

# Product data sheet

Specifications



## variable speed drive ATV11 - 0.37kW - 230V 1-phase supply - IP20

ATV11PU09M2E315

! Discontinued

! Discontinued on: Dec 31, 2010

! End-of-service on: Dec 31, 2012

### Main

|                                    |                                                                                                                                                                                                                                                            |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Range Of Product                   | Altivar 11                                                                                                                                                                                                                                                 |
| Product Or Component Type          | Variable speed drive                                                                                                                                                                                                                                       |
| Product Specific Application       | Simple machine                                                                                                                                                                                                                                             |
| Component Name                     | ATV11                                                                                                                                                                                                                                                      |
| Application Market                 | European                                                                                                                                                                                                                                                   |
| Mounting Support                   | Base plate                                                                                                                                                                                                                                                 |
| Emc Filter                         | Integrated                                                                                                                                                                                                                                                 |
| Built-In Fan                       | Without                                                                                                                                                                                                                                                    |
| Network Number Of Phases           | 1 phase                                                                                                                                                                                                                                                    |
| [Us] Rated Supply Voltage          | 200...240 V - 15...10 %                                                                                                                                                                                                                                    |
| Supply Frequency                   | 50...60 Hz - 5...5 %                                                                                                                                                                                                                                       |
| Motor Power Kw                     | 0.37 kW                                                                                                                                                                                                                                                    |
| Line Current                       | 5.3 A at 230 V, I <sub>sc</sub> = 1 kA                                                                                                                                                                                                                     |
| Nominal Output Current             | 2.1 A 230 V motor 4 kHz                                                                                                                                                                                                                                    |
| Maximum Transient Current          | 3.1 A for 60 s                                                                                                                                                                                                                                             |
| Power Dissipation In W             | 20.5 W at nominal load                                                                                                                                                                                                                                     |
| Switching Frequency                | 2...16 kHz adjustable<br>4...16 kHz with derating factor                                                                                                                                                                                                   |
| Braking Torque                     | 150 % of nominal motor torque with braking resistor at high inertia<br>20 % of nominal motor torque without braking resistor at no load<br>80 % of nominal motor torque with braking resistor at no load                                                   |
| Asynchronous Motor Control Profile | Sensorless flux vector control with PWM type motor control signal                                                                                                                                                                                          |
| Electrical Connection              | Terminal, clamping capacity: 1.5 mm², AWG 14 (AI1, RA-RC, LI1...LI4, DO)<br>Terminal, clamping capacity: 1.5 mm², AWG 14 (L1, L2, L3, U, V, W, PA, PC)                                                                                                     |
| Supply                             | Internal supply for logic inputs: 15 V (+/- 15 %) 100 A, protection type: overload and short-circuit protection<br>Internal supply for reference potentiometer (2.2 to 10 kOhm): 5...5.25 VDC 10 A, protection type: overload and short-circuit protection |
| Analogue Input Type                | Configurable current AI1 4...20 mA 250 Ohm without adding resistor<br>Configurable voltage AI1 0...5 V 40000 Ohm only with internal supply<br>Configurable current AI1 0...20 mA 250 Ohm<br>Configurable voltage AI1 0...10 V 40000 Ohm                    |
| Sampling Duration                  | AI1: 20 ms analog<br>LI1...LI4: 20 ms discrete                                                                                                                                                                                                             |

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

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Response Time                         | 20 ms DO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Linearity Error                       | DO: +/- 1 % for output<br>AI: +/- 5 % for input                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Discrete Input Type                   | Assignable LI1 forward 5000 Ohm 15 V 24 V<br>Assignable LI2 reverse 5000 Ohm 15 V 24 V<br>Assignable LI3/LI4 4 preset speeds 5000 Ohm 15 V 24 V                                                                                                                                                                                                                                                                                                                                                                                                  |
| Discrete Input Logic                  | Positive logic (source) (LI1...LI4), < 5 V (state 0), > 11 V (state 1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Discrete Output Type                  | Assignable as external voltage DO 30 V max, 30 mA<br>Assignable as open collector logic output DO 100 Ohm, 50 mA max<br>Factory set as PWM open collector output DO at 2 kHz 10 mA max<br>Protected relay logic RA-RC 1 NO<br>Assignable as internal voltage DO                                                                                                                                                                                                                                                                                  |
| Minimum Switching Current             | RA-RC 10 mA at 24 V DC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Maximum Switching Current             | 2 A 250 V AC inductive cos phi = 0.4 7 ms RA-RC<br>2 A 30 V DC inductive cos phi = 0.4 7 ms RA-RC<br>5 A 250 V AC resistive cos phi = 1 0 ms RA-RC<br>5 A 30 V DC resistive cos phi = 1 0 ms RA-RC                                                                                                                                                                                                                                                                                                                                               |
| Protection Type                       | Line supply overvoltage: drive<br>Line supply undervoltage: drive<br>Overheating protection: drive<br>Short-circuit between motor phases: drive<br>Thermal protection: motor<br>Overcurrent between output phases and earth: drive                                                                                                                                                                                                                                                                                                               |
| Frequency Resolution                  | Display unit: 0.1 Hz<br>Analog input: converter A/D, 10 bits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Electromagnetic Compatibility         | 1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to EN/IEC 61000-4-5<br>Electrical fast transient/burst immunity test level 4 conforming to EN/IEC 61000-4-4<br>Electrostatic discharge immunity test level 3 conforming to EN/IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 conforming to EN/IEC 61000-4-3                                                                                                                                                                                    |
| Maximum Motor Cable Length            | 10 m without additional EMC filter from 2 to 16 kHz conforming to EN 55011 class A group 1<br>10 m without additional EMC filter from 2 to 16 kHz conforming to EN 55022 class A group 1<br>20 m with additional EMC filter from 2 to 16 kHz conforming to EN 55011 class B<br>5 m without additional EMC filter from 2 to 12 kHz conforming to EN 55011 class B<br>5 m without additional EMC filter from 2 to 12 kHz conforming to EN 55022 class B<br>50 m with additional EMC filter from 2 to 16 kHz conforming to EN 55011 class A group 1 |
| Vibration Resistance                  | 1 gn (f= 13...200 Hz) conforming to EN/IEC 60068-2-6<br>1.5 mm peak to peak (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...93 % without condensation conforming to IEC 60068-2-3<br>5...93 % without dripping water conforming to IEC 60068-2-3                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Ambient Air Temperature For Operation | -10...40 °C without derating<br>40...50 °C by removing the protective cover from the top of the drive<br>50...60 °C by removing the protective cover from the top of the drive with current derating of 2.2 % per °C                                                                                                                                                                                                                                                                                                                             |
| Operating Altitude                    | <= 1000 m without derating<br>> 1000 m with current derating 1 % per 100 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Complementary

|                              |                     |
|------------------------------|---------------------|
| Product Destination          | Asynchronous motors |
| Supply Voltage Limits        | 170...264 V         |
| Network Frequency Limits     | 47.5...63 Hz        |
| Speed Drive Output Frequency | 0...200 Hz          |
| Nominal Switching Frequency  | 4 kHz               |
| Speed Range                  | 1...20              |

|                                     |                                                                                                                                                               |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transient Overtorque                | 150...170 % of nominal motor torque                                                                                                                           |
| Regulation Loop                     | Adjustable frequency<br>Possible correction for machines with high resistive torque/inertia/fast cycles<br>Factory-set with the speed loop stability and gain |
| Motor Slip Compensation             | Adjustable<br>Preset in factory                                                                                                                               |
| Prospective Line Isc                | 1 kA                                                                                                                                                          |
| Output Voltage                      | <= power supply voltage                                                                                                                                       |
| Insulation                          | Electrical between power and control                                                                                                                          |
| Analogue Input Number               | 1                                                                                                                                                             |
| Discrete Input Number               | 4                                                                                                                                                             |
| Discrete Output Number              | 2                                                                                                                                                             |
| Acceleration And Deceleration Ramps | Linear from 0 to 99.9 s                                                                                                                                       |
| Braking To Standstill               | By DC injection                                                                                                                                               |
| Insulation Resistance               | > 500 MOhm                                                                                                                                                    |
| Marking                             | CE                                                                                                                                                            |
| Operating Position                  | Vertical +/- 10 degree                                                                                                                                        |
| Cad Overall Width                   | 72 mm                                                                                                                                                         |
| Cad Overall Height                  | 142 mm                                                                                                                                                        |
| Cad Overall Depth                   | 101 mm                                                                                                                                                        |
| Outer Dimension                     | 142 x 72 x 101 mm                                                                                                                                             |
| Net Weight                          | 0.9 kg                                                                                                                                                        |

## Environment

|                                     |                             |
|-------------------------------------|-----------------------------|
| Standards                           | EN 50178                    |
| Product Certifications              | N998<br>UL<br>CSA<br>C-Tick |
| Ip Degree Of Protection             | IP20                        |
| Ambient Air Temperature For Storage | -25...65 °C                 |