

ATV320U11N4C

variable speed drive ATV320 - 1.1kW -
380...500V - 3 phase - compact



Main

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|------------------------------------|--|
| Range of product | Altivar Machine ATV320 |
| Product or component type | Variable speed drive |
| Product specific application | Complex machines |
| Device short name | ATV320 |
| Format of the drive | Compact |
| Product destination | Asynchronous motors Synchronous motors |
| EMC filter | Class C2 EMC filter integrated |
| IP degree of protection | IP20 conforming to EN/IEC 61800-5-1 |
| Degree of protection | UL type 1 with UL type 1 conformity kit |
| Type of cooling | Fan |
| Network number of phases | 3 phases |
| [Us] rated supply voltage | 380...500 V (- 15...10 %) |
| Supply frequency | 50...60 Hz (- 5...5 %) |
| Motor power kW | 1.1 kW for heavy duty |
| Motor power hp | 1.5 hp for heavy duty |
| Line current | 3.8 A at 500 V for heavy duty 5 A at 380 V for heavy duty |
| Prospective line I _{sc} | <= 5 kA |
| Apparent power | 3.3 kVA at 500 V for heavy duty |
| Continuous output current | 3 A at 4 kHz for heavy duty |
| Maximum transient current | 4.5 A during 60 s for heavy duty |
| Asynchronous motor control profile | Voltage/Frequency ratio, 2 points Voltage/Frequency ratio, 5 points Flux vector control without sensor, standard Voltage/Frequency ratio - Energy Saving, quadratic U/f Flux vector control without sensor - Energy Saving |
| Synchronous motor control profile | Vector control without sensor |
| Speed drive output frequency | 0.1...599 Hz |

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

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| Nominal switching frequency | 4 kHz |
| Switching frequency | 2...16 kHz adjustable |
| Safety function | STO (safe torque off) SIL 2 |
| Communication port protocol | CANopen Modbus |
| Option card | Communication module: DeviceNet Communication module: Profibus DP V1 Communication module: Profinet Communication module: Ethernet/IP 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: Ethernet Powerlink |

Offer Sustainability

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| Sustainable offer status | Not Green Premium product |
| RoHS (date code: YYWW) | Compliant - since 1610 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity |
| REACH | Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold |

Complementary

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| Output voltage | \leq power supply voltage |
| Permissible temporary current boost | 1.5 x I_n during 60 s for heavy duty |
| Speed range | 1...100 with asynchronous motor in open-loop mode |
| Speed accuracy | +/- 10 % of nominal slip 0.2 T_n to T_n |
| 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 | Automatic whatever the load Not available in voltage/frequency ratio (2 or 5 points) Adjustable 0...300 % |
| Acceleration and deceleration ramps | S U CUS Deceleration ramp automatic stop DC injection Deceleration ramp adaptation Linear Ramp switching |
| Braking to standstill | By DC injection |
| Protection type | Drive: short-circuit between motor phases Drive: overcurrent between output phases and earth Drive: overheating protection Drive: input phase breaks Drive: thermal protection |
| Frequency resolution | Display unit: 0.1 Hz Analog input: 0.012/50 Hz |
| Electrical connection | Control, screw terminal: 0.5...1.5 mm ² AWG 20...AWG 16 Power supply, screw terminal: 2.5...6 mm ² AWG 14...AWG 10 Motor/Braking resistor, screw terminal: 2.5...6 mm ² AWG 14...AWG 10 |
| Type of connector | 1 RJ45 for Modbus/CANopen on control terminal |
| Physical interface | 2-wire RS 485 for Modbus |
| Transmission frame | RTU for Modbus |
| Transmission rate | 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps for CANopen 4.8, 9.6, 19.2, 38.4 kbit/s for Modbus |
| Data format | 8 bits, configurable odd, even or no parity for Modbus |
| Type of polarization | No impedance for Modbus |
| Number of addresses | 1...127 for CANopen |

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| | 1...247 for Modbus |
| Method of access | Slave for CANopen |
| Supply | Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC (+/- 5 %) current <= 10 mA (overload and short-circuit protection) |
| Local signalling | 1 LED green for CANopen run 1 LED red for CANopen error 1 LED red for drive fault |
| Width | 105 mm |
| Height | 188 mm with EMC plate 142 mm |
| Depth | 158 mm |
| Product weight | 1.3 kg |
| Analogue input number | 3 |
| Analogue input type | Current (AI3): 0...20 mA (or 4-20 mA, x-20 mA, 20-x mA or other patterns by configuration), impedance 250 Ohm, resolution 10 bits Voltage (AI1): 0...10 V DC, impedance 30000 Ohm, resolution 10 bits Bipolar differential voltage (AI2): +/- 10 V DC, impedance 30000 Ohm, resolution 10 bits |
| Discrete input number | 7 |
| Discrete input type | Switch-configurable PTC probe (DI6): 24...30 V DC Programmable as pulse input 20 kpps (DI5): 24...30 V DC: level 1 PLC Programmable (sink/source) (DI1...DI4): 24...30 V DC: level 1 PLC Safe torque off (STO): 24...30 V DC, impedance 1500 Ohm |
| Discrete input logic | Negative logic (sink): : DI1...DI6, > 19 V (state 0) < 13 V (state 1) Positive logic (source): : DI1...DI6, < 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 (AI1, AI2, AI3): 2 ms Analog output (AQ1): 2 ms |
| Accuracy | Analog input AI1, AI2, AI3: +/- 0.2 % for a temperature of -10...60 °C Analog input AI1, AI2, AI3: +/- 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 output (AQ1): +/- 0.3 % Analog input (AI1, AI2, AI3): +/- 0.2...0.5 % of maximum value |
| Discrete output number | 3 |
| Discrete output type | Configurable relay logic NO/NC (R1A, R1B, R1C): electrical durability 100000 cycles Logic (LO) Configurable relay logic NO (R2A, R2B): electrical durability 100000 cycles |
| Refresh time | Logic input (DI1...DI6): 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 (R2) on resistive load (cos phi = 1: 5 A at 30 V DC 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 |
| Specific application | Machinery |

Environment

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| Isolation | Between power and control terminals |
| Insulation resistance | > 1 mOhm at 500 V DC for 1 minute to earth |
| Noise level | 51 dB conforming to 86/188/EEC |
| Power dissipation in W | 47 W (fan) at 380 V, 4 kHz |
| Volume of cooling air | 18 m3/h |
| Operating position | Vertical +/- 10 degree |
| Electromagnetic compatibility | Conducted radio-frequency immunity test conforming to IEC 61000-4-6 level 3 1.2/50 µs - 8/20 µs surge immunity test conforming to IEC 61000-4-5 level 3 Electrical fast transient/burst immunity test conforming to IEC 61000-4-4 level 4 |

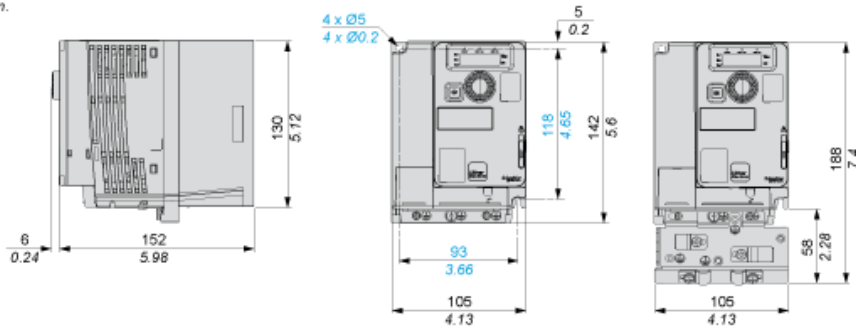
Electrostatic discharge immunity test conforming to IEC 61000-4-2 level 3
 Radiated radio-frequency electromagnetic field immunity test conforming to IEC 61000-4-3 level 3
 Voltage dips and interruptions immunity test conforming to IEC 61000-4-11

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| Pollution degree | 2 conforming to EN/IEC 61800-5-1 |
| Vibration resistance | 1 gn (f = 13...200 Hz) conforming to EN/IEC 60068-2-6 1.5 mm peak to peak (f = 2...13 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...3000 m with current derating 1 % per 100 m |
| Standards | EN/IEC 61800-5-1 IEC 61508 IEC 13849-1 EN/IEC 61800-3 IEC 60721-3 EN/IEC 61800-3 environment 1 category C2 |
| Product certifications | CSA NOM 117 UL RCM EAC |
| Marking | CE |

Dimensions

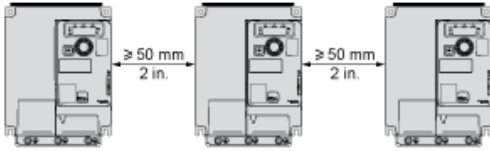
Views: Right - Front - Front with EMC Plate

mm
in.



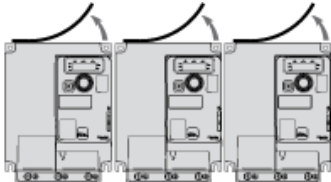
Mounting Types

Mounting Type A: Individual with Ventilation Cover

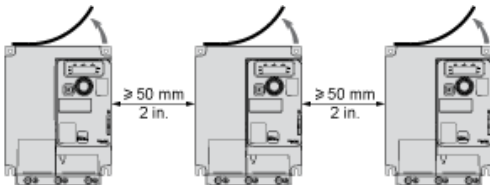


Only Possible at Ambient Temperature Less or Equal to 50 °C (122 °F)

Mounting Type B: Side by Side, Ventilation Cover Removed



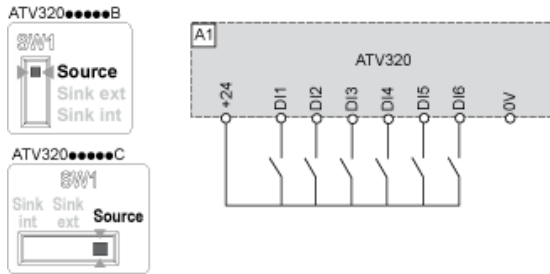
Mounting Type C: Individual, Ventilation Cover Removed



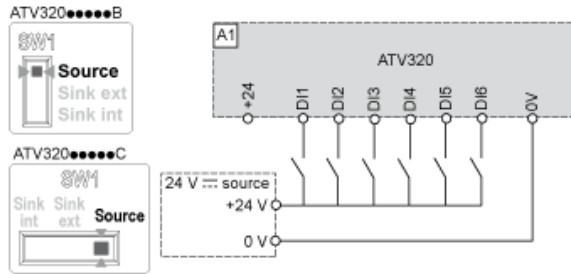
For Operation at Ambient Temperature Above 50 °C (122 °F)

Digital Inputs Wiring

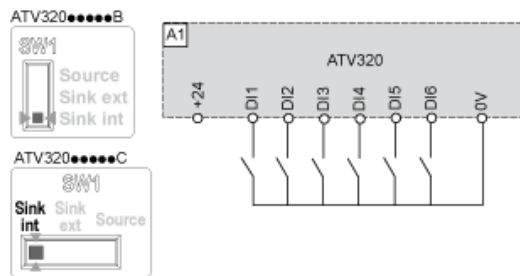
The logic input switch (SW1) is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs. Switch SW1 set to “Source” position and use of the output power supply for the DIs.



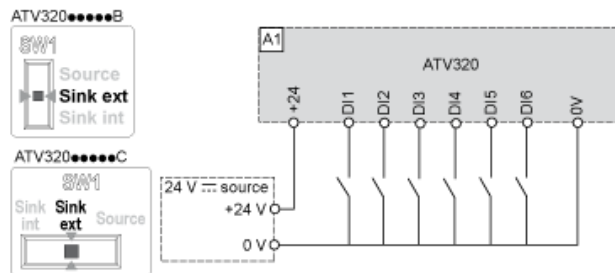
Switch SW1 set to “Source” position and use of an external power supply for the DIs.



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

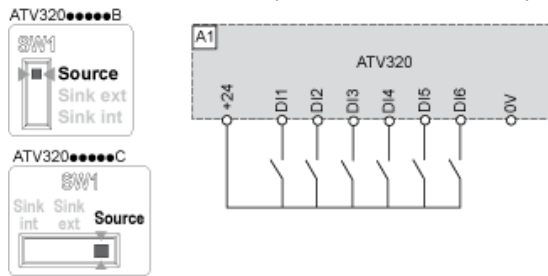


Switch SW1 set to “Sink Ext” position and use of an external power supply for the DIs.

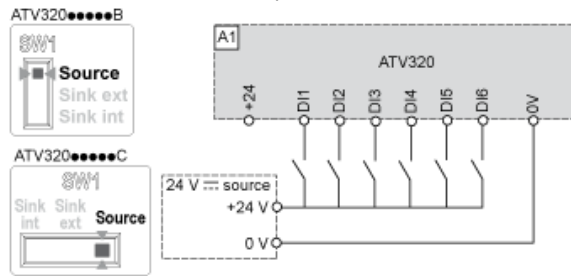


Digital Inputs Wiring

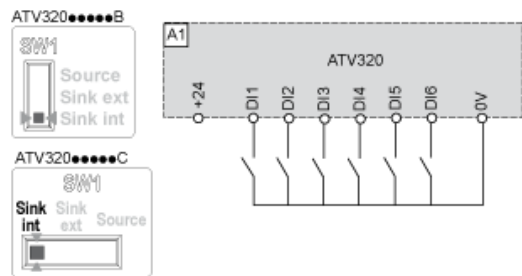
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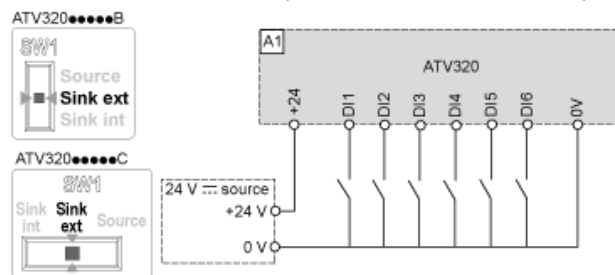
Switch SW1 set to "Source" position and use of an external power supply for the DIs.



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

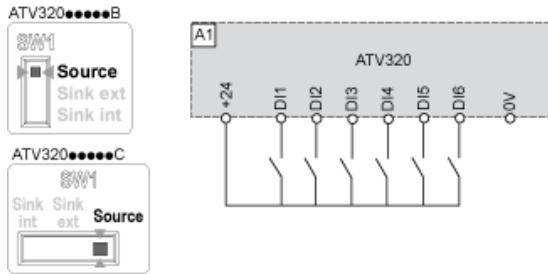


Switch SW1 set to "Sink Ext" position and use of an external power supply for the DIs.

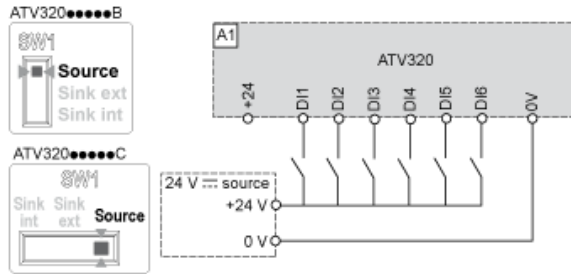


Digital Inputs Wiring

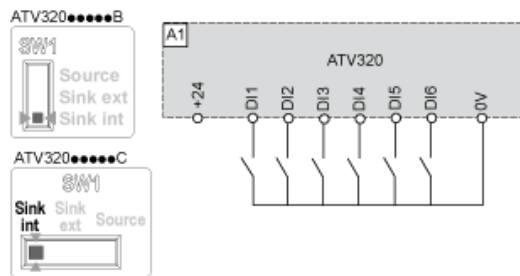
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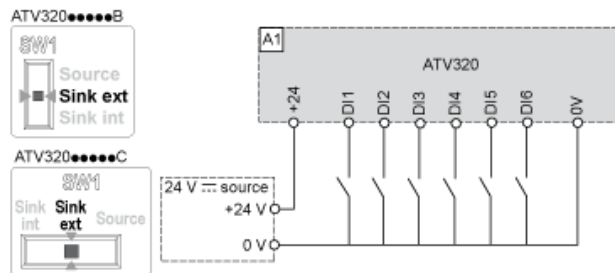
Switch SW1 set to “Source” position and use of an external power supply for the DIs.



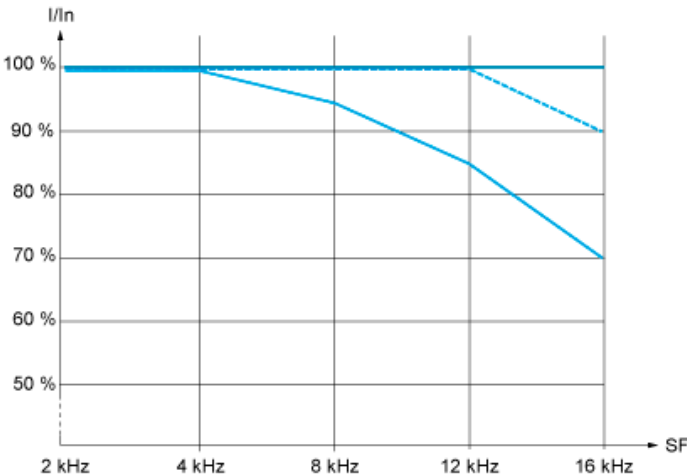
Switch SW1 set to “Sink Int” position and use of the output power supply for the DIs.



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



Derating Curves



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