

# ATV12HU30M3

variable speed drive ATV12 - 3kW - 200..240V  
- 3ph - with heat sink



## Main

|                                    |                                                                                                      |
|------------------------------------|------------------------------------------------------------------------------------------------------|
| Range of product                   | Altivar 12                                                                                           |
| Product or component type          | Variable speed drive                                                                                 |
| Product destination                | Asynchronous motors                                                                                  |
| Product specific application       | Simple machine                                                                                       |
| Assembly style                     | With heat sink                                                                                       |
| Component name                     | ATV12                                                                                                |
| Quantity per set                   | Set of 1                                                                                             |
| EMC filter                         | Without EMC filter                                                                                   |
| Built-in fan                       | With                                                                                                 |
| Network number of phases           | Three phase                                                                                          |
| [Us] rated supply voltage          | 200...240 V (- 15...10 %)                                                                            |
| Motor power kW                     | 3 kW                                                                                                 |
| Communication port protocol        | Modbus                                                                                               |
| Line current                       | 15.9 A at 240 V<br>19 A at 200 V                                                                     |
| Speed range                        | 1...20                                                                                               |
| Transient overtorque               | 150...170 % of nominal motor torque depending on drive rating and type of motor                      |
| Asynchronous motor control profile | Quadratic voltage/frequency ratio<br>Sensorless flux vector control<br>Voltage/Frequency ratio (V/f) |
| IP degree of protection            | IP20 without blanking plate on upper part                                                            |
| Noise level                        | 50 dB                                                                                                |

## Complementary

|                              |                                                                                                                                                                                                                                                                                          |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply frequency             | 50/60 Hz (+/- 5 %)                                                                                                                                                                                                                                                                       |
| Type of connector            | 1 RJ45 for Modbus on front face                                                                                                                                                                                                                                                          |
| Physical interface           | 2-wire RS 485 for Modbus                                                                                                                                                                                                                                                                 |
| Transmission frame           | RTU for Modbus                                                                                                                                                                                                                                                                           |
| Transmission rate            | 38400 bit/s<br>19200 bit/s<br>9600 bit/s<br>4800 bit/s                                                                                                                                                                                                                                   |
| Number of addresses          | 1...247 for Modbus                                                                                                                                                                                                                                                                       |
| Communication service        | Read device identification (43)<br>Read/Write multiple registers (23), messaging: 4/4 words maximum<br>Write multiple registers (16), messaging: 27 words maximum<br>Write single register (06), messaging: 29 words maximum<br>Read holding registers (03), messaging: 29 words maximum |
| Prospective line Isc         | <= 5 kA                                                                                                                                                                                                                                                                                  |
| Continuous output current    | 12.2 A at 4 kHz                                                                                                                                                                                                                                                                          |
| Maximum transient current    | 18.3 A for 60 s                                                                                                                                                                                                                                                                          |
| Speed drive output frequency | 0.5...400 Hz                                                                                                                                                                                                                                                                             |
| Nominal switching frequency  | 4 kHz                                                                                                                                                                                                                                                                                    |
| Switching frequency          | 4...16 kHz with derating factor<br>2...16 kHz adjustable                                                                                                                                                                                                                                 |
| Braking torque               | Up to 70 % of nominal motor torque without braking resistor<br>Up to 150 % of nominal motor torque with braking resistor at high inertia                                                                                                                                                 |

|                                     |                                                                                                                                                                                                                                                                                                       |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Motor slip compensation             | Adjustable<br>Preset in factory                                                                                                                                                                                                                                                                       |
| Output voltage                      | 200...240 V three phase                                                                                                                                                                                                                                                                               |
| Electrical connection               | L1, L2, L3, U, V, W, PA, PC terminal 5.5 mm <sup>2</sup> (AWG 10)                                                                                                                                                                                                                                     |
| Tightening torque                   | 1.2 N.m                                                                                                                                                                                                                                                                                               |
| Insulation                          | Electrical between power and control                                                                                                                                                                                                                                                                  |
| Supply                              | Internal supply for logic inputs 24 V DC, voltage limits 20.4...28.8 V, 100 mA for overload and short-circuit protection<br>Internal supply for reference potentiometer 5 V DC, voltage limits 4.75...5.25 V, 10 mA for overload and short-circuit protection                                         |
| Analogue input number               | 1                                                                                                                                                                                                                                                                                                     |
| Analogue input type                 | AI1 configurable voltage 0...5 V, impedance 30 kOhm<br>AI1 configurable voltage 0...10 V, impedance 30 kOhm<br>AI1 configurable current 0...20 mA, impedance 250 Ohm                                                                                                                                  |
| Discrete input number               | 4                                                                                                                                                                                                                                                                                                     |
| Discrete input type                 | (LI1...LI4) programmable, 24 V, voltage limits 18...30 V                                                                                                                                                                                                                                              |
| Discrete input logic                | Positive logic (source), 0...< 5 V (state 0), > 11 V (state 1)<br>Negative logic (sink), > 16 V (state 0), < 10 V (state 1), input impedance 3.5 kOhm                                                                                                                                                 |
| Sampling duration                   | < 10 ms for analogue input<br>< 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 current, analogue output range 0...20 mA, output impedance 800 Ohm, analogue output resolution 8 bits<br>(AO1) software-configurable voltage, analogue output range 0...10 V, output impedance 470 Ohm, analogue output resolution 8 bits                                 |
| Discrete output number              | 2                                                                                                                                                                                                                                                                                                     |
| Discrete output type                | (R1A, R1B, R1C) protected relay output 1 C/O<br>(LO+, LO-) logic output                                                                                                                                                                                                                               |
| Minimum switching current           | 5 mA at 24 V DC for logic relay                                                                                                                                                                                                                                                                       |
| Maximum switching current           | 4 A at 30 V DC resistive load cos phi = 1 L/R = 0 ms for logic relay<br>3 A at 250 V AC resistive load cos phi = 1 L/R = 0 ms for logic relay<br>2 A at 30 V DC inductive load cos phi = 0.4 L/R = 7 ms for logic relay<br>2 A at 250 V AC inductive load cos phi = 0.4 L/R = 7 ms for logic relay    |
| Acceleration and deceleration ramps | Linear from 0 to 999.9 s<br>S<br>U                                                                                                                                                                                                                                                                    |
| Braking to standstill               | By DC injection, 0.1...30 s                                                                                                                                                                                                                                                                           |
| Protection type                     | Thermal motor protection via the drive by continuous calculation of I <sup>2</sup> t<br>Against input phase loss in three-phase<br>Short-circuit between motor phases<br>Overheating protection<br>Overcurrent between output phases and earth<br>Line supply undervoltage<br>Line supply overvoltage |
| Frequency resolution                | Display unit 0.1 Hz<br>Analog input converter A/D, 10 bits                                                                                                                                                                                                                                            |
| Time constant                       | 20 ms, tolerance +/- 1 ms for reference change                                                                                                                                                                                                                                                        |
| Marking                             | CE                                                                                                                                                                                                                                                                                                    |
| Operating position                  | Vertical +/- 10 degree                                                                                                                                                                                                                                                                                |
| Height                              | 184 mm                                                                                                                                                                                                                                                                                                |
| Width                               | 140 mm                                                                                                                                                                                                                                                                                                |
| Depth                               | 141.2 mm                                                                                                                                                                                                                                                                                              |
| Product weight                      | 2 kg                                                                                                                                                                                                                                                                                                  |

## Environment

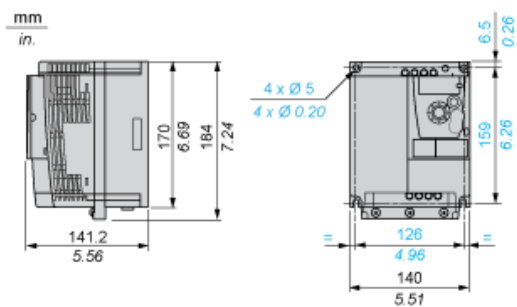
|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electromagnetic compatibility         | Voltage dips and interruptions immunity test conforming to EN/IEC 61000-4-11<br>Surge immunity test (level 3) conforming to EN/IEC 61000-4-5<br>Radiated radio-frequency electromagnetic field immunity test (level 3) conforming to EN/IEC 61000-4-3<br>Immunity to conducted disturbances (level 3) conforming to EN/IEC 61000-4-6<br>Electrostatic discharge immunity test (level 3) conforming to EN/IEC 61000-4-2<br>Electrical fast transient/burst immunity test (level 4) conforming to EN/IEC 61000-4-4 |
| Electromagnetic emission              | Conducted emissions conforming to EN/IEC 61800-3<br>Radiated emissions, class: environment 1 category C2 conforming to EN/IEC 61800-3 - test level: 2...16 kHz shielded motor cable                                                                                                                                                                                                                                                                                                                              |
| Product certifications                | CSA<br>C-Tick<br>GOST<br>NOM<br>UL                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Vibration resistance                  | 1.5 mm peak to peak (f = 3...13 Hz) drive unmounted on symmetrical DIN rail conforming to EN/IEC 60068-2-6<br>1 gn (f = 13...200 Hz) conforming to EN/IEC 60068-2-6                                                                                                                                                                                                                                                                                                                                              |
| Shock resistance                      | 15 gn for 11 ms conforming to EN/IEC 60068-2-27                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Relative humidity                     | 5...95 % without dripping water conforming to IEC 60068-2-3<br>5...95 % without condensation conforming to IEC 60068-2-3                                                                                                                                                                                                                                                                                                                                                                                         |
| Ambient air temperature for storage   | -25...70 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Ambient air temperature for operation | 50...60 °C with current derating 2.2 % per °C<br>-10...50 °C with protective cover from the top of the drive removed                                                                                                                                                                                                                                                                                                                                                                                             |
| Operating altitude                    | > 1000...3000 m with current derating 1 % per 100 m<br><= 1000 m without derating                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Offer Sustainability

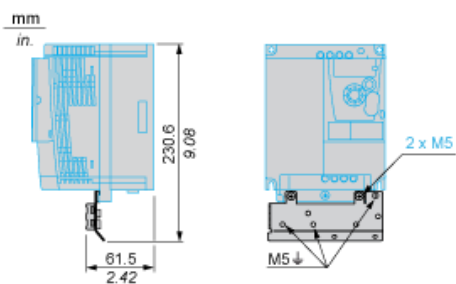
|                          |                                                                                       |
|--------------------------|---------------------------------------------------------------------------------------|
| Sustainable offer status | Not Green Premium product                                                             |
| RoHS (date code: YYWW)   | Compliant - since 0901 - <a href="#">Schneider Electric declaration of conformity</a> |

## Dimensions

### Drive without EMC Conformity Kit

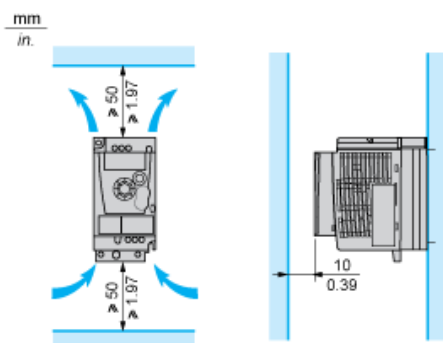


### Drive with EMC Conformity Kit

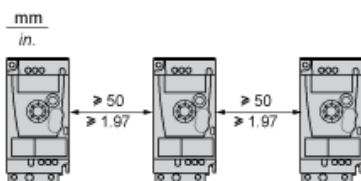


## Mounting Recommendations

### Clearance for Vertical Mounting



### Mounting Type A

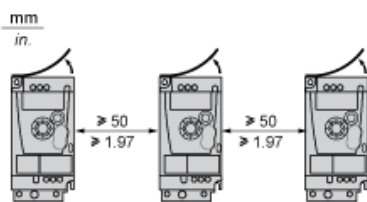


### Mounting Type B



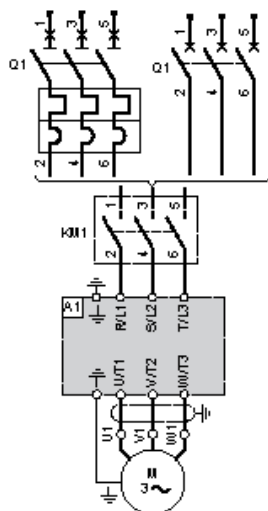
Remove the protective cover from the top of the drive.

### Mounting Type C



Remove the protective cover from the top of the drive.

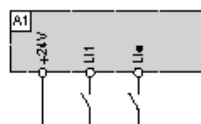
### Three-Phase Power Supply Wiring Diagram



- A1 Drive  
KM1 Contactor (only if a control circuit is needed)  
Q1 Circuit breaker

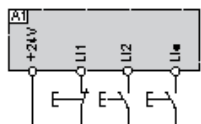
### Recommended Schemes

#### 2-Wire Control for Logic I/O with Internal Power Supply



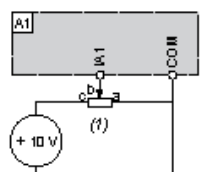
- L11 : Forward  
L1• : Reverse  
A1 : Drive

#### 3-Wire Control for Logic I/O with Internal Power Supply



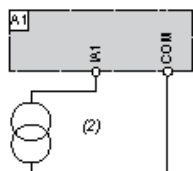
- L11 : Stop  
L12 : Forward  
L1• : Reverse  
A1 : Drive

#### Analog Input Configured for Voltage with Internal Power Supply



- (1) 2.2 kΩ...10 kΩ reference potentiometer  
A1 : Drive

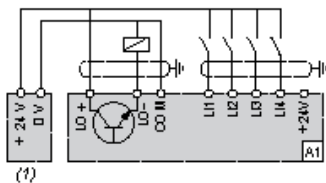
## Analog Input Configured for Current with Internal Power Supply



(2) 0-20 mA 4-20 mA supply

A1 : Drive

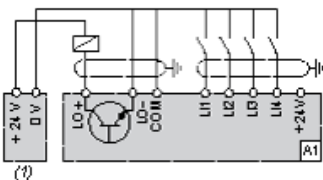
## Connected as Positive Logic (Source) with External 24 vdc Supply



(1) 24 vdc supply

A1 : Drive

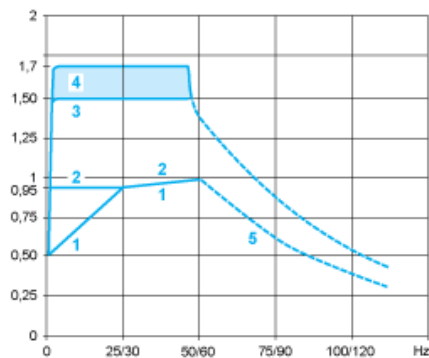
## Connected as Negative Logic (Sink) with External 24 vdc supply



(1) 24 vdc supply

A1 : Drive

## Torque Curves



- 1 : Self-cooled motor: continuous useful torque (1)
  - 2 : Force-cooled motor: continuous useful torque
  - 3 : Transient overtorque for 60 s
  - 4 : Transient overtorque for 2 s
  - 5 : Torque in overspeed at constant power (2)
- (1) For power ratings  $\leq 250$  W, derating is 20% instead of 50% at very low frequencies.
- (2) The nominal motor frequency and the maximum output frequency can be adjusted from 0.5 to 400 Hz. The mechanical overspeed capability of the selected motor must be checked with the manufacturer.