Product data sheet

Specifications

To be discontinued

enclosed variable speed drive ATV61 Plus - 1400 kW - 400V - IP54

ATV61EXA5M14N4

To be discontinued on: 31 December 2023

To be end-of-service on: 31 December 2031

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	Control transformer for 230 V A plinth An IP65 remote mounting kit for graphic display terminal A switch and fast-acting fuses A wired ready-assembled Sarel Spacial 6000 enclosure Terminals/bars for motor connection Integrated drive system ATV61EM14N4E1
EMC filter	Integrated
Network number of phases	3 phases
Rated supply voltage	380...415 V +/- 10 %
Supply frequency	50...60 Hz
Motor power kW	1400 kW, 3 phases at 380...415 V
Line current	2344 A at 400 V3 phases / 1400 kW
IP degree of protection	IP54

Complementary

Apparent power	1624 kVA for 400 V3 phases / 1400 kW
Prospective line Isc	100 kA with external fuses
Continuous output current	2430 A at 2.5 kHz, 400 V3 phases
Maximum transient current	2916 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 0.2 Tn to Tn without speed feedback
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 Voltage/frequency ratio, 2 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	Suppressable Not available in voltage/frequency ratio (2 or 5 points) Automatic whatever the load Adjustable
Supply voltage limits	342…457 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
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 0.6 N.m (R1A, R1B, R1C, R2A, R2B) entry from the bottom Screw clamp terminals - 1.5 mm² 0.25 N.m (AI1-/AI1+, AI2, AO1, LI1...LI6, PWR) entry from the bottom Bar M12 - 16 x 240 mm² 41 N.m (L1/R, L2/S, L3/T) entry from the bottom at 6-pulse operation Bar M12 - 8 x 240 mm² 41 N.m (L1/R, L2/S, L3/T) entry from the bottom at 12-pulse operation
Motor recommanded cable cross section	9 (3 x 240) mm² 11 (3 x 185) mm²
Short-circuit protection	3200 A fuse protection type gI - power supply upstream - at 6-pulse operation 1600 A fuse protection type gI - power supply upstream - at 12-pulse operation
Supply	External supply: 24 V (19…30 V)DC, <1 A Internal supply for reference potentiometer: 10 V (10…11 V)DC, <10 A Internal supply: 24 V (21…27 V)DC, <100 A
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 - 500 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: (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	5 A at 250 V AC on resistive load - cos phi = 1 for configurable relay logic 5 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 5 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 (LI1...LI6), 0...5 V (state 0), 11...30 V (state 1) Negative (LI1...LI6), 16...30 V (state 0), 0...10 V (state 1) Positive (PWR), 0...2 V (state 0), 17...30 V (state 1)
Acceleration and deceleration ramps	S, U or customized Linear adjustable separately from 0.01 to 9000 s
Braking to standstill	By DC injection, <60 s
Protection type	Overheating protection: drive Thermal protection: drive Short-circuit between motor phases: drive Input phase breaks: drive Overcurrent between output phases and earth: drive Overvoltages on the DC bus: drive Break on the control circuit: drive Against exceeding limit speed: drive Line supply undervoltage: drive Line supply overvoltage: drive Against input phase loss: drive Thermal protection: motor Motor phase break: motor Power removal: drive Power removal: motor
Dielectric strength	3535 V DC between earth and power terminals 5092 V DC between control and power terminals
Insulation resistance	> 1 mOhm 500 V DC for 1 minute
Frequency resolution	Display unit: 0.1 Hz Analog input: 0.024/50 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	9600 bps, 19200 bps for Modbus on front face 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps for Modbus on terminal 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…247 for Modbus 1…127 for CANopen
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 12-pulse supply 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 Circuit breaker for power circuit Line reactor for power circuit Control terminals for control circuit Adaptor for 115 V logic inputs for control circuit Isolated amplifier for control circuit
Option card	Communication card for Modbus TCP/IP Communication card for Fipio Communication card for Modbus/Uni-Telway Communication card for Modbus Plus Communication card for EtherNet/IP

	Communication card for DeviceNet Communication card for Profibus DP Communication card for Profibus DP V1 Communication card for Interbus-S Communication card for CC-Link Communication card for LonWorks Communication card for METASYS N2 Communication card for APOGEE FLN Communication card for BACnet Basic I/O extension card Extended I/O extension card Controller inside programmable card Multi-pump 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	3400 mm
Height	2009 mm
Depth	642 mm
Net weight	1925 kg

Environment

Electromagnetic compatibility	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 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 Voltage dips and interruptions immunity test conforming to IEC 61000-4-11
Standards	EN/IEC 61800-5-1 EN 61800-3 environments 1 category C3 EN/IEC 61800-3 EN 61800-3 environments 2 category C3 EN 55011 class A group 2
Product certifications	GOST ATEX
Marking	CE
Pollution degree	3 conforming to EN/IEC 61800-5-1
Noise level	79 dB
Vibration resistance	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 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 1.5 % per °C)
Ambient air temperature for storage	-25…70 °C
Volume of cooling air	11000 m3/h
Operating altitude	<= 1000 m without derating 1000...3000 m with current derating 1 % per 100 m

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	200.0 cm

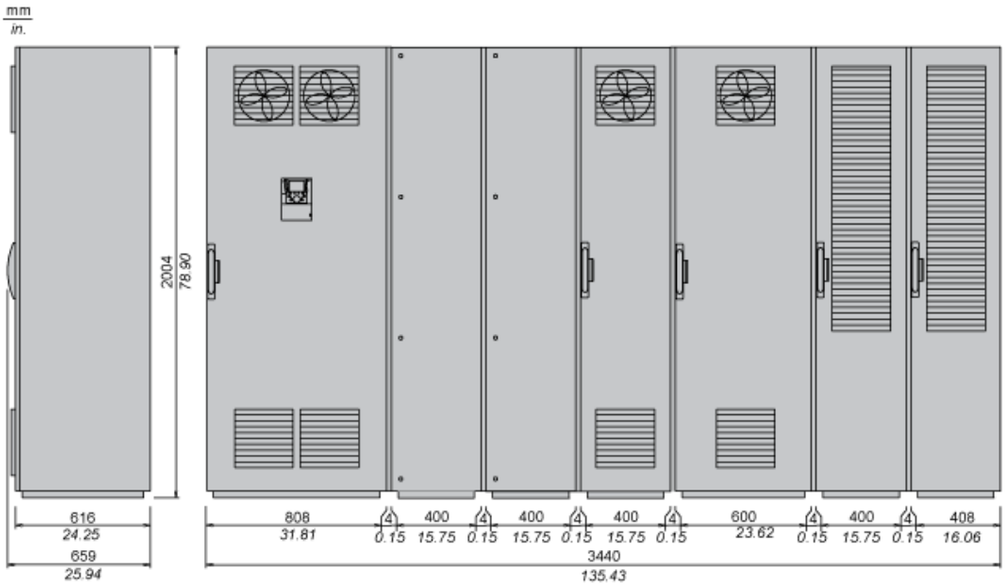
Package 1 Width	66.0 cm
Package 1 Length	344.0 cm
Package 1 Weight	1920.0 kg
Unit Type of Package 2	CAR
Number of Units in Package 2	1
Package 2 Height	215.0 cm
Package 2 Width	68.0 cm
Package 2 Length	346.0 cm
Package 2 Weight	1920.0 kg

Contractual warranty

Warranty	18 months

IP 23 Floor-Standing Enclosure with Separate Air Flows

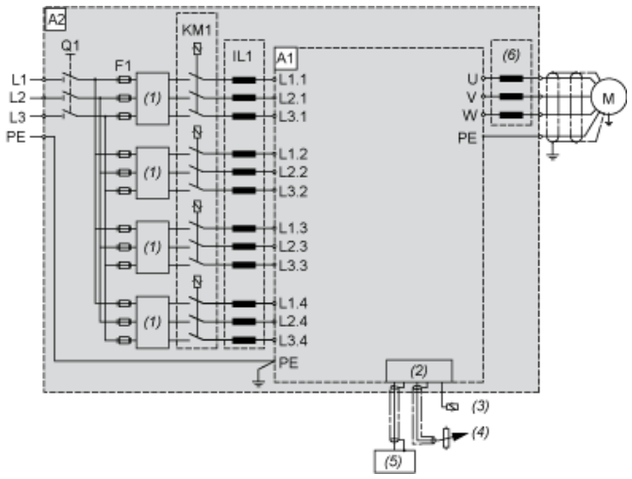
Dimensions



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

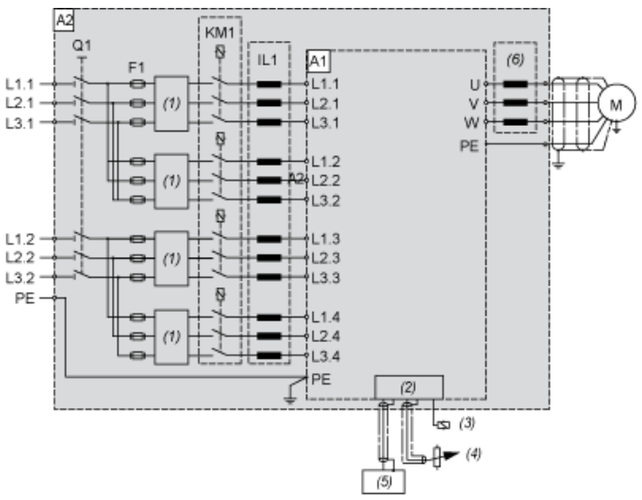
Floor-Standing Enclosure with Separate Air Flows

Standard 6-pulse Design



A1 Drive
A2 Enclosure
F1 Fuses
IL1 Optional line choke
KM1 Optional line contactor
M Motor
Q1 Switch
(1) Filter
(2) Control
(3) Relay control
(4) Reference potentiometer
(5) PLC
(6) Optional motor choke

Optional 12-pulse Design



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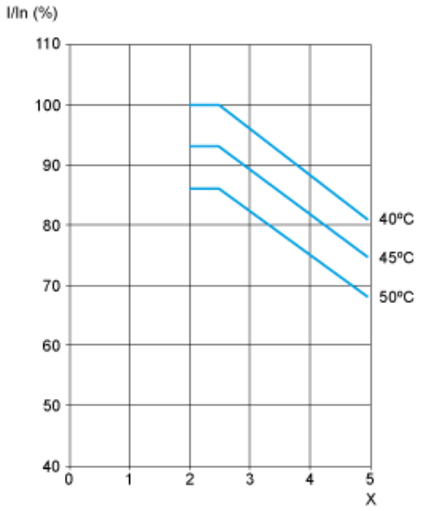
IP 23 Floor-Standing Enclosure with Separate Air Flows

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.

Recommended replacement(s)