### 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**: 2.2 kW
- **Motor power hp**: 3 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**: 18.4 A at 240 V
  21.9 A at 200 V, $I_{sc} = 1$ kA
- **EMC filter**: Integrated
- **Apparent power**: 4.4 kVA
- **Prospective line $I_{sc}$**: 1 kA
- **Continuous output current**: 11 A at 4 kHz
- **Maximum transient current**: 16.5 A for 60 s
- **Power dissipation in W**: 123 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

*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

### Braking torque with braking resistor
- <= 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
Automatic whatever the load:
- Adjustable
- Suppressable

### Output voltage
<= power supply voltage

### Electrical connection
- A1, A2, A3, 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
- A1, A2, A3, 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
- A11 configurable voltage 0...10 V, input voltage 30 V max, impedance: 30000 Ohm
- A12 configurable voltage +/- 10 V, input voltage 30 V max, impedance: 30000 Ohm
- A13 configurable current 0...20 mA, impedance: 250 Ohm

### Sampling duration
- A11, A12, A13: 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)
- Negative logic (source) (LI1...LI6), > 19 V (state 0)
- Positive logic (source) (LI1...LI6), < 5 V (state 0), > 11 V (state 1)

### 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
S, U or customized
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 unitsCANopen bus status:

### Time constant
5 ms for reference change

### Frequency resolution
Analog input: 0.1...100 Hz
<table>
<thead>
<tr>
<th>Communication port protocol</th>
<th>CANopen</th>
</tr>
</thead>
<tbody>
<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  Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4  Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2  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>184 mm</td>
</tr>
<tr>
<td>Width</td>
<td>142 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>152 mm</td>
</tr>
<tr>
<td>Net weight</td>
<td>3.1 kg</td>
</tr>
<tr>
<td>Option card</td>
<td>Communication card for CANopen daisy chain  Communication card for DeviceNet  Communication card for Fipio  Communication card for Modbus TCP  Communication card for Proflbus DP</td>
</tr>
</tbody>
</table>

**Environment**

| IP degree of protection          | IP20 without cover plate |
| Pollution degree                 | 2                     |
| Protective treatment             | TC                    |
| Vibration resistance             | 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 |
| Shock resistance                 | 15 gn for 11 ms conforming to EN/IEC 60068-2-27 |
| Relative humidity                | 5…95 % without condensation conforming to IEC 60068-2-3  5…95 % without dripping water conforming to IEC 60068-2-3 |
| Ambient air temperature for storage | -25…70 °C          |
| Ambient air temperature for operation | -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) |
| Operating altitude               | <= 1000 m without  >= 1000 m with current derating 1 % per 100 m |
| Operating position               | Vertical +/- 10 degree |

**Offer Sustainability**

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

<table>
<thead>
<tr>
<th>Warranty</th>
<th>18 months</th>
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</thead>
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