# Product data sheet
## Characteristics

# ATV320U22M3C
variable speed drive, Altivar Machine ATV320, 2.2kW, 200 to 240V, 3 phases, compact



## Main

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|---|---|
| Range of product | Altivar Machine ATV320 |
| Product or component type | Variable speed drive |
| Product specific application | Complex machines |
| Variant | Standard version |
| Format of the drive | Compact |
| Mounting mode | Wall mount |
| Communication port protocol | Modbus serial<br>CANopen |
| Option card | Communication module, CANopen<br>Communication module, EtherCAT<br>Communication module, Profibus DP V1<br>Communication module, PROFINET<br>Communication module, Ethernet Powerlink<br>Communication module, EtherNet/IP<br>Communication module, DeviceNet |
| [Us] rated supply voltage | 200...240 V - 15...10 % |
| Nominal output current | 11.0 A |
| Motor power kW | 2.2 KW for heavy duty |
| Motor power hp | 3 Hp |
| EMC filter | Without EMC filter |
| IP degree of protection | IP20 |

## Complementary

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| Discrete input number | 7 |
| Discrete input type | STO safe torque off, 24 V DC, impedance: 1.5 kOhm<br>DI1...DI6 logic inputs, 24 V DC (30 V)<br>DI5 programmable as pulse input: 0…30 kHz, 24 V DC (30 V) |
| Discrete input logic | Positive logic (source)<br>Negative logic (sink) |
| Discrete output number | 3 |
| Discrete output type | Open collector DQ+ 0…1 kHz 30 V DC 100 mA<br>Open collector DQ- 0…1 kHz 30 V DC 100 mA |
| Analogue input number | 3 |
| Analogue input type | AI1 voltage: 0...10 V DC, impedance: 30 kOhm, resolution 10 bits<br>AI2 bipolar differential voltage: +/- 10 V DC, impedance: 30 kOhm, resolution 10 bits<br>AI3 current: 0...20 mA (or 4-20 mA, x-20 mA, 20-x mA or other patterns by configuration), impe |
| Analogue output number | 1 |
| Analogue output type | Software-configurable current AQ1: 0...20 mA impedance 800 Ohm, resolution 10 bits<br>Software-configurable voltage AQ1: 0...10 V DC impedance 470 Ohm, resolution 10 bits |

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| Relay output type | Configurable relay logic R1A 1 NO electrical durability 100000 cycles<br>Configurable relay logic R1B 1 NC electrical durability 100000 cycles<br>Configurable relay logic R1C<br>Configurable relay logic R2A 1 NO electrical durability 100000 cycles<br>Configurable relay logic R2C |
| Maximum switching current | Relay output R1A, R1B, R1C on resistive load, cos phi = 1: 3 A at 250 V AC<br>Relay output R1A, R1B, R1C on resistive load, cos phi = 1: 3 A at 30 V DC<br>Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 2<br>Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 3<br>Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC<br>Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC |
| Minimum switching current | Relay output R1A, R1B, R1C, R2A, R2C: 5 mA at 24 V DC |
| Method of access | Slave CANopen |
| 4 quadrant operation possible | True |
| Asynchronous motor control profile | Voltage/Frequency ratio, 5 points<br>Flux vector control without sensor, standard<br>Voltage/Frequency ratio - Energy Saving, quadratic U/f<br>Flux vector control without sensor - Energy Saving<br>Voltage/Frequency ratio, 2 points |
| Synchronous motor control profile | Vector control without sensor |
| Maximum output frequency | 0.599 KHz |
| Acceleration and deceleration ramps | Linear<br>U<br>S<br>CUS<br>Ramp switching<br>Acceleration/Deceleration ramp adaptation<br>Acceleration/Deceleration automatic stop with DC injection |
| Motor slip compensation | Automatic whatever the load<br>Adjustable 0...300 %<br>Not available in voltage/frequency ratio (2 or 5 points) |
| Switching frequency | 2...16 kHz adjustable<br>4...16 kHz with derating factor |
| Nominal switching frequency | 4 kHz |
| Braking to standstill | By DC injection |
| Brake chopper integrated | True |
| Line current | 14.9 A at 200 V (heavy duty)<br>12.5 A at 240 V (heavy duty) |
| Maximum input current | 14.9 A |
| Maximum output voltage | 240 V |
| Apparent power | 5.2 KVA at 240 V (heavy duty) |
| Network frequency | 50...60 Hz |
| Relative symmetric network frequency tolerance | 5 % |
| Prospective line Isc | 5 KA |
| Base load current at high overload | 3.7 A |
| Power dissipation in W | Fan: 91 W at 200 V, switching frequency 4 kHz |
| With safety function Safely Limited Speed (SLS) | True |
| With safety function Safe brake management (SBC/SBT) | False |
| With safety function Safe Operating Stop (SOS) | False |
| With safety function Safe Position (SP) | False |
| With safety function Safe programmable logic | False |
| With safety function Safe Speed Monitor (SSM) | False |
| With safety function Safe Stop 1 (SS1) | True |
| With sft fct Safe Stop 2 (SS2) | False |
| With safety function Safe torque off (STO) | True |
| With safety function Safely Limited Position (SLP) | False |
| With safety function Safe Direction (SDI) | False |
| Protection type | Input phase breaks: drive<br>Overcurrent between output phases and earth: drive<br>Overheating protection: drive<br>Short-circuit between motor phases: drive<br>Thermal protection: drive |
| Width | 105.0 Mm |
| Height | 143.0 Mm |

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| Depth | 138.0 Mm |
| Net weight | 1.4 Kg |
| Transient overtorque | 170…200 % of nominal motor torque |

## Environment

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| Operating position | Vertical +/- 10 degree |
| Product certifications | CE[RETURN]ATEX[RETURN]NOM[RETURN]GOST[RETURN]EAC[RETURN]RCM[RETURN] |
| Marking | CE<br>ATEX<br>UL<br>CSA<br>EAC<br>RCM |
| Standards | IEC 61800-5-1 |
| Electromagnetic compatibility | 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-<br>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4<br>1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5<br>Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6<br>Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 |
| Environmental class (during operation) | Class 3C3 according to IEC 60721-3-3<br>Class 3S2 according to IEC 60721-3-3 |
| Maximum acceleration under shock impact (during operation) | 150 m/s² at 11 ms |
| Maximum acceleration under vibrational stress (during operation) | 10 m/s² at 13...200 Hz |
| Maximum deflection under vibratory load (during operation) | 1.5 mm at 2...13 Hz |
| Permitted relative humidity (during operation) | Class 3K5 according to EN 60721-3 |
| Volume of cooling air | 14.8 M3/H |
| Overvoltage category | III |
| Regulation loop | Adjustable PID regulator |
| Speed accuracy | +/- 10 % of nominal slip 0.2 Tn to Tn |
| Pollution degree | 2 |
| Ambient air transport temperature | -25…70 °C |
| Ambient air temperature for operation | -10…50 °C without derating<br>50…60 °C with derating factor |
| Ambient air temperature for storage | -25…70 °C |

## Packing Units

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|---|---|
| Unit Type of Package 1 | PCE |
| Number of Units in Package 1 | 1 |
| Package 1 Height | 18.000 Cm |
| Package 1 Width | 18.500 Cm |
| Package 1 Length | 18.500 Cm |
| Package 1 Weight | 1.611 Kg |
| Unit Type of Package 2 | S06 |
| Number of Units in Package 2 | 30 |
| Package 2 Height | 75.000 Cm |
| Package 2 Width | 60.000 Cm |
| Package 2 Length | 80.000 Cm |
| Package 2 Weight | 62.350 Kg |

## Offer Sustainability

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| Recyclability potential, in % | 57 |
| Total lifecycle Carbon footprint | 1 945 kg CO2 eq. |
| Carbon footprint of the manufacturing phase [A1 to A3] | 31.76653750837768 |
| Carbon footprint of the manufacturing phase [A1 to A3] | 32 kg CO2 eq. |
| Carbon footprint of the distribution phase [A4] | 0.340178916419305 |
| Carbon footprint of the distribution phase [A4] | 0.3 kg CO2 eq. |
| Carbon footprint of the installation phase [A5] | 0.3696596635296066 |
| Carbon footprint of the installation phase [A5] | 0.4 kg CO2 eq. |

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| Carbon footprint of the use phase [B2, B3, B4, B6] | 1910.110634387908 |
| Carbon footprint of the use phase [B2, B3, B4, B6] | 1 910 kg CO2 eq. |
| Mercury free | Yes |
| Sustainable packaging | Yes |
| Carbon footprint of the end-of-life phase [C1 to C4] | 2.681425551340864 |
| Carbon footprint of the end-of-life phase [C1 to C4] | 3 kg CO2 eq. |
| Environmental Disclosure | Product Environmental Profile |
| Total lifecycle Carbon footprint | 1945 |
| Average percentage of ASI certified metals | 100 % |
| Packaging made with recycled cardboard | Yes |
| Packaging without single use plastic | Yes |
| SCIP Number | C0283eca-aee5-4ec9-9f8c-c7e056d0a8d7 |
| REACh Regulation | Reference contains Substances of Very High Concern above the threshold |
| EU RoHS Directive | Compliant By Exemption |
| California proposition 65 | WARNING: This product can expose you to chemicals including: Lead and lead compounds, which |
| Product contributes to saved and avoided emissions | Yes |
| End of life manual availability | End Of Life Information |
| Take-back | No |
| WEEE Label | The product must be disposed on European Union markets following specific waste collection and |

## Contractual warranty

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|---|---|
| Warranty (in months) | 18 |

Product Life Status : Commercialised