Product datasheet
Characteristics

ATV320U75N4B
variable speed drive ATV320 - 7.5kW - 380...500V - 3 phase - book

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
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	7.5 kW for heavy duty
Motor power hp	10 hp for heavy duty
Line current	18.7 A at 500 V for heavy duty 26.5 A at 380 V for heavy duty
Prospective line Isc	<= 22 kA
Apparent power	16.2 kVA at 500 V for heavy duty
Continuous output current	17 A at 4 kHz for heavy duty
Maximum transient current	25.5 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 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	SMS (safe maximum speed) SS1 (safe stop 1) STO (safe torque off) SIL 3 SLS (safe limited speed) GDL (guard door locking)
Communication port protocol	Modbus CANopen
Option card	Communication module: Profinet Communication module: Ethernet Powerlink Communication module: CANopen SUB-D 9 Communication module: DeviceNet Communication module: EtherCAT RJ45 Communication module: CANopen open style terminal block Communication module: Profibus DP V1 Communication module: CANopen daisy chain RJ45 Communication module: Ethernet/IP

Complementary

Output voltage	<= power supply voltage
Permissible temporary current boost	1.5 x In 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 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	Adjustable 0...300 % Not available in voltage/frequency ratio (2 or 5 points) Automatic whatever the load
Acceleration and deceleration ramps	Deceleration ramp adaptation Deceleration ramp automatic stop DC injection Ramp switching U CUS S Linear
Braking to standstill	By DC injection
Protection type	Drive: short-circuit between motor phases Drive: input phase breaks Drive: thermal protection Drive: overcurrent between output phases and earth Drive: overheating protection
Frequency resolution	Analog input: 0.012/50 Hz Display unit: 0.1 Hz
Electrical connection	Control, screw terminal: 0.5...1.5 mm² AWG 20...AWG 16 Power supply, screw terminal: 6...16 mm² AWG 8...AWG 6 Motor/Braking resistor, screw terminal: 2.5...16 mm² AWG 12...AWG 6
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 <= 10 mA (overload and short-circuit protection)
Local signalling	1 LED red for CANopen error

	1 LED green for CANopen run 1 LED red for drive voltage 1 LED red for drive fault
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	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 (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 output (AQ1): 2 ms Analog input (AI1, AI2, AI3): 2 ms
Accuracy	Analog input AI1, AI2, AI3: +/- 0.5 % 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 output AQ1: +/- 1 % for a temperature of 25 °C
Linearity error	Analog input (AI1, AI2, AI3): +/- 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 Logic (LO) Configurable relay logic NO (R2A, R2B): electrical durability 100000 cycles
Refresh time	Relay output (R1A, R1B, R1C): 2 ms Relay output (R2A, R2C): 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 (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, 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: 4 A at 30 V DC Relay output (R1, R2) on inductive load (cos phi = 0.4: 2 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	53.3 dB conforming to 86/188/EEC
Power dissipation in W	263 W (fan) at 380 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 Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 Electrical fast transient/burst immunity test conforming to IEC 61000-4-4 level 4 Radiated radio-frequency electromagnetic field immunity test conforming to IEC 61000-4-3 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
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 = 3...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...2000 m with current derating 1 % per 100 m <= 1000 m without derating
Standards	EN 61800-3 environment 2 category C2 EN 61800-3 environment 1 category C2 EN/IEC 61800-5-1 EN/IEC 61800-3 EN 55011 class A group 1
Product certifications	NOM 117 EAC RCM UL CSA
Marking	CE