Product data sheet
Characteristics

ATV71HC20N4D
variable speed drive ATV71 - 200kW - 300HP - 480 V - EMC filer

Main

Range of product	Altivar 71
Product or component type	Variable speed drive
Product specific application	Complex, high-power machines
Assembly style	With heat sink
Component name	ATV71
Variant	Reinforced version Without DC choke
EMC filter	Integrated
Network number of phases	3 phases
[Us] rated supply voltage	380...480 V - 15...10 %
Motor power kW	200 kW 3 phases 380...480 V
Motor power hp	300 hp 3 phases 380...480 V
Line current	286 A 480 V 3 phases 200 kW 300 hp 357 A 380 V 3 phases 200 kW 300 hp
Apparent power	235 kVA 380 V 3 phases 200 kW 300 hp
Prospective line Isc	≤ 50 kA 3 phases
Nominal output current	387 A 2.5 kHz 380 V 3 phases 200 kW 300 hp 387 A 2.5 kHz 460 V 3 phases 200 kW 300 hp
Maximum transient current	580 A 60 s 3 phases 200 kW 300 hp 638 A 2 s 3 phases 200 kW 300 hp
Speed drive output frequency	0...500 Hz
Nominal switching frequency	2.5 kHz
Switching frequency	2.5...8 kHz adjustable 2.5...8 kHz with derating factor
Asynchronous motor control profile	ENA (Energy adaptation) system for unbalanced loads Flux vector control (FVC) with sensor (current vector) Sensorless flux vector control (SFVC) (voltage or current vector) Voltage/Frequency ratio (2 or 5 points)
Type of polarization	No impedance Modbus

Complementary

Product destination	Asynchronous motors Synchronous motors
Supply voltage limits	323...528 V
Supply frequency	50...60 Hz - 5...5 %
Network frequency limits	47,5...63 Hz
Speed range	1...100 asynchronous motor in open-loop mode, without speed feedback 1...1000 asynchronous motor in closed-loop mode with encoder feedback 1...50 synchronous motor in open-loop mode, without speed feedback
Speed accuracy	+/- 0.01 % of nominal speed in closed-loop mode with encoder feedback 0.2 Tn to Tn +/- 10 % of nominal slip without speed feedback 0.2 Tn to Tn
Torque accuracy	+/- 15 % in open-loop mode, without speed feedback +/- 5 % in closed-loop mode with encoder feedback

Transient overtorque	170 % +/- 10 % 60 s 220 % +/- 10 % 2 s
Braking torque	30 % without braking resistor < 150 % with braking or hoist resistor
Synchronous motor control profile	Vector control without speed feedback
Regulation loop	Adjustable PI regulator
Motor slip compensation	Adjustable Automatic whatever the load Not available in voltage/frequency ratio (2 or 5 points) Suppressable
Local signalling	1 LED red drive voltage
Output voltage	<= power supply voltage
Insulation	Electrical between power and control
Type of cable	IEC cable without mounting kit 1 45 °C copper 70 °C PVC IEC cable with an IP21 or an IP31 kit 3 40 °C copper 70 °C PVC IEC cable without mounting kit 1 45 °C copper 90 °C XLPE/EPR UL 508 cable with a NEMA Type1 kit 3 40 °C copper 75 °C PVC
Electrical connection	Terminal 2.5 mm² AWG 14 AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR Terminal 4 x 185 mm² L1/R, L2/S, L3/T, U/T1, V/T2, W/T3 Terminal 4 x 185 mm² PC/-, PO, PA/+
Tightening torque	0,6 N.m AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR 41 N.m 360 lb.in L1/R, L2/S, L3/T, U/T1, V/T2, W/T3 41 N.m 360 lb.in PC/-, PO, PA/+
Supply	Internal supply 24 V DC 21...27 V ≤ 200 mA overload and short-circuit protection Internal supply for reference potentiometer (1 to 10 kOhm) 10.5 V DC +/- 5 % ≤ 10 mA overload and short-circuit protection
Analogue input number	2
Analogue input type	Bipolar differential voltage AI1-/AI1+ +/- 10 V DC 24 V max 11 bits + sign Software-configurable current AI2 0...20 mA 242 Ohm 11 bits Software-configurable voltage AI2 0...10 V DC 24 V max 30000 Ohm 11 bits
Sampling duration	2 ms +/- 0.5 ms LI1...LI5 discrete 2 ms +/- 0.5 ms LI6 if configured as logic input discrete 2 ms +/- 0.5 ms AI1-/AI1+ analog 2 ms +/- 0.5 ms AI2 analog
Response time	2 ms +/- 0.5 ms AO1 analog 7 ms +/- 0.5 ms R1A, R1B, R1C discrete 7 ms +/- 0.5 ms R2A, R2B discrete <= 100 ms in STO (Safe Torque Off)
Accuracy	+/- 0.6 % AI1-/AI1+ for a temperature variation 60 °C +/- 0.6 % AI2 for a temperature variation 60 °C +/- 1 % AO1 for a temperature variation 60 °C
Linearity error	+/- 0.15 % of maximum value AI1-/AI1+, AI2 +/- 0.2 % AO1
Analogue output number	1
Analogue output type	Software-configurable current AO1 0...20 mA 500 Ohm 10 bits Software-configurable logic output AO1 10 V ≤ 20 mA Software-configurable voltage AO1 0...10 V DC 470 Ohm 10 bits
Discrete output number	2
Discrete output type	Configurable relay logic R1A, R1B, R1C NO/NC 100000 cycles Configurable relay logic R2A, R2B NO 100000 cycles
Minimum switching current	3 mA 24 V DC configurable relay logic
Maximum switching current	2 A 250 V AC inductive cos phi = 0.4 L/R = 7 ms R1, R2 2 A 30 V DC inductive cos phi = 0.4 L/R = 7 ms R1, R2 5 A 250 V AC resistive cos phi = 1 L/R = 0 ms R1, R2 5 A 30 V DC resistive cos phi = 1 L/R = 0 ms R1, R2
Discrete input number	7
Discrete input type	Programmable LI1...LI5 24 V DC level 1 PLC 3500 Ohm Safety input PWR 24 V DC 1500 Ohm Switch-configurable LI6 24 V DC level 1 PLC 3500 Ohm Switch-configurable PTC probe LI6 0...6 1500 Ohm
Discrete input logic	Negative logic (sink) LI6 if configured as logic input > 16 V < 10 V Negative logic (sink) LI1...LI5 > 16 V < 10 V Positive logic (source) LI6 if configured as logic input < 5 V > 11 V Positive logic (source) LI1...LI5 < 5 V > 11 V PWR < 2 V > 17 V

Acceleration and deceleration ramps	S, U or customized Automatic adaptation of ramp if braking capacity exceeded, by using resistor Linear adjustable separately from 0.01 to 9000 s
Braking to standstill	By DC injection
Protection type	Against exceeding limit speed drive Against input phase loss drive Break on the control circuit drive Input phase breaks drive Line supply overvoltage drive Line supply undervoltage drive Motor phase break motor Overcurrent between output phases and earth drive Overheating protection drive Overvoltages on the DC bus drive Power removal motor Short-circuit between motor phases drive Thermal protection drive Thermal protection motor
Insulation resistance	> 1 MOhm 500 V DC for 1 minute to earth
Frequency resolution	0.024/50 Hz analog input 0.1 Hz display unit
Communication port protocol	CANopen Modbus
Type of connector	1 RJ45 Modbus on front face 1 RJ45 Modbus on terminal Male SUB-D 9 on RJ45 CANopen
Physical interface	2-wire RS 485 Modbus
Transmission frame	RTU Modbus
Transmission rate	20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps CANopen 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps Modbus on terminal 9600 bps, 19200 bps Modbus on front face
Data format	8 bits, 1 stop, even parity Modbus on front face 8 bits, odd even or no configurable parity Modbus on terminal
Number of addresses	1...127 CANopen 1...247 Modbus
Method of access	Slave CANopen
Marking	CE
Operating position	Vertical +/- 10 degree
Product weight	140 kg
Option card	I/O extension card Communication card Modbus TCP Communication card Fipio Communication card Modbus/Uni-Telway Communication card Modbus Plus Communication card Ethernet/IP Communication card DeviceNet Communication card Profibus DP Communication card Profibus DP V1 Communication card Interbus-S Communication card CC-Link Controller inside programmable card Interface card for encoder Overhead crane card

Environment

Noise level	77 dB 86/188/EEC
Dielectric strength	3535 V DC between earth and power terminals 5092 V DC between control and power terminals
Electromagnetic compatibility	1.2/50 µs - 8/20 µs surge immunity test level 3 IEC 61000-4-5 Conducted radio-frequency immunity test level 3 IEC 61000-4-6 Electrical fast transient/burst immunity test level 4 IEC 61000-4-4 Electrostatic discharge immunity test level 3 IEC 61000-4-2 Radiated radio-frequency electromagnetic field immunity test level 3 IEC 61000-4-3 Voltage dips and interruptions immunity test IEC 61000-4-11
Standards	EN/IEC 61800-3 EN/IEC 61800-5-1 EN 55011 class A group 2 EN 61800-3 environments 1 category C3 EN 61800-3 environments 2 category C3 IEC 60721-3-3 class 3C2 UL Type 1
Product certifications	C-Tick CSA GOST NOM 117 UL
Pollution degree	2 EN/IEC 61800-5-1 3 UL 840
IP degree of protection	IP00 EN/IEC 60529 IP00 EN/IEC 61800-5-1 IP30 on side parts EN/IEC 61800-5-1 IP30 on the front panel EN/IEC 60529 IP30 on the front panel EN/IEC 61800-5-1 IP30 on side parts EN/IEC 60529 IP41 on upper part EN/IEC 61800-5-1 IP41 on upper part EN/IEC 60529 IP54 on lower part EN/IEC 61800-5-1 IP54 on lower part EN/IEC 60529
Vibration resistance	0.6 gn 10...200 Hz EN/IEC 60068-2-6 1.5 mm peak to peak 3...10 Hz EN/IEC 60068-2-6
Shock resistance	4 gn 11 ms EN/IEC 60068-2-27
Relative humidity	5...95 % without condensation IEC 60068-2-3 5...95 % without dripping water IEC 60068-2-3
Ambient air temperature for operation	-10...50 °C without derating
Ambient air temperature for storage	-25...70 °C
Operating altitude	1000...3000 m with current derating 1 % per 100 m ≤ 1000 m without derating
RoHS EUR conformity date	4Q2009
RoHS EUR status	Will be compliant