### Product datasheet

**Characteristics**

ATV312HU11M2412 variable speed drive ATV312 - 1.1kW - 2.4kVA - 74W - 200..240 V- 1-phase supply

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#### Main

- **Range of product**: Altivar 312 Solar
- **Product or component type**: Variable speed drive
- **Product destination**: Asynchronous motors
- **Product specific application**: Pumping station with photovoltaic arrays
- **Assembly style**: With heat sink
- **Device short name**: ATV312

#### Complementary

- **Motor power kW**: 1.1 kW
- **Motor power hp**: 1.5 hp
- **[Us] rated supply voltage**: 200…240 V - 5…5 %
- **Supply voltage limits**: 170…264 V
- **Supply frequency**: 50…60 Hz - 5…5 %
- **Network frequency**: 47.5…63 Hz
- **Network number of phases**: Single phase
- **Line current**: 10.2 A at 240 V
  - 12.1 A at 200 V, Isc = 1 kA
- **EMC filter**: Integrated
- **Apparent power**: 2.4 kVA
- **Prospective line Isc**: 1 kA
- **Continuous output current**: 6.9 A at 4 kHz
- **Maximum transient current**: 10.4 A for 60 s
- **Power dissipation in W**: 74 W at nominal load
- **Speed drive output frequency**: 0.5…500 Hz
- **Nominal switching frequency**: 4 kHz
- **Switching frequency**: 2…16 kHz adjustable
- **Speed range**: 1…50

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Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications.
Transient overtorque: 150…170 % of nominal motor torque

Braking torque:
- <= 150 % during 60 s with braking resistor
- 100 % with braking resistor continuously
- 150 % without braking resistor

Asynchronous motor control profile: Factory set: energy saving mode

Regulation loop: Frequency PI regulator

Motor slip compensation:
- Suppressable
- Adjustable
- Automatic whatever the load

Output voltage: <= power supply voltage

Electrical connection:
- AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, L1...L6 terminal 2.5 mm² AWG 14
- L1, L2, L3, U, V, W, PA, PB, PA+/-, PC/- terminal 2.5 mm² AWG 14

Tightening torque:
- AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, L1...L6: 0.6 N.m
- L1, L2, L3, U, V, W, PA, PB, PA+/-, PC/-: 0.8 N.m

Insulation: Electrical between power and control

Supply:
- Internal supply for logic inputs at 19…30 V, <100 A, protection type: overload and short-circuit protection
- Internal supply for reference potentiometer (2.2 to 10 kOhm) at 10...10.8 V, <10 A, protection type: overload and short-circuit protection

Analogue input number: 3

Analogue input type:
- AI1 configurable voltage 0...10 V, input voltage 30 V max, impedance: 30000 Ohm
- AI2 configurable voltage +/- 10 V, input voltage 30 V max, impedance: 30000 Ohm
- AI3 configurable current 0...20 mA, impedance: 250 Ohm

Sampling duration:
- AI1, AI2, AI3: 8 ms analog
- L1...L6: 4 ms discrete

Response time:
- AOV, AOC 8 ms for analog
- R1A, R1B, R1C, R2A, R2B 8 ms for discrete

Linearity error: +/- 0.2 % for output

Analogue output number: 2

Analogue output type:
- AOC configurable current: 0...20 mA, impedance: 800 Ohm, resolution: 8 bits
- AOV configurable voltage: 0...10 V, impedance: 470 Ohm, resolution: 8 bits

Discrete input logic:
- Logic input not wired (LI1...LI4), < 13 V (state 1)
- Positive logic (source) (LI1...LI6), < 5 V (state 0), > 11 V (state 1)
- Negative logic (source) (LI1...LI6), > 19 V (state 0)

Discrete output number: 2

Discrete output type:
- Configurable relay logic: (R1A, R1B, R1C) 1 NO + 1 NC - 100000 cycles
- Configurable relay logic: (R2A, R2B) NC - 100000 cycles

Minimum switching current: R1-R2 10 mA at 5 V DC

Maximum switching current:
- 2 A at 250 V AC on inductive load - cos phi = 0.4 - L/R = 7 ms (R1-R2)
- 2 A at 30 V DC on inductive load - cos phi = 0.4 - L/R = 7 ms (R1-R2)
- 5 A at 250 V AC on resistive load - cos phi = 1 - L/R = 0 ms (R1-R2)
- 5 A at 30 V DC on resistive load - cos phi = 1 - L/R = 0 ms (R1-R2)

Discrete input number: 6

Discrete input type:
- (LI1...LI6) programmable at 24 V, 0…100 mA for PLC, impedance: 3500 Ohm

Acceleration and deceleration ramps: Linear adjustable separately from 0.1 to 999.9 s

Braking to standstill: By DC injection

Protection type:
- Input phase breaks: drive
- Line supply overvoltage and undervoltage safety circuits: drive
- Line supply phase loss safety function, for three phases supply: drive
- Motor phase breaks: drive
- Overcurrent between output phases and earth (on power up only): drive
- Overheating protection: drive
- Short-circuit between motor phases: drive
- Thermal protection: motor

Dielectric strength:
- 2040 V DC between earth and power terminals
- 2880 V AC between control and power terminals

Insulation resistance: >= 500 mOhm 500 V DC for 1 minute

Local signalling:
- 1 LED (red) drive voltage: Four 7-segment display units
- CANopen bus status:

Time constant: 5 ms for reference change

Frequency resolution: Analog input: 0.1...100 Hz
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication port protocol</td>
<td>Modbus, CANopen</td>
</tr>
<tr>
<td>Connector type</td>
<td>1 RJ45 for Modbus/CANopen</td>
</tr>
<tr>
<td>Physical interface</td>
<td>RS485 multidrop serial link</td>
</tr>
<tr>
<td>Transmission frame</td>
<td>RTU</td>
</tr>
<tr>
<td>Transmission rate</td>
<td>10, 20, 50, 125, 250, 500 kbps or 1 Mbps for CANopen 4800, 9600 or 19200 bps for Modbus</td>
</tr>
<tr>
<td>Number of addresses</td>
<td>1…127 for CANopen 1…247 for Modbus</td>
</tr>
<tr>
<td>Number of drive</td>
<td>127 for CANopen 31 for Modbus</td>
</tr>
<tr>
<td>Electromagnetic compatibility</td>
<td>1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5</td>
</tr>
<tr>
<td></td>
<td>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4</td>
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<tr>
<td></td>
<td>Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2</td>
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<tr>
<td></td>
<td>Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3</td>
</tr>
<tr>
<td>Standards</td>
<td>IEC 61800-5-1  IEC 61800-3</td>
</tr>
<tr>
<td>Marking</td>
<td>CE</td>
</tr>
<tr>
<td>Height</td>
<td>143 mm</td>
</tr>
<tr>
<td>Width</td>
<td>107 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>152 mm</td>
</tr>
<tr>
<td>Net weight</td>
<td>1.8 kg</td>
</tr>
<tr>
<td>Option card</td>
<td>Communication card for CANopen daisy chain  Communication card for DeviceNet</td>
</tr>
<tr>
<td></td>
<td>Communication card for Fipio  Communication card for Modbus TCP  Communication card for Profbus DP</td>
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</table>

**Environment**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP degree of protection</td>
<td>IP20 without cover plate</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2</td>
</tr>
<tr>
<td>Protective treatment</td>
<td>TC</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>1 gn (f= 13…150 Hz) conforming to EN/IEC 60068-2-6 1.5 mm (f = 3…13 Hz) conforming to EN/IEC 60068-2-6</td>
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<tr>
<td>Shock resistance</td>
<td>15 gn for 11 ms conforming to EN/IEC 60068-2-27</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>5….95 % without condensation conforming to IEC 6068-2-3 5….95 % without dripping water conforming to IEC 6068-2-3</td>
</tr>
<tr>
<td>Ambient air temperature for storage</td>
<td>-25…70 °C</td>
</tr>
<tr>
<td>Ambient air temperature for operation</td>
<td>-10…50 °C without (with protective cover on top of the drive) -10…60 °C with derating factor (without protective cover on top of the drive)</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>&lt;= 1000 m without  &gt;= 1000 m with current derating 1 % per 100 m</td>
</tr>
<tr>
<td>Operating position</td>
<td>Vertical +/- 10 degree</td>
</tr>
</tbody>
</table>

**Offer Sustainability**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable offer status</td>
<td>Green Premium product</td>
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<tr>
<td>REACH Regulation</td>
<td>REACH Declaration</td>
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<tr>
<td>EU RoHS Directive</td>
<td>Pro-active compliance (Product out of EU RoHS legal scope)  EU RoHS Declaration</td>
</tr>
<tr>
<td>Mercury free</td>
<td>Yes</td>
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<tr>
<td>RoHS exemption information</td>
<td>Yes</td>
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<tr>
<td>China RoHS Regulation</td>
<td>China RoHS declaration</td>
</tr>
<tr>
<td>Environmental Disclosure</td>
<td>Product Environmental Profile</td>
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<tr>
<td>Circularity Profile</td>
<td>End of Life Information</td>
</tr>
<tr>
<td>WEEE</td>
<td>The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins</td>
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<tr>
<td>Contractual warranty</td>
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<tr>
<td>Warranty</td>
<td>18 months</td>
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