## Main

<table>
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<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td>Range of product</td>
<td>Altivar Machine ATV320</td>
</tr>
<tr>
<td>Product or component type</td>
<td>Variable speed drive</td>
</tr>
<tr>
<td>Product specific application</td>
<td>Complex machines</td>
</tr>
<tr>
<td>Device short name</td>
<td>ATV320</td>
</tr>
<tr>
<td>Format of the control block</td>
<td>Book</td>
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<tr>
<td>Product destination</td>
<td>Asynchronous motors</td>
</tr>
<tr>
<td></td>
<td>Synchronous motors</td>
</tr>
<tr>
<td>EMC filter</td>
<td>Class C2 EMC filter integrated</td>
</tr>
<tr>
<td>IP degree of protection</td>
<td>IP20 conforming to EN/IEC 61800-5-1</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>UL type 1 with UL type 1 conformity kit</td>
</tr>
<tr>
<td>Type of cooling</td>
<td>Fan</td>
</tr>
<tr>
<td>Network number of phases</td>
<td>3 phases</td>
</tr>
<tr>
<td>[Us] rated supply voltage</td>
<td>380...500 V (-15...10 %)</td>
</tr>
<tr>
<td>Supply frequency</td>
<td>50...60 Hz (-5...5 %)</td>
</tr>
<tr>
<td>Motor power kW</td>
<td>5.5 kW for heavy duty</td>
</tr>
<tr>
<td>Motor power hp</td>
<td>7.5 hp for heavy duty</td>
</tr>
<tr>
<td>Line current</td>
<td>19.8 A at 380 V for heavy duty</td>
</tr>
<tr>
<td></td>
<td>15.2 A at 500 V for heavy duty</td>
</tr>
<tr>
<td>Prospective line Isc</td>
<td>22 kA</td>
</tr>
<tr>
<td>Apparent power</td>
<td>13.2 kVA at 500 V for heavy duty</td>
</tr>
<tr>
<td>Continuous output current</td>
<td>14.3 A at 4 kHz for heavy duty</td>
</tr>
<tr>
<td>Maximum transient current</td>
<td>21.5 A during 60 s for heavy duty</td>
</tr>
<tr>
<td>Asynchronous motor control profile</td>
<td>Voltage/frequency ratio, 2 points</td>
</tr>
<tr>
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<td></td>
<td>Flux vector control without sensor - Energy Saving</td>
</tr>
<tr>
<td></td>
<td>Voltage/frequency ratio - Energy Saving, quadratic U/f</td>
</tr>
<tr>
<td></td>
<td>Flux vector control without sensor, standard</td>
</tr>
<tr>
<td>Synchronous motor control profile</td>
<td>Vector control without sensor</td>
</tr>
<tr>
<td>Speed drive output frequency</td>
<td>0.1...599 Hz</td>
</tr>
</tbody>
</table>

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.
Nominal switching frequency

- 4 kHz

Switching frequency

- 4...16 kHz with current derating
- 2...16 kHz adjustable

Safety function

- STO (safe torque off) SIL 3
- SS1 (safe stop 1)
- SMS (safe maximum speed)
- SLS (safe limited speed)
- GDL (guard door locking)

Communication port protocol

- Modbus
- CANopen

Optional communication modules

- Communication module: CANopen daisy chain RJ45
- Communication module: CANopen SUB-D 9
- Communication module: CANopen open style terminal block
- Communication module: EtherCAT RJ45
- Communication module: DeviceNet
- Communication module: Ethernet/IP
- Communication module: Profinet
- Communication module: Ethernet Powerlink

Complementary

Variant

- Standard version

Output voltage

- <= power supply voltage

Permissible temporary current boost

- 1.5 x In during 60 s for heavy duty

Speed range

- With asynchronous motor in open-loop mode

Speed accuracy

- +/- 10 % of nominal slip 0.2 Tn to Tn

Torque accuracy

- +/- 15 %

Transient overtorque

- 170...200 % of nominal motor torque

Braking torque

- <= 170 % with braking resistor during 60 s

Regulation loop

- Adjustable PID regulator

Motor slip compensation

- Not available in voltage/frequency ratio (2 or 5 points)
  Automatic whatever the load
- Adjustable 0...300 %

Acceleration and deceleration ramps

- Linear
- U
- Deceleration ramp automatic stop DC injection
- Ramp switching
- Deceleration ramp adaptation
- S
- CUS

Braking to standstill

- By DC injection

Protection type

- Drive: thermal protection
- Drive: overcurrent between output phases and earth
- Drive: input phase breaks
- Drive: overheating protection
- Drive: short-circuit between motor phases

Frequency resolution

- Display unit: 0.1 Hz
- Analog input: 0.012/50 Hz

Electrical connection

- Control, screw terminal: 0.5...1.5 mm² AWG 20...AWG 16
- Motor/braking resistor, screw terminal: 2.5...16 mm² AWG 12...AWG 6
- Power supply, screw terminal: 4...16 mm² AWG 10...AWG 6

Connector type

- 1 RJ45 for Modbus/CANopen on front face

Physical interface

- 2-wire RS 485 for Modbus

Transmission frame

- RTU for Modbus

Transmission rate

- 4.8, 9.6, 19.2, 38.4 kbit/s for Modbus
- 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps for CANopen

Data format

- 8 bits, configurable odd, even or no parity for Modbus

Type of polarization

- No impedance for Modbus

Number of addresses

- For CANopen
- For Modbus

Method of access

- Slave for CANopen
<table>
<thead>
<tr>
<th>Supply</th>
<th>Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC (+/- 5 %) current &lt;= 10 mA (overload and short-circuit protection)</th>
</tr>
</thead>
</table>
| Local signalling | 1 LED green for CANopen run  
1 LED red for CANopen error  
1 LED red for drive fault  
1 LED red for drive voltage |
| Width | 150 mm |
| Height | 232 mm  
308 mm with EMC plate |
| Depth | 232 mm |
| Product weight | 7.5 kg |
| Analogue input number | 3 |
| Analogue input type | Voltage (A1): 0...10 V DC, impedance 30000 Ohm, resolution 10 bits  
Bipolar differential voltage (A12): +/- 10 V DC, impedance 30000 Ohm, resolution 10 bits  
Current (A13): 0...20 mA (or 4-20 mA, 20-x mA or other patterns by configuration), impedance 250 Ohm, resolution 10 bits |
| Discrete input number | 7 |
| Discrete input type | Programmable (sink/source) (D1...D4): 24...30 V DC: level 1 PLC  
Programmable as pulse input 20 kpps (D5): 24...30 V DC: level 1 PLC  
Switch-configurable PTC probe (D6): 24...30 V DC  
Safe torque off (STO): 24...30 V DC, impedance 1500 Ohm |
| Discrete input logic | Negative logic (sink): : D1...D6, > 19 V (state 0) < 13 V (state 1)  
Positive logic (source): : D1...D6, < 5 V (state 0) > 11 V (state 1) |
| Analogue output number | 1 |
| Analogue output type | Software-configurable current (AQ1): 0...20 mA, impedance 800 Ohm, resolution 10 bits  
Software-configurable voltage (AQ1): 0...10 V, impedance 470 Ohm, resolution 10 bits |
| Sampling duration | Analog input (A1, A2, A3): 2 ms  
Analog output (AQ1): 2 ms |
| Accuracy | Analog input A1, A2, A3: +/- 0.2 % for a temperature of -10...60 °C  
Analog input A1, A2, A3: +/- 0.5 % for a temperature of 25 °C  
Analog output AQ1: +/- 1 % for a temperature of 25 °C  
Analog output AQ1: +/- 2 % for a temperature of -10...60 °C |
| Linearity error | Analog input (A1, A2, A3): +/- 0.2...0.5 % of maximum value  
Analog output (AQ1): +/- 0.3 % |
| Discrete output number | 3 |
| Discrete output type | Configurable relay logic NO/NC (R1A, R1B, R1C): electrical durability 100000 cycles  
Configurable relay logic NO (R2A, R2B): electrical durability 100000 cycles  
Logic (LO) |
| Refresh time | Logic input (D1...D6): 8 ms (+/- 0.7 ms)  
Relay output (R1A, R1B, R1C): 2 ms  
Relay output (R2A, R2C): 2 ms |
| Minimum switching current | Relay output (R1, R2): 5 mA at 24 V DC |
| Maximum switching current | Relay output (R1) on resistive load (cos phi = 1): 3 A at 250 V AC  
Relay output (R1) on resistive load (cos phi = 1): 4 A at 30 V DC  
Relay output (R1, R2) on inductive load (cos phi = 0.4): 2 A at 250 V AC  
Relay output (R1, R2) on inductive load (cos phi = 0.4): 2 A at 30 V DC  
Relay output (R2) on resistive load (cos phi = 1): 5 A at 250 V AC  
Relay output (R2) on resistive load (cos phi = 1): 5 A at 30 V DC |
| Specific application | Machinery |
| Variable speed drive application selection | Hoisting self erecting  
Material handling carousel  
Material handling conveyor  
Material handling lifting platform  
Material handling palletizers - medium performance  
Material handling transfer table  
Material handling turn table  
Material working (wood, ceramic, stone, pvc, metal) cutting - medium accuracy  
Material working (wood, ceramic, stone, pvc, metal) drilling  
Material working (wood, ceramic, stone, pvc, metal) saw  
Packaging bagging  
Packaging feed conveyor low performance  
Packaging filling bottles - intermittent operation  
Packaging linear labeling  
Packaging other application  
Packaging stretching wrapping  
Packaging tray take |
| **Motor power range** | 4...6 kW 380...440 V 3 phases  
4...6 kW 480...500 V 3 phases |
| **Motor starter type** | Variable speed drive |

### Environment

| **Isolation** | Between power and control terminals |
| **Insulation resistance** | > 1 mOhm at 500 V DC for 1 minute to earth |
| **Noise level** | 53.3 dB conforming to 86/188/EEC |
| **Power dissipation in W** | 233 W (fan) at 380 V, 4 kHz |
| **Operating position** | Vertical +/- 10 degree |

#### Electromagnetic compatibility

- Conducted radio-frequency immunity test conforming to IEC 61000-4-6 level 3
- Electrical fast transient/burst immunity test conforming to IEC 61000-4-4 level 4
- Electrostatic discharge immunity test conforming to IEC 61000-4-2 level 3
- Radiated radio-frequency electromagnetic field immunity test conforming to IEC 61000-4-3 level 3
- Voltage dips and interruptions immunity test conforming to IEC 61000-4-11
  1.2/50 µs - 8/20 µs surge immunity test conforming to IEC 61000-4-5 level 3

#### Pollution degree

- 2 conforming to EN/IEC 61800-5-1

#### Vibration resistance

- 1.5 mm peak to peak (f = 3...13 Hz) conforming to EN/IEC 60068-2-6
- 1 gn (f = 13...200 Hz) conforming to EN/IEC 60068-2-6

#### Shock resistance

- 15 gn during 11 ms conforming to EN/IEC 60068-2-27

#### Relative humidity

- 5...95 % without condensation conforming to IEC 60068-2-3
- 5...95 % without dripping water conforming to IEC 60068-2-3

#### Ambient air temperature for operation

- -10...50 °C without derating
- 50...60 °C with derating factor

#### Ambient air temperature for storage

- -25...70 °C

#### Operating altitude

- <= 1000 m without derating
- 1000...2000 m with current derating 1 % per 100 m

#### Environmental characteristic

- Chemical pollution resistance class 3C3 EN/IEC 60721-3-3
- Dust pollution resistance class 3S2 EN/IEC 60721-3-3

#### Standards

- EN/IEC 61800-3
- EN/IEC 61800-5-1
- EN 55011 class A group 1
- EN 61800-3 environment 1 category C2
- EN 61800-3 environment 2 category C2

#### Product certifications

- CSA
- UL
- RCM
- EAC
- NOM 117

#### Marking

- CE

### Offer Sustainability

| **Sustainable offer status** | Green Premium product |
| **RoHS (date code: YYWW)** | Compliant - since 1614 - Schneider Electric declaration of conformity
| **REACH** | Reference not containing SVHC above the threshold
| **Product environmental profile** | Available
| **Product end of life instructions** | Available

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**PRODUCT END OF LIFE INSTRUCTIONS**

**Availability:**

- EOL Process:
  - Recycling
  - Disposal

**Sustainability Details:**

- **Green Premium Product:** Yes
- **RoHS Compliance:** Yes
- **REACH Compliance:** Yes
- **Product Environmental Profile:** Available
- **End of Life Information:** Available

**Additional Information:**

- **Life is On**
- **Schneider Electric**
Dimensions

Right and Front View

Right and Front View with EMC Plate
Mounting and Clearance

(1) Minimum value corresponding to thermal constraints.
Connection Diagrams

Diagram with Line Contactor
Connection diagrams conforming to standards ISO13849 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1.

Diagram with Switch Disconnect
Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1.
Control Connection Diagram in Source Mode

(1) Analog output
(2) Analog inputs
(3) Reference potentiometer (10 kOhm maxi)
(4) Digital inputs
Digital Inputs Wiring

The logic input switch (SW1) is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs. Switch SW1 set to “Source” position and use of the output power supply for the DIs.

Switch SW1 set to “Source” position and use of an external power supply for the DIs.

Switch SW1 set to “Sink Int” position and use of the output power supply for the DIs.

Switch SW1 set to “Sink Ext” position and use of an external power supply for the DIs.
Derating Curves

Derating curve for the nominal drive current (In) as a function of temperature and switching frequency (SF).

- 40 °C (104 °F) - Mounting type A, B and C
- 50 °C (122 °F) - Mounting type A, B and C
- 60 °C (140 °F) - Mounting type B and C

In : Nominal Drive Current
SF : Switching Frequency