



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	Asynchronous motors Synchronous motors
EMC filter	Class C2 EMC filter integrated
IP degree of protection	IP20 conforming to EN/IEC 61800-5-1
Type of cooling	Fan
Phase	1 phase
[Us] rated supply voltage	200...240 V (- 15...10 %)
Supply frequency	50...60 Hz (- 5...5 %)
Motor power kW	0.37 kW heavy duty
Motor power hp	0.5 hp heavy duty
Line current	5 A at 240 V heavy duty 6 A at 200 V heavy duty
Prospective line I _{sc}	<= 1 kA
Apparent power	1.2 kVA at 240 V heavy duty
Continuous output current	3.3 A at 4 kHz heavy duty
Maximum transient current	5 A during 60 s 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
Nominal switching frequency	4 kHz

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

Complementary

Output voltage	\leq power supply voltage
Permissible temporary current boost	1.5 x I _n during 60 s 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: overheating protection Drive: input phase breaks Drive: overcurrent between output phases and earth Drive: short-circuit between motor phases Drive: thermal protection
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 Modbus/CANopen on front face
Physical interface	2-wire RS 485 Modbus
Transmission frame	RTU Modbus
Transmission rate	4.8, 9.6, 19.2, 38.4 kbit/s Modbus 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps CANopen
Data format	8 bits, configurable odd, even or no parity Modbus
Type of polarization	No impedance Modbus
Number of addresses	1...127 CANopen 1...247 Modbus
Method of access	Slave 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 green CANopen run 1 LED red drive fault 1 LED red drive voltage

	1 LED red CANopen error
Width	1.77 in (45 mm)
Height	12.8 in (325 mm)
Depth	9.65 in (245 mm)
Product weight	5.29 lb(US) (2.4 kg)
Analogue input number	3
Analogue input type	Voltage (AI1): 0...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 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 (sink/source) (DI1...DI4): 24...30 V DC: level 1 PLC Safe torque off (STO): 24...30 V DC, impedance 1500 Ohm 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 output AQ1: +/- 1 % for a temperature of 25 °C Analog input AI1, AI2, AI3: +/- 0.2 % for a temperature of -10...60 °C Analog output AQ1: +/- 2 % for a temperature of -10...60 °C Analog input AI1, AI2, AI3: +/- 0.5 % 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/NC (R1A, R1B, R1C): electrical durability 100000 cycles Configurable relay logic NO (R2A, R2B): electrical durability 100000 cycles Logic (LO)
Refresh time	Logic input (DI1...DI6): 8 ms (+/- 0.7 ms) Relay output (R2A, R2C): 2 ms Relay output (R1A, R1B, R1C): 2 ms
Minimum switching current	Relay output (R1, R2): 5 mA at 24 V DC
Maximum switching current	Relay output (R1, R2) on inductive load (cos phi = 0.4: 2 A at 250 V AC 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 30 V DC Relay output (R1) on resistive load (cos phi = 1: 4 A at 30 V DC 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 250 V AC
Specific application	Machinery

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	38 W (fan) at 200 V, 4 kHz
Operating position	Vertical +/- 10 degree
Electromagnetic compatibility	1.2/50 µs - 8/20 µs surge immunity test conforming to IEC 61000-4-5 level 3 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
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	14...122 °F (-10...50 °C) without derating 122...140 °F (50...60 °C) with derating factor
Ambient air temperature for storage	-13...158 °F (-25...70 °C)
Operating altitude	3280.84...6561.68 ft (1000...2000 m) with current derating 1 % per 100 m <= 3280.84 ft (1000 m) without derating
Standards	EN 55011 class A group 1 EN/IEC 61800-5-1 EN/IEC 61800-3 EN 61800-3 environment 1 category C2 EN 61800-3 environment 2 category C2
Product certifications	CSA NOM 117 UL RCM EAC
Marking	CE