



Main

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	Book
Product destination	Synchronous motors Asynchronous motors
EMC filter	Class C2 EMC filter integrated
IP degree of protection	IP20 conforming to EN/IEC 61800-5-1
Type of cooling	Fan
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	0.18 kW for heavy duty
Motor power hp	0.25 hp for heavy duty
Line current	3.4 A at 200 V for heavy duty 2.8 A at 240 V for heavy duty
Prospective line I _{sc}	<= 1 kA
Apparent power	0.7 kVA at 240 V for heavy duty
Continuous output current	1.5 A at 4 kHz for heavy duty
Maximum transient current	2.3 A during 60 s for heavy duty
Asynchronous motor control profile	Flux vector control without sensor, standard Voltage/Frequency ratio, 2 points Voltage/Frequency ratio, 5 points Flux vector control without sensor - Energy Saving Voltage/Frequency ratio - Energy Saving, quadratic U/f
Synchronous motor control profile	Vector control without sensor
Speed drive output frequency	0.1...599 Hz
Nominal switching frequency	4 kHz

Switching frequency	2...16 kHz adjustable
Safety function	SMS (safe maximum speed) SS1 (safe stop 1) GDL (guard door locking) STO (safe torque off) SIL 3 SLS (safe limited speed)
Communication port protocol	CANopen Modbus
Option card	Communication module: Ethernet Powerlink Communication module: CANopen SUB-D 9 Communication module: DeviceNet Communication module: Profibus DP V1 Communication module: Ethernet/IP Communication module: Profinet Communication module: CANopen daisy chain RJ45 Communication module: CANopen open style terminal block Communication module: EtherCAT RJ45

Complementary

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	Not available in voltage/frequency ratio (2 or 5 points) Adjustable 0...300 % Automatic whatever the load
Acceleration and deceleration ramps	CUS Deceleration ramp automatic stop DC injection Deceleration ramp adaptation Linear S U Ramp switching
Braking to standstill	By DC injection
Protection type	Drive: overcurrent between output phases and earth Drive: input phase breaks Drive: thermal protection Drive: overheating protection Drive: short-circuit between motor phases
Frequency resolution	Analog input: 0.012/50 Hz Display unit: 0.1 Hz
Electrical connection	Control, screw terminal: 0.5...1.5 mm ² AWG 20...AWG 16 Motor/Braking resistor, screw terminal: 1.5...2.5 mm ² AWG 14...AWG 12 Power supply, screw terminal: 1.5...4 mm ² AWG 14...AWG 10
Type of connector	1 RJ45 for Modbus/CANopen on front face
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 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 \leq 10 mA (overload and short-circuit protection)
Local signalling	1 LED red for drive voltage 1 LED red for drive fault 1 LED green for CANopen run

	1 LED red for CANopen error
Width	45 mm
Height	325 mm
Depth	245 mm
Product weight	2.4 kg
Analogue input number	3
Analogue input type	Bipolar differential voltage (AI2): +/- 10 V DC, impedance 30000 Ohm, resolution 10 bits 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
Discrete input number	7
Discrete input type	Programmable (sink/source) (DI1...DI4): 24...30 V DC: level 1 PLC Safe torque off (STO): 24...30 V DC, impedance 1500 Ohm Switch-configurable PTC probe (DI6): 24...30 V DC Programmable as pulse input 20 kpps (DI5): 24...30 V DC: level 1 PLC
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 voltage (AQ1): 0...10 V, impedance 470 Ohm, resolution 10 bits Software-configurable current (AQ1): 0...20 mA, impedance 800 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: +/- 2 % for a temperature of -10...60 °C Analog output AQ1: +/- 1 % for a temperature of 25 °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 (R2A, R2B): electrical durability 100000 cycles Configurable relay logic NO/NC (R1A, R1B, R1C): electrical durability 100000 cycles Logic (LO)
Refresh time	Relay output (R2A, R2C): 2 ms Relay output (R1A, R1B, R1C): 2 ms Logic input (DI1...DI6): 8 ms (+/- 0.7 ms)
Minimum switching current	Relay output (R1, R2): 5 mA at 24 V DC
Maximum switching current	Relay output (R2) on resistive load (cos phi = 1): 5 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) 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 30 V DC Relay output (R2) on resistive load (cos phi = 1): 5 A at 250 V AC Relay output (R1) on resistive load (cos phi = 1): 3 A at 250 V AC

Environment

Isolation	Between power and control terminals
Insulation resistance	> 1 mOhm at 500 V DC for 1 minute to earth
Noise level	43 dB conforming to 86/188/EEC
Power dissipation in W	25 W (fan) at 200 V, 4 kHz
Operating position	Vertical +/- 10 degree
Electromagnetic compatibility	Conducted radio-frequency immunity test conforming to IEC 61000-4-6 level 3 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 Electrical fast transient/burst immunity test conforming to IEC 61000-4-4 level 4 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 dripping water conforming to IEC 60068-2-3 5...95 % without condensation 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...2000 m with current derating 1 % per 100 m <= 1000 m without derating
Standards	EN/IEC 61800-3 EN 61800-3 environment 2 category C2 EN/IEC 61800-5-1 EN 55011 class A group 1 EN 61800-3 environment 1 category C2
Product certifications	NOM 117 UL RCM EAC CSA
Marking	CE