

# Product datasheet

Specifications



## variable speed drive ATV31 - 2.2kW - 240V 1-phase supply - EMC filter - IP20

ATV31HU22M2

⚠ Discontinued on: 31 Dec 2011

⚠ End-of-service on: 31 Dec 2015

⚠ Discontinued

### Main

|                                    |  |
|------------------------------------|--|
| Range of product                   | Altivar  |
| Product or component type          | Variable speed drive   |
| Product specific application       | Simple machine   |
| Component name                     | ATV31  |
| Assembly style                     | With heat sink   |
| EMC filter                         | Integrated   |
| [Us] rated supply voltage          | 200...240 V - 5...5 %  |
| Supply frequency                   | 50...60 Hz - 5...5 %   |
| Network number of phases           | Single phase   |
| Motor power kW                     | 2.2 kW 4 kHz   |
| Motor power hp                     | 3 hp 4 kHz   |
| Line current                       | 18.4 A at 240 V<br>21.9 A at 200 V, I <sub>sc</sub> = 1 kA   |
| Apparent power                     | 4.4 kVA  |
| Prospective line I <sub>sc</sub>   | 1 kA   |
| Nominal output current             | 11 A 4 kHz   |
| Maximum transient current          | 16.5 A for 60 s  |
| Power dissipation in W             | 123 W at nominal load  |
| Asynchronous motor control profile | Factory set : constant torque<br>Sensorless flux vector control with PWM type motor control signal |
| Analogue input number              | 3  |

### Complementary

|                             |                                     |
|-----------------------------|-------------------------------------|
| Product destination         | Asynchronous motors                 |
| Supply voltage limits       | 170...264 V                         |
| Network frequency           | 47.5...63 Hz                        |
| Output frequency            | 0.0005...0.5 kHz                    |
| Nominal switching frequency | 4 kHz                               |
| Switching frequency         | 2...16 kHz adjustable               |
| Speed range                 | 1...50                              |
| Transient overtorque        | 150...170 % of nominal motor torque |

|  |   |
|--|---|
| <b>Braking torque</b>                      | <= 150 % during 60 s with braking resistor<br>100 % with braking resistor continuously<br>150 % without braking resistor  |
| <b>Regulation loop</b>                     | Frequency PI regulator  |
| <b>Motor slip compensation</b>             | Suppressable<br>Automatic whatever the load<br>Adjustable   |
| <b>Output voltage</b>                      | <= power supply voltage   |
| <b>Electrical connection</b>               | AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6 terminal 2.5 mm <sup>2</sup> AWG 14<br>L1, L2, L3, U, V, W, PA, PB, PA/+, PC/- terminal 2.5 mm <sup>2</sup> AWG 14  |
| <b>Tightening torque</b>                   | AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6: 0.6 N.m<br>L1, L2, L3, U, V, W, PA, PB, PA/+, PC/-: 0.8 N.m  |
| <b>Insulation</b>                          | Electrical between power and control  |
| <b>Supply</b>                              | Internal supply for logic inputs: 19...30 V 100 mA, protection type: overload and short-circuit protection<br>Internal supply for reference potentiometer (2.2 to 10 kOhm): 10...10.8 V 10 mA, protection type: overload and short-circuit protection   |
| <b>Analogue input type</b>                 | AI3 configurable current 0...20 mA, impedance: 250 Ohm<br>AI1 configurable voltage 0...10 V, input voltage 30 V max, impedance: 30000 Ohm<br>AI2 configurable voltage +/- 10 V, input voltage 30 V max, impedance: 30000 Ohm  |
| <b>Sampling duration</b>                   | LI1...LI6: 4 ms discrete<br>AI1, AI2, AI3: 8 ms analog  |
| <b>Response time</b>                       | AOV, AOC 8 ms for analog<br>R1A, R1B, R1C, R2A, R2B 8 ms for discrete   |
| <b>Linearity error</b>                     | +/- 0.2 % for output  |
| <b>Analogue output number</b>              | 2   |
| <b>Analogue output type</b>                | AOC configurable current: 0...20 mA, impedance: 800 Ohm, resolution: 8 bits<br>AOV configurable voltage: 0...10 V, impedance: 470 Ohm, resolution: 8 bits   |
| <b>Discrete input logic</b>                | Positive logic (source) (LI1...LI6), < 5 V (state 0), > 11 V (state 1)<br>Logic input not wired (LI1...LI4), < 13 V (state 1)<br>Negative logic (source) (LI1...LI6), > 19 V (state 0)  |
| <b>Discrete output number</b>              | 2   |
| <b>Discrete output type</b>                | Configurable relay logic: (R1A, R1B, R1C) 1 NO + 1 NC - 100000 cycles<br>Configurable relay logic: (R2A, R2B) NC - 100000 cycles  |
| <b>Minimum switching current</b>           | R1-R2 10 mA at 5 V DC   |
| <b>Maximum switching current</b>           | R1-R2: 2 A at 250 V AC inductive load, cos phi = 0.4 and L/R = 7 ms<br>R1-R2: 2 A at 30 V DC inductive load, cos phi = 0.4 and L/R = 7 ms<br>R1-R2: 5 A at 250 V AC resistive load, cos phi = 1 and L/R = 0 ms<br>R1-R2: 5 A at 30 V DC resistive load, cos phi = 1 and L/R = 0 ms  |
| <b>Discrete input number</b>               | 6   |
| <b>Discrete input type</b>                 | (LI1...LI6) programmable at 24 V, 0...100 mA for PLC, impedance: 3500 Ohm   |
| <b>Acceleration and deceleration ramps</b> | Linear adjustable separately from 0.1 to 999.9 s<br>S, U or customized  |
| <b>Braking to standstill</b>               | By DC injection   |
| <b>Protection type</b>                     | 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 |
| <b>Insulation resistance</b>               | >= 500 mOhm 500 V DC for 1 minute   |

|                             |  |
|-----------------------------|--|
| <b>Display type</b>         | 1 LED (red) for drive voltage<br>Four 7-segment display units for CANopen bus status                               |
| <b>Time constant</b>        | 5 ms for reference change  |
| <b>Frequency resolution</b> | Display unit: 0.1 Hz<br>Analog input: 0.1...100 Hz   |
| <b>Connector type</b>       | 1 RJ45 for CANopen via VW3 CANTAP2 adaptor<br>1 RJ45 for Modbus  |
| <b>Physical interface</b>   | RS485 multidrop serial link for CANopen via VW3 CANTAP2 adaptor<br>RS485 multidrop serial link for Modbus          |
| <b>Transmission frame</b>   | RTU for CANopen via VW3 CANTAP2 adaptor<br>RTU for Modbus  |
| <b>Transmission rate</b>    | 10, 20, 50, 125, 250, 500 kbps or 1 Mbps for CANopen via VW3 CANTAP2 adaptor<br>4800, 9600 or 19200 bps for Modbus |
| <b>Number of addresses</b>  | 1...127 for CANopen via VW3 CANTAP2 adaptor<br>1...247 for Modbus  |
| <b>Number of drive</b>      | 127 for CANopen via VW3 CANTAP2 adaptor<br>31 for Modbus   |
| <b>Marking</b>              | CE   |
| <b>Operating position</b>   | Vertical +/- 10 degree   |
| <b>Outer dimension</b>      | 184 x 140 x 150 mm<br>215 x 185 x 158 mm<br>230 x 200 x 152 mm   |
| <b>Net weight</b>           | 3.1 kg   |

## Environment

|  |   |
|--|---|
| <b>Dielectric strength</b>                   | 2040 V DC between earth and power terminals<br>2880 V AC between control and power terminals  |
| <b>Electromagnetic compatibility</b>         | 1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5<br>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4<br>Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3 |
| <b>Standards</b>                             | EN 50178  |
| <b>Product certifications</b>                | UL<br>C-Tick<br>N998<br>CSA   |
| <b>IP degree of protection</b>               | On upper part: IP20 (without cover plate)<br>On connection terminals: IP21<br>On upper part: IP31<br>On upper part: IP41  |
| <b>pollution degree</b>                      | 2   |
| <b>Protective treatment</b>                  | TC  |
| <b>Vibration resistance</b>                  | 1 gn (f= 13...150 Hz) conforming to EN/IEC 60068-2-6<br>1.5 mm (f= 3...13 Hz) conforming to EN/IEC 60068-2-6  |
| <b>Shock resistance</b>                      | 15 gn for 11 ms conforming to EN/IEC 60068-2-27   |
| <b>Relative humidity</b>                     | 5...95 % without condensation conforming to IEC 60068-2-3<br>5...95 % without dripping water conforming to IEC 60068-2-3  |
| <b>Ambient air temperature for storage</b>   | -25...70 °C   |
| <b>Ambient air temperature for operation</b> | -10...50 °C without derating (with protective cover on top of the drive)<br>-10...60 °C with derating factor (without protective cover on top of the drive)   |
| <b>Operating altitude</b>                    | >= 1000 m with current derating 1 % per 100 m   |

# Contractual warranty

---

Warranty

18 months