Product data sheet
Characteristics

ATV61EXS5C50N
enclosed variable speed drive ATV61 Plus - 500 kW - 500V - IP54 SA

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
Product composition	A plinth A switch and fast-acting fuses An IP65 remote mounting kit for graphic display terminal A line choke in an additional enclosure A wired ready-assembled Sarel Spacial 6000 enclosure Terminals/Bars for motor connection ATV61HC63Y standard drive IP00
EMC filter	Integrated
Network number of phases	3 phases
Rated supply voltage	500...525 V (+/- 10 %)
Supply frequency	50...60 Hz
Motor power kW	500 kW, 3 phases at 500 V
Line current	673 A for 500 V 3 phases / 500 kW
IP degree of protection	IP54

Complementary

Apparent power	583 kVA for 500 V, 3 phases 500 kW
Prospective line Isc	<= 100 kA with external fuses
Continuous output current	740 A at 2.5 kHz, 500 V 3 phases
Maximum transient current	888 A for 60 s, 3 phases
Speed drive output frequency	0.1...500 Hz
Nominal switching frequency	2.5 kHz
Switching frequency	2...4.9 kHz adjustable 2.5...4.9 kHz with derating factor
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	450...578 V

Network frequency limits	47.5...63 Hz
Overvoltage category	Class 3 conforming to EN 50178
Local signalling	LCD display unit - 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	Bar M12 - 4 x 240 mm² (U/T1, V/T2, W/T3) entry from the bottom Bar M12 - 4 x 300 mm² (L1/R, L2/S, L3/T) entry from the bottom Terminal - 2.5 mm² / AWG 14 (AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR) entry from the bottom
Motor recommanded cable cross section	3 (3 x 185) mm²
Short circuit protection	1000 A fuse protection (gI fuse) on power supply upstream
Supply	Internal supply : 24 V (21...27 V) DC, 0...100 mA Internal supply for reference potentiometer : 10 V (10...11 V) DC, 0...10 mA 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 : (R1A, R1B, R1C) NO/NC - 6.5...7.5 ms - 100000 cycles Configurable relay logic : (R2A, R2B) NO - 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	Positive logic (source) (PWR) , 0...2 V (state 0), 17...30 V (state 1) Negative logic (sink) (LI1...LI6) , 16...30 V (state 0), 0...10 V (state 1) Positive logic (source) (LI1...LI6) , 0...5 V (state 0), 11...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	Thermal protection for motor Power removal for motor Motor phase break for motor Thermal protection for drive Short-circuit between motor phases for drive Power removal for drive Overvoltages on the DC bus for drive Overheating protection for drive Overcurrent between output phases and earth for drive Line supply undervoltage for drive Line supply overvoltage for drive Input phase breaks for drive Break on the control circuit for drive Against input phase loss for drive Against exceeding limit speed for drive
Dielectric strength	5345 V DC between control and power terminals 3110 V DC between earth and power terminals
Insulation resistance	> 1 mOhm at 500 V DC for 1 minute
Frequency resolution	0.1 Hz for display unit 0.024/50 Hz for analog input

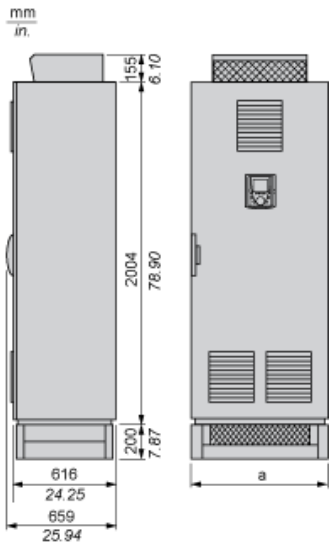
Communication port protocol	CANopen Modbus
Type of connector	Male SUB-D 9 on RJ45 for CANopen 1 RJ45 for Modbus on terminal 1 RJ45 for Modbus on front face
Physical interface	2-wire RS 485 for Modbus
Transmission frame	RTU for Modbus
Transmission rate	20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps for CANopen 9600 bps, 19200 bps for Modbus on front face 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps for Modbus on terminal
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...247 for Modbus 1...127 for CANopen
Method of access	Slave for CANopen
Options for enclosure configuration	Enclosure plinth for control circuit Circuit breaker for control circuit Isolated amplifier for control circuit Adaptor for 115 V logic inputs for control circuit Control terminals for control circuit External 24 V DC supply terminals for power circuit Relay output C/O for control circuit Braking unit for power circuit Cable entry via the top for power circuit Motor choke for power circuit Enclosure heating for power circuit Ammeter for power circuit Line contactor for power circuit Door handle for main switch for power circuit Voltmeter for power circuit External motor fan for power circuit Motor heating for power circuit Key switch (local/remote) for power circuit Enclosure lighting for power circuit Buffer voltage 24 V DC power supply for power circuit External 230 V supply terminals for power circuit Design for IT networks for power circuit Insulation monitoring for power circuit Pt100 relay for power circuit PTC relay for power circuit Safe standstill for power circuit
Option card	Encoder interface cards Extended I/O extension card Basic I/O extension card Multi-pump card Controller inside programmable card Communication card for Profibus DP V1 Communication card for Profibus DP Communication card for Modbus/Uni-Telway Communication card for Modbus TCP Communication card for Modbus Plus Communication card for METASYS N2 Communication card for LonWorks Communication card for Interbus-S Communication card for Fipio Communication card for Ethernet/IP Communication card for DeviceNet Communication card for CC-Link Communication card for BACnet Communication card for APOGEE FLN
Operating position	Vertical +/- 10 degree
Colour of enclosure	RAL 7035
Colour of base of enclosure	Dark grey RAL 7022
Width	1600 mm
Height	2362 mm
Depth	642 mm
Product weight	1000 kg

Environment

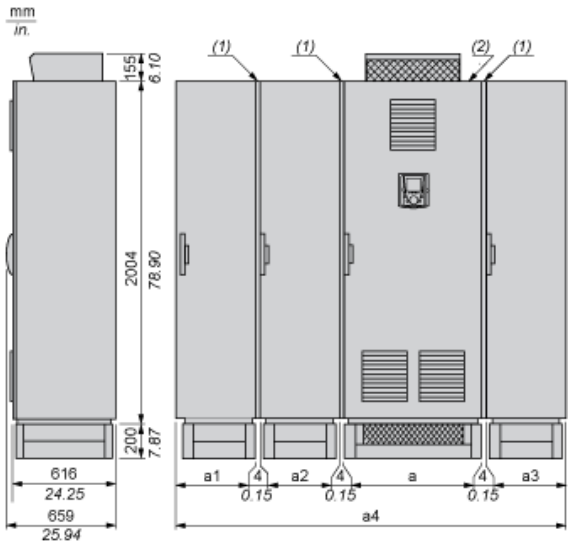
Electromagnetic compatibility	Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3 Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2 Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4 Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5
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	73 dB
Pollution degree	3 conforming to EN/IEC 61800-5-1
Vibration resistance	3M3 conforming to EN/IEC 60721-3-3 1.5 mm (f = 3...10 Hz) conforming to EN/IEC 60068-2-6 0.6 gn (f = 10...200 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 1 % per °C 0...40 °C without derating
Ambient air temperature for storage	-25...70 °C
Volume of cooling air	3000 m3/h
Operating altitude	1000...2260 m with current derating 1 % per 100 m <= 1000 m without derating

IP 54 Floor-Standing Enclosure with Separate Air Flows

Standard Compact Floor-Standing Enclosure



Standard Floor-Standing Enclosure + Additional 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.

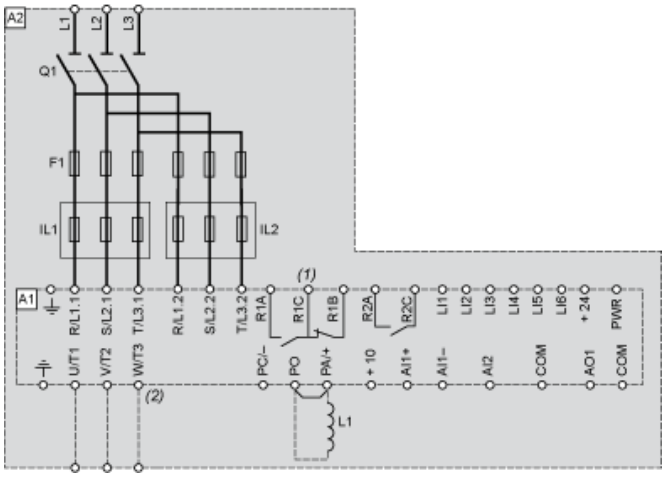
Options	a	a1	a2	a3	a4
With or without common options or options dependent on the drive rating	1208 mm/47.5 in.	–	408 mm/16 in.	–	1620 mm/63.7 in.
Cable entry via the top option	1200 mm/47.2 in.	–	408 mm/16 in.	408 mm/16 in.	2024 mm/79.6 in.
Braking unit option	1208 mm/47.5 in.	408 mm/16 in.	400 mm/15.7 in.	–	2024 mm/79.6 in.
Braking unit + cable entry via the top options	1200 mm/47.2 in.	408 mm/16 in.	400 mm/15.7 in.	408 mm/16 in.	2428 mm/95.5 in.
Motor choke option	1200 mm/47.2 in.	–	408 mm/16 in.	408 mm/16 in.	2024 mm/79.6 in.

Options	a	a1	a2	a3	a4

(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



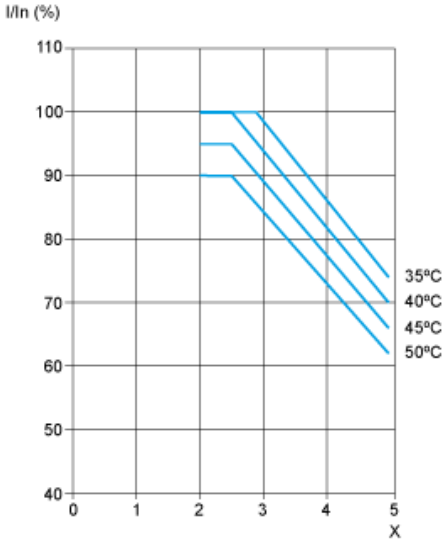
A1 Drive
A2 Enclosure
F1 Fast-acting semi-conductor fuse
IL1, IL2 Line chokes
L1 DC choke
Q1 Switch
(1) Fault relay contacts. For remote signalling of drive status.
(2) Only for ATV•1EXS5•••N and ATV•1EXS5•••Y.

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.