

# ATV312HU11M2412

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



## 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                       | 12.1 A at 200 V, I <sub>sc</sub> = 1 kA<br>10.2 A at 240 V                                                                                                                                                                         |
| EMC filter                         | Integrated                                                                                                                                                                                                                         |
| Apparent power                     | 2.4 kVA                                                                                                                                                                                                                            |
| Prospective line I <sub>sc</sub>   | 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                                                                                                                                                                                                                             |
| Transient overtorque               | 150...170 % of nominal motor torque                                                                                                                                                                                                |
| Braking torque                     | 150 % without braking resistor<br>100 % with braking resistor continuously<br>150 % with braking resistor for 60 s                                                                                                                 |
| Braking torque                     | 150 % without braking resistor<br>100 % with braking resistor continuously<br>≤ 150 % with braking resistor for 60 s                                                                                                               |
| Asynchronous motor control profile | Factory set: energy saving mode                                                                                                                                                                                                    |
| Regulation loop                    | Frequency PI regulator                                                                                                                                                                                                             |
| Motor slip compensation            | Adjustable<br>Automatic whatever the load<br>Suppressable                                                                                                                                                                          |
| Output voltage                     | ≤ power supply voltage                                                                                                                                                                                                             |
| Electrical connection              | Terminal - cable cross section: 2.5 mm², AWG 14 (terminal(s) L1, L2, L3, U, V, W, PA, PB, PA/+, PC/-)<br>Terminal - cable cross section: 2.5 mm², AWG 14 (terminal(s) AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6) |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tightening torque                   | 0.8 N.m (terminal(s) L1, L2, L3, U, V, W, PA, PB, PA/+, PC/-)<br>0.6 N.m (terminal(s) AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6)                                                                                                                                                                                                                                                              |
| Insulation                          | Electrical between power and control                                                                                                                                                                                                                                                                                                                                                                            |
| Supply                              | Internal supply for reference potentiometer (2.2 to 10 kOhm) at 10...10.8 V, <= 10 A, protection type: overload and short-circuit protection<br>Internal supply for logic inputs at 19...30 V, <= 100 A, protection type: overload and short-circuit protection                                                                                                                                                 |
| Analogue input number               | 3                                                                                                                                                                                                                                                                                                                                                                                                               |
| Analogue input type                 | AI3 configurable current 0...20 mA, impedance: 250 Ohm<br>AI2 configurable voltage +/- 10 V, 30 V max, impedance: 30000 Ohm<br>AI1 configurable voltage 0...10 V, 30 V max, impedance: 30000 Ohm                                                                                                                                                                                                                |
| Sampling duration                   | 4 ms (terminal(s) LI1...LI6), input: discrete<br>8 ms (terminal(s) AI1, AI2, AI3), input: analog                                                                                                                                                                                                                                                                                                                |
| Response time                       | 8 ms, output: discrete (terminal(s) R1A, R1B, R1C, R2A, R2B)<br>8 ms, output: analog (terminal(s) AOV, AOC)                                                                                                                                                                                                                                                                                                     |
| Linearity error                     | +/- 0.2 % output                                                                                                                                                                                                                                                                                                                                                                                                |
| Analogue output number              | 2                                                                                                                                                                                                                                                                                                                                                                                                               |
| Analogue output type                | AOV configurable voltage 0...10 V, impedance: 470 Ohm, resolution: 8 bits<br>AOC configurable current 0...20 mA, impedance: 800 Ohm, resolution: 8 bits                                                                                                                                                                                                                                                         |
| Discrete input logic                | LI1...LI6 positive logic (source), < 5 V (state 0), > 11 V (state 1)<br>LI1...LI6 negative logic (source), > 19 V (state 0)<br>LI1...LI4 logic input not wired, < 13 V (state 1)                                                                                                                                                                                                                                |
| Discrete output number              | 2                                                                                                                                                                                                                                                                                                                                                                                                               |
| Discrete output type                | R2A, R2B configurable relay logic, NC, electrical service life: 100000 cycles<br>R1A, R1B, R1C configurable relay logic, 1 NO + 1 NC, electrical service life: 100000 cycles                                                                                                                                                                                                                                    |
| Minimum switching current           | 10 mA at 5 V DC (terminal(s) R1-R2)                                                                                                                                                                                                                                                                                                                                                                             |
| Maximum switching current           | 5 A at 30 V DC on resistive load - cos phi = 1 - L/R = 0 ms (R1-R2)<br>5 A at 250 V AC on resistive load - cos phi = 1 - L/R = 0 ms (R1-R2)<br>2 A at 30 V DC on inductive load - cos phi = 0.4 - L/R = 7 ms (R1-R2)<br>2 A at 250 V AC on inductive load - cos phi = 0.4 - L/R = 7 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<br>S, U or customized                                                                                                                                                                                                                                                                                                                                          |
| Braking to standstill               | By DC injection                                                                                                                                                                                                                                                                                                                                                                                                 |
| Protection type                     | Thermal protection for motor<br>Short-circuit between motor phases for drive<br>Overheating protection for drive<br>Overcurrent between output phases and earth (on power up only) for drive<br>Motor phase breaks for drive<br>Line supply phase loss safety function, for three phases supply for drive<br>Line supply overvoltage and undervoltage safety circuits for drive<br>Input phase breaks for drive |
| Dielectric strength                 | 2880 V AC between control and power terminals<br>2040 V DC between earth and power terminals                                                                                                                                                                                                                                                                                                                    |
| Insulation resistance               | >= 500 mOhm at 500 V DC for 1 minute                                                                                                                                                                                                                                                                                                                                                                            |
| Local signalling                    | Four 7-segment display units signal for CANopen bus status<br>1 LED (red) signal for drive voltage                                                                                                                                                                                                                                                                                                              |
| Time constant                       | 5 ms for reference change                                                                                                                                                                                                                                                                                                                                                                                       |
| Frequency resolution                | 0.1 Hz for display unit<br>0.1...100 Hz for analog input                                                                                                                                                                                                                                                                                                                                                        |
| Communication port protocol         | CANopen<br>Modbus                                                                                                                                                                                                                                                                                                                                                                                               |
| Type of connector                   | 1 RJ45 for Modbus/CANopen                                                                                                                                                                                                                                                                                                                                                                                       |
| Physical interface                  | RS485 multidrop serial link                                                                                                                                                                                                                                                                                                                                                                                     |
| Transmission frame                  | RTU                                                                                                                                                                                                                                                                                                                                                                                                             |
| Transmission rate                   | 4800, 9600 or 19200 bps for Modbus<br>10, 20, 50, 125, 250, 500 kbps or 1 Mbps for CANopen                                                                                                                                                                                                                                                                                                                      |
| Number of addresses                 | 1...247 for Modbus<br>1...127 for CANopen                                                                                                                                                                                                                                                                                                                                                                       |
| Number of drive                     | 31 for Modbus<br>127 for CANopen                                                                                                                                                                                                                                                                                                                                                                                |

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| Electromagnetic compatibility | Radiated radio-frequency electromagnetic field immunity test - test level 3 conforming to IEC 61000-4-3<br>Electrostatic discharge immunity test - test level 3 conforming to IEC 61000-4-2<br>Electrical fast transient/burst immunity test - test level 4 conforming to IEC 61000-4-4<br>1.2/50 $\mu$ s - 8/20 $\mu$ s surge immunity test - test level 3 conforming to IEC 61000-4-5 |
| Standards                     | IEC 61800-3<br>IEC 61800-5-1                                                                                                                                                                                                                                                                                                                                                            |
| Marking                       | CE                                                                                                                                                                                                                                                                                                                                                                                      |
| Height                        | 143 mm                                                                                                                                                                                                                                                                                                                                                                                  |
| Width                         | 107 mm                                                                                                                                                                                                                                                                                                                                                                                  |
| Depth                         | 152 mm                                                                                                                                                                                                                                                                                                                                                                                  |
| Product weight                | 1.8 kg                                                                                                                                                                                                                                                                                                                                                                                  |
| Option card                   | Communication card for Profibus DP<br>Communication card for Modbus TCP<br>Communication card for Fipio<br>Communication card for DeviceNet<br>Communication card for CANopen daisy chain                                                                                                                                                                                               |

## Environment

|                                       |                                                                                                                                                         |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| IP degree of protection               | IP20 without cover plate                                                                                                                                |
| Pollution degree                      | 2                                                                                                                                                       |
| Protective treatment                  | TC                                                                                                                                                      |
| Vibration resistance                  | 1.5 mm (f = 3...13 Hz) conforming to EN/IEC 60068-2-6<br>1 gn (f = 13...150 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 dripping water conforming to IEC 60068-2-3<br>5...95 % without condensation conforming to IEC 60068-2-3                                |
| Ambient air temperature for storage   | -25...70 °C                                                                                                                                             |
| Ambient air temperature for operation | -10...60 °C with derating factor without protective cover on top of the drive<br>-10...50 °C without derating with protective cover on top of the drive |
| Operating altitude                    | $\geq$ 1000 m with current derating 1 % per 100 m<br>$\leq$ 1000 m without derating                                                                     |
| Operating position                    | Vertical +/- 10 degree                                                                                                                                  |

## Offer Sustainability

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|--------------------------|---------------------------|
| Sustainable offer status | Not Green Premium product |
|--------------------------|---------------------------|