Product data sheet
Characteristics

ATV21HU30M3X
variable speed drive - ATV21 - 3kW NAHP - 240V - IP20

Main

Range of product	Altivar 21
Product or component type	Variable speed drive
Product destination	Asynchronous motors
Product specific application	Pumps and fans in HVAC
Assembly style	With heat sink
Component name	ATV21
EMC filter	Without EMC filter
Power supply voltage	200...240 V (- 15...10 %)
Network number of phases	3 phases
Motor power kW	3 kW
Line current	10 A for 240 V 11.9 A for 200 V
Speed range	1...10
Transient overtorque	120 % of nominal motor torque +/- 10 % for 60 s
Asynchronous motor control profile	Constant voltage/frequency ratio Current flux vector control (FVC) without speed feedback Energy saving ratio Quadratic voltage/frequency ratio Constant voltage/frequency ratio with automatic IR compensation
Communication port protocol	Modbus
Type of polarization	No impedance
IP degree of protection	IP20 on upper part without blanking plate on cover conforming to EN/IEC 60529 IP20 on upper part without blanking plate on cover conforming to EN/IEC 61800-5-1 IP21 conforming to EN/IEC 60529 IP21 conforming to EN/IEC 61800-5-1 IP41 on upper part conforming to EN/IEC 60529 IP41 on upper part conforming to EN/IEC 61800-5-1
Option card	APOGEE FLN communication card BACnet communication card LonWorks communication card METASYS N2 communication card

Complementary

Power supply voltage limits	170...264 V
Power supply frequency	50...60 Hz (- 5...5 %)
Power supply frequency limits	47.5...63 Hz
Apparent power	5.2 kVA for 240 V
Maximum prospective line Isc	5 kA
Maximum continuous output current	13.7 A at 230 V
Maximum transient current	15.1 A for 60 s
Speed drive output frequency	0.5...200 Hz
Nominal switching frequency	12 kHz
Switching frequency	12...16 kHz with derating 6...16 kHz adjustable
Speed accuracy	+/- 10 % of nominal slip for 0.2 Tn to Tn torque variation
Torque accuracy	+/- 15 %

Regulation loop	Adjustable PI regulator
Motor slip compensation	Adjustable Automatic whatever the load Not available in voltage/frequency ratio motor control
Diagnostic	1 LED red for DC bus energized
Output voltage	<= power supply voltage
Insulation	Electrical between power and control
Recommended type of cable for mounting in an enclosure	With UL Type 1 kit: 3-strand UL 508 cable at 40 °C, copper 75 °C PVC Without mounting kit: 1-strand IEC cable at 45 °C, copper 70 °C PVC Without mounting kit: 1-strand IEC cable at 45 °C, copper 90 °C XLPE/EPR
Electrical connection	L1/R, L2/S, L3/T terminal 6 mm² / AWG 10 VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES terminal 2.5 mm² / AWG 14
Tightening torque	L1/R, L2/S, L3/T 1.3 N.m / 11.5 lb.in VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES 0.6 N.m
Supply	Internal supply at 24 V DC, voltage limits 21...27 V <= 200 mA for overload and short-circuit protection Internal supply for reference potentiometer (1 to 10 kOhm) at 10.5 V DC, tolerance +/- 5 % <= 10 mA for overload and short-circuit protection
Analogue input number	2
Analogue input type	VIA switch-configurable current 0...20 mA, impedance 242 Ohm, resolution 11 bits VIA switch-configurable voltage 0...10 V DC, input voltage 24 V max, impedance 30000 Ohm, resolution 11 bits VIB configurable PTC probe 0...6 probes, impedance 1500 Ohm VIB configurable voltage 0...10 V DC, input voltage 24 V max, impedance 30000 Ohm, resolution 11 bits
Sampling duration	F 2 ms +/- 0.5 ms for discrete input(s) R 2 ms +/- 0.5 ms for discrete input(s) RES 2 ms +/- 0.5 ms for discrete input(s) VIA 2 ms +/- 0.5 ms for analog input(s) VIB 2 ms +/- 0.5 ms for analog input(s)
Response time	FLA, FLC 7 ms +/- 0.5 ms for discrete output(s) FLB, FLC 7 ms +/- 0.5 ms for discrete output(s) FM 2 ms +/- 0.5 ms for analog output(s) RY, RC 7 ms +/- 0.5 ms for discrete output(s)
Accuracy	FM +/- 1 % for a temperature variation 60 °C VIA +/- 0.6 % for a temperature variation 60 °C VIB +/- 0.6 % for a temperature variation 60 °C
Linearity error	FM +/- 0.2 % for output VIA +/- 0.15 % of maximum value for input VIB +/- 0.15 % of maximum value for input
Analogue output number	1
Analogue output type	FM switch-configurable current 0...20 mA, impedance 500 Ohm, resolution 10 bits FM switch-configurable voltage 0...10 V DC, impedance 470 Ohm, resolution 10 bits
Discrete output number	2
Discrete output type	FLA, FLC configurable relay logic NO, electrical service life 100000 cycles FLB, FLC configurable relay logic NC, electrical service life 100000 cycles RY, RC configurable relay logic NO, electrical service life 100000 cycles
Minimum switching current	Configurable relay logic 3 mA at 24 V DC
Maximum switching current	FL, R on inductive load, 2 A at 250 V AC, cos phi = 0.4, L/R = 7 ms FL, R on inductive load, 2 A at 30 V DC, cos phi = 0.4, L/R = 7 ms FL, R on resistive load, 5 A at 250 V AC, cos phi = 1, L/R = 0 ms FL, R on resistive load, 5 A at 30 V DC, cos phi = 1, L/R = 0 ms
Discrete input type	F programmable 24 V DC, with level 1 PLC, impedance 3500 Ohm R programmable 24 V DC, with level 1 PLC, impedance 3500 Ohm RES programmable 24 V DC, with level 1 PLC, impedance 3500 Ohm
Discrete input logic	F, R, RES negative logic (sink), state 0 >= 16 V, state 1 <= 10 V F, R, RES positive logic (source), state 0 <= 5 V, state 1 >= 11 V
Acceleration and deceleration ramps	Automatic based on the load Linear adjustable separately from 0.01 to 3200 s
Braking to standstill	By DC injection

Protection type	Drive against exceeding limit speed Drive against input phase loss Drive break on the control circuit Drive input phase breaks Drive line supply overvoltage and undervoltage Drive line supply undervoltage Drive overcurrent between output phases and earth Drive overheating protection Drive overvoltages on the DC bus Drive short-circuit between motor phases Drive thermal power stage Motor motor phase break Motor thermal protection Motor with PTC probes
Insulation resistance	>= 1 MOhm at 500 V DC for 1 minute
Frequency resolution	Analog input 0.024/50 Hz Display unit 0.1 Hz
Connector type	1 RJ45
Physical interface	2-wire RS 485
Transmission frame	RTU
Transmission rate	9600 bps or 19200 bps
Data format	8 bits, 1 stop, odd even or no configurable parity
Number of addresses	1...247
Communication service	Monitoring inhibitable Read device identification (43) Read holding registers (03) 2 words maximum Time out setting from 0.1 to 100 s Write multiple registers (16) 2 words maximum Write single register (06)
Marking	CE
Operating position	Vertical +/- 10 degree
Height	184 mm
Width	142 mm
Depth	48 mm
Product weight	3.05 kg

Environment

Noise level	51 dB conforming to 86/188/EEC
Dielectric strength	2830 V DC between earth and power terminals 4230 V DC between control and power terminals
Electromagnetic compatibility	1.2/50 µs - 8/20 µs surge immunity test IEC 61000-4-5 level 3 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
Standards	EN 61800-3 EN 61800-3 environments 1 category C1 EN 61800-3 environments 1 category C2 EN 61800-3 environments 1 category C3 EN 61800-3 environments 2 category C1 EN 61800-3 environments 2 category C2 EN 61800-3 environments 2 category C3 EN 61800-5-1 IEC 61800-3 IEC 61800-3 environments 1 category C1 IEC 61800-3 environments 1 category C2 IEC 61800-3 environments 1 category C3 IEC 61800-3 environments 2 category C1 IEC 61800-3 environments 2 category C2 IEC 61800-3 environments 2 category C3 IEC 61800-5-1 UL Type 1
Product certifications	CSA C-Tick NOM 117 UL
Vibration resistance	1 gn (f = 13...200 Hz) conforming to EN/IEC 60068-2-8 1.5 mm (f = 3...13 Hz) conforming to EN/IEC 60068-2-6

Shock resistance	15 gn for 11 ms conforming to IEC 60068-2-27
Pollution degree	3 conforming to IEC 61800-5-1
Environmental characteristic	Classes 3C1 conforming to IEC 60721-3-3 Classes 3S2 conforming to IEC 60721-3-3
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	> 50 °C with derating -10...40 °C without derating
Ambient air temperature for storage	-25...70 °C
Operating altitude	<= 2000 m 1000...3000 m limited to 2000 m for the Corner Grounded distribution network
RoHS EUR status	Compliant
RoHS EUR conformity date	0808