

# Bảng thông số sản phẩm

Thông số kỹ thuật



## variable speed drive ATV610, 160 kW/250HP, 380...460 V, IP20

ATV610C16N4

### Main

|                                    |  |
|------------------------------------|--|
| Range of product                   | Easy Altivar 610   |
| Product or component type          | Variable speed drive   |
| Product specific application       | Fan, pump, compressor, conveyor  |
| Device short name                  | ATV610   |
| Variant                            | Standard version   |
| Product destination                | Asynchronous motors  |
| Mounting mode                      | Cabinet mount  |
| EMC filter                         | Integrated conforming to EN/IEC 61800-3 category C3 with 50 m  |
| IP degree of protection            | IP20   |
| Type of cooling                    | Forced convection  |
| Supply frequency                   | 50...60 Hz +/-5 %  |
| Network number of phases           | 3 phases   |
| [Us] rated supply voltage          | 380...460 V - 15...10 %  |
| Motor power kW                     | 160 kW for normal duty<br>132 kW for heavy duty  |
| Motor power hp                     | 250 hp for normal duty<br>200 hp for heavy duty  |
| Line current                       | 284 A at 380 V (normal duty)<br>249.5 A at 460 V (normal duty)<br>237 A at 380 V (heavy duty)<br>205.9 A at 460 V (heavy duty) |
| Prospective line I <sub>sc</sub>   | 50 kA  |
| Apparent power                     | 198.8 kVA at 460 V (normal duty)<br>164.0 kVA at 460 V (heavy duty)  |
| Continuous output current          | 302 A at 2.5 kHz for normal duty<br>250 A at 2.5 kHz for heavy duty  |
| Maximum transient current          | 332 A during 60 s (normal duty)<br>375 A during 60 s (heavy duty)  |
| Asynchronous motor control profile | Constant torque standard<br>Optimized torque mode<br>Variable torque standard  |
| Output frequency                   | 0.0001...0.5 kHz   |
| Nominal switching frequency        | 2.5 kHz  |
| Switching frequency                | 1...8 kHz adjustable   |

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| <b>Number of preset speeds</b>     | 16 preset speeds  |
| <b>Communication port protocol</b> | Modbus serial   |
| <b>Option card</b>                 | Slot A: communication card, Profibus DP V1<br>Slot A: digital or analog I/O extension card<br>Slot A: relay output card |

## Complementary

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| <b>Output voltage</b>                      | <= power supply voltage  |
| <b>Motor slip compensation</b>             | Not available in permanent magnet motor law<br>Automatic whatever the load<br>Adjustable<br>Can be suppressed  |
| <b>Acceleration and deceleration ramps</b> | Linear adjustable separately from 0.01 to 9000 s<br>S, U or customized   |
| <b>Braking to standstill</b>               | By DC injection  |
| <b>Protection type</b>                     | Thermal protection: motor<br>Motor phase break: motor<br>Thermal protection: drive<br>Overheating: drive<br>Overcurrent between output phases and earth: drive<br>Overload of output voltage: drive<br>Short-circuit protection: drive<br>Motor phase break: drive<br>Overvoltages on the DC bus: drive<br>Line supply overvoltage: drive<br>Line supply undervoltage: drive<br>Line supply phase loss: drive<br>Overspeed: drive<br>Break on the control circuit: drive |
| <b>Frequency resolution</b>                | Display unit: 0.1 Hz<br>Analog input: 0.012/50 Hz  |
| <b>Electrical connection</b>               | Control, screw terminal: 0.5...1.5 mm <sup>2</sup><br>Line side, screw terminal: 2 x 95...3 x 120 mm <sup>2</sup><br>Motor, screw terminal: 2 x 95...3 x 120 mm <sup>2</sup>   |
| <b>Connector type</b>                      | 1 RJ45 (on the remote graphic terminal) for Modbus serial  |
| <b>Physical interface</b>                  | 2-wire RS 485 for Modbus serial  |
| <b>Transmission frame</b>                  | RTU for Modbus serial  |
| <b>Transmission rate</b>                   | 4.8, 9.6, 19.2, 38.4 kbit/s for Modbus serial  |
| <b>Type of polarization</b>                | No impedance for Modbus serial   |
| <b>Number of addresses</b>                 | 1...247 for Modbus serial  |
| <b>Method of access</b>                    | Slave  |
| <b>Supply</b>                              | External supply for digital inputs: 24 V DC (19...30 V), <1.25 mA, protection type: overload and short-circuit protection<br>Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 mA, protection type: overload and short-circuit protection   |
| <b>Local signalling</b>                    | 2 LEDs for local diagnostic<br>1 LED (yellow) for embedded communication status<br>2 LEDs (dual colour) for communication module status<br>1 LED (red) for presence of voltage   |
| <b>Width</b>                               | 320 mm   |
| <b>Height</b>                              | 852 mm<br>1159 mm with IP21 conformity kit   |
| <b>Depth</b>                               | 390 mm   |
| <b>Net weight</b>                          | 82 kg  |
| <b>Analogue input number</b>               | 3  |
| <b>Analogue input type</b>                 | AI1, AI2, AI3 software-configurable voltage: 0...10 V DC, impedance: 30 kOhm, resolution 12 bits<br>AI1, AI2, AI3 software-configurable current: 0...20 mA, impedance: 250 Ohm, resolution 12 bits<br>AI2, AI3 software-configurable temperature probe or water level sensor   |
| <b>Discrete input number</b>               | 6  |
| <b>Discrete input type</b>                 | DI1...DI6 programmable as logic input, 24 V DC (<= 30 V), impedance: 3.5 kOhm<br>DI5, DI6 programmable as pulse input: 0...30 kHz, 24 V DC (<= 30 V)   |

|                                  |  |
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| <b>Input compatibility</b>       | DI1...DI6: logic input level 1 PLC conforming to EN/IEC 61131-2<br>DI5, DI6: pulse input level 1 PLC conforming to IEC 65A-68  |
| <b>Discrete input logic</b>      | Positive logic (source): DI1...DI6 configurable logic input, < 5 V (state 0), > 11 V (state 1)<br>Negative logic (sink): DI1...DI6 configurable logic input, > 16 V (state 0), < 10 V (state 1)<br>Positive logic (source): DI5, DI6 configurable pulse input, < 0.6 V (state 0), > 2.5 V (state 1)                                      |
| <b>Analogue output number</b>    | 2  |
| <b>Analogue output type</b>      | Software-configurable current AQ1, AQ2: 0...20 mA, resolution 10 bits<br>Software-configurable voltage AQ1, AQ2: 0...10 V DC impedance 470 Ohm, resolution 10 bits   |
| <b>Sampling duration</b>         | 5 ms +/- 0.1 ms (AI1, AI2, AI3) - analog input<br>2 ms +/- 0.5 ms (DI1...DI6)configurable - discrete input<br>5 ms +/- 1 ms (DI5, DI6)configurable - pulse input<br>10 ms +/- 1 ms (AQ1, AQ2) - analog output  |
| <b>Accuracy</b>                  | +/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input<br>+/- 1 % AQ1, AQ2 for a temperature variation 60 °C analog output   |
| <b>Linearity error</b>           | AI1, AI2, AI3: +/- 0.15 % of maximum value for analog input<br>AQ1, AQ2: +/- 0.2 % for analog output   |
| <b>Relay output number</b>       | 3  |
| <b>Relay output type</b>         | Configurable relay logic R1: fault relay NO/NC electrical durability 100000 cycles<br>Configurable relay logic R2: sequence relay NO electrical durability 100000 cycles<br>Configurable relay logic R3: sequence relay NO electrical durability 100000 cycles   |
| <b>Refresh time</b>              | Relay output (R1, R2, R3): 5 ms (+/- 0.5 ms)   |
| <b>Minimum switching current</b> | Relay output R1, R2, R3: 5 mA at 24 V DC   |
| <b>Maximum switching current</b> | Relay output R1, R2, R3 on resistive load, cos phi = 1: 3 A at 250 V AC<br>Relay output R1, R2, R3 on resistive load, cos phi = 1: 3 A at 30 V DC<br>Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 250 V AC<br>Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 30 V DC |
| <b>Isolation</b>                 | Between power and control terminals  |
| <b>Insulation resistance</b>     | > 1 MOhm 500 V DC for 1 minute to earth  |

## Environment

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|--|--|
| <b>Noise level</b>                           | 76 dB conforming to 86/188/EEC   |
| <b>Power dissipation in W</b>                | 3270 W(forced convection) at 380 V, switching frequency 2.5 kHz  |
| <b>Operating position</b>                    | Vertical +/- 10 degree   |
| <b>Electromagnetic compatibility</b>         | Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3<br>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4<br>1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5<br>Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 |
| <b>Pollution degree</b>                      | 2 conforming to EN/IEC 61800-5-1   |
| <b>Vibration resistance</b>                  | 1.5 mm peak to peak (f= 2...13 Hz) conforming to IEC 60068-2-6<br>1 gn (f= 13...200 Hz) conforming to IEC 60068-2-6  |
| <b>Shock resistance</b>                      | 6 gn for 11 ms conforming to IEC 60068-2-27  |
| <b>Relative humidity</b>                     | 5...95 % without condensation conforming to IEC 60068-2-3  |
| <b>Ambient air temperature for operation</b> | -15...45 °C (without derating)<br>45...60 °C (with derating factor)  |
| <b>Operating altitude</b>                    | <= 1000 m without derating<br>1000...4800 m with current derating 1 % per 100 m  |
| <b>Environmental characteristic</b>          | Chemical pollution resistance class 3C3 conforming to EN/IEC 60721-3-3<br>Dust pollution resistance class 3S3 conforming to EN/IEC 60721-3-3   |
| <b>Standards</b>                             | EN/IEC 61800-3<br>Environment 2 category C3 EN/IEC 61800-3<br>EN/IEC 61800-5-1<br>IEC 60721-3  |
| <b>Marking</b>                               | CE   |

## Packing Units

|                               |     |
|-------------------------------|-----|
| <b>Unit Type of Package 1</b> | PCE |
|-------------------------------|-----|

|                                     |           |
|-------------------------------------|-----------|
| <b>Number of Units in Package 1</b> | 1         |
| <b>Package 1 Weight</b>             | 97.461 kg |
| <b>Package 1 Height</b>             | 48 cm     |
| <b>Package 1 width</b>              | 65 cm     |
| <b>Package 1 Length</b>             | 103 cm    |

## Offer Sustainability

|                                   |   |
|-----------------------------------|---|
| <b>Sustainable offer status</b>   | Green Premium product   |
| <b>REACH Regulation</b>           | <a href="#">REACH Declaration</a>   |
| <b>EU RoHS Directive</b>          | Pro-active compliance (Product out of EU RoHS legal scope)<br><a href="#">EU RoHS Declaration</a>   |
| <b>Mercury free</b>               | Yes   |
| <b>RoHS exemption information</b> | <a href="#">Yes</a>   |
| <b>China RoHS Regulation</b>      | <a href="#">China RoHS declaration</a>  |
| <b>Environmental Disclosure</b>   | <a href="#">Product Environmental Profile</a>   |
| <b>Circularity Profile</b>        | <a href="#">End of Life Information</a>   |
| <b>WEEE</b>                       | The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins                                       |
| <b>Upgradeability</b>             | <a href="#">Upgradeable through digital modules and upgraded components</a>  |