

# เอกสารข้อมูลผลิตภัณฑ์

ข้อมูลจำเพาะ



variable speed drive, Easy Altivar 310, 15kW, 20hp, 380 to 460V, 3 phase, without filter

ATV310HD15N4E

## Main

|                              |   |
|------------------------------|---|
| 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               | 15 kW for heavy duty<br>18.5 kW for normal duty |
| Motor power hp               | 20 hp for heavy duty<br>25 hp for normal duty   |
| Noise level                  | 50 dB   |

## Complementary

|                             |  |
|-----------------------------|--|
| Quantity per set            | Set of 1   |
| EMC filter                  | Without EMC filter   |
| Type of cooling             | Integrated fan   |
| 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<br>9600 bit/s<br>19200 bit/s<br>38400 bit/s   |
| Number of addresses         | 1...247 for Modbus   |
| Communication service       | Read holding registers (03) 29 words<br>Write single register (06) 29 words<br>Write multiple registers (16) 27 words<br>Read/write multiple registers (23) 4/4 words<br>Read device identification (43) |
| Line current                | 46.5 A at 380 V (heavy duty)<br>46.6 A at 380 V (normal duty)<br>38.5 A at 460 V (heavy duty)<br>38.8 A at 460 V (normal duty)   |
| Apparent power              | 30.7 kVA at 460 V (heavy duty)<br>31.2 kVA at 460 V (normal duty)  |

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| <b>Prospective line I<sub>sc</sub></b> | 22 kA ( heavy duty )<br>5 kA ( normal duty )   |
| <b>Continuous output current</b>       | 33 A heavy duty<br>36 A normal duty  |
| <b>Maximum transient current</b>       | 49.5 A during 60 s (heavy duty)<br>39.6 A during 60 s (normal duty)  |
| <b>Power dissipation in W</b>          | 416.0 W, at I <sub>n</sub> (heavy duty)<br>451.7 W, at I <sub>n</sub> (normal duty)  |
| <b>Speed drive output frequency</b>    | 0.5...400 Hz   |
| <b>Nominal switching frequency</b>     | 4 kHz  |
| <b>Switching frequency</b>             | 2...12 kHz adjustable  |
| <b>Speed range</b>                     | 1...20 for asynchronous motor  |
| <b>Transient overtorque</b>            | 170...200 % of nominal motor torque depending on drive rating and type of motor  |
| <b>Braking torque</b>                  | Up to 150 % of nominal motor torque with braking resistor<br>Up to 70 % of nominal motor torque without braking resistor   |
| <b>Motor control profile</b>           | Voltage/frequency ratio (V/f)<br>Voltage/frequency ratio - Energy Saving, quadratic U/f<br>Sensorless vector control (SVC)   |
| <b>Motor slip compensation</b>         | Adjustable   |
| <b>Output voltage</b>                  | 380...460 V three phase  |
| <b>Electrical connection</b>           | Terminal, clamping capacity: 16...25 mm <sup>2</sup> , AWG 4...AWG 3 (L1, L2, L3, PA+, PB, U, V, W)  |
| <b>Tightening torque</b>               | 2.2...2.4 N.m  |
| <b>Insulation</b>                      | Electrical between power and control   |
| <b>Supply</b>                          | Internal supply for reference potentiometer: 5 V (4.75...5.25 V)DC, <10 mA with overload and short-circuit protection<br>Internal supply for logic inputs: 24 V (20.4...28.8 V)DC, <100 mA with overload and short-circuit protection  |
| <b>Analogue input number</b>           | 1  |
| <b>Analogue input type</b>             | Configurable current AI1 0...20 mA 250 Ohm<br>Configurable voltage AI1 0...10 V 30 kOhm<br>Configurable voltage AI1 0...5 V 30 kOhm  |
| <b>Discrete input number</b>           | 4  |
| <b>Discrete input type</b>             | Programmable LI1...LI4 24 V 18...30 V  |
| <b>Discrete input logic</b>            | Negative logic (sink), > 16 V (state 0), < 10 V (state 1), input impedance 3.5 kOhm<br>Positive logic (source), 0...< 5 V (state 0), > 11 V (state 1)  |
| <b>Sampling duration</b>               | 10 ms for analogue input<br>20 ms, tolerance +/- 1 ms for logic input  |
| <b>Linearity error</b>                 | +/- 0.3 % of maximum value for analogue input  |
| <b>Analogue output number</b>          | 1  |
| <b>Analogue output type</b>            | AO1 software-configurable voltage: 0...10 V AC 0...10 V 0...0.02 A, impedance: 470 Ohm, resolution 8 bits<br>AO1 software-configurable current: 0...20 mA, impedance: 800 Ohm, resolution 8 bits   |
| <b>Discrete output number</b>          | 2  |
| <b>Discrete output type</b>            | Logic output LO+, LO-<br>Protected relay output R1A, R1B, R1C 1 C/O  |
| <b>Minimum switching current</b>       | 5 mA at 24 V DC for logic relay  |
| <b>Maximum switching current</b>       | 2 A at 250 V AC on inductive load cos phi = 0.4 L/R = 7 ms for logic relay<br>2 A at 30 V DC on inductive load cos phi = 0.4 L/R = 7 ms for logic relay<br>3 A at 250 V AC on resistive load cos phi = 1 L/R = 0 ms for logic relay<br>4 A at 30 V DC on resistive load cos phi = 1 L/R = 0 ms for logic relay |

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|--|---|
| <b>Acceleration and deceleration ramps</b> | Linear from 0...999.9 s<br>S<br>U   |
| <b>Braking to standstill</b>               | By DC injection, <30 s  |
| <b>Protection type</b>                     | Line supply overvoltage<br>Line supply undervoltage<br>Overcurrent between output phases and earth<br>Overheating protection<br>Short-circuit between motor phases<br>Against input phase loss in three-phase<br>Thermal motor protection via the drive by continuous calculation of I <sup>2</sup> t |
| <b>Frequency resolution</b>                | Analog input: converter A/D, 10 bits<br>Display unit: 0.1 Hz  |
| <b>Time constant</b>                       | 20 ms +/- 1 ms for reference change   |
| <b>Operating position</b>                  | Vertical +/- 10 degree  |
| <b>Height</b>                              | 330 mm  |
| <b>Width</b>                               | 180 mm  |
| <b>Depth</b>                               | 191 mm  |
| <b>Product weight</b>                      | 6.3 kg  |
| <b>Supply frequency</b>                    | 50/60 Hz +/- 5 %  |
| <b>Product destination</b>                 | Asynchronous motors   |

## Environment

|  |  |
|--|--|
| <b>Electromagnetic compatibility</b>         | Electrical fast transient/burst immunity test - test level: level 4 conforming to IEC 61000-4-4<br>Electrostatic discharge immunity test - test level: level 3 conforming to IEC 61000-4-2<br>Immunity to conducted disturbances - test level: level 3 conforming to IEC 61000-4-6<br>Radiated radio-frequency electromagnetic field immunity test - test level: level 3 conforming to IEC 61000-4-3<br>Voltage dips and interruptions immunity test conforming to IEC 61000-4-11<br>Surge immunity test - test level: level 3 conforming to IEC 61000-4-5 |
| <b>Standards</b>                             | IEC 61800-5-1  |
| <b>Product certifications</b>                | CE<br>EAC<br>KC  |
| <b>IP degree of protection</b>               | IP20 without blanking plate on upper part<br>IP4X top  |
| <b>Pollution degree</b>                      | 2 conforming to IEC 61800-5-1  |
| <b>Environmental characteristic</b>          | Dust pollution resistance class 3S2 conforming to IEC 60721-3-3<br>Chemical pollution resistance class 3C3 conforming to IEC 60721-3-3   |
| <b>Shock resistance</b>                      | 15 gn conforming to IEC 60068-2-27 for 11 ms   |
| <b>Relative humidity</b>                     | 5...95 % without condensation conforming to IEC 60068-2-3<br>5...95 % without dripping water conforming to IEC 60068-2-3   |
| <b>Ambient air temperature for storage</b>   | -25...70 °C  |
| <b>Ambient air temperature for operation</b> | -10...55 °C without derating<br>55...60 °C protective cover from the top of the drive removed with current derating 2.2 % per °C   |
| <b>Operating altitude</b>                    | <= 1000 m without derating   |

## Packing Units

|                                     |     |
|-------------------------------------|-----|
| <b>Unit Type of Package 1</b>       | PCE |
| <b>Number of Units in Package 1</b> | 1   |

|                                     |          |
|-------------------------------------|----------|
| <b>Package 1 Height</b>             | 19.1 cm  |
| <b>Package 1 Width</b>              | 18.0 cm  |
| <b>Package 1 Length</b>             | 33.0 cm  |
| <b>Package 1 Weight</b>             | 7.6 kg   |
| <b>Unit Type of Package 2</b>       | P06      |
| <b>Number of Units in Package 2</b> | 6        |
| <b>Package 2 Height</b>             | 105.0 cm |
| <b>Package 2 Width</b>              | 60.0 cm  |
| <b>Package 2 Length</b>             | 80.0 cm  |
| <b>Package 2 Weight</b>             | 61.6 kg  |

## ความยั่งยืน

ฉลาก **Green Premium™** เป็นความมุ่งมั่นของ Schneider Electric ในการส่งมอบผลิตภัณฑ์ที่มีประสิทธิภาพด้านสิ่งแวดล้อมที่ดีที่สุด Green Premium ให้คำมั่นว่าจะปฏิบัติตามกฎระเบียบล่าสุด ความโปร่งใสต่อผลกระทบด้านสิ่งแวดล้อม รวมถึงผลิตภัณฑ์หมุนเวียนและ CO<sub>2</sub> ต่ำ

คู่มือการประเมินความยั่งยืนของผลิตภัณฑ์เป็นเอกสารวิจัยที่ช่วยชี้แจงมาตรฐานฉลากสิ่งแวดล้อมทั่วโลกและวิธีการตีความการประเมิน

[เรียนรู้เพิ่มเติมเกี่ยวกับ Green Premium >](#)

[แนวทางในการประเมินความยั่งยืนของผลิตภัณฑ์ >](#)



ความโปร่งใส RoHS/REACH

## ประสิทธิภาพด้านสุขภาพ

Mercury Free

Rohs Exemption Information [Yes](#)

## ใบรับรองและมาตรฐาน

Reach Regulation [REACH Declaration](#)

Eu Rohs Directive [Compliant with Exemptions](#)

China Rohs Regulation [China RoHS declaration](#)

Environmental Disclosure [Product Environmental Profile](#)

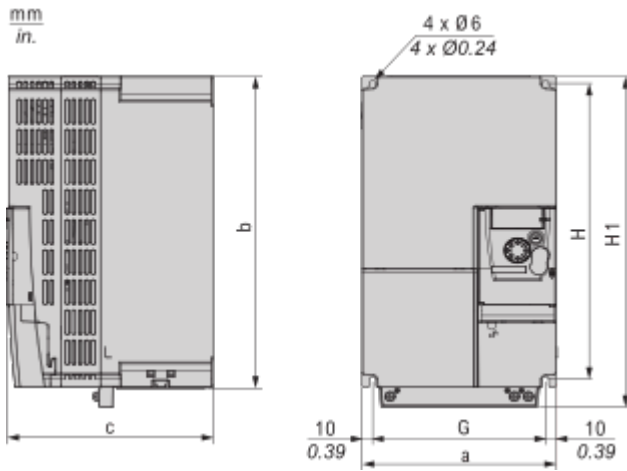
Weee [The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins](#)

Circularity Profile [End of Life Information](#)

Dimensions Drawings

Dimensions

Side and Front Sides



Dimensions in mm

| a   | b   | c   | G   | H   | H1  | Ø | For screws |
|-----|-----|-----|-----|-----|-----|---|------------|
| 180 | 331 | 191 | 160 | 295 | 330 | 6 | M5         |

Dimensions in in.

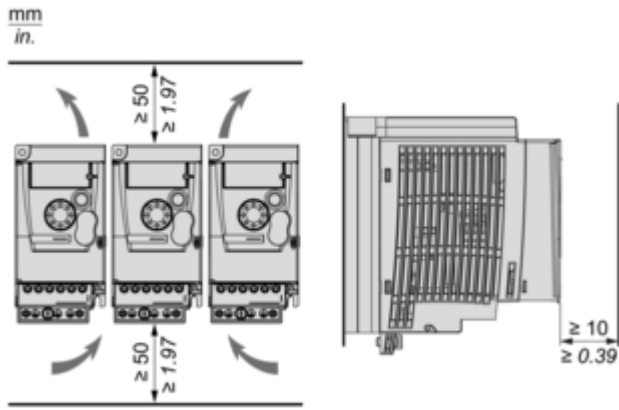
| a    | b     | c    | G    | H     | H1    | Ø    | For screws |
|------|-------|------|------|-------|-------|------|------------|
| 7.09 | 12.24 | 7.52 | 6.29 | 11.61 | 12.99 | 0.23 | M5         |

Mounting and Clearance

Mounting Recommendations

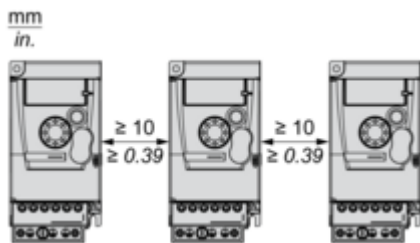
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Clearance

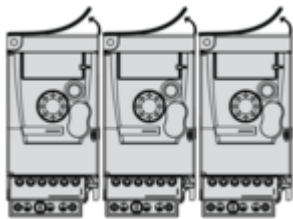


Mounting Types

Mounting Type A



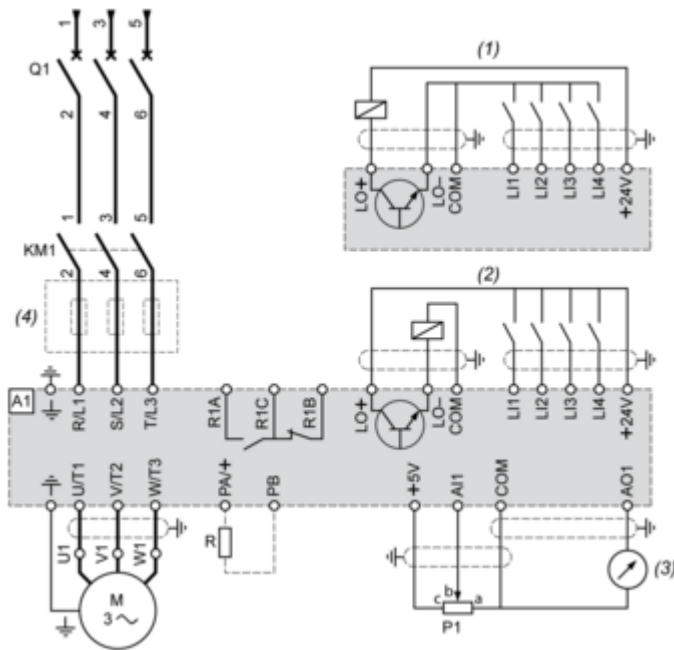
Mounting Type B



Remove the protective cover from the top of the drive.

Connections and Schema

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)