

# Product datasheet

Specifications



## enclosed variable speed drive ATV61 Plus-LH - 500 KW 400V - IP23 - low harmonic

ATV61EXC2C50N4H

 **Discontinued on:** Jan 23, 2021

 **Discontinued**

### Main

|                           |   |
|---------------------------|---|
| Range Of Product          | Altivar 61 Plus-LH  |
| Product Or Component Type | Variable speed drive  |
| Device Short Name         | ATV61   |
| Product Destination       | Asynchronous motors<br>Synchronous motors   |
| Assembly Style            | In floor-standing enclosure compact version   |
| Kit Composition           | A wired ready-assembled Schneider Spacial SF enclosure<br>Active infeed converter<br>ATV61HC50N4D standard drive IP00<br>Terminals/bars for motor connection<br>Clean power filter with integrated EMC filter<br>A switch and fast-acting fuses<br>An IP65 remote mounting kit for graphic display terminal<br>Power supply 24 V DC<br>A line choke<br>Control transformer 230 V AC |
| Emc Filter                | Integrated  |
| Network Number Of Phases  | 3 phases  |
| Rated Supply Voltage      | 380...415 V +/- 10 %  |
| Supply Voltage Limits     | 342...457 V   |
| Supply Frequency          | 50...60 Hz - 5...5 %  |
| Network Frequency Limits  | 47.5...63 Hz  |
| Motor Power Kw            | 500 kW, 3 phases at 380...415 V   |
| Line Current              | 780 A at 400 V3 phases / 500 kW   |
| Ip Degree Of Protection   | IP23  |

### Complementary

|                              |   |
|------------------------------|---|
| Apparent Power               | 540 kVA for 400 V, 3 phases 500 kW  |
| Prospective Line Isc         | 100 kA with external fuses<br>35 kA without external fuses<br>70 kA with option circuit breaker |
| Continuous Output Current    | 941 A, 2.5 kHz at 400 V 3 phases  |
| Maximum Transient Current    | 1129 A (duration=60 s) at 400 V 3 phases  |
| Speed Drive Output Frequency | 0.1...500 Hz  |
| Nominal Switching Frequency  | 2.5 kHz   |
| Switching Frequency          | 2...8 kHz adjustable<br>2.5...8 kHz with derating factor  |

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

|  |  |
|--|--|
| <b>Speed Range</b>                           | 1...100 in open-loop mode, without speed feedback  |
| <b>Speed Accuracy</b>                        | +/- 10 % of nominal slip 0.2 Tn to Tn without speed feedback   |
| <b>Torque Accuracy</b>                       | +/- 15 % in open-loop mode, without speed feedback   |
| <b>Transient Overtorque</b>                  | 120 % of nominal motor torque for 60 s   |
| <b>Braking Torque</b>                        | 100 % continuous<br>120 % for 60 seconds   |
| <b>Asynchronous Motor Control Profile</b>    | Voltage/frequency ratio (2 or 5 points)<br>Energy saving ratio<br>Flux vector control without sensor, standard   |
| <b>Synchronous Motor Control Profile</b>     | Vector control without sensor, standard  |
| <b>Regulation Loop</b>                       | Adjustable PI regulator  |
| <b>Motor Slip Compensation</b>               | Not available in voltage/frequency ratio (2 or 5 points)<br>Can be suppressed<br>Adjustable<br>Automatic whatever the load   |
| <b>Overvoltage Category</b>                  | Class 3 conforming to EN 50178   |
| <b>Local Signalling</b>                      | LCD display unit for operation function, status and configuration - mounted in the front door  |
| <b>Output Voltage</b>                        | <= power supply voltage  |
| <b>Isolation</b>                             | Between power and control terminals  |
| <b>Type Of Cable</b>                         | IEC cable at 40 °C, copper 70 °C / PVC   |
| <b>Electrical Connection</b>                 | Terminal - 2.5 mm <sup>2</sup> / AWG 14 (AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR) entry from the bottom<br>Bar M12 - 4 x 300 mm <sup>2</sup> (L1/R, L2/S, L3/T) entry from the bottom<br>Bar M12 - 4 x 240 mm <sup>2</sup> (U/T1, V/T2, W/T3) entry from the bottom   |
| <b>Motor Recommended Cable Cross Section</b> | 4 (3 x 185) mm <sup>2</sup>  |
| <b>Short-Circuit Protection</b>              | 550 A 2 fuses type gI - power supply upstream  |
| <b>Supply</b>                                | External supply: 24 V (19...30 V)DC, <1 A, 30 W<br>Internal supply for reference potentiometer: 10 V (10...11 V)DC, <10 mA<br>Internal supply: 24 V (21...27 V)DC, <100 mA   |
| <b>Analogue Input Number</b>                 | 2  |
| <b>Analogue Input Type</b>                   | AI2 software-configurable voltage: 0...10 V DC, 24 V max, impedance: 30 kOhm, sampling time: 1.5...2.5 ms, resolution: 11 bits<br>AI1-/AI1+ bipolar differential voltage: +/- 10 V DC, 24 V max, sampling time: 1.5...2.5 ms, resolution: 11 bits + sign<br>AI2 software-configurable current: 0...20 mA/4...20 mA, impedance: 250 Ohm, sampling time: 1.5...2.5 ms, resolution: 11 bits |
| <b>Analogue Output Number</b>                | 1  |
| <b>Analogue Output Type</b>                  | Software-configurable voltage: (AO1) 0...10 V DC - 470 Ohm - sampling time: 1.5...2.5 ms - resolution: 10 bits<br>Software-configurable current: (AO1) 0...20 mA/4...20 mA - 500 Ohm - sampling time: 1.5...2.5 ms - resolution: 10 bits   |
| <b>Discrete Output Number</b>                | 1  |
| <b>Discrete Output Type</b>                  | Configurable relay logic: (R1A, R1B, R1C)NO/NC - 6.5...7.5 ms - 100000 cycles  |
| <b>Minimum Switching Current</b>             | 3 mA at 24 V DC (configurable relay logic)   |
| <b>Maximum Switching Current</b>             | 5 A at 250 V AC on resistive load - cos phi = 1 for configurable relay logic<br>5 A at 30 V DC on resistive load - L/R = 0 ms for configurable relay logic<br>2 A at 250 V AC on inductive load - cos phi = 0.4 for configurable relay logic<br>2 A at 30 V DC on inductive load - L/R = 7 ms for configurable relay logic   |
| <b>Discrete Input Number</b>                 | 6  |

|                                     |  |
|-------------------------------------|--|
| Discrete Input Type                 | Programmable (LI1...LI4) at 24 V DC <= 30 V level 1 PLC 3.5 kOhm (duration=1.5... 2.5 ms)<br>Switch-configurable (LI6) at 24 V DC <= 30 V level 1 PLC 1.5 kOhm (duration=1.5... 2.5 ms)<br>Safety input (PWR) at 24 V DC <= 30 V 1.5 kOhm  |
| Discrete Input Logic                | Positive logic (source) (LI1...LI6), 0...5 V (state 0), 11...30 V (state 1)<br>Negative logic (sink) (LI1...LI6), 16...30 V (state 0), 0...10 V (state 1)<br>Positive logic (source) (PWR), 0...2 V (state 0), 17...30 V (state 1)   |
| Acceleration And Deceleration Ramps | S, U or customized<br>Linear adjustable separately from 0.01 to 9000 s   |
| Braking To Standstill               | By regenerative braking with active front end  |
| Protection Type                     | Against exceeding limit speed: drive<br>Against input phase loss: drive<br>Line supply overvoltage: drive<br>Line supply undervoltage: drive<br>Overcurrent between output phases and earth: drive<br>Overheating protection: drive<br>Overvoltages on the DC bus: drive<br>Power removal: drive<br>Short-circuit between motor phases: drive<br>Thermal protection: motor<br>Motor phase break: motor |
| Dielectric Strength                 | 3535 V DC between earth and power terminals<br>5092 V DC between control and power terminals   |
| Insulation Resistance               | > 1 mOhm 500 V DC for 1 minute to earth  |
| Frequency Resolution                | Analog input: 0.024/50 Hz<br>Display unit: 0.1 Hz  |
| Communication Port Protocol         | Modbus<br>CANopen  |
| Connector Type                      | 1 RJ45 (on front face) for Modbus<br>1 RJ45 (on terminal) for Modbus<br>Male SUB-D 9 on RJ45 for CANopen   |
| Physical Interface                  | 2-wire RS 485 for Modbus   |
| Transmission Frame                  | RTU for Modbus   |
| Transmission Rate                   | 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps for Modbus on terminal<br>9600 bps, 19200 bps for Modbus on front face<br>20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps for CANopen  |
| Data Format                         | 8 bits, 1 stop, even parity for Modbus on front face<br>8 bits, odd even or no configurable parity for Modbus on terminal  |
| Type Of Polarization                | No impedance for Modbus  |
| Number Of Addresses                 | 1...127 for CANopen<br>1...247 for Modbus  |
| Method Of Access                    | Slave CANopen  |

|                     |  |
|---------------------|--|
| Function Available  | Safe standstill for power circuit<br>PTC relay for power circuit<br>Pt100 relay for power circuit<br>Insulation monitoring for power circuit<br>Design for IT networks for power circuit<br>External 230 V supply terminals for power circuit<br>Buffer voltage 24 V DC power supply for power circuit<br>Enclosure lighting for power circuit<br>Key switch (local/remote) for power circuit<br>Motor heating for power circuit<br>External motor fan for power circuit<br>Voltmeter for power circuit<br>Door handle for main switch for power circuit<br>Ammeter for power circuit<br>Enclosure heating for power circuit<br>Motor choke for power circuit<br>Cable entry via the top for power circuit<br>Enclosure plinth for power circuit<br>Relay output C/O for control circuit<br>External 24 V DC supply terminals for power circuit<br>Control terminals for control circuit<br>Adaptor for 115 V logic inputs for control circuit<br>Isolated amplifier for control circuit |
| Option Card         | Communication card for APOGEE FLN<br>Communication card for BACnet<br>Communication card for CC-Link<br>Communication card for DeviceNet<br>Communication card for EtherNet/IP<br>Communication card for Fipio<br>Communication card for Interbus-S<br>Communication card for LonWorks<br>Communication card for METASYS N2<br>Communication card for Modbus Plus<br>Communication card for Modbus TCP<br>Communication card for Modbus/Uni-Telway<br>Communication card for Profibus DP<br>Communication card for Profibus DP V1<br>Controller inside programmable card<br>Multi-pump card<br>Basic I/O extension card<br>Extended I/O extension card<br>Encoder interface cards  |
| Operating Position  | Vertical +/- 10 degree   |
| Colour Of Enclosure | Light grey (RAL 7035)  |
| Width               | 2000 mm  |
| Height              | 2157 mm  |
| Depth               | 642 mm   |
| Net Weight          | 1455 kg  |

## Environment

|                        |   |
|------------------------|---|
| Standards              | EN 60204-1<br>EN 61800-3 environments 2 category C3<br>EN 61800-5-1<br>EN 61800-2   |
| Product Certifications | GOST<br>C-Tick<br>ATEX  |
| Marking                | CE  |
| Noise Level            | 71 dB   |
| Pollution Degree       | 2 conforming to EN/IEC 61800-5-1  |
| Vibration Resistance   | 0.6 gn (f= 10...200 Hz) conforming to EN/IEC 60068-2-6<br>1.5 mm peak to peak (f= 3...10 Hz) conforming to EN/IEC 60068-2-6<br>3M3 conforming to EN/IEC 60721-3-3 |

|                                       |  |
|---------------------------------------|--|
| Shock Resistance                      | 4 gn for 11 ms conforming to EN/IEC 60068-2-27<br>3M2 conforming to EN/IEC 60721-3-3 |
| Environmental Characteristic          | 3K3 without condensation conforming to IEC 60721-3-3                                 |
| Relative Humidity                     | 0...95 %   |
| Ambient Air Temperature For Operation | 0...40 °C (without derating)<br>40...50 °C (with current derating of 1.8 % per °C)   |
| Ambient Air Temperature For Storage   | -25...70 °C  |
| Volume Of Cooling Air                 | 3600 m3/h  |
| Operating Altitude                    | <= 1000 m without derating<br>1000...3000 m with current derating 1 % per 100 m      |

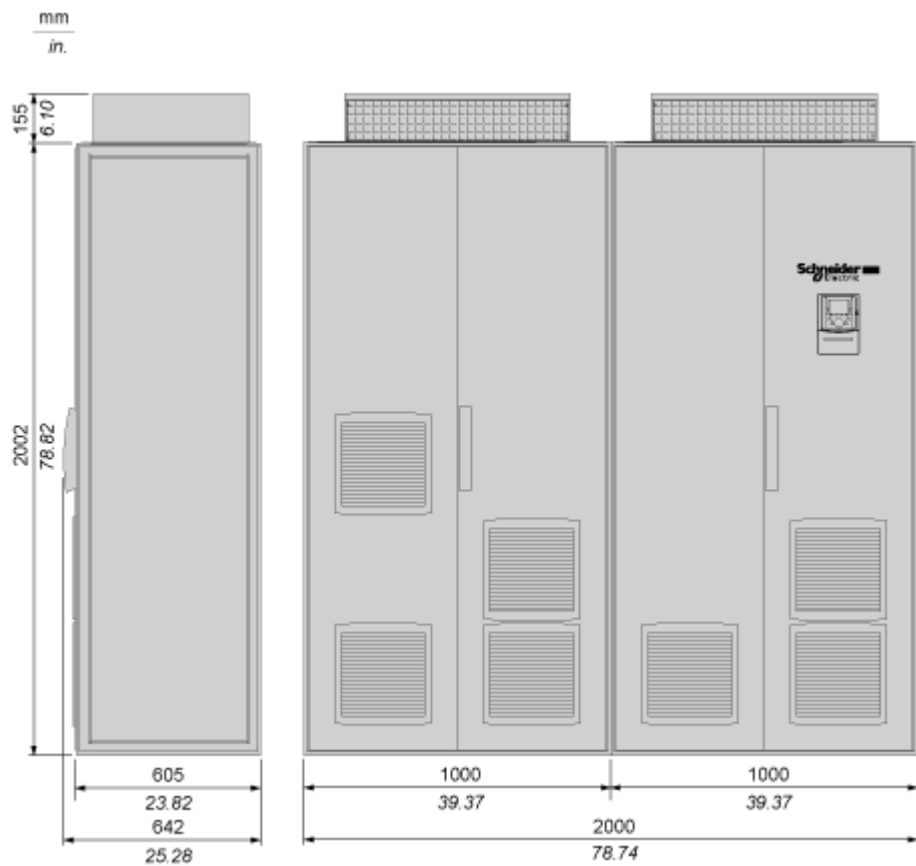
## Packing Units

|                              |           |
|------------------------------|-----------|
| Unit Type Of Package 1       | PCE       |
| Number Of Units In Package 1 | 1         |
| Package 1 Height             | 216.0 cm  |
| Package 1 Width              | 64.0 cm   |
| Package 1 Length             | 20.0 cm   |
| Package 1 Weight             | 1464.0 kg |

## Contractual warranty

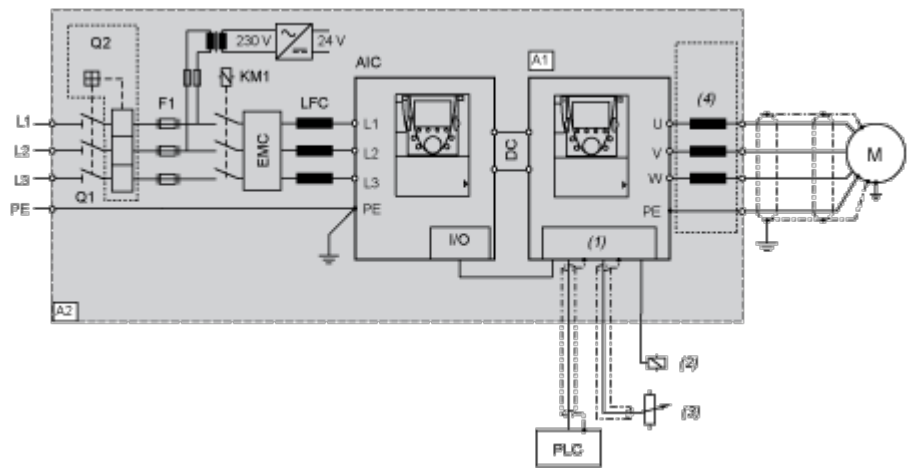
|          |           |
|----------|-----------|
| Warranty | 18 months |
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Dimensions



Connections and Schema

Wiring Diagram



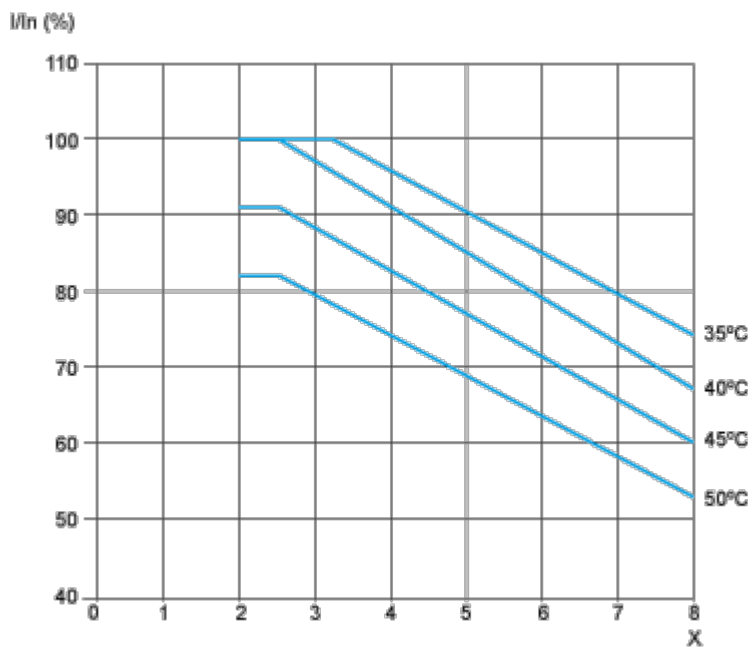
- A1 Drive
- A2 Enclosure
- AIC Active Infeed Converter
- M Motor
- Q1 Main switch built-in as standard
- Q2 Optional circuit breaker
- F1 Main fuses
- KM1 Line contactor
- EMC EMC filter
- LFC Line Filter Choke
- (1) Control
- (2) Relay control
- (3) Reference potentiometer
- (4) Option motor choke

Performance Curves

Derating Curves

The derating curves for the drive nominal current ( $I_n$ ) are dependent on the temperature and switching frequency. For intermediate temperatures, interpolate between 2 curves.

NOTE: The drive will reduce the switching frequency automatically in the event of excessive temperature rise.



X    Switching frequency (kHz)

NOTE: The temperatures shown correspond to the temperature of the air entering the enclosure.