



Main

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| Range of product | Easy Altivar 610 |
| Product or component type | Variable speed drive |
| Product specific application | Fan, pump, compressor, conveyor |
| Device short name | ATV610 |
| Variant | Standard version |
| Product destination | Asynchronous motors |
| Mounting mode | Cabinet mount |
| EMC filter | Integrated conforming to EN/IEC 61800-3 category C3 with 50 m |
| IP degree of protection | IP20 |
| Type of cooling | Forced convection |
| Supply frequency | 50...60 Hz +/-5 % |
| Network number of phases | 3 phases |
| [Us] rated supply voltage | 380...415 V - 15...10 % |
| Motor power kW | 4 kW for normal duty 3 kW for heavy duty |
| Motor power hp | 5 hp for normal duty |
| Line current | 8.8 A at 380 V (normal duty) 8.5 A at 415 V (normal duty) 7.2 A at 380 V (heavy duty) 6.7 A at 415 V (heavy duty) |
| Prospective line Isc | 5 kA |
| Apparent power | 6.1 kVA at 415 V (normal duty) 4.8 kVA at 415 V (heavy duty) |
| Continuous output current | 9.3 A at 4 kHz for normal duty 7.2 A at 4 kHz for heavy duty |
| Maximum transient current | 10.2 A during 60 s (normal duty) 10.8 A during 60 s (heavy duty) |
| Asynchronous motor control profile | Optimized torque mode Variable torque standard Constant torque standard |

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

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| Output frequency | 0.0001...0.5 kHz |
| Nominal switching frequency | 4 kHz |
| Switching frequency | 2...12 kHz adjustable |
| Number of preset speeds | 16 preset speeds |
| Communication port protocol | Modbus serial |
| Option card | Slot A: communication card, Profibus DP V1 Slot A: digital or analog I/O extension card Slot A: relay output card |

Complementary

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| Output voltage | <= power supply voltage |
| Motor slip compensation | Adjustable Automatic whatever the load Can be suppressed Not available in permanent magnet motor law |
| Acceleration and deceleration ramps | S, U or customized Linear adjustable separately from 0.01 to 9000 s |
| Braking to standstill | By DC injection |
| Protection type | Thermal protection: motor Motor phase break: motor Thermal protection: drive Overheating: drive Overcurrent between output phases and earth: drive Overload of output voltage: drive Short-circuit protection: drive Motor phase break: drive Overvoltages on the DC bus: drive Line supply overvoltage: drive Line supply undervoltage: drive Line supply phase loss: drive Overspeed: drive Break on the control circuit: drive |
| Frequency resolution | Display unit: 0.1 Hz Analog input: 0.012/50 Hz |
| Electrical connection | Control, screw terminal: 0.5...1.5 mm ² Line side, screw terminal: 2.5...16 mm ² Motor, screw terminal: 2.5...16 mm ² |
| Connector type | 1 RJ45 (on the remote graphic terminal) for Modbus serial |
| Physical interface | 2-wire RS 485 for Modbus serial |
| Transmission frame | RTU for Modbus serial |
| Transmission rate | 4.8, 9.6, 19.2, 38.4 kbit/s for Modbus serial |
| Type of polarization | No impedance for Modbus serial |
| Number of addresses | 1...247 for Modbus serial |
| Method of access | Slave |
| Supply | External supply for digital inputs: 24 V DC (19...30 V), <1.25 mA, protection type: overload and short-circuit protection Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 mA, protection type: overload and short-circuit protection |
| Local signalling | 2 LEDslocal diagnostic: 1 LED (yellow)embedded communication status: 2 LEDs (dual colour)communication module status: 1 LED (red)presence of voltage: |
| Width | 145 mm |
| Height | 297 mm 350 mm with EMC plate |
| Depth | 203 mm |
| Product weight | 4 kg |
| Analogue input number | 3 |
| Analogue input type | AI1, AI2, AI3 software-configurable voltage: 0...10 V DC, impedance: 30 kOhm, resolution 12 bits AI1, AI2, AI3 software-configurable current: 0...20 mA, impedance: 250 Ohm, resolution 12 bits AI2, AI3 software-configurable temperature probe or water level sensor |
| Discrete input number | 6 |

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| Discrete input type | DI1...DI6 programmable as logic input, 24 V DC (<= 30 V), impedance: 3.5 kOhm DI5, DI6 programmable as pulse input: 0...30 kHz, 24 V DC (<= 30 V) |
| Input compatibility | DI1...DI6: logic input level 1 PLC conforming to EN/IEC 61131-2 DI5, DI6: pulse input level 1 PLC conforming to IEC 65A-68 |
| Discrete input logic | Positive logic (source): DI1...DI6 configurable logic input, < 5 V (state 0), > 11 V (state 1) Negative logic (sink): DI1...DI6 configurable logic input, > 16 V (state 0), < 10 V (state 1) Positive logic (source): DI5, DI6 configurable pulse input, < 0.6 V (state 0), > 2.5 V (state 1) |
| Analogue output number | 2 |
| Analogue output type | Software-configurable current AQ1, AQ2: 0...20 mA, resolution 10 bits Software-configurable voltage AQ1, AQ2: 0...10 V DC impedance 470 Ohm, resolution 10 bits |
| Sampling duration | 5 ms +/- 0.1 ms (AI1, AI2, AI3) - analog input 2 ms +/- 0.5 ms (DI1...DI6)configurable - discrete input 5 ms +/- 1 ms (DI5, DI6)configurable - pulse input 10 ms +/- 1 ms (AQ1, AQ2) - analog output |
| Accuracy | +/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input +/- 1 % AQ1, AQ2 for a temperature variation 60 °C analog output |
| Linearity error | AI1, AI2, AI3: +/- 0.15 % of maximum value for analog input AQ1, AQ2: +/- 0.2 % for analog output |
| Relay output number | 3 |
| Relay output type | Configurable relay logic R1: fault relay NO/NC electrical durability 100000 cycles Configurable relay logic R2: sequence relay NO electrical durability 100000 cycles Configurable relay logic R3: sequence relay NO electrical durability 100000 cycles |
| Refresh time | Relay output (R1, R2, R3): 5 ms (+/- 0.5 ms) |
| Minimum switching current | Relay output R1, R2, R3: 5 mA at 24 V DC |
| Maximum switching current | Relay output R1, R2, R3 on resistive load, cos phi = 1: 3 A at 250 V AC Relay output R1, R2, R3 on resistive load, cos phi = 1: 3 A at 30 V DC Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 250 V AC Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 30 V DC |
| Isolation | Between power and control terminals |
| Insulation resistance | > 1 MOhm 500 V DC for 1 minute to earth |

Environment

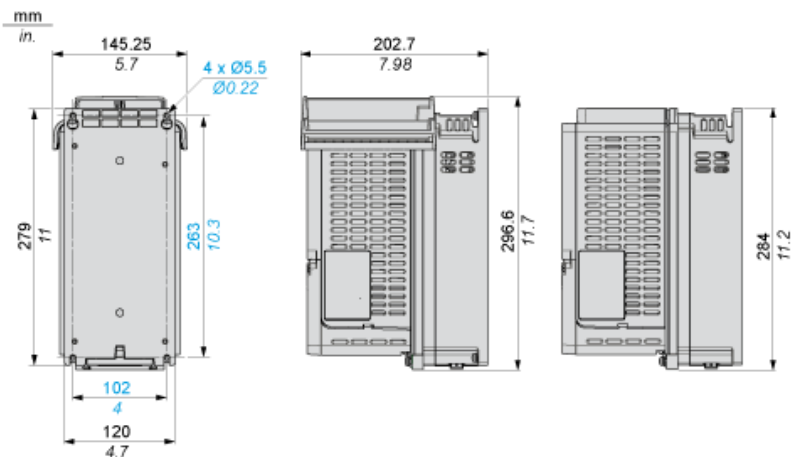
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| Noise level | 55 dB conforming to 86/188/EEC |
| Power dissipation in W | 128 W(forced convection) at 380 V, switching frequency 4 kHz 32 W(natural convection) at 380 V, switching frequency 4 kHz |
| Operating position | Vertical +/- 10 degree |
| 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 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 |
| Pollution degree | 2 conforming to EN/IEC 61800-5-1 |
| Vibration resistance | 1.5 mm peak to peak (f= 2...13 Hz) conforming to IEC 60068-2-6 1 gn (f= 13...200 Hz) conforming to IEC 60068-2-6 |
| Shock resistance | 15 gn for 11 ms conforming to IEC 60068-2-27 |
| Relative humidity | 5...95 % without condensation conforming to IEC 60068-2-3 |
| Ambient air temperature for operation | -15...45 °C (without) 45...60 °C (with derating factor) |
| Operating altitude | <= 1000 m without 1000...4800 m with current derating 1 % per 100 m |
| Environmental characteristic | Chemical pollution resistance class 3C3 conforming to EN/IEC 60721-3-3 Dust pollution resistance class 3S3 conforming to EN/IEC 60721-3-3 |
| Standards | EN/IEC 61800-3 Environment 2 category C3 EN/IEC 61800-3 EN/IEC 61800-5-1 IEC 60721-3 |
| Product certifications | REACH |
| Marking | CE |

Offer Sustainability

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|----------------------------|---|
| Sustainable offer status | Green Premium product |
| REACH Regulation | REACH Declaration |
| EU RoHS Directive | Pro-active compliance (Product out of EU RoHS legal scope) 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 |

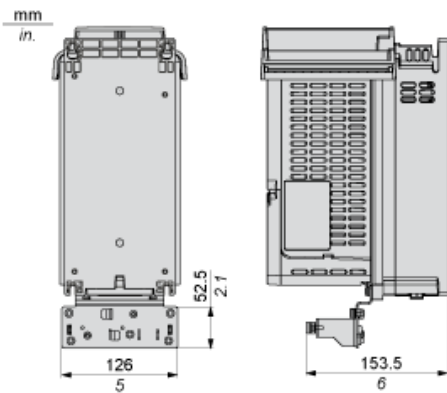
Dimensions

IP20 Drives



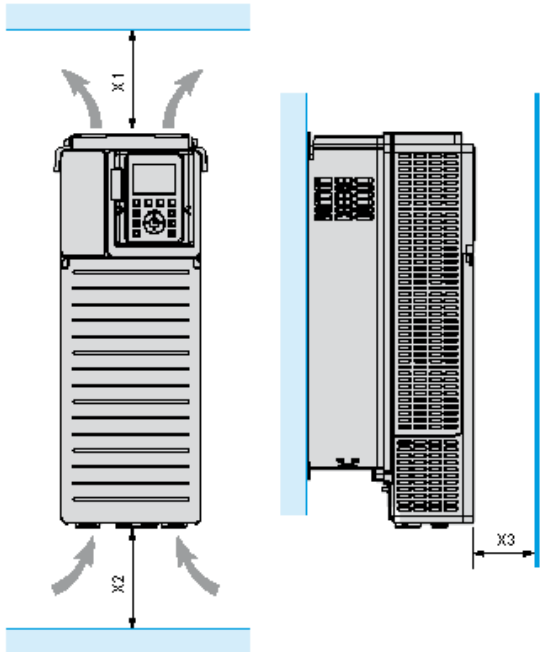
Drawings from left to right: rear view, right side view with top cover, right side view without top cover.

IP20 Drives With EMC Plate



Drawings from left to right: rear view, right side view with top cover.

Clearances

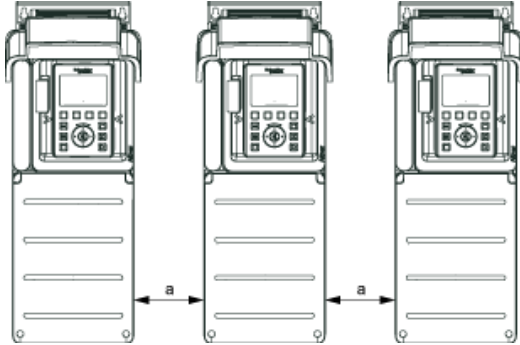


| X1 | X2 | X3 |
|---------------------|---------------------|--------------------|
| ≥ 100 mm (3.94 in.) | ≥ 100 mm (3.94 in.) | ≥ 10 mm (0.39 in.) |

- Mount the device in a vertical position ($\pm 10^\circ$). This is required for cooling the device.
- Do not mount the device close to heat sources.
- Leave sufficient free space so that the air required for cooling purposes can circulate from the bottom to the top of the drive.

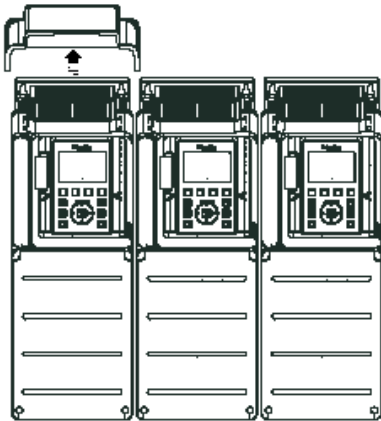
Mounting Types

Mounting Type A: Individual IP21

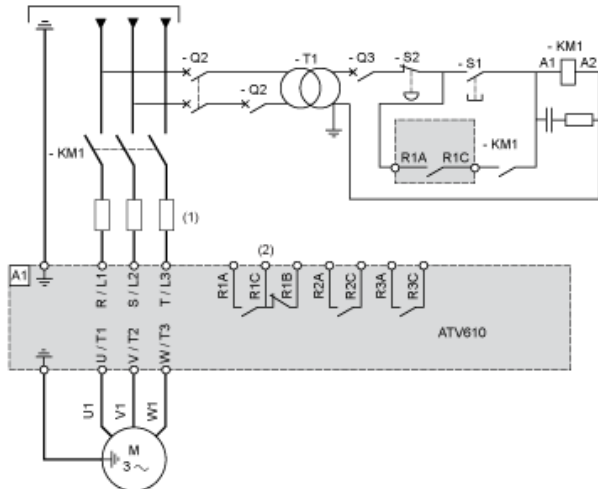


$a \geq 100 \text{ mm (3.94 in.)}$

Mounting Type B: Side by Side IP20

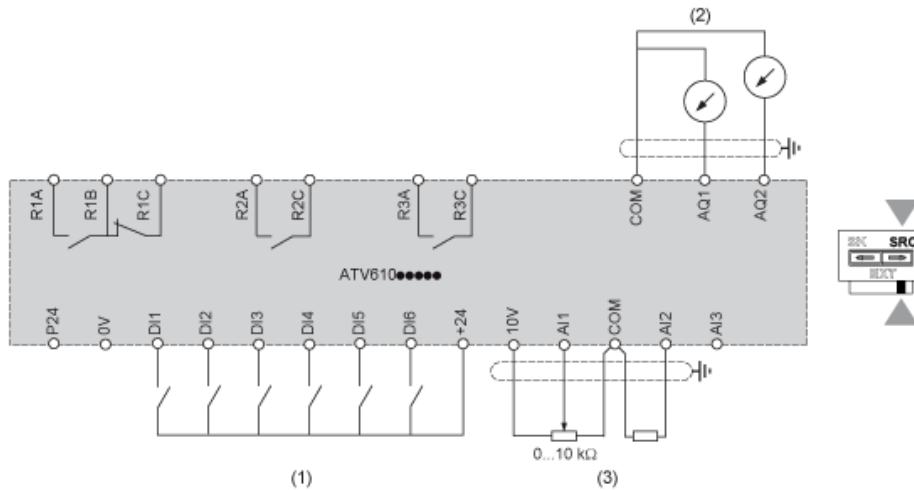


Single or Three-phase Power Supply - Diagram With Line Contactor



- (1) Line chokes
- (2) See control block wiring diagram
- A1 : Drive
- KM1 : Line Contactor
- Q2, Q3 : Circuit breakers
- S1, S2 : Pushbuttons
- T1 : Transformer for control part

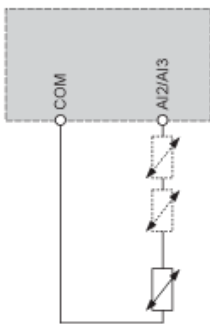
Control Block Wiring Diagram



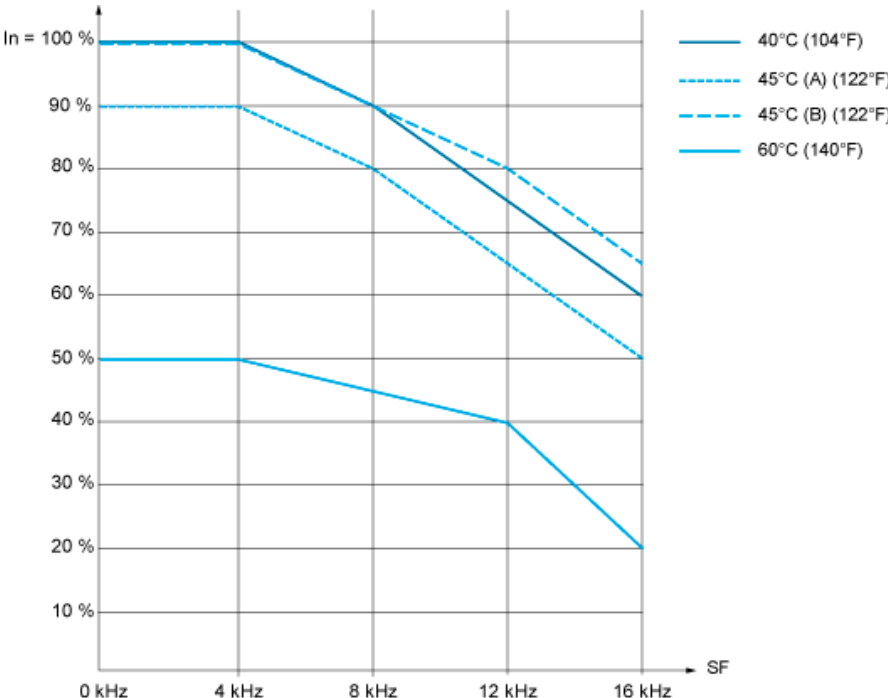
- (1) Digital Input
- (2) Analog Output
- (3) Analog Input
- R1A, R1B, R1C Relay output
- R2A, R2C Sequence relay output
- R3A, R3C Sequence relay output

Sensor Connection

It is possible to connect either 1 or 3 sensors on terminals AI2 or AI3.



Derating Curves



In : Nominal Drive Current
SF : Switching Frequency