Product data sheet
Characteristics

ATV61EXS5C20N
enclosed variable speed drive ATV61 Plus - 200 kW - 500V - IP54 SA



To be discontinued

Main

Range of product	Altivar 61 Plus
Product or component type	Variable speed drive
Device short name	ATV61
Product destination	Synchronous motors Asynchronous motors
Product specific application	Pumping and ventilation machine
Assembly style	In floor-standing enclosure with separate air flows
Product composition	ATV61HC25Y standard drive IP00 Terminals/bars for motor connection A wired ready-assembled Sarel Spacial 6000 enclosure A plinth An IP65 remote mounting kit for graphic display terminal A switch and fast-acting fuses A line choke in an additional enclosure
EMC filter	Integrated
Network number of phases	3 phases
Rated supply voltage	500...525 V +/- 10 %
Supply frequency	50...60 Hz
Motor power kW	200 kW, 3 phases at 500 V
Line current	277 A at 500 V3 phases / 200 kW
IP degree of protection	IP54

Complementary

Apparent power	240 kVA for 500 V, 3 phases 200 kW
Prospective line Isc	100 kA with external fuses
Continuous output current	312 A, 2.5 kHz at 500 V 3 phases
Maximum transient current	374 A for 60 s, 3 phases
Speed drive output frequency	0.1…500 Hz
Nominal switching frequency	2.5 kHz
Switching frequency	2.5...4.9 kHz with derating factor 2...4.9 kHz adjustable
Speed range	1…100 in open-loop mode, without speed feedback
Speed accuracy	+/- 10 % of nominal slip 0.2 Tn to Tn without speed feedback

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Torque accuracy	+/- 15 % in open-loop mode, without speed feedback
Transient overtorque	120 % of nominal motor torque for 60 s 135 % of nominal motor torque for 2 s
Braking torque	30 % without braking resistor <= 125 % with braking resistor
Asynchronous motor control profile	Voltage/frequency ratio, 5 points Flux vector control without sensor, standard Voltage/frequency ratio, 2 points 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	Suppressable Not available in voltage/frequency ratio (2 or 5 points) Adjustable Automatic whatever the load
Supply voltage limits	450…578 V
Network frequency limits	47.5…63 Hz
Overvoltage category	Class 3 conforming to EN 50178
Local signalling	LCD display unit for operation function, status and configuration - mounted in the front door
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 - 2.5 mm² / AWG 14 (AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR) entry from the bottom Terminal M10 - 2 x 150 mm² (L1/R, L2/S, L3/T) entry from the bottom Terminal M12 - 4 x 240 mm² (U/T1, V/T2, W/T3) entry from the bottom
Motor recommanded cable cross section	3 x 185 mm²
Short-circuit protection	400 A fuse protection type gI - power supply upstream
Supply	External supply: 24 V (19…30 V)DC, <1 A Internal supply for reference potentiometer: 10 V (10…11 V)DC, <10 mA Internal supply: 24 V (21…27 V)DC, <100 mA
Analogue input number	2
Analogue input type	AI2 software-configurable voltage: 0...10 V DC, 24 V max, impedance: 30 kOhm, sampling time: 1.5…2.5 ms, resolution: 11 bits AI1-/AI1+ bipolar differential voltage: +/- 10 V DC, 24 V max, sampling time: 1.5…2.5 ms, resolution: 11 bits + sign AI2 software-configurable current: 0...20 mA/4...20 mA, impedance: 250 Ohm, sampling time: 1.5…2.5 ms, resolution: 11 bits
Analogue output number	1
Analogue output type	Software-configurable voltage: (AO1) 0...10 V DC - 470 Ohm - sampling time: 1.5…2.5 ms - resolution: 10 bits Software-configurable current: (AO1) 0...20 mA/4...20 mA - 500 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	5 A at 250 V AC on resistive load - cos phi = 1 for configurable relay logic 2 A at 30 V DC on inductive load - L/R = 7 ms for configurable relay logic 5 A at 30 V DC on resistive load - L/R = 0 ms for configurable relay logic 2 A at 250 V AC on inductive load - cos phi = 0.4 for configurable relay logic
Discrete input number	7
Discrete input type	Programmable (LI1...LI5) 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), 0...5 V (state 0), 11...30 V (state 1) Negative logic (sink) (LI1...LI6), 16...30 V (state 0), 0...10 V (state 1) Positive logic (source) (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, <60 s

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 Power removal: drive Short-circuit between motor phases: drive Thermal protection: drive Motor phase break: motor Power removal: motor Thermal protection: motor
Dielectric strength	3110 V DC between earth and power terminals 5345 V DC between control and power terminals
Insulation resistance	> 1 mOhm 500 V DC for 1 minute
Frequency resolution	Analog input: 0.024/50 Hz Display unit: 0.1 Hz
Communication port protocol	Modbus CANopen
Connector type	1 RJ45 (on front face) for Modbus 1 RJ45 (on terminal) for Modbus Male SUB-D 9 on 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
Type of polarization	No impedance for Modbus
Number of addresses	1…127 for CANopen 1…247 for Modbus
Method of access	Slave CANopen
Options for enclosure configuration	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 Line contactor 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 Braking unit 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 Circuit breaker for control circuit Enclosure plinth for control circuit
Option card	Communication card for APOGEE FLN Communication card for BACnet Communication card for CC-Link Communication card for DeviceNet Communication card for Ethernet/IP Communication card for Fipio Communication card for Interbus-S Communication card for LonWorks

	Communication card for METASYS N2 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 Controller inside programmable card Multi-pump card Basic I/O extension card Extended I/O extension card Encoder interface cards
Operating position	Vertical +/- 10 degree
Colour of enclosure	Light grey (RAL 7035)
Colour of base of enclosure	Dark grey (RAL 7022)
Width	1200 mm
Height	2362 mm
Depth	642 mm
Net weight	570 kg

Environment

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 class A group 2 EN/IEC 61800-3 EN 61800-3 environments 1 category C3 EN/IEC 61800-5-1 EN 61800-3 environments 2 category C3
Product certifications	GOST ATEX
Marking	CE
Noise level	72 dB
Pollution degree	3 conforming to EN/IEC 61800-5-1
Vibration resistance	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 3M3 conforming to EN/IEC 60721-3-3
Shock resistance	4 gn for 11 ms conforming to EN/IEC 60068-2-27 3M2 conforming to EN/IEC 60721-3-3
Environmental characteristic	3C2 without condensation conforming to IEC 60721-3-3 3S2 without condensation conforming to IEC 60721-3-3 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 % per °C)
Ambient air temperature for storage	-25…70 °C
Volume of cooling air	1400 m3/h
Operating altitude	<= 1000 m without derating 1000...2260 m with current derating 1 % per 100 m

Packing Units

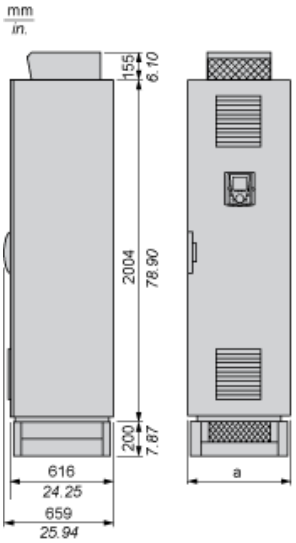
Package 1 Weight	535.000 kg
Package 1 Height	21.600 dm
Package 1 width	6.600 dm
Package 1 Length	8.160 dm

Contractual warranty

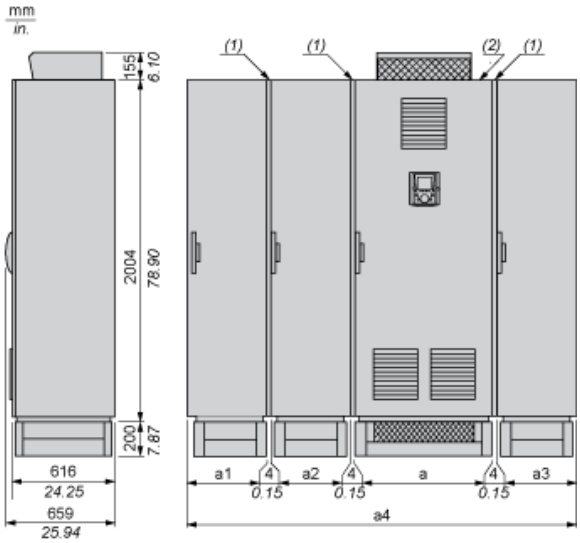
Warranty	18 months

IP 54 Floor-Standing Enclosure with Separate Air Flows

Standard Floor-Standing Enclosure



Standard Compact Floor-Standing Enclosure + Additional Floor-Standing Enclosures, According to the Configuration



(1) Seal. For each floor-standing enclosure added, allow a 4 mm/0.15 in. space for the seal.
(2) Standard version floor-standing enclosure.

NOTE: The position of the enclosures must be complied with during installation. The number of additional enclosures can vary according to the chosen configuration.

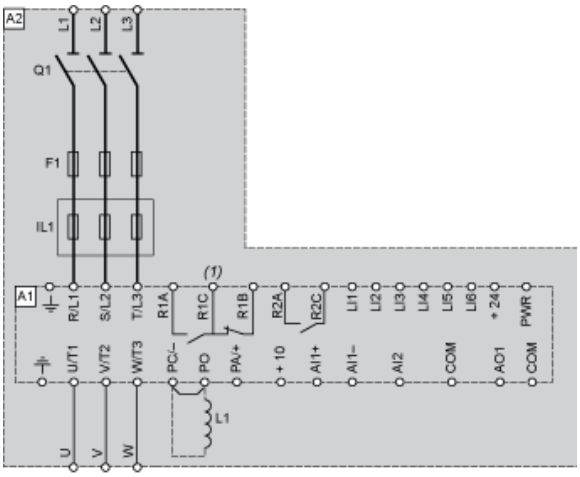
Options	a	a1	a2	a3	a4
With or without common options or options dependent on the drive rating	808 mm/31.8 in.	–	–	408 mm/16 in.	1220 mm/48 in.
Cable entry via the top option	808 mm/31.8 in.	–	–	408 mm/16 in.	1220 mm/48 in.
Braking unit option	800 mm/31.5 in.	–	408 mm/16 in.	408 mm/16 in.	1624 mm/63.9 in.
Braking unit + cable entry via the top options	800 mm/31.5 in.	–	408 mm/16 in.	408 mm/16 in.	1624 mm/63.9 in.

Options	a	a1	a2	a3	a4
Motor choke + cable entry via the top option	800 mm/31.5 in.	–	408 mm/16 in.	408 mm/16 in.	1624 mm/63.9 in.
Motor choke + braking unit + cable entry via the top option	800 mm/31.5 in.	408 mm/16 in.	400 mm/15.7 in.	408 mm/16 in.	2028 mm/79.8 in.

(3) Except sinus filter option, which requires an additional enclosure. The sinus filter option is not compatible with the cable entry via the top option.
(4) The cable entry via the top option is not compatible with the sinus filter option.

IP 54 Floor-Standing Enclosure with Separate Air Flows

Wiring Diagram



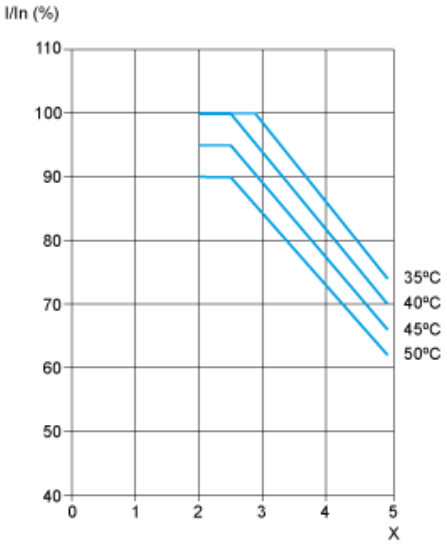
A1 Drive
A2 Enclosure
F1 Fast-acting semi-conductor fuse
IL1 Line choke
L1 DC choke
Q1 Switch
(1) Fault relay contacts. For remote signalling of drive status.

Floor-Standing Enclosure Compact Version

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.