

# ATV212HU55N4

variable speed drive ATV212 - 5.5kW - 7.5hp -  
480V - 3ph - EMC - IP21



## Main

|                              |                                   |
|------------------------------|-----------------------------------|
| Range of product             | Altivar 212                       |
| Product or component type    | Variable speed drive              |
| Device short name            | ATV212                            |
| Product destination          | Asynchronous motors               |
| Product specific application | Pumps and fans in HVAC            |
| Assembly style               | With heat sink                    |
| Network number of phases     | 3 phases                          |
| Motor power kW               | 5.5 kW                            |
| Motor power hp               | 7.5 hp                            |
| [Us] rated supply voltage    | 380...480 V - 15...10 %           |
| Supply voltage limits        | 323...528 V                       |
| Supply frequency             | 50...60 Hz - 5...5 %              |
| Network frequency            | 47.5...63 Hz                      |
| EMC filter                   | Class C2 EMC filter integrated    |
| Line current                 | 10.9 A at 380 V<br>8.6 A at 480 V |

## Complementary

|                              |                                                           |
|------------------------------|-----------------------------------------------------------|
| Apparent power               | 9.1 kVA at 380 V                                          |
| Prospective line Isc         | 22 kA                                                     |
| Continuous output current    | 12 A at 380 V<br>12 A at 460 V                            |
| Maximum transient current    | 13.2 A for 60 s                                           |
| Speed drive output frequency | 0.5...200 Hz                                              |
| Nominal switching frequency  | 12 kHz                                                    |
| Switching frequency          | 6...16 kHz adjustable<br>12...16 kHz with derating factor |
| Speed range                  | 1...10                                                    |

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| Speed accuracy                      | +/- 10 % of nominal slip 0.2 Tn to Tn                                                                                                                                                                                                                                                                                                              |
| Torque accuracy                     | +/- 15 %                                                                                                                                                                                                                                                                                                                                           |
| Transient overtorque                | 120 % of nominal motor torque +/- 10 % for 60 s                                                                                                                                                                                                                                                                                                    |
| Asynchronous motor control profile  | Voltage/frequency ratio, 2 points<br>Voltage/frequency ratio, 5 points<br>Voltage/frequency ratio, automatic IR compensation (U/f + automatic Uo)<br>Flux vector control without sensor, standard<br>Voltage/frequency ratio - Energy Saving, quadratic U/f                                                                                        |
| Regulation loop                     | Adjustable PI regulator                                                                                                                                                                                                                                                                                                                            |
| Motor slip compensation             | Not available in voltage/frequency ratio motor control<br>Automatic whatever the load<br>Adjustable                                                                                                                                                                                                                                                |
| Local signalling                    | 1 LED (red)DC bus energized:                                                                                                                                                                                                                                                                                                                       |
| Output voltage                      | <= power supply voltage                                                                                                                                                                                                                                                                                                                            |
| Isolation                           | Electrical between power and control                                                                                                                                                                                                                                                                                                               |
| Type of cable                       | Without mounting kit: 1 wire(s)IEC cable at 45 °C, copper 90 °C / XLPE/EPR<br>Without mounting kit: 1 wire(s)IEC cable at 45 °C, copper 70 °C / PVC<br>With UL Type 1 kit: 3 wire(s)UL 508 cable at 40 °C, copper 75 °C / PVC                                                                                                                      |
| Electrical connection               | VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES: terminal 2.5 mm <sup>2</sup> / AWG 14<br>L1/R, L2/S, L3/T: terminal 6 mm <sup>2</sup> / AWG 10                                                                                                                                                                                                     |
| Tightening torque                   | 1.3 N.m, 11.5 lb.in (L1/R, L2/S, L3/T)<br>0.6 N.m (VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES)                                                                                                                                                                                                                                                 |
| Supply                              | Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 A, protection type: overload and short-circuit protection<br>Internal supply: 24 V DC (21...27 V), <200 A, protection type: overload and short-circuit protection                                                                                               |
| Analogue input number               | 2                                                                                                                                                                                                                                                                                                                                                  |
| Analogue input type                 | VIA switch-configurable voltage: 0...10 V DC 24 V max, impedance: 30000 Ohm, resolution 10 bits<br>VIB configurable voltage: 0...10 V DC 24 V max, impedance: 30000 Ohm, resolution 10 bits<br>VIB configurable PTC probe: 0...6 probes, impedance: 1500 Ohm<br>VIA switch-configurable current: 0...20 mA, impedance: 250 Ohm, resolution 10 bits |
| Sampling duration                   | 2 ms +/- 0.5 ms F discrete<br>2 ms +/- 0.5 ms R discrete<br>2 ms +/- 0.5 ms RES discrete<br>3.5 ms +/- 0.5 ms VIA analog<br>22 ms +/- 0.5 ms VIB analog                                                                                                                                                                                            |
| Response time                       | FM 2 ms, tolerance +/- 0.5 ms for analog output(s)<br>FLA, FLC 7 ms, tolerance +/- 0.5 ms for discrete output(s)<br>FLB, FLC 7 ms, tolerance +/- 0.5 ms for discrete output(s)<br>RY, RC 7 ms, tolerance +/- 0.5 ms for discrete output(s)                                                                                                         |
| Accuracy                            | +/- 0.6 % (VIA) for a temperature variation 60 °C<br>+/- 0.6 % (VIB) for a temperature variation 60 °C<br>+/- 1 % (FM) for a temperature variation 60 °C                                                                                                                                                                                           |
| Linearity error                     | VIA: +/- 0.15 % of maximum value for input<br>VIB: +/- 0.15 % of maximum value for input<br>FM: +/- 0.2 % for output                                                                                                                                                                                                                               |
| Analogue output number              | 1                                                                                                                                                                                                                                                                                                                                                  |
| Analogue output type                | FM switch-configurable voltage 0...10 V DC, impedance: 7620 Ohm, resolution 10 bits<br>FM switch-configurable current 0...20 mA, impedance: 970 Ohm, resolution 10 bits                                                                                                                                                                            |
| Discrete output number              | 2                                                                                                                                                                                                                                                                                                                                                  |
| Discrete output type                | Configurable relay logic: (FLA, FLC) NO - 100000 cycles<br>Configurable relay logic: (FLB, FLC) NC - 100000 cycles<br>Configurable relay logic: (RY, RC) NO - 100000 cycles                                                                                                                                                                        |
| Minimum switching current           | 3 mA at 24 V DC for configurable relay logic                                                                                                                                                                                                                                                                                                       |
| Maximum switching current           | 5 A at 250 V AC on resistive load - cos phi = 1 - L/R = 0 ms (FL, R)<br>5 A at 30 V DC on resistive load - cos phi = 1 - L/R = 0 ms (FL, R)<br>2 A at 250 V AC on inductive load - cos phi = 0.4 - L/R = 7 ms (FL, R)<br>2 A at 30 V DC on inductive load - cos phi = 0.4 - L/R = 7 ms (FL, R)                                                     |
| Discrete input type                 | F programmable 24 V DC, with level 1 PLC, impedance: 4700 Ohm<br>R programmable 24 V DC, with level 1 PLC, impedance: 4700 Ohm<br>RES programmable 24 V DC, with level 1 PLC, impedance: 4700 Ohm                                                                                                                                                  |
| Discrete input logic                | Positive logic (source) (F, R, RES), <= 5 V (state 0), >= 11 V (state 1)<br>Negative logic (sink) (F, R, RES), >= 16 V (state 0), <= 10 V (state 1)                                                                                                                                                                                                |
| Acceleration and deceleration ramps | Automatic based on the load<br>Linear adjustable separately from 0.01 to 3200 s                                                                                                                                                                                                                                                                    |

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| Braking to standstill                      | By DC injection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Protection type                            | Overheating protection: drive<br>Thermal power stage: drive<br>Short-circuit between motor phases: drive<br>Input phase breaks: drive<br>Overcurrent between output phases and earth: drive<br>Overvoltages on the DC bus: drive<br>Break on the control circuit: drive<br>Against exceeding limit speed: drive<br>Line supply overvoltage and undervoltage: drive<br>Line supply undervoltage: drive<br>Against input phase loss: drive<br>Thermal protection: motor<br>Motor phase break: motor<br>With PTC probes: 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Frequency resolution                       | Display unit: 0.1 Hz<br>Analog input: 0.024/50 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Communication port protocol                | METASYS N2<br>LonWorks<br>BACnet<br>Modbus<br>APOGEE FLN                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Connector type                             | 1 RJ45<br>1 open style                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Physical interface                         | 2-wire RS 485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Transmission frame                         | RTU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Transmission rate                          | 9600 bps or 19200 bps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Data format                                | 8 bits, 1 stop, odd even or no configurable parity                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Type of polarization                       | No impedance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Number of addresses                        | 1...247                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Communication service                      | Read device identification (43)<br>Read holding registers (03) 2 words maximum<br>Write multiple registers (16) 2 words maximum<br>Write single register (06)<br>Monitoring inhibitible<br>Time out setting from 0.1 to 100 s                                                                                                                                                                                                                                                                                               |
| Option card                                | Communication card for LonWorks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Operating position                         | Vertical +/- 10 degree                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Width                                      | 142 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Height                                     | 184 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Depth                                      | 150 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Product weight                             | 3.35 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Power dissipation in W                     | 215 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Air flow                                   | 74 m3/h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Functionality                              | Mid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Specific application                       | HVAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| IP degree of protection                    | IP21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Variable speed drive application selection | Building - HVAC Compressor for scroll<br>Building - HVAC Fan<br>Building - HVAC Pump                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Motor power range AC-3                     | 4...6 kW at 380...440 V 3 phases<br>4...6 kW at 480...500 V 3 phases                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Motor starter type                         | Variable speed drive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Environment

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| Electromagnetic compatibility | 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 |
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|                                       | Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6<br>Voltage dips and interruptions immunity test conforming to IEC 61000-4-11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Pollution degree                      | 3 conforming to IEC 61800-5-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| IP degree of protection               | IP20 on upper part without blanking plate on cover conforming to EN/IEC 61800-5-1<br>IP20 on upper part without blanking plate on cover conforming to EN/IEC 60529<br>IP21 conforming to EN/IEC 61800-5-1<br>IP21 conforming to EN/IEC 60529<br>IP41 on upper part conforming to EN/IEC 61800-5-1<br>IP41 on upper part conforming to EN/IEC 60529                                                                                                                                                                                                                                                                                                                                                                              |
| Vibration resistance                  | 1.5 mm (f= 3...13 Hz) conforming to EN/IEC 60068-2-6<br>1 gn (f= 13...200 Hz) conforming to EN/IEC 60068-2-8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Shock resistance                      | 15 gn for 11 ms conforming to IEC 60068-2-27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Environmental characteristic          | Classes 3C1 conforming to IEC 60721-3-3<br>Classes 3S2 conforming to IEC 60721-3-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Noise level                           | 51 dB conforming to 86/188/EEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Operating altitude                    | 1000...3000 m limited to 2000 m for the Corner Grounded distribution network with current derating 1 % per 100 m<br><= 1000 m without                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Relative humidity                     | 5...95 % without condensation conforming to IEC 60068-2-3<br>5...95 % without dripping water conforming to IEC 60068-2-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Ambient air temperature for operation | -10...40 °C (without)<br>40...50 °C (with derating factor)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Ambient air temperature for storage   | -25...70 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Standards                             | IEC 61800-3 category C3<br>IEC 61800-3 category C2<br>EN 61800-3 category C3<br>EN 55011 class A group 1<br>IEC 61800-3 environments 1 category C2<br>EN 61800-3 environments 1 category C3<br>IEC 61800-3 environments 2 category C1<br>EN 61800-3 environments 2 category C3<br>EN 61800-3 environments 2 category C1<br>IEC 61800-3<br>IEC 61800-3 environments 2 category C2<br>EN 61800-3 category C2<br>EN 61800-3 environments 1 category C2<br>IEC 61800-5-1<br>EN 61800-3 environments 1 category C1<br>EN 61800-3 environments 2 category C2<br>EN 61800-5-1<br>IEC 61800-3 environments 2 category C3<br>IEC 61800-3 environments 1 category C1<br>IEC 61800-3 environments 1 category C3<br>EN 61800-3<br>UL Type 1 |
| Product certifications                | NOM 117<br>CSA<br>C-Tick<br>UL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Marking                               | CE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Offer Sustainability

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

Contractual warranty

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| Warranty | 18 months |
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