



## 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                                                                                                                                                                                                                         |
| Maximum Horse Power Rating         | 1.5 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                       | 3.7 A 500 V<br>4.9 A 380 V, I <sub>sc</sub> = 1 kA                                                                                                                                                                             |
| EMC filter                         | Integrated                                                                                                                                                                                                                     |
| Apparent power                     | 3.2 kVA                                                                                                                                                                                                                        |
| Prospective line I <sub>sc</sub>   | 1 kA                                                                                                                                                                                                                           |
| Continuous output current          | 3 A 4 kHz                                                                                                                                                                                                                      |
| Maximum transient current          | 4.5 A 60 s                                                                                                                                                                                                                     |
| Power dissipation in W             | 48 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 % 60 s with braking resistor<br>100 % with braking resistor continuously<br>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<br>Suppressable<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 0.00 in <sup>2</sup> (2.5 mm <sup>2</sup> ) AWG 14 |
| 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/- 7.08 lbf.in (0.8 N.m)                                                                             |
| Insulation                         | Electrical between power and control                                                                                                                                                                                           |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply                              | Internal supply for logic inputs 19...30 V, <100 A overload and short-circuit protection<br>Internal supply for reference potentiometer (2.2 to 10 kOhm) 10...10.8 V, <10 A 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 | S, U or customized<br>Linear adjustable separately from 0.1 to 999.9 s                                                                                                                                                                                                                                                                                                          |
| 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                    | Drive voltage 1 LED red)<br>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 61800-5-1<br>IEC 61800-3                                                                                                                                                                                                                                                                                                                                                    |

|                |                                                                                                                                                                       |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Marking        | CE                                                                                                                                                                    |
| Maximum Height | 12.97 in (329.5 mm)                                                                                                                                                   |
| Maximum Width  | 9.65 in (245 mm)                                                                                                                                                      |
| Maximum Depth  | 7.56 in (192 mm)                                                                                                                                                      |
| Net Weight     | 3.97 lb(US) (1.8 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 ft (1000 m) with current derating 1 % per 100 m                                                                                 |
| Operating position                    | Vertical +/- 10 degree                                                                                                                                                                |

## Ordering and shipping details

|                       |                                              |
|-----------------------|----------------------------------------------|
| Category              | 22152 - ATV320/ATV312/ATV32 (.25 THRU 7.5HP) |
| Discount Schedule     | CP4B                                         |
| GTIN                  | 03606480508592                               |
| Nbr. of units in pkg. | 1                                            |
| Package weight(Lbs)   | 3.97 lb(US) (1.80 kg)                        |
| Returnability         | No                                           |

## Packing Units

|                  |          |
|------------------|----------|
| Package 1 Height | 2.000 dm |
| Package 1 width  | 2.150 dm |
| Package 1 Length | 2.550 dm |

## Offer Sustainability

|                            |                                                                                                                              |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Sustainable offer status   | Green Premium product                                                                                                        |
| EU RoHS Directive          | Pro-active compliance (Product out of EU RoHS legal scope) <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

|          |           |
|----------|-----------|
| Warranty | 18 months |
|----------|-----------|