

# ATV61EXC2C25N4H

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



## 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 line choke<br>A switch and fast-acting fuses<br>An IP65 remote mounting kit for graphic display terminal<br>Terminals/Bars for motor connection<br>ATV61HC25N4D standard drive IP00<br>A wired ready-assembled Schneider Spacial SF enclosure<br>Active infeed converter<br>Control transformer 230 V AC<br>Power supply 24 V DC<br>Clean power filter with integrated EMC filter |
| 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            | 250 kW, 3 phases at 380...415 V                                                                                                                                                                                                                                                                                                                                                     |
| Line current              | 395 A at 400 V 3 phases / 250 kW                                                                                                                                                                                                                                                                                                                                                    |
| IP degree of protection   | IP23                                                                                                                                                                                                                                                                                                                                                                                |

## Complementary

|                                    |                                                                                                                |
|------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Apparent power                     | 274 kVA at 400 V, 3 phases 250 kW                                                                              |
| Prospective line Isc               | 20 kA without external fuses<br>100 kA with option circuit breaker<br>100 kA with external fuses               |
| Continuous output current          | 481 A, 2.5 kHz at 400 V 3 phases                                                                               |
| Maximum transient current          | 577 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                | 2.5...8 kHz with derating factor<br>2...8 kHz adjustable                                                       |
| Speed range                        | 1...100 in open-loop mode, without speed feedback                                                              |
| Speed accuracy                     | +/- 10 % of nominal slip for 0.2 Tn to Tn torque variation without speed feedback                              |
| Torque accuracy                    | +/- 15 % in open-loop mode, without speed feedback                                                             |
| Transient overtorque               | 120 % of nominal motor torque for 60 s                                                                         |
| Braking torque                     | 120 % for 60 seconds<br>100 % continuous                                                                       |
| Asynchronous motor control profile | Energy saving ratio<br>Voltage/Frequency ratio (2 or 5 points)<br>Flux vector control without sensor, standard |
| Synchronous motor control profile  | Vector control without sensor, standard                                                                        |
| Regulation loop                    | Adjustable PI regulator                                                                                        |

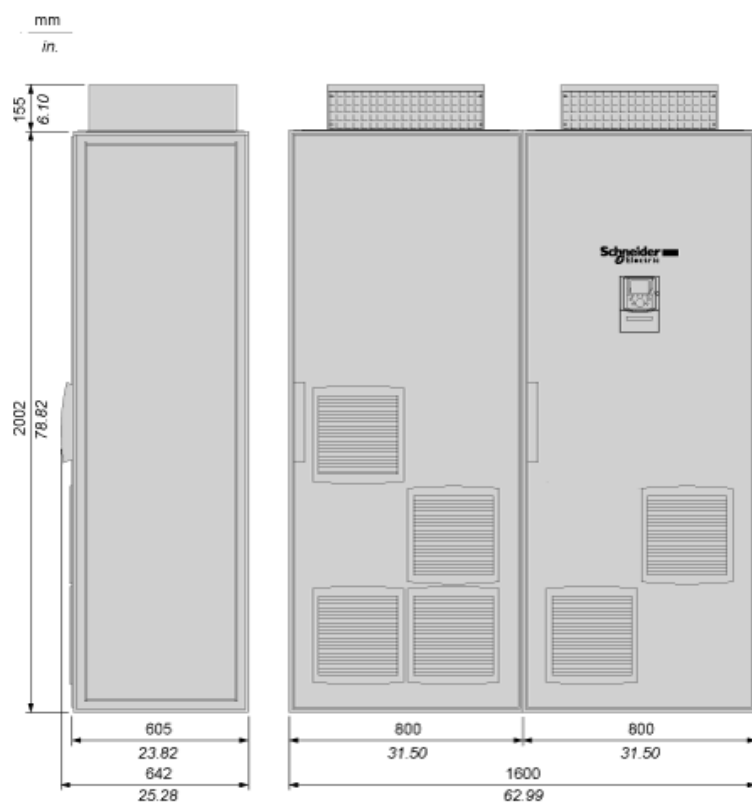
|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Motor slip compensation               | Adjustable<br>Automatic whatever the load<br>Can be suppressed<br>Not available in voltage/frequency ratio (2 or 5 points)                                                                                                                                                                                                                                                                                                                                    |
| Overvoltage category                  | Class 3 conforming to EN 50178                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Local signalling                      | LCD display unit - operation function, status and configuration - mounted in the front door                                                                                                                                                                                                                                                                                                                                                                   |
| Output voltage                        | <= power supply voltage                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Isolation                             | Between power and control terminals                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Type of cable                         | IEC cable at 40 °C, copper 70 °C / PVC                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Electrical connection                 | Terminal - screw type M10,connection capacity: 2 x 300 mm <sup>2</sup> ,terminal(s): L1/R, L2/S, L3/T, cable entry:entry from the bottom<br>Terminal - screw type M12,connection capacity: 4 x 240 mm <sup>2</sup> ,terminal(s): U/T1, V/T2, W/T3, cable entry:entry from the bottom<br>Terminal,Connection capacity: 2.5 mm <sup>2</sup> AWG 14,terminal(s): AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR, cable entry:entry from the bottom |
| Motor recommended cable cross section | 2 (3 x 150) mm <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Short circuit protection              | 550 A 1 fuse (gl fuse) on power supply upstream                                                                                                                                                                                                                                                                                                                                                                                                               |
| Supply                                | Internal supply at 24 V DC (21...27 V), 0...100 mA<br>Internal supply for reference potentiometer at 10 V DC (10...11 V), 0...10 mA<br>External supply at 24 V DC (19...30 V), 1 A, 30 W                                                                                                                                                                                                                                                                      |
| Analogue input number                 | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Analogue input type                   | Software-configurable current : (AI2) 0...20 mA/4...20 mA - 250 Ohm - sampling time: 1.5...2.5 ms - resolution: 11 bits<br>Bipolar differential voltage : (AI1-/AI1+) +/- 10 V DC - 24 V max - sampling time: 1.5...2.5 ms - resolution: 11 bits + sign<br>Software-configurable voltage : (AI2) 0...10 V DC - 24 V max - 30 kOhm - sampling time: 1.5...2.5 ms - resolution: 11 bits                                                                         |
| Analogue output number                | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Analogue output type                  | Software-configurable current : (AO1) 0...20 mA/4...20 mA - 500 Ohm - sampling time: 1.5...2.5 ms - resolution: 10 bits<br>Software-configurable voltage : (AO1) 0...10 V DC - 470 Ohm - sampling time: 1.5...2.5 ms - resolution: 10 bits                                                                                                                                                                                                                    |
| Discrete output number                | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Discrete output type                  | Configurable relay logic : (R1A, R1B, R1C) NO/NC - 6.5...7.5 ms - 100000 cycles                                                                                                                                                                                                                                                                                                                                                                               |
| Minimum switching current             | 3 mA at 24 V DC (configurable relay logic)                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Maximum switching current             | 2 A at 30 V DC on inductive load - L/R = 7 ms (configurable relay logic)<br>2 A at 250 V AC on inductive load - cos phi = 0.4 (configurable relay logic)<br>5 A at 30 V DC on resistive load - L/R = 0 ms (configurable relay logic)<br>5 A at 250 V AC on resistive load - cos phi = 1 (configurable relay logic)                                                                                                                                            |
| Discrete input number                 | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Discrete input type                   | Safety input (PWR) 24 V DC (<= 30 V) - 1.5 kOhm<br>Switch-configurable (LI6) 24 V DC (<= 30 V) , with level 1 PLC - 1.5 kOhm - sampling time: 1.5...2.5 ms<br>Programmable (LI1...LI4) 24 V DC (<= 30 V) , with level 1 PLC - 3.5 kOhm - sampling time: 1.5...2.5 ms                                                                                                                                                                                          |
| Discrete input logic                  | Positive logic (source) (PWR) , 0...2 V (state 0), 17...30 V (state 1)<br>Negative logic (sink) (LI1...LI6) , 16...30 V (state 0), 0...10 V (state 1)<br>Positive logic (source) (LI1...LI6) , 0...5 V (state 0), 11...30 V (state 1)                                                                                                                                                                                                                         |
| Acceleration and deceleration ramps   | Linear adjustable separately from 0.01 to 9000 s<br>S, U or customized                                                                                                                                                                                                                                                                                                                                                                                        |
| Braking to standstill                 | By regenerative braking with active front end                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Protection type                       | Motor phase break for motor<br>Thermal protection for motor<br>Short-circuit between motor phases for drive<br>Power removal for drive<br>Overvoltages on the DC bus for drive<br>Overheating protection for drive<br>Overcurrent between output phases and earth for drive<br>Line supply undervoltage for drive<br>Line supply overvoltage for drive<br>Against input phase loss for drive<br>Against exceeding limit speed for drive                       |
| Dielectric strength                   | 5092 V DC between control and power terminals<br>3535 V DC between earth and power terminals                                                                                                                                                                                                                                                                                                                                                                  |
| Insulation resistance                 | > 1 mOhm at 500 V DC for 1 minute to earth                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Frequency resolution                  | 0.1 Hz for display unit<br>0.024/50 Hz for analog input                                                                                                                                                                                                                                                                                                                                                                                                       |

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Communication port protocol | CANopen<br>Modbus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Type of connector           | Male SUB-D 9 on RJ45 for CANopen<br>1 RJ45 for Modbus on terminal<br>1 RJ45 for Modbus on front face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Physical interface          | 2-wire RS 485 for Modbus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Transmission frame          | RTU for Modbus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Transmission rate           | 20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps for CANopen<br>9600 bps, 19200 bps for Modbus on front face<br>4800 bps, 9600 bps, 19200 bps, 38.4 Kbps for Modbus on terminal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Data format                 | 8 bits, odd even or no configurable parity for Modbus on terminal<br>8 bits, 1 stop, even parity for Modbus on front face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Type of polarization        | No impedance for Modbus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Number of addresses         | 1...247 for Modbus<br>1...127 for CANopen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Method of access            | Slave for CANopen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Function available          | Isolated amplifier for control circuit<br>Adaptor for 115 V logic inputs for control circuit<br>Control terminals for control circuit<br>External 24 V DC supply terminals for power circuit<br>Relay output C/O for control circuit<br>Enclosure plinth for power circuit<br>Cable entry via the top for power circuit<br>Motor choke for power circuit<br>Enclosure heating for power circuit<br>Ammeter for power circuit<br>Door handle for main switch for power circuit<br>Voltmeter for power circuit<br>External motor fan for power circuit<br>Motor heating for power circuit<br>Key switch (local/remote) for power circuit<br>Enclosure lighting for power circuit<br>Buffer voltage 24 V DC power supply for power circuit<br>External 230 V supply terminals for power circuit<br>Design for IT networks for power circuit<br>Insulation monitoring for power circuit<br>Pt100 relay for power circuit<br>PTC relay for power circuit<br>Safe standstill for power circuit |
| Option card                 | Encoder interface cards<br>Extended I/O extension card<br>Basic I/O extension card<br>Multi-pump card<br>Controller inside programmable card<br>Communication card for Profibus DP V1<br>Communication card for Profibus DP<br>Communication card for Modbus/Uni-Telway<br>Communication card for Modbus TCP<br>Communication card for Modbus Plus<br>Communication card for METASYS N2<br>Communication card for LonWorks<br>Communication card for Interbus-S<br>Communication card for Fipio<br>Communication card for Ethernet/IP<br>Communication card for DeviceNet<br>Communication card for CC-Link<br>Communication card for BACnet<br>Communication card for APOGEE FLN                                                                                                                                                                                                                                                                                                        |
| Operating position          | Vertical +/- 10 degree                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Colour of enclosure         | Light grey RAL 7035                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Width                       | 1600 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Height                      | 2157 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Depth                       | 642 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Product weight              | 980 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

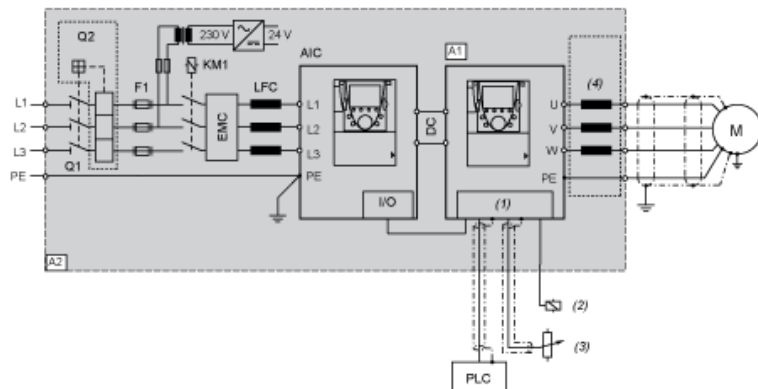
## Environment

|                                       |                                                                                                                                                                     |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards                             | EN 60204-1<br>EN 61800-3 environments 2 category C3<br>EN 61800-5-1<br>EN 61800-2                                                                                   |
| Product certifications                | ATEX<br>C-Tick<br>GOST                                                                                                                                              |
| Marking                               | CE                                                                                                                                                                  |
| Noise level                           | 70 dB                                                                                                                                                               |
| Pollution degree                      | 2 conforming to EN/IEC 61800-5-1                                                                                                                                    |
| Vibration resistance                  | 3M3 conforming to EN/IEC 60721-3-3<br>1.5 mm peak to peak (f = 3...10 Hz) conforming to EN/IEC 60068-2-6<br>0.6 gn (f = 10...200 Hz) conforming to EN/IEC 60068-2-6 |
| Shock resistance                      | 3M2 conforming to EN/IEC 60721-3-3<br>4 gn for 11 ms conforming to EN/IEC 60068-2-27                                                                                |
| Environmental characteristic          | 3K3 without condensation conforming to IEC 60721-3-3                                                                                                                |
| Relative humidity                     | <= 95 %                                                                                                                                                             |
| Ambient air temperature for operation | 40...50 °C with current derating of 1.8 % per °C<br>0...40 °C without derating                                                                                      |
| Ambient air temperature for storage   | -25...70 °C                                                                                                                                                         |
| Volume of cooling air                 | 2400 m3/h                                                                                                                                                           |
| Operating altitude                    | 1000...3000 m with current derating 1 % per 100 m<br><= 1000 m without derating                                                                                     |

## Dimensions



## Wiring Diagram

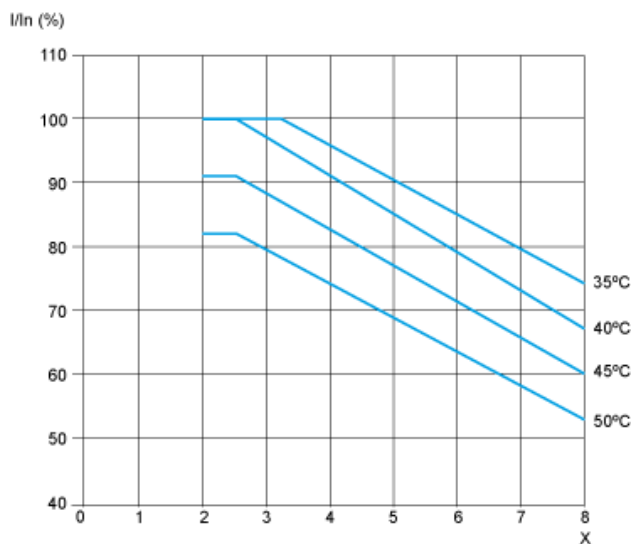


- A1 Drive
- A2 Enclosure
- AIC Active Infeed Converter
- M Motor
- Q1 Main switch built-in as standard
- Q2 Optional circuit breaker
- F1 Main fuses
- KM1 Line contactor
- EMC EMC filter
- LFC Line Filter Choke
- (1) Control
- (2) Relay control
- (3) Reference potentiometer
- (4) Option motor choke

## 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.