



### 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                     | 15 kW   |
| Maximum Horse Power Rating         | 20 hp   |
| [Us] rated supply voltage          | 380...500 V - 5...5 %   |
| Supply voltage limits              | 323...550 V   |
| Supply frequency                   | 50...60 Hz - 5...5 %  |
| Network Frequency                  | 47.5...63 Hz  |
| Phase                              | 3 phase   |
| Line current                       | 48.2 A 380 V, I <sub>sc</sub> = 22 kA<br>36.8 A 500 V   |
| EMC filter                         | Integrated  |
| Apparent power                     | 32 kVA  |
| Prospective line I <sub>sc</sub>   | 22 kA   |
| Continuous output current          | 33 A 4 kHz  |
| Maximum transient current          | 49.5 A 60 s   |
| Power dissipation in W             | 492 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   |
| Asynchronous motor control profile | Factory set: energy saving mode   |
| Regulation loop                    | Frequency PI regulator  |
| Motor slip compensation            | Suppressable<br>Automatic whatever the load<br>Adjustable   |
| Output voltage                     | <= power supply voltage   |
| Electrical connection              | AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6 terminal 0.00 in <sup>2</sup> (2.5 mm <sup>2</sup> ) AWG 14<br>L1, L2, L3, U, V, W, PA, PB, PA+, PC/- terminal 0.04 in <sup>2</sup> (25 mm <sup>2</sup> ) AWG 3 |
| Tightening torque                  | AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6 5.31 lbf.in (0.6 N.m)<br>L1, L2, L3, U, V, W, PA, PB, PA+, PC/- 39.83 lbf.in (4.5 N.m)  |
| Insulation                         | Electrical between power and control  |
| Supply                             | Internal supply for logic inputs 19...30 V, <100 mA overload and short-circuit protection<br>Internal supply for reference potentiometer (2.2 to 10 kOhm) 10...10.8 V, <10 mA overload and short-circuit protection         |
| Analogue input number              | 3   |

|                                     |   |
|-------------------------------------|---|
| Analogue input type                 | AI1 configurable voltage 0...10 V 30 V max 30000 Ohm<br>AI2 configurable voltage +/- 10 V 30 V max 30000 Ohm<br>AI3 configurable current 0...20 mA 250 Ohm  |
| Sampling duration                   | AI1, AI2, AI3 8 ms analog<br>LI1...LI6 4 ms discrete  |
| Response time                       | AOV, AOC 8 ms analog<br>R1A, R1B, R1C, R2A, R2B 8 ms discrete   |
| Linearity error                     | +/- 0.2 % output  |
| Analogue output number              | 2   |
| Analogue output type                | AOC configurable current 0...20 mA 800 Ohm 8 bits<br>AOV configurable voltage 0...10 V 470 Ohm 8 bits   |
| Discrete input logic                | Logic input not wired LI1...LI4), < 13 V<br>Negative logic (source) LI1...LI6), > 19 V<br>Positive logic (source) LI1...LI6), < 5 V, > 11 V   |
| Discrete output number              | 2   |
| Discrete output type                | Configurable relay logic R1A, R1B, R1C) 1 NO + 1 NC - 100000 cycles<br>Configurable relay logic R2A, R2B) NC - 100000 cycles  |
| Minimum switching current           | R1-R2 10 mA 5 V DC  |
| Maximum switching current           | 2 A 250 V AC inductive cos phi = 0.4 L/R = 7 ms R1-R2)<br>2 A 30 V DC inductive cos phi = 0.4 L/R = 7 ms R1-R2)<br>5 A 250 V AC resistive cos phi = 1 L/R = 0 ms R1-R2)<br>5 A 30 V DC resistive cos phi = 1 L/R = 0 ms R1-R2)  |
| Discrete input number               | 6   |
| Discrete input type                 | LI1...LI6) programmable 24 V, 0...100 mA PLC 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                     | Input phase breaks drive<br>Line supply overvoltage and undervoltage safety circuits drive<br>Line supply phase loss safety function, for three phases supply drive<br>Motor phase breaks drive<br>Overcurrent between output phases and earth (on power up only) drive<br>Overheating protection drive<br>Short-circuit between motor phases drive<br>Thermal protection motor |
| Dielectric strength                 | 2410 V DC between earth and power terminals<br>3400 V AC between control and power terminals  |
| Insulation resistance               | >= 500 mOhm 500 V DC for 1 minute   |
| Local signalling                    | For drive voltage 1 LED (red)<br>For CANopen bus status four 7-segment display units  |
| Time constant                       | 5 ms for reference change   |
| Frequency resolution                | Analog input 0.1...100 Hz<br>Display unit 0.1 Hz  |
| Communication Port Protocol         | Modbus<br>CANopen   |
| Connector type                      | 1 RJ45 Modbus/CANopen   |
| Physical interface                  | RS485 multidrop serial link   |
| Transmission frame                  | RTU   |
| Transmission Rate                   | 10, 20, 50, 125, 250, 500 kbps or 1 Mbps CANopen<br>4800, 9600 or 19200 bps Modbus  |
| Number of addresses                 | 1...127 CANopen<br>1...247 Modbus   |
| Number of drive                     | 127 CANopen<br>31 Modbus  |
| Electromagnetic compatibility       | 1.2/50 µs - 8/20 µs surge immunity test level 3 IEC 61000-4-5<br>Electrical fast transient/burst immunity test level 4 IEC 61000-4-4<br>Electrostatic discharge immunity test level 3 IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 IEC 61000-4-3   |
| Standards                           | IEC 61800-3<br>IEC 61800-5-1  |
| Marking                             | CE  |
| Height                              | 12.97 in (329.5 mm)   |
| Width                               | 9.65 in (245 mm)  |
| Depth                               | 7.56 in (192 mm)  |

|             |   |
|-------------|---|
| Net Weight  | 24.25 lb(US) (11 kg)  |
| Option card | Communication card CANopen daisy chain<br>Communication card DeviceNet<br>Communication card Fipio<br>Communication card Modbus TCP<br>Communication card Profibus DP |

## Environment

|                                       |   |
|---------------------------------------|---|
| IP degree of protection               | IP20 without cover plate  |
| Pollution degree                      | 2   |
| Protective treatment                  | TC  |
| Vibration resistance                  | 1 gn 13...150 Hz)EN/IEC 60068-2-6<br>1.5 mm 3...13 Hz)EN/IEC 60068-2-6  |
| Shock resistance                      | 15 gn 11 ms EN/IEC 60068-2-27   |
| Relative humidity                     | 5...95 % without condensation IEC 60068-2-3<br>5...95 % without dripping water IEC 60068-2-3  |
| Ambient Air Temperature for Storage   | -13...158 °F (-25...70 °C)  |
| Ambient air temperature for operation | 14...122 °F (-10...50 °C) without derating with protective cover on top of the drive)<br>14...140 °F (-10...60 °C) with derating factor without protective cover on top of the drive) |
| Operating altitude                    | <= 3280.84 ft (1000 m) without derating<br>3280.84...9842.52 ft (1000...3000 m) with current derating 1 % per 100 m   |
| Operating position                    | Vertical +/- 10 degree  |

## Ordering and shipping details

|                       |  |
|-----------------------|--|
| Category              | 22153 - ATV320/ATV312/ATV32 (10 THRU 30HP) |
| Discount Schedule     | CP4B                                       |
| GTIN                  | 3606485433783                              |
| Nbr. of units in pkg. | 1  |
| Package weight(Lbs)   | 26.19 lb(US) (11.88 kg)                    |
| Returnability         | No   |
| Country of origin     | ID   |

## Packing Units

|                              |                         |
|------------------------------|-------------------------|
| Unit Type of Package 1       | PCE                     |
| Package 1 Height             | 11.22 in (28.5 cm)      |
| Package 1 width              | 11.81 in (30 cm)        |
| Package 1 Length             | 15.75 in (40 cm)        |
| Unit Type of Package 2       | S06                     |
| Number of Units in Package 2 | 1                       |
| Package 2 Weight             | 26.19 lb(US) (11.88 kg) |
| Package 2 Height             | 28.94 in (73.5 cm)      |
| Package 2 width              | 23.62 in (60 cm)        |
| Package 2 Length             | 31.50 in (80 cm)        |