



### Main

Range of product	Altivar 71 Plus-LH
Product or component type	Variable speed drive
Device short name	ATV71
Product destination	Asynchronous motors Synchronous motors
Assembly style	In floor-standing enclosure compact version
Kit composition	A line choke A switch and fast-acting fuses An IP65 remote mounting kit for graphic display terminal Terminals/bars for motor connection A wired ready-assembled Schneider Spacial SF enclosure Active infeed converter Control transformer 230 V AC Power supply 24 V DC Clean power filter with integrated EMC filter ATV71HC11N4 standard drive IP00

### Complementary

EMC filter	Integrated
Network number of phases	3 phases
[Us] rated supply voltage	380...415 V (+/- 10 %)
Supply voltage limits	342...457 V
Supply frequency	50...60 Hz (+/- 5 %)
Network frequency limits	47.5...63 Hz
Motor power kW	110 kW 3 phases at 380...415 V
Line current	177 A at 400 V 3 phases 110 kW
Apparent power	123 kVA at 400 V 3 phases 110 kW
Prospective line I <sub>sc</sub>	100 kA with external fuses 100 kA with option circuit breaker
Continuous output current	215 A 2.5 kHz at 400 V 3 phases
Maximum transient current	323 A for 60 s at 400 V 3 phases
Speed drive output frequency	0.1...500 Hz
Nominal switching frequency	2.5 kHz
Switching frequency	2...8 kHz adjustable 2.5...8 kHz with derating factor

Speed range	1...100 in open-loop mode, without speed feedback
Speed accuracy	+/- 0.01 % of nominal speed (0.2 Tn to Tn) in closed-loop mode with encoder feedback +/- 10 % of nominal slip (0.2 Tn to Tn) without speed feedback
Torque accuracy	+/- 15 % in open-loop mode, without speed feedback +/- 5 % in closed-loop mode with encoder feedback
Transient overtorque	170 % of nominal motor torque (+/- 10 %) 60 s 220 % of nominal motor torque (+/- 10 %) 2 s
Braking torque	100 % continuous 120 % for 60 seconds
Asynchronous motor control profile	ENA (Energy adaptation) system for unbalanced loads Voltage/frequency ratio (2 or 5 points) Vector control with/without speed feedback
Synchronous motor control profile	Vector control without sensor, standard Vector control with sensor, standard
Regulation loop	Adjustable PI regulator
Motor slip compensation	Adjustable Automatic whatever the load Can be suppressed Not available in voltage/frequency ratio (2 or 5 points)
Overvoltage category	Class 3 conforming to EN 50178
Local signalling	LCD display unit with operation function, status and configuration - mounted in the front door
Output voltage	<= power supply voltage
Isolation	Between power and control terminals
Type of cable	IEC cable at 40 °C copper 70 °C PVC
Electrical connection	Terminal, clamping capacity: 2.5 mm <sup>2</sup> AWG 14 (AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR) for entry from the bottom Terminal M10, clamping capacity: 2 x 150 mm <sup>2</sup> (L1/R, L2/S, L3/T) for entry from the bottom Terminal M12, clamping capacity: 2 x 240 mm <sup>2</sup> (U/T1, V/T2, W/T3) for entry from the bottom
Motor recommended cable cross section	3 x 120 mm <sup>2</sup>
Short-circuit protection	250 A for fuse 3 gl power supply upstream
Supply	External supply at 24 V DC 19...30 V 1 A 30 W Internal supply for reference potentiometer at 10 V DC 10...11 V <= 10 mA Internal supply at 24 V DC 21...27 V <= 100 mA
Analogue input number	2
Analogue input type	Bipolar differential voltage (AI1-/AI1+) +/- 10 V DC at 24 V max, duration: 1.5...2.5 ms) 11 bits + sign Software-configurable voltage (AI2) 0...10 V DC at 24 V max 30 kOhm, duration: 1.5...2.5 ms) 11 bits Software-configurable current (AI2) 0...20 mA/4...20 mA 250 Ohm, duration: 1.5...2.5 ms) 11 bits
Analogue output number	1
Analogue output type	Software-configurable voltage (AO1) 0...10 V DC at 470 Ohm, duration: 1.5...2.5 ms 10 bits Software-configurable current (AO1) 0...20 mA/4...20 mA at 500 Ohm, duration: 1.5...2.5 ms 10 bits
Discrete output number	1
Discrete output type	Configurable relay logic (R1A, R1B, R1C) NO/NC, response time: 6.5...7.5 ms - electrical durability: 100000 cycles
Minimum switching current	3 mA at 24 V DC (configurable relay logic)
Maximum switching current	5 A at 250 V AC - load type: resistive cos phi = 1 configurable relay logic 5 A at 30 V DC - load type: resistive L/R = 0 ms configurable relay logic 2 A at 250 V AC - load type: inductive cos phi = 0.4 configurable relay logic 2 A at 30 V DC - load type: inductive L/R = 7 ms configurable relay logic
Discrete input number	6
Discrete input type	Programmable (LI1...LI4) at 24 V DC <= 30 V level 1 PLC 3.5 kOhm (duration=1.5...2.5 ms) Switch-configurable (LI6) at 24 V DC <= 30 V level 1 PLC 1.5 kOhm (duration=1.5...2.5 ms) Safety input (PWR) at 24 V DC <= 30 V 1.5 kOhm
Discrete input logic	Positive logic (source) (LI1...LI6) voltage (state 0): 0...5 V voltage (state 1): 11...30 V Negative logic (sink) (LI1...LI6) voltage (state 0): 16...30 V voltage (state 1): 0...10 V Positive logic (source) (PWR) voltage (state 0): 0...2 V voltage (state 1): 17...30 V
Acceleration and deceleration ramps	Linear adjustable separately from 0.01 to 9000 s S, U or customized
Braking to standstill	By regenerative braking with active front end
Protection type	Overheating protection for drive Short-circuit between motor phases for drive Overcurrent between output phases and earth for drive

	<p>Overvoltages on the DC bus for drive  Against exceeding limit speed for drive  Line supply undervoltage for drive  Line supply overvoltage for drive  Against input phase loss for drive  Thermal protection for motor  Motor phase break for motor  Power removal for drive</p>
Dielectric strength	<p>3535 V DC between earth and power terminals  5092 V DC between control and power terminals</p>
Insulation resistance	> 1 mOhm at 500 V DC for 1 minute to earth
Frequency resolution	<p>0.1 Hz for display unit  0.024/50 Hz for analog input</p>
Communication port protocol	<p>CANopen  Modbus</p>
Connector type	<p>1 RJ45 - communication protocol: Modbus on front face  1 RJ45 - communication protocol: Modbus on terminal  Male SUB-D 9 on RJ45 - communication protocol: CANopen</p>
Physical interface	2-wire RS 485 - communication protocol: Modbus
Transmission frame	RTU - communication protocol: Modbus
Transmission rate	<p>20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps - communication protocol: CANopen  4800 bps, 9600 bps, 19200 bps, 38.4 Kbps - communication protocol: Modbus on terminal  9600 bps, 19200 bps - communication protocol: Modbus on front face</p>
Data format	<p>8 bits, 1 stop, even parity - communication protocol: Modbus on front face  8 bits, odd even or no configurable parity - communication protocol: Modbus on terminal</p>
Type of polarization	No impedance - communication protocol: Modbus
Number of addresses	<p>1...127 - communication protocol: CANopen  1...247 - communication protocol: Modbus</p>
Method of access	Slave - communication protocol: CANopen
Function available	<p>Safe standstill for power circuit  PTC relay for power circuit  Pt100 relay for power circuit  Insulation monitoring for power circuit  Design for IT networks for power circuit  External 230 V supply terminals for power circuit  Buffer voltage 24 V DC power supply for power circuit  Enclosure lighting for power circuit  Key switch (local/remote) for power circuit  Motor heating for power circuit  External motor fan for power circuit  Voltmeter for power circuit  Door handle for main switch for power circuit  Ammeter for power circuit  Enclosure heating for power circuit  Motor choke for power circuit  Cable entry via the top for power circuit  Enclosure plinth for power circuit  Relay output C/O for control circuit  External 24 V DC supply terminals for power circuit  Control terminals for control circuit  Adaptor for 115 V logic inputs for control circuit  Isolated amplifier for control circuit</p>
Option card	<p>Communication card - communication protocol: CC-Link  Communication card - communication protocol: DeviceNet  Communication card - communication protocol: Ethernet/IP  Communication card - communication protocol: Fipio  Communication card - communication protocol: Interbus-S  Communication card - communication protocol: Modbus Plus  Communication card - communication protocol: Modbus TCP  Communication card - communication protocol: Modbus/Uni-Telway  Communication card - communication protocol: Profibus DP  Communication card - communication protocol: Profibus DP V1  Controller inside programmable card  Basic I/O extension card  Extended I/O extension card  Encoder interface cards</p>
Operating position	Vertical +/- 10 degree
Colour of enclosure	Light grey RAL 7035

Width	800 mm
Height	2237 mm
Depth	642 mm
Product weight	600 kg

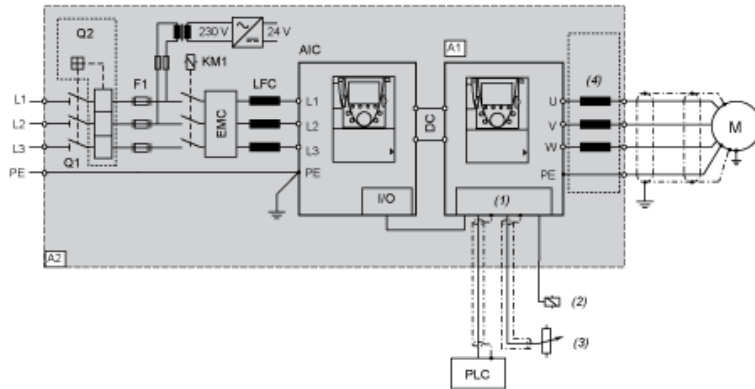
## Environment

IP degree of protection	IP54
Standards	EN 60204-1 EN 61800-3 environments 2 category C3 EN 61800-5-1 EN 61800-2
Product certifications	ATEX C-Tick GOST
Marking	CE
Noise level	76 dB
Pollution degree	3 conforming to EN 61800-5-1
Vibration resistance	0.6 gn (f=10...200 Hz) conforming to EN/IEC 60068-2-6 1.5 mm peak to peak (f=3...10 Hz) conforming to EN/IEC 60068-2-6 3M3 conforming to EN/IEC 60721-3-3
Shock resistance	4 gn 11 ms conforming to EN/IEC 60068-2-27 3M2 conforming to EN/IEC 60721-3-3
Environmental characteristic	3K3 without condensation conforming to IEC 60721-3-3
Relative humidity	0...95 %
Ambient air temperature for operation	0...40 °C without derating 40...50 °C with current derating of 1.8 % per °C
Ambient air temperature for storage	-25...70 °C
Volume of cooling air	1200 m <sup>3</sup> /h
Operating altitude	<= 1000 m without derating 1000...3000 m with current derating 1 % per 100 m

Dimensions



Wiring Diagram

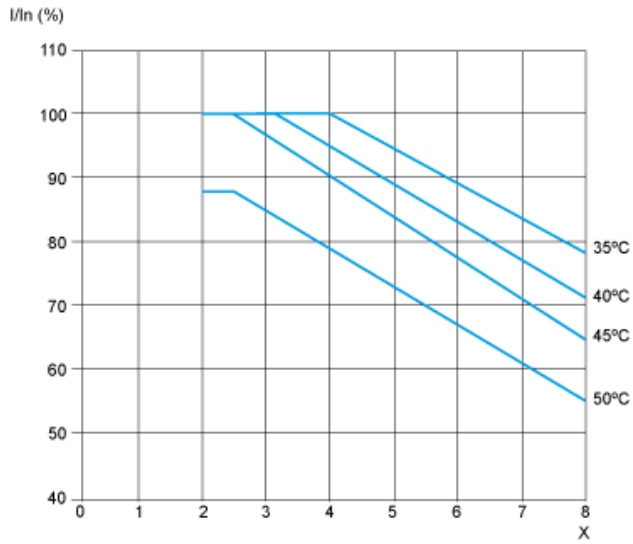


- A1 Drive
- A2 Enclosure
- AIC Active Infeed Converter
- M Motor
- Q1 Main switch built-in as standard
- Q2 Optional circuit breaker
- F1 Main fuses
- KM1 Line contactor
- EMC EMC filter
- LFC Line Filter Choke
- (1) Control
- (2) Relay control
- (3) Reference potentiometer
- (4) Option motor choke

Derating Curves

The derating curves for the drive nominal current ( $I_n$ ) are dependent on the temperature and switching frequency. For intermediate temperatures, interpolate between 2 curves.

NOTE: The drive will reduce the switching frequency automatically in the event of excessive temperature rise.



X Switching frequency (kHz)

NOTE: The temperatures shown correspond to the temperature of the air entering the enclosure.