Product data sheet
Characteristics

ATV61ES5C31N4
enclosed variable speed drive ATV61Plus - 315 kW-400V - IP54- simplified version

Main

Range of product	Altivar 61 Plus
Product or component type	Variable speed drive
Device short name	ATV61
Product destination	Asynchronous motors Synchronous motors
Product specific application	Pumping and ventilation machine
Assembly style	In floor-standing enclosure with separate air flows Ready to use
Product composition	A DC choke A plinth ATV61HC31N4 drive on heatsink An IP65 remote mounting kit for graphic display terminal Motor terminals A wired ready-assembled Sarel Spacial 6000 enclosure Circuit breaker
EMC filter	Integrated
Network number of phases	3 phases
Rated supply voltage	380...415 V (+/- 10 %)
Supply frequency	50...60 Hz
Motor power kW	315 kW, 3 phases at 380...415 V
Line current	527 A 3 phases / 280 kW
IP degree of protection	IP54

Complementary

Apparent power	365 kVA for 400 V 3 phases / 280 kW
Prospective line Isc	<= 50 kA with external fuses
Continuous output current	616 A at 2.5 kHz, 400 V 3 phases
Maximum transient current	739 A for 60 s, 3 phases
Speed drive output frequency	0.1...500 Hz
Nominal switching frequency	2.5 kHz
Switching frequency	2.5...8 kHz with derating factor 2...8 kHz adjustable
Speed range	1...100 in open-loop mode, without speed feedback
Speed accuracy	+/- 10 % of nominal slip for 0.2 Tn to Tn torque variation without speed feedback
Torque accuracy	+/- 15 % in open-loop mode, without speed feedback
Transient overtorque	135 % of nominal motor torque for 2 s 120 % of nominal motor torque for 60 s
Braking torque	<= 125 % with braking resistor 30 % without braking resistor
Asynchronous motor control profile	Voltage/Frequency ratio, 2 points Voltage/Frequency ratio, 5 points Flux vector control without sensor, standard Voltage/Frequency ratio - Energy Saving, quadratic U/f
Synchronous motor control profile	Vector control without sensor, standard
Regulation loop	Adjustable PI regulator
Motor slip compensation	Adjustable Automatic whatever the load Not available in voltage/frequency ratio (2 or 5 points) Suppressable

Supply voltage limits	342...457 V
Network frequency limits	47.5...63 Hz
Overvoltage category	Class 3 EN 50178
Local signalling	LCD display unit - operation function, status and configuration
Output voltage	<= supply voltage
Isolation	Electrical between power and control
Type of cable for external connection	IEC cable at 40 °C, copper 70 °C / PVC
Electrical connection	Terminal M12 - 3 x 185 mm² (L1/R, L2/S, L3/T) Terminal M12 - 4 x 240 mm² (U/T1, V/T2, W/T3) Terminal - 2.5 mm² / AWG 14 (AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR)
Motor recommanded cable cross section	3 (3 x 150) mm²
Short circuit protection	800 A fuse protection (gI fuse) on power supply upstream
Supply	Internal supply : 24 V (21...27 V) DC, 0 mA...100 A Internal supply for reference potentiometer : 10 V (10...11 V) DC, 0 mA...10 A External supply : 24 V (19...30 V) DC, 1 A
Analogue input number	2
Analogue input type	Software-configurable current : (AI2) 0...20 mA/4...20 mA - 250 Ohm - sampling time: 1.5...2.5 ms - resolution: 11 bits Bipolar differential voltage : (AI1-/AI1+) +/- 10 V DC - 24 V max - sampling time: 1.5...2.5 ms - resolution: 11 bits + sign Software-configurable voltage : (AI2) 0...10 V DC - 24 V max - 30 kOhm - sampling time: 1.5...2.5 ms - resolution: 11 bits
Analogue output number	1
Analogue output type	Software-configurable current : (AO1) 0...20 mA/4...20 mA - 500 Ohm - sampling time: 1.5...2.5 ms - resolution: 10 bits Software-configurable voltage : (AO1) 0...10 V DC - 470 Ohm - sampling time: 1.5...2.5 ms - resolution: 10 bits
Discrete output number	2
Discrete output type	Configurable relay logic : (R2A, R2B) NO - 6.5...7.5 ms - 100000 cycles Configurable relay logic : (R1A, R1B, R1C) NO/NC - 6.5...7.5 ms - 100000 cycles
Minimum switching current	3 mA at 24 V DC (configurable relay logic)
Maximum switching current	2 A at 250 V AC on inductive load - cos phi = 0.4 (configurable relay logic) 5 A at 30 V DC on resistive load - L/R = 0 ms (configurable relay logic) 2 A at 30 V DC on inductive load - L/R = 7 ms (configurable relay logic) 5 A at 250 V AC on resistive load - cos phi = 1 (configurable relay logic)
Discrete input number	7
Discrete input type	Safety input (PWR) 24 V DC (<= 30 V) - 1.5 kOhm Switch-configurable (LI6) 24 V DC (<= 30 V) , with level 1 PLC - 1.5 kOhm - sampling time: 1.5...2.5 ms Programmable (LI1...LI5) 24 V DC (<= 30 V) , with level 1 PLC - 3.5 kOhm - sampling time: 1.5...2.5 ms
Discrete input logic	Negative (LI1...LI6) , 16...30 V (state 0), 0...10 V (state 1) Positive (LI1...LI6) , 0...5 V (state 0), 11...30 V (state 1) Positive (PWR) , 0...2 V (state 0), 17...30 V (state 1)
Acceleration and deceleration ramps	Linear adjustable separately from 0.01 to 9000 s S, U or customized
Braking to standstill	By DC injection, 0...60 s
Protection type	Power removal for motor Power removal for drive Motor phase break for motor Thermal protection for motor Against input phase loss for drive Line supply overvoltage for drive Line supply undervoltage for drive Against exceeding limit speed for drive Break on the control circuit for drive Overvoltages on the DC bus for drive Overcurrent between output phases and earth for drive Input phase breaks for drive Short-circuit between motor phases for drive Thermal protection for drive Overheating protection for drive
Dielectric strength	5092 V DC between control and power terminals 3535 V DC between earth and power terminals
Insulation resistance	> 1 mOhm at 500 V DC for 1 minute
Frequency resolution	0.024/50 Hz for analog input 0.1 Hz for display unit

Communication port protocol	CANopen Modbus
Type of connector	Male SUB-D 9 on RJ45 for CANopen 1 RJ45 for Modbus on terminal 1 RJ45 for Modbus on front face
Physical interface	2-wire RS 485 for Modbus
Transmission frame	RTU for Modbus
Transmission rate	20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps for CANopen 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps for Modbus on terminal 9600 bps, 19200 bps for Modbus on front face
Data format	8 bits, odd even or no configurable parity for Modbus on terminal 8 bits, 1 stop, even parity for Modbus on front face
Type of polarization	No impedance for Modbus
Number of addresses	1...127 addresses for CANopen 1...247 addresses for Modbus
Method of access	Slave for CANopen
Operating position	Vertical +/- 10 degree
Colour of enclosure	Light grey RAL 7035
Colour of base of enclosure	Dark grey RAL 7022
Width	800 mm
Height	2362 mm
Depth	642 mm
Product weight	440 kg

Environment

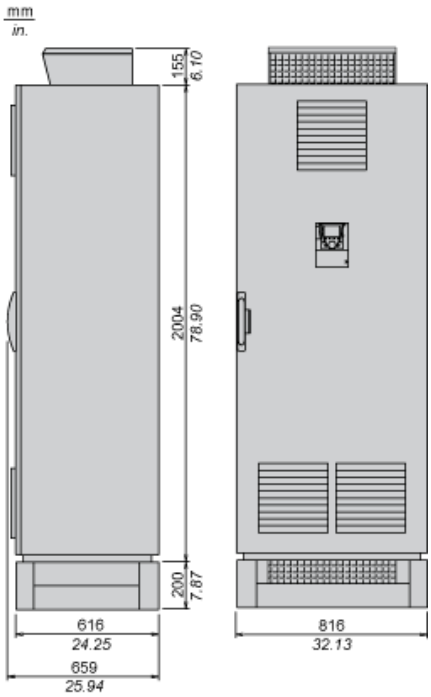
Electromagnetic compatibility	Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5 Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4 Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3 Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2
Standards	EN 55011 class A group 2 EN 61800-3 environments 1 category C3 EN 61800-3 environments 2 category C3 EN/IEC 61800-3 EN/IEC 61800-5-1
Product certifications	ATEX GOST
Marking	CE
Noise level	72 dB
Pollution degree	3 conforming to EN/IEC 61800-5-1
Vibration resistance	3M3 conforming to EN/IEC 60721-3-3 0.6 gn (f = 10...200 Hz) conforming to EN/IEC 60068-2-6 1.5 mm (f = 3...10 Hz) conforming to EN/IEC 60068-2-6
Shock resistance	3M2 conforming to EN/IEC 60721-3-3 4 gn for 11 ms conforming to EN/IEC 60068-2-27
Environmental characteristic	3K3 without condensation conforming to IEC 60721-3-3 3S2 without condensation conforming to IEC 60721-3-3 3C2 without condensation conforming to IEC 60721-3-3
Relative humidity	<= 95 %
Ambient air temperature for operation	40...50 °C with current derating of 2 % per °C 0...40 °C without derating
Ambient air temperature for storage	-25...70 °C
Volume of cooling air	1400 m3/h
Operating altitude	1000...3000 m with current derating 1 % per 100 m <= 1000 m without derating

Offer Sustainability

Sustainable offer status	Not Green Premium product
RoHS	Will be Compliant on 4Q2013

Ready to Use IP 54 Enclosure

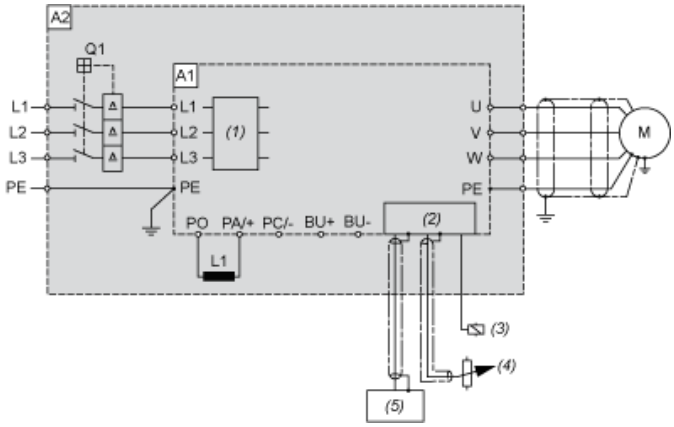
Dimensions



NOTE: For each floor-standing enclosure added, allow a 4 mm/0.15 in. space for the seal.

Ready to Use IP 54 Enclosure

Wiring Diagram



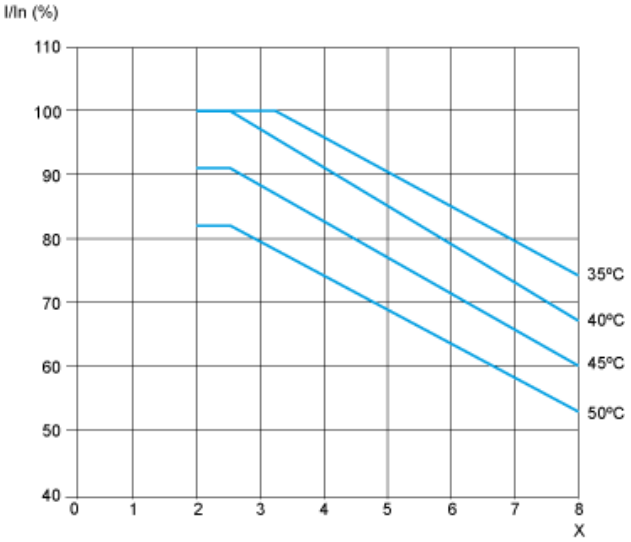
A1 Drive
A2 Enclosure
L1 DC choke
M Motor
Q1 Circuit breaker
(1) Filter
(2) Control
(3) Relay control
(4) Reference potentiometer
(5) PLC

Ready to Use IP 54 Enclosure

Derating Curves

The derating curves for the drive nominal current (In) 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.