Product datasheet

Specifications

enclosed variable speed drive ATV71 Plus - 315 kW - 690 V - IP23

ATV71EXC2C31Y

Discontinued on: Jul 23, 2021 AD

To be discontinued

Main

Range Of Product	Altivar 71 Plus
Product Or Component Type	Variable speed drive
Device Short Name	ATV71 Plus
Product Destination	Asynchronous motors Synchronous motors
Product Specific Application	Complex, high-power machines
Assembly Style	In floor-standing enclosure compact version
Product Composition	ATV71HC31Y drive on heatsink An IP65 remote mounting kit for graphic display terminal A line choke A switch and fast-acting semi-conductor fuses Terminals/bars for motor connection A wired ready-assembled Sarel Spacial 6000 enclosure
Emc Filter	Integrated
Network Number Of Phases	3 phases
Rated Supply Voltage	690 V +/- 10 %
Supply Voltage Limits	621…759 V
Supply Frequency	50...60 Hz +/- 5 %
Network Frequency	47.5...63 Hz
Motor Power Kw	315 kW at 690 V
Line Current	371 A for 690 V / 315 kW

Complementary

Apparent Power	379 kVA for 690 V / 315 kW
Prospective Line Isc	100 kA with external fuses
Continuous Output Current	355 A at 2.5 kHz, 690 V / 315 kW
Maximum Transient Current	533 A for 60 s / 315 kW
Speed Drive Output Frequency	0…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	+/- 0.01 % of nominal speed in closed-loop mode with encoder feedback 0.2 Tn to Tn +/- 10 % of nominal slip without speed feedback 0.2 Tn to Tn

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 % for 60 s 220 % of nominal motor torque +/- 10 % for 2 s
Braking Torque	<= 150 % with braking or hoist resistor 30 % without braking resistor
Asynchronous Motor Control Profile	Flux vector control without sensor, ENA (energy Adaptation) system Flux vector control without sensor, 2 points Flux vector control with sensor, standard Voltage/frequency ratio, 2 points Voltage/frequency ratio, 5 points Voltage/frequency ratio - Energy Saving, quadratic U/f Flux vector control without sensor, standard
Synchronous Motor Control Profile	Vector control without sensor, standard Vector control with sensor, standard
Regulation Loop	Adjustable PI regulator
Motor Slip Compensation	Not available in voltage/frequency ratio (2 or 5 points) Adjustable Suppressable Automatic whatever the load
Overvoltage Category	Class 3 conforming to EN 50178
Local Signalling	LCD display unit for operation function, status and configuration
Output Voltage	<= power 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 M12 - 4 x 240 mm² (U/T1, V/T2, W/T3) entry from the bottom Terminal M12 - 3 x 185 mm² (L1/R, L2/S, L3/T) entry from the bottom
Motor Recommanded Cable Cross Section	2 (3 x 95) mm²
Short-Circuit Protection	500 A fuse protection type gI - power supply upstream
Supply	External supply: 24 V DC (19…30 V), <1 A Internal supply for reference potentiometer: 10 V DC (10…11 V), <10 mA Internal supply: 24 V DC (21…27 V), <100 mA
Analogue Input Number	2
Analogue Input Type	AI2 software-configurable voltage: 0...10 V DC, 24 V max, impedance: 30000 Ohm, 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: (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 (R1, R2) 5 A at 30 V DC on resistive load - L/R = 0 ms (R1, R2) 2 A at 250 V AC on inductive load - cos phi = 0.4 (R1, R2) 2 A at 30 V DC on inductive load - L/R = 7 ms (R1, R2)
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	Automatic adaptation of ramp if braking capacity exceeded, by using resistor S, U or customized Linear adjustable separately from 0.01 to 9000 s
Braking To Standstill	By DC injection
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 Short-circuit between motor phases: drive Thermal protection: drive Input phase breaks: 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 to earth
Frequency Resolution	Analog input: 0.024/50 Hz Display unit: 0.1 Hz
Communication Port Protocol	CANopen Modbus
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…247 for CANopen 1…247 for Modbus
Method Of Access	Slave CANopen
Option Card	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 Modbus Plus Communication card for Modbus/Uni-Telway Communication card for Profibus DP Communication card for Profibus DP V1 Communication card for Modbus TCP/IP Controller inside programmable card Basic I/O extension card Extended I/O extension card Encoder interface cards

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 External 24 V DC supply terminals 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 Circuit breaker 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 Enclosure plinth for power circuit Braking unit for power circuit Door handle for circuit breaker for power circuit Control terminals for control circuit Adaptor for 115 V logic inputs for control circuit Relay output C/O for control circuit Isolated amplifier for control circuit
Operating Position	Vertical +/- 10 degree
Colour Of Enclosure	Light grey (RAL 7035)
Height	2162 mm
Width	800 mm
Depth	642 mm
Net Weight	550 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
Pollution Degree	2 conforming to EN/IEC 61800-5-1
Ip Degree Of Protection	IP23
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
Noise Level	66 dB conforming to 86/188/EEC
Environmental Characteristic	Without condensation: 3C2 conforming to IEC 60721-3-3 Without condensation: 3K3 conforming to IEC 60721-3-3 Without condensation: 3S2 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 0.6 % per °C)
Ambient Air Temperature For Storage	-25…70 °C
Volume Of Cooling Air	1200 m3/h
Operating Altitude	<= 1000 m without derating 1000...3000 m with current derating 1 % per 100 m

Standards	EN/IEC 61800-3 EN/IEC 61800-5-1 EN 61800-3 environments 1 category C3 EN 61800-3 environments 2 category C3 EN 55011 class A group 2
Product Certifications	GOST ATEX
Marking	CE

Packing Units

Unit Type Of Package 1	PCE
Number Of Units In Package 1	1
Package 1 Height	216.0 cm
Package 1 Width	66.0 cm
Package 1 Length	101.6 cm
Package 1 Weight	550.0 kg

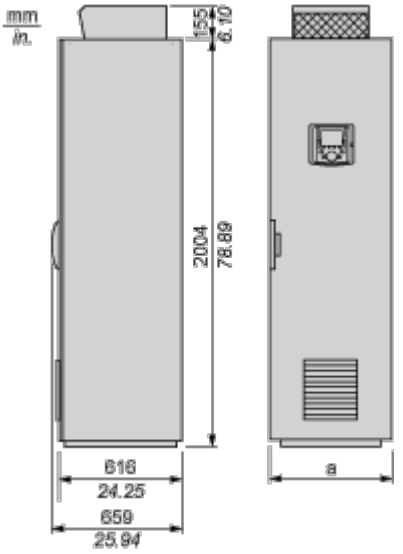
Contractual warranty

Warranty	18 months

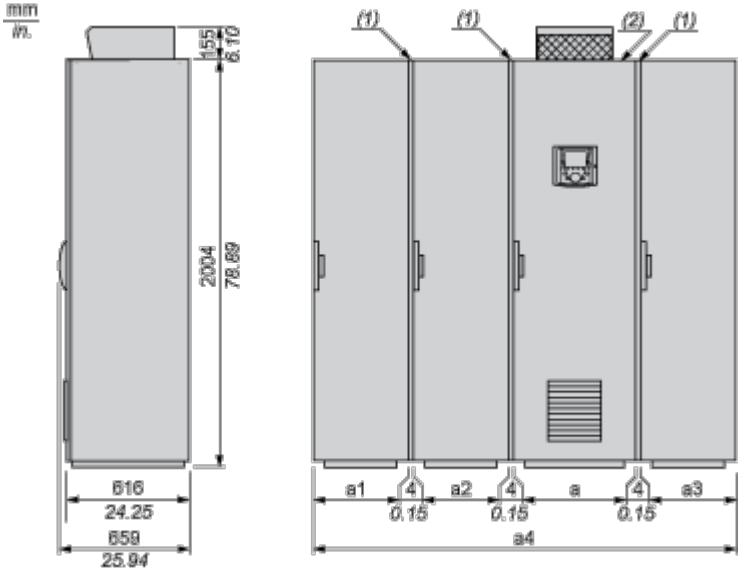
Dimensions Drawings

IP 23 Floor-Standing Enclosure Compact Version

Standard Compact 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 IP 23 compact 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	816 mm/ 32.1 in.	–	–	–	816 mm/ 32.1 in.
Cable entry via the top option	808 mm/ 31.8 in.	–	408 mm/ 16 in.	–	1220 mm/ 48 in.
Braking unit option	808 mm/ 31.8 in.	–	408 mm/ 16 in.	–	1220 mm/ 48 in.
Braking unit + cable entry via the top options	808 mm/ 31.8 in.	408 mm/ 16 in.	400 mm/ 15.7 in.	–	1624 mm/ 63.9 in.

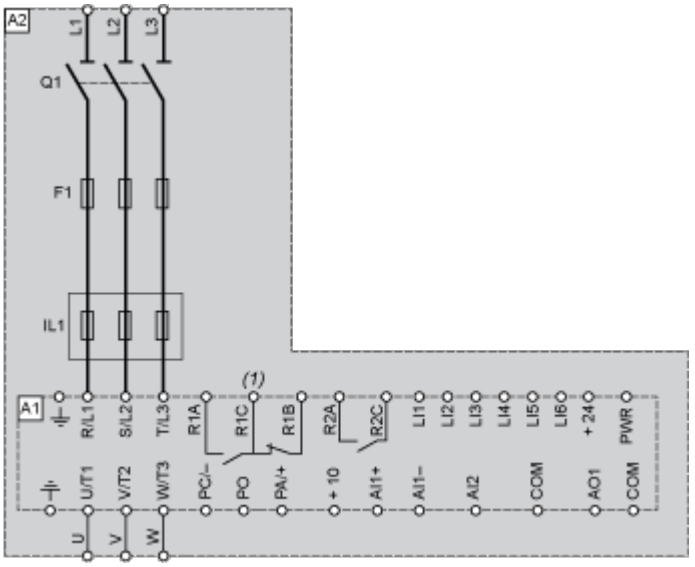
(3) Except sinus filter option, which requires an additional enclosure. The sinus filter option is not compatible with the cable entry via the top option.

(4) The cable entry via the top option is not compatible with the sinus filter option.

Connections and Schema

Floor-Standing Enclosure Compact Version

Wiring Diagram



A1 Drive

A2 Enclosure

F1 Fast-acting semi-conductor fuse

IL1 Line choke

Q1 Switch

(1) Fault relay contacts. For remote signalling of drive status.

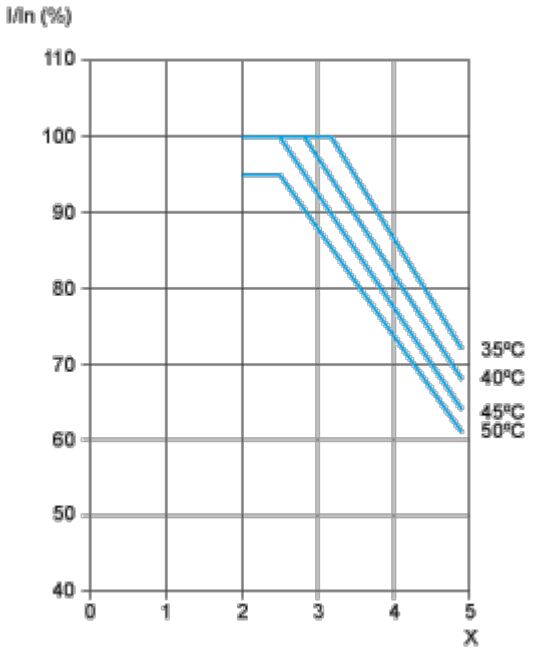
Performance Curves

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.