg
Communication cards					
DeviceNet card Port: 1 removable 5-way screw connector Profiles supported: ■ CIP AC DRIVE ■ CiA 402 drive	-	-	**VW3A3609**	0.66	0.30

(1) Altivar Process drives can only take one communication card.
(2) Only straight connectors are compatible with Altivar Process drives.
(3) Altivar Process drives can only take one communication card.

Altivar Process 600 variable speed drives

Accessories & Options
Connectivity

VW3A3720

Modicon M580 *(2)*

SoMove software
Web browser

2 **2** **2** **2 or 3**
1 **1** **1**
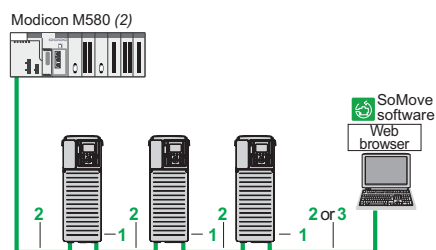
Altivar Process drive + VW3A3720 card

Example of connection on an EtherNet/IP network

EtherNet/IP and Modbus TCP networks

Description	Item	Length		Part number	Weight	
		ft	m		lbs	kg
Communication card						
EtherNet/IP and Modbus TCP dual port card For connection to the Modbus TCP network or EtherNet/IP network. Ports: 2 RJ45 connectors ■ 10/100 Mbps, half duplex and full duplex ■ Embedded Web server Requires cordset 490NTW000●●/●●U or 490NTC000●●/●●U	**1**	-	-	**VW3A3720**	0.04	0.02
ConneXium™ cordsets *(3)*						
Straight shielded twisted pair cables equipped with 2 RJ45 connectors conforming to EIA/TIA-568 categroy 5 and IEC 11801/EN 50173-1 class D	**2**	6.56	2	**490NTW00002**	-	-
		16.40	5	**490NTW00005**	-	-
		39.37	12	**490NTW00012**	-	-
Crossover shielded twisted pair cables equipped with 2 RJ45 connectors conforming to EIA/TIA-568 categroy 5 and IEC 11801/EN 50173-1 class D	**3**	16.40	5	**490NTC00005**	-	-
		49.21	15	**490NTC00015**	-	-
Straight shielded twisted pair cables equipped with 2 RJ45 connectors conforming to UL and CSA 22.1	**2**	6.56	2	**490NTW00002U**	-	-
		16.40	5	**490NTW00005U**	-	-
		39.37	12	**490NTw00012U**	-	-
Crossover shielded twisted pair cables equipped with 2 RJ45 connectors conforming to UL and CSA 22.1	**3**	16.40	5	**490NTC00005U**	-	-
		49.21	15	**490NTC00015U**	-	-

*(1) Altivar Process drives can only take one communication card.*
(2) Please refer to the "M580 automation platform" catalog on our website www.schneider-electric.com.
(3) Also exist in 40 and 80 m/131 and 262 ft lengths. For other ConneXium connection accessories, please consult our website www.schneider-electric.com.

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Quality Assurance

This document communicates a summary of the processes, procedures and quality assurance that are in place for the manufacturing of the Altivar Process 600. Altivar Process 600 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.
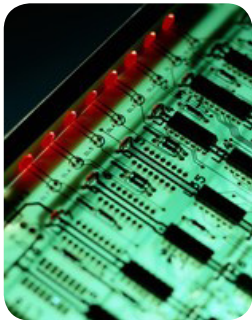
Outline of Test Process and Procedures

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 preformed on the drive and its main components. Each tracked process must have been completed successfully to proceed. These include:
- Supplier preformed 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

Altivar Process 600 variable speed drives

Quality Assurance

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 l
- 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

Design
Build
Operate Maintain
Improve
Renew
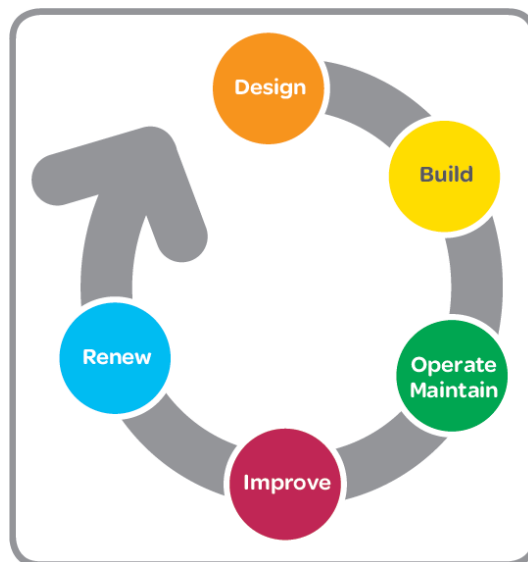
Talk to someone you can trust

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 6:00 am until 8:00 pm Eastern time to assist with product selection, 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	**1-866-507-0904**
Fax	**859-372-1565**
Email	**customer.training@schneider-electric.com**

>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**

AC Drives & Soft Starters Family:

For more information on the entire Schneider Electric product offer for AC drives and Soft starters, follow the links below:

Scheider Electric Website

Altivar and Altistart Product Brochure