

Product datasheet

Specifications



variable speed drive ATV310, 4 kW, 5.5 hp, 380...460 V, 3 phase, without filter

ATV310HU40N4E

Main

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|------------------------------|-------------------------|
| Range of product | Easy Altivar 310 |
| Product or component type | Variable speed drive |
| Product specific application | Simple machine |
| Assembly style | With heat sink |
| Device short name | ATV310 |
| Network number of phases | Three phase |
| [Us] rated supply voltage | 380...460 V - 15...10 % |
| Motor power kW | 4 kW |
| Motor power hp | 5.5 hp |
| Noise level | 50 dB |

Complementary

| | |
|-----------------------------|--|
| Product destination | Asynchronous motors |
| Quantity per set | Set of 1 |
| EMC filter | Without EMC filter |
| Type of cooling | Integrated fan |
| Supply frequency | 50/60 Hz +/- 5 % |
| Communication port protocol | Modbus |
| Connector type | RJ45 (on front face) for Modbus |
| Physical interface | 2-wire RS 485 for Modbus |
| Transmission frame | RTU for Modbus |
| Transmission rate | 4800 bit/s 9600 bit/s 19200 bit/s 38400 bit/s |
| Number of addresses | 1...247 for Modbus |
| Communication service | Read holding registers (03) 29 words Write single register (06) 29 words Write multiple registers (16) 27 words Read/write multiple registers (23) 4/4 words Read device identification (43) |
| Line current | 11.4 A |
| Apparent power | 9.1 kVA |

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| Prospective line I_{sc} | 5 kA |
| Continuous output current | 9.5 A at 4 kHz |
| Maximum transient current | 14.3 A for 60 s |
| Power dissipation in W | 102.72 W at I _n |
| Speed drive output frequency | 0.5...400 Hz |
| Nominal switching frequency | 4 kHz |
| Switching frequency | 2...12 kHz adjustable |
| Speed range | 1...20 |
| Transient overtorque | 170...200 % of nominal motor torque depending on drive rating and type of motor |
| Braking torque | Up to 150 % of nominal motor torque with braking resistor at high inertia Up to 70 % of nominal motor torque without braking resistor |
| Asynchronous motor control profile | Quadratic voltage/frequency ratio Energy saving ratio Sensorless flux vector control |
| Motor slip compensation | Adjustable Adjustable |
| Output voltage | 380...460 V three phase |
| Electrical connection | Terminal, clamping capacity: 2.5...4 mm ² (L1, L2, L3, PA+, PB, U, V, W) |
| Tightening torque | 1.2...1.4 N.m |
| Insulation | Electrical between power and control |
| Supply | Internal supply for reference potentiometer: 5 V (4.75...5.25 V)DC, <10 mA with overload and short-circuit protection Internal supply for logic inputs: 24 V (20.4...28.8 V)DC, <100 mA with overload and short-circuit protection |
| Analogue input number | 1 |
| Analogue input type | Configurable current AI1 0...20 mA 250 Ohm Configurable voltage AI1 0...10 V 30 kOhm Configurable voltage AI1 0...5 V 30 kOhm |
| Discrete input number | 4 |
| Discrete input type | Programmable LI1...LI4 24 V 18...30 V |
| Discrete input logic | Negative logic (sink), > 16 V (state 0), < 10 V (state 1), input impedance 3.5 kOhm Positive logic (source), 0...< 5 V (state 0), > 11 V (state 1) |
| Sampling duration | 10 ms for analogue input 20 ms, tolerance +/- 1 ms for logic input |
| Linearity error | +/- 0.3 % of maximum value for analogue input |
| Analogue output number | 1 |
| Analogue output type | AO1 software-configurable voltage: 0...10 V, impedance: 470 Ohm, resolution 8 bits AO1 software-configurable current: 0...20 mA, impedance: 800 Ohm, resolution 8 bits |
| Discrete output number | 2 |
| Discrete output type | Logic output LO+, LO- Protected relay output R1A, R1B, R1C 1 C/O |
| Minimum switching current | 5 mA at 24 V DC for logic relay |
| Maximum switching current | 2 A at 250 V AC on inductive load cos phi = 0.4 L/R = 7 ms for logic relay 2 A at 30 V DC on inductive load cos phi = 0.4 L/R = 7 ms for logic relay 3 A at 250 V AC on resistive load cos phi = 1 L/R = 0 ms for logic relay 4 A at 30 V DC on resistive load cos phi = 1 L/R = 0 ms for logic relay |
| Acceleration and deceleration ramps | Linear from 0...999.9 s S Linear from 0...999.9 s |
| Braking to standstill | By DC injection, <30 s |
| Protection type | Line supply overvoltage Line supply undervoltage Overcurrent between output phases and earth Overheating protection Short-circuit between motor phases Against input phase loss in three-phase |

Thermal motor protection via the drive by continuous calculation of I²t

| | |
|-----------------------------|--|
| Frequency resolution | Analog input: converter A/D, 10 bits Display unit: 0.1 Hz |
| Time constant | 20 ms +/- 1 ms for reference change |
| Operating position | Vertical +/- 10 degree |
| Height | 184 mm |
| Width | 140 mm |
| Depth | 151 mm |
| Net weight | 1.8 kg |

Environment

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| Electromagnetic compatibility | Electrical fast transient/burst immunity test - test level: level 4 conforming to EN/IEC 61000-4-4 Electrostatic discharge immunity test - test level: level 3 conforming to EN/IEC 61000-4-2 Immunity to conducted disturbances - test level: level 3 conforming to EN/IEC 61000-4-6 Radiated radio-frequency electromagnetic field immunity test - test level: level 3 conforming to EN/IEC 61000-4-3 Voltage dips and interruptions immunity test conforming to EN/IEC 61000-4-11 Surge immunity test - test level: level 3 conforming to EN/IEC 61000-4-5 |
| Standards | EN/IEC 61800-5-1 EN/IEC 61800-3 |
| IP degree of protection | IP20 without blanking plate on upper part IP40 top |
| Pollution degree | 2 conforming to EN/IEC 61800-5-1 |
| Environmental characteristic | Dust pollution resistance class 3S2 conforming to EN/IEC 60721-3-3 Chemical pollution resistance class 3C3 conforming to EN/IEC 60721-3-3 |
| Shock resistance | 15 gn conforming to EN/IEC 60068-2-27 for 11 ms |
| Relative humidity | 5...95 % without condensation conforming to IEC 60068-2-3 5...95 % without dripping water conforming to IEC 60068-2-3 |
| Ambient air temperature for storage | -25...70 °C |
| Ambient air temperature for operation | -10...55 °C without derating 55...60 °C protective cover from the top of the drive removed with current derating 2.2 % per °C |
| Operating altitude | <= 1000 m without derating |

Packing Units

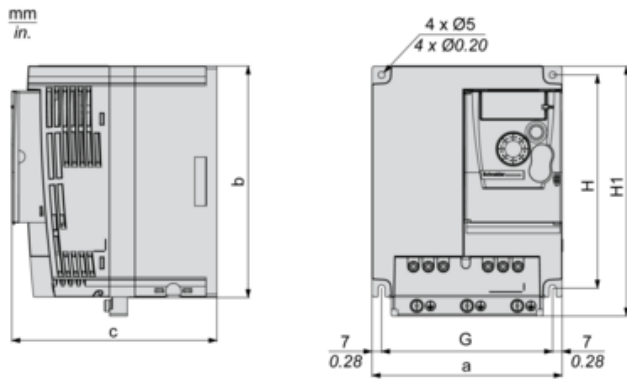
| | |
|-------------------------------------|----------|
| Unit Type of Package 1 | PCE |
| Number of Units in Package 1 | 1 |
| Package 1 Weight | 2.16 kg |
| Package 1 Height | 18.8 cm |
| Package 1 Width | 18.29 cm |
| Package 1 Length | 23.11 cm |
| Unit Type of Package 2 | S03 |
| Number of Units in Package 2 | 2 |
| Package 2 Weight | 4.981 kg |
| Package 2 Height | 30 cm |
| Package 2 Width | 30 cm |
| Package 2 Length | 40 cm |

Offer Sustainability

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|---------------------------------|-----------------------------------|
| Sustainable offer status | Green Premium product |
| REACH Regulation | REACH Declaration |

| | |
|-----------------------------------|---|
| EU RoHS Directive | Compliant EU RoHS Declaration |
| Mercury free | Yes |
| RoHS exemption information | Yes |
| China RoHS Regulation | China RoHS declaration |
| Environmental Disclosure | Product Environmental Profile |
| Circularity Profile | End of Life Information |
| WEEE | The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins |

Dimensions



Dimensions in mm

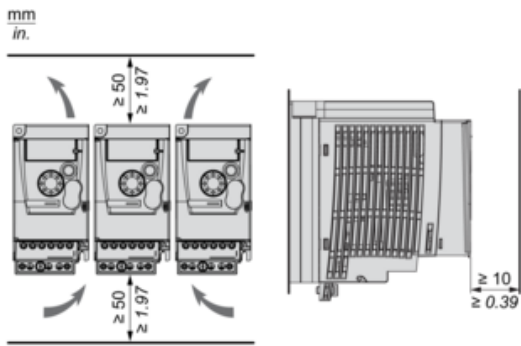
| a | b | c | G | H | H1 | Ø | For screws |
|-----|-----|-----|-----|-----|-----|---|------------|
| 140 | 171 | 151 | 126 | 157 | 184 | 5 | M4 |

Dimensions in in.

| a | b | c | G | H | H1 | Ø | For screws |
|------|------|------|------|------|------|------|------------|
| 5.51 | 6.73 | 5.94 | 4.96 | 6.18 | 7.24 | 0.20 | M4 |

Mounting Recommendations

Clearance

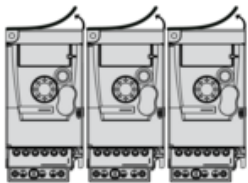


Mounting Types

Mounting Type A

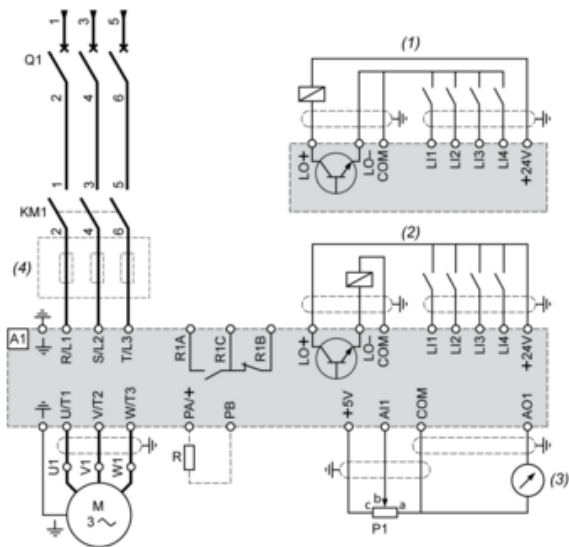


Mounting Type B



Remove the protective cover from the top of the drive.

Three-Phase Power Supply Wiring Diagram



A1 : Drive

KM1 : Contactor (only if a control circuit is needed)

P1 : 2.2 kΩ reference potentiometer. This can be replaced by a 10 kΩ potentiometer (maximum).

Q1 : Circuit breaker

R : Braking resistor (optional)

(1) Negative logic (Sink)

(2) Positive logic (Source) (factory set configuration)

(3) 0...10 V or 0...20 mA

(4) Line choke three-phase (optional)