

ATV71HU40S6X

variable speed drive ATV71 - 4kW-5HP - 600V -
w/o EMC filter-graphic terminal



Main

Range of product	Altivar 71
Product or component type	Variable speed drive
Product specific application	Complex, high-power machines
Component name	ATV71
Motor power kW	4 kW, 3 phases at 500 V
Motor power hp	5 hp, 3 phases at 575 V
Maximum motor cable length	30 m shielded cable 50 m unshielded cable
Power supply voltage	500...600 V - 15...10 %
Network number of phases	3 phases
Line current	12.5 A for 500 V 3 phases 4 kW / 5 hp 10.9 A for 600 V 3 phases 4 kW / 5 hp
EMC filter	Without EMC filter
Assembly style	With heat sink
Variant	Built-in unit with forced cooling
Prospective line I _{sc}	22 kA for 3 phases
Nominal output current	7.5 A at 4 kHz 500 V 3 phases 4 kW / 5 hp 6.1 A at 4 kHz 575 V 3 phases 4 kW / 5 hp
Maximum transient current	11.3 A for 60 s 3 phases 4 kW / 5 hp 12.4 A for 2 s 3 phases 4 kW / 5 hp
Output frequency	0.1...500 Hz
Nominal switching frequency	4 kHz
Switching frequency	2.5...6 kHz adjustable 4...6 kHz with derating factor
Asynchronous motor control profile	Flux vector control without sensor, standard Voltage/frequency ratio, 5 points Flux vector control without sensor, ENA (energy Adaptation) system Voltage/frequency ratio - Energy Saving, quadratic U/f Flux vector control with sensor, standard Voltage/frequency ratio, 2 points Flux vector control without sensor, 2 points

Type of polarization	No impedance for Modbus
Complementary	
Product destination	Asynchronous motors Synchronous motors
Power supply voltage limits	425...660 V
Power supply frequency	50...60 Hz +/- 5 %
Power supply frequency limits	47.5...63 Hz
Speed range	1...100 in open-loop mode, without speed feedback
Speed accuracy	+/- 10 % of nominal slip without speed feedback 0.2 Tn to Tn
Torque accuracy	+/- 15 % in open-loop mode, without speed feedback
Transient overtorque	220 % of nominal motor torque +/- 10 % for 2 s 170 % of nominal motor torque +/- 10 % for 60 s
Braking torque	30 % without braking resistor ≤ 125 % with braking resistor
Synchronous motor control profile	Vector control without sensor, standard Vector control with sensor, standard
Regulation loop	Frequency PI regulator
Motor slip compensation	Automatic whatever the load Adjustable Not available in voltage/frequency ratio (2 or 5 points) Can be suppressed
Diagnostic	LCD display unitoperation function, status and configuration:
Output voltage	≤ power supply voltage
Insulation	Electrical between power and control
Type of cable for mounting in an enclosure	With an IP21 or an IP31 kit: 3 wire(s)IEC cable at 40 °C, copper 70 °C / PVC Without mounting kit: 1 wire(s)IEC cable at 45 °C, copper 70 °C / PVC Without mounting kit: 1 wire(s)IEC cable at 45 °C, copper 90 °C / XLPE/EPR With UL Type 1 kit: 3 wire(s)UL 508 cable at 40 °C, copper 75 °C / PVC
Electrical connection	Terminal, clamping capacity: 2.5 mm², AWG 14 (AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR) Terminal, clamping capacity: 16 mm², AWG 4 (L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB)
Tightening torque	0.6 N.m (AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR) 3 N.m, 26.5 lb.in (L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB)
Supply	Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 mA, protection type: overload and short-circuit protection Internal supply: 24 V DC (21...27 V), <200 mA, protection type: overload and short-circuit protection External supply: 24 V DC (19...30 V)
Analogue input number	2
Analogue input type	AI1-/AI1+ bipolar differential voltage: +/- 10 V DC 24 V max, resolution 11 bits + sign AI2 software-configurable current: 0...20 mA, impedance: 242 Ohm, resolution 11 bits AI2 software-configurable voltage: 0...10 V DC 24 V max, impedance: 30000 Ohm, resolution 11 bits
Input sampling time	2 ms +/- 0.5 ms (AI1-/AI1+) - analog input(s) 2 ms +/- 0.5 ms (AI2) - analog input(s) 2 ms +/- 0.5 ms (LI1...LI5) - discrete input(s) 2 ms +/- 0.5 ms (LI6)if configured as logic input - discrete input(s) 2 ms +/- 0.5 ms (AO1) - analog input(s)
Response time	≤ 100 ms in STO (Safe Torque Off) R1A, R1B, R1C ≤ 7 ms, tolerance +/- 0.5 ms R2A, R2B ≤ 7 ms, tolerance +/- 0.5 ms
Absolute accuracy precision	+/- 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	+/- 0.2 % (AO1) +/- 0.15 % of maximum value (AI1-/AI1+) +/- 0.15 % of maximum value (AI2)
Analogue output number	1
Analogue output type	AO1 software-configurable logic output 10 V 20 mA AO1 software-configurable current 0...20 mA, impedance: 500 Ohm, resolution 10 bits AO1 software-configurable voltage 0...10 V DC, impedance: 470 Ohm, resolution 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 at 24 V DC for configurable relay logic
Maximum switching current	R1, R2: 2 A at 250 V AC inductive load, $\cos \phi = 0.4$ R1, R2: 2 A at 30 V DC inductive load, $\cos \phi = 0.4$ R1, R2: 5 A at 250 V AC resistive load, $\cos \phi = 1$ R1, R2: 5 A at 30 V DC resistive load, $\cos \phi = 1$
Discrete input number	7
Discrete input type	LI1...LI5: programmable 24 V DC with level 1 PLC, impedance: 3500 Ohm LI6: switch-configurable 24 V DC with level 1 PLC, impedance: 3500 Ohm LI6: switch-configurable PTC probe 0...6, impedance: 1500 Ohm PWR: safety input 24 V DC, impedance: 1500 Ohm conforming to ISO 13849-1 level d
Discrete input logic	Negative logic (sink) (LI1...LI5), $> 16 \text{ V}$ (state 0), $< 10 \text{ V}$ (state 1) Positive logic (source) (LI1...LI5), $< 5 \text{ V}$ (state 0), $> 11 \text{ V}$ (state 1) Negative logic (sink) (LI6)if configured as logic input, $> 16 \text{ V}$ (state 0), $< 10 \text{ V}$ (state 1) Positive logic (source) (LI6)if configured as logic input, $< 5 \text{ V}$ (state 0), $> 11 \text{ V}$ (state 1) Positive logic (source) (PWR), $< 2 \text{ V}$ (state 0), $> 17 \text{ V}$ (state 1)
Acceleration and deceleration ramps	Linear adjustable separately from 0.01 to 9000 s Automatic adaptation of ramp if braking capacity exceeded, by using resistor S, U or customized
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 Overcurrent between output phases and earth: drive Overheating protection: drive Overvoltages on the DC bus: drive Short-circuit between motor phases: drive Thermal protection: drive Motor phase break: motor Power removal: motor Thermal protection: motor Power removal: drive
Insulation resistance	$> 1 \text{ mOhm}$ 500 V DC for 1 minute to earth
Frequency resolution	Analog input: 0.024/50 Hz Display unit: 0.1 Hz
Communication port protocol	CANopen Modbus
Connector type	1 RJ45 (on front face) for Modbus 1 RJ45 (on terminal) for Modbus 1 RJ45 for CANopen
Physical interface	2-wire RS 485 for Modbus
Transmission frame	RTU for Modbus
Transmission rate	4800 bps, 9600 bps, 19200 bps, 38.4 Kbps for Modbus on terminal 9600 bps, 19200 bps for Modbus on front face 20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps for CANopen
Data format	8 bits, 1 stop, even parity for Modbus on front face 8 bits, odd even or no configurable parity for Modbus on terminal
Number of addresses	1...127 for CANopen 1...247 for Modbus
Method of access	Slave CANopen
Marking	CE
Operating position	Vertical ± 10 degree
Height	295 mm
Depth	213 mm
Width	210 mm
Product weight	7.5 kg
Option card	Communication card for CC-Link Controller inside programmable card Communication card for DeviceNet Communication card for Ethernet/IP Communication card for Fipio

I/O extension card
Communication card for Interbus-S
Communication card for Modbus Plus
Communication card for Modbus TCP
Communication card for Modbus/Uni-Telway
Communication card for Profibus DP
Communication card for Profibus DP V1
Communication card for LonWorks
Communication card for METASYS N2
Communication card for APOGEE FLN
Communication card for BACnet

Environment

Noise level	60.2 dB conforming to 86/188/EEC
Dielectric strength	5092 V DC between control and power terminals 3800 V DC between earth and power terminals
Electromagnetic compatibility	1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5 Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4 Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2 Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3 Voltage dips and interruptions immunity test conforming to IEC 61000-4-11
Standards	EN 55011 group 1 class B IEC 60721-3-3 class 3C1 EN/IEC 61800-3 UL Type 1 EN/IEC 61800-3 environment 2 EN/IEC 61800-3 environment 1 EN/IEC 61800-5-1 IEC 60721-3-3 class 3S2
Product certifications	C-Tick GOST CSA NOM 117 UL
Pollution degree	3 conforming to UL 840 3 conforming to EN/IEC 61800-5-1
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 IP54 on lower part conforming to EN/IEC 60529 IP54 on lower part 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 for 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) 50...60 °C (with derating factor)
Ambient air temperature for storage	-25...70 °C
Operating altitude	<= 1000 m without 1000...2260 m with current derating 1 % per 100 m

Offer Sustainability

Sustainable offer status	Green Premium product
REACH Regulation	REACH Declaration
EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS declaration

Environmental Disclosure	Product Environmental Profile
Circularity Profile	End of Life Information
WEEE	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

Contractual warranty

Warranty	18 months
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