

## Product data sheet

### Characteristics

# ATV12H018M2TQ

variable speed drive ATV12 - 0.18kW - 0.25hp -  
200..240V - 1ph - lot of 14

Product availability : Non-Stock - Not normally stocked in distribution facility



Price\* : 184.62 USD



### Main

|                                    |                                                                                                      |
|------------------------------------|------------------------------------------------------------------------------------------------------|
| Range of product                   | Altivar 12                                                                                           |
| Product or component type          | Variable speed drive                                                                                 |
| Product destination                | Asynchronous motors                                                                                  |
| Product specific application       | Simple machine                                                                                       |
| Assembly style                     | On base plate                                                                                        |
| Component name                     | ATV12                                                                                                |
| Quantity per set                   | Set of 14                                                                                            |
| EMC filter                         | Integrated                                                                                           |
| Built-in fan                       | Without                                                                                              |
| Phase                              | 1 phase                                                                                              |
| [Us] rated supply voltage          | 200...240 V - 15...10 %                                                                              |
| Motor power kW                     | 0.18 kW                                                                                              |
| Maximum Horse Power Rating         | 0.25 hp                                                                                              |
| Communication port protocol        | Modbus                                                                                               |
| Line current                       | 3.4 A 200 V<br>2.8 A 240 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>Voltage/frequency ratio (V/f)<br>Sensorless flux vector control |
| IP degree of protection            | IP20 without blanking plate on upper part                                                            |
| Noise level                        | 0 dB                                                                                                 |

### Complementary

|                  |                  |
|------------------|------------------|
| Supply frequency | 50/60 Hz +/- 5 % |
|------------------|------------------|

\* Price is "List Price" and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Jul 30, 2021

|                                     |                                                                                                                                                                                                                                                    |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connector type                      | 1 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 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)                                           |
| Prospective line Isc                | 1 kA                                                                                                                                                                                                                                               |
| Continuous output current           | 1.4 A 4 kHz                                                                                                                                                                                                                                        |
| Maximum transient current           | 2.1 A 60 s                                                                                                                                                                                                                                         |
| Speed drive output frequency        | 0.5...400 Hz                                                                                                                                                                                                                                       |
| Nominal switching frequency         | 4 kHz                                                                                                                                                                                                                                              |
| Switching frequency                 | 2...16 kHz adjustable<br>4...16 kHz with derating factor                                                                                                                                                                                           |
| Braking torque                      | Up to 70 % of nominal motor torque without braking resistor                                                                                                                                                                                        |
| Motor slip compensation             | Adjustable<br>Preset in factory                                                                                                                                                                                                                    |
| Output voltage                      | 200...240 V 3 phase                                                                                                                                                                                                                                |
| Electrical connection               | Terminal 3.5 mm <sup>2</sup> , AWG 12 L1, L2, L3, U, V, W, PA, PC)                                                                                                                                                                                 |
| Tightening torque                   | 7.08 lbf.in (0.8 N.m)                                                                                                                                                                                                                              |
| Insulation                          | Electrical between power and control                                                                                                                                                                                                               |
| Supply                              | Internal supply for reference potentiometer 5 V DC 4.75...5.25 V), <10 mA overload and short-circuit protection<br>Internal supply for logic inputs 24 V DC 20.4...28.8 V), <100 mA overload and short-circuit protection                          |
| Analogue input number               | 1                                                                                                                                                                                                                                                  |
| Analogue input type                 | 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                                                                                                                |
| Discrete input number               | 4                                                                                                                                                                                                                                                  |
| Discrete input type                 | Programmable LI1...LI4 24 V 18...30 V                                                                                                                                                                                                              |
| Discrete input logic                | Negative logic (sink), > 16 V, < 10 V 3.5 kOhm<br>Positive logic (source), 0...< 5 V, > 11 V                                                                                                                                                       |
| Sampling duration                   | 20 ms +/- 1 ms logic input<br>10 ms analogue input                                                                                                                                                                                                 |
| Linearity error                     | +/- 0.3 % of maximum value analogue input                                                                                                                                                                                                          |
| Analogue output number              | 1                                                                                                                                                                                                                                                  |
| Analogue output type                | AO1 software-configurable voltage 0...10 V 470 Ohm 8 bits<br>AO1 software-configurable current 0...20 mA 800 Ohm 8 bits                                                                                                                            |
| Discrete output number              | 2                                                                                                                                                                                                                                                  |
| Discrete output type                | Logic output LO+, LO-<br>Protected relay output R1A, R1B, R1C 1 C/O                                                                                                                                                                                |
| Minimum switching current           | 5 mA 24 V DC logic relay                                                                                                                                                                                                                           |
| Maximum switching current           | 2 A 250 V AC inductive cos phi = 0.4 L/R = 7 ms logic relay<br>2 A 30 V DC inductive cos phi = 0.4 L/R = 7 ms logic relay<br>3 A 250 V AC resistive cos phi = 1 L/R = 0 ms logic relay<br>4 A 30 V DC resistive cos phi = 1 L/R = 0 ms logic relay |
| Acceleration and deceleration ramps | S<br>U<br>Linear from 0 to 999.9 s                                                                                                                                                                                                                 |
| Braking to standstill               | By DC injection, <30 s                                                                                                                                                                                                                             |
| Protection type                     | Line supply overvoltage<br>Line supply undervoltage<br>Overcurrent between output phases and earth<br>Overheating protection<br>Short-circuit between motor phases                                                                                 |

|                                            |                                                                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|                                            | Against input phase loss in three-phase<br>Thermal motor protection via the drive by continuous calculation of I <sup>2</sup> t |
| Frequency resolution                       | Analog input converter A/D, 10 bits<br>Display unit 0.1 Hz                                                                      |
| Time constant                              | 20 ms +/- 1 ms for reference change                                                                                             |
| Marking                                    | CE                                                                                                                              |
| Operating position                         | Vertical +/- 10 degree                                                                                                          |
| Height                                     | 5.63 in (143 mm)                                                                                                                |
| Width                                      | 2.83 in (72 mm)                                                                                                                 |
| Depth                                      | 4.02 in (102.2 mm)                                                                                                              |
| Net Weight                                 | 1.54 lb(US) (0.7 kg)                                                                                                            |
| Variable speed drive application selection | Commercial equipment Mixer<br>Commercial equipment Other application<br>Textile Ironing                                         |
| Motor starter type                         | Variable speed drive                                                                                                            |

## Environment

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electromagnetic compatibility         | Electrical fast transient/burst immunity test level 4 EN/IEC 61000-4-4<br>Electrostatic discharge immunity test level 3 EN/IEC 61000-4-2<br>Immunity to conducted disturbances level 3 EN/IEC 61000-4-6<br>Radiated radio-frequency electromagnetic field immunity test level 3 EN/IEC 61000-4-3<br>Surge immunity test level 3 EN/IEC 61000-4-5<br>Voltage dips and interruptions immunity test EN/IEC 61000-4-11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Electromagnetic emission              | Radiated emissions environment 1 category C2 EN/IEC 61800-3 2...16 kHz shielded motor cable<br>Conducted emissions with integrated EMC filter environment 1 category C1 EN/IEC 61800-3 2, 4, 8, 12 and 16 kHz shielded motor cable <16.40 ft (5 m)<br>Conducted emissions with integrated EMC filter environment 1 category C2 EN/IEC 61800-3 2...12 kHz shielded motor cable <16.40 ft (5 m)<br>Conducted emissions with integrated EMC filter environment 1 category C2 EN/IEC 61800-3 2, 4 and 16 kHz shielded motor cable <32.81 ft (10 m)<br>Conducted emissions with additional EMC filter environment 1 category C1 EN/IEC 61800-3 4...12 kHz shielded motor cable <65.62 ft (20 m)<br>Conducted emissions with additional EMC filter environment 1 category C2 EN/IEC 61800-3 4...12 kHz shielded motor cable <164.04 ft (50 m)<br>Conducted emissions with additional EMC filter environment 2 category C3 EN/IEC 61800-3 4...12 kHz shielded motor cable <164.04 ft (50 m) |
| Product certifications                | UL<br>C-tick<br>NOM<br>GOST<br>CSA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Vibration resistance                  | 1 gn 13...200 Hz)EN/IEC 60068-2-6<br>1.5 mm peak to peak 3...13 Hz) - drive unmounted on symmetrical DIN rail - EN/IEC 60068-2-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Shock resistance                      | 15 gn 11 ms EN/IEC 60068-2-27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Relative humidity                     | 5...95 % without condensation IEC 60068-2-3<br>5...95 % without dripping water IEC 60068-2-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Ambient air temperature for storage   | -13...158 °F (-25...70 °C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Ambient air temperature for operation | 14...104 °F (-10...40 °C) protective cover from the top of the drive removed<br>104...140 °F (40...60 °C) with current derating 2.2 % per °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Operating altitude                    | > 3280.84...6561.68 ft (> 1000...2000 m) with current derating 1 % per 100 m<br><= 3280.84 ft (1000 m) without derating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Ordering and shipping details

|                       |                                     |
|-----------------------|-------------------------------------|
| Category              | 22042 - ATV12 DRIVE AND ACCESSORIES |
| Discount Schedule     | CP4B                                |
| GTIN                  | 03606480076565                      |
| Nbr. of units in pkg. | 1                                   |
| Package weight(Lbs)   | 27.05 oz (767 g)                    |
| Returnability         | No                                  |
| Country of origin     | ID                                  |

## Packing Units

|                        |                  |
|------------------------|------------------|
| Unit Type of Package 1 | PCE              |
| Package 1 Height       | 7.87 in (20 cm)  |
| Package 1 width        | 15.75 in (40 cm) |
| Package 1 Length       | 23.62 in (60 cm) |

## Offer Sustainability

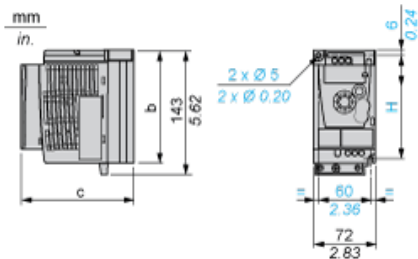
|                            |                                                                                                                                                                                                                                                                                             |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sustainable offer status   | Green Premium product                                                                                                                                                                                                                                                                       |
| California proposition 65  | WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a> |
| REACH Regulation           | <a href="#">REACH Declaration</a>                                                                                                                                                                                                                                                           |
| EU RoHS Directive          | Pro-active compliance (Product out of EU RoHS legal scope)<br><a href="#">EU RoHS Declaration</a>                                                                                                                                                                                           |
| Mercury free               | Yes                                                                                                                                                                                                                                                                                         |
| RoHS exemption information | <a href="#">Yes</a>                                                                                                                                                                                                                                                                         |
| China RoHS Regulation      | <a href="#">China RoHS declaration</a>                                                                                                                                                                                                                                                      |
| Environmental Disclosure   | <a href="#">Product Environmental Profile</a>                                                                                                                                                                                                                                               |
| Circularity Profile        | <a href="#">End of Life Information</a>                                                                                                                                                                                                                                                     |
| WEEE                       | The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.                                                                                                                                                                |

## Contractual warranty

|          |           |
|----------|-----------|
| Warranty | 18 months |
|----------|-----------|

Dimensions

Drive without EMC Conformity Kit



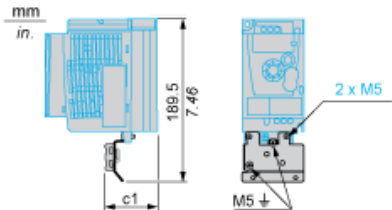
Dimensions in mm

| b   | c     | H   |
|-----|-------|-----|
| 142 | 102.2 | 131 |

Dimensions in in.

| b    | c    | H    |
|------|------|------|
| 5.59 | 4.02 | 5.16 |

Drive with EMC Conformity Kit



Dimensions in mm

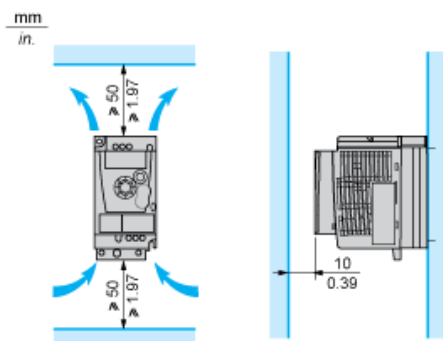
| c1 |
|----|
| 34 |

Dimensions in in.

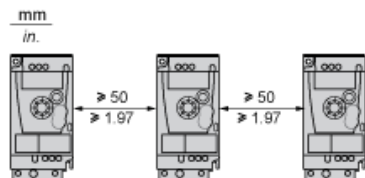
| c1   |
|------|
| 1.34 |

## Mounting Recommendations

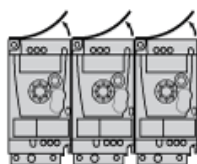
### Clearance for Vertical Mounting



### Mounting Type A

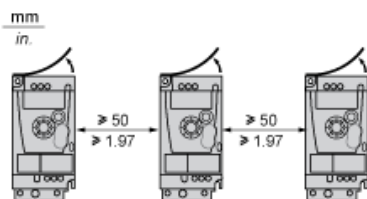


### Mounting Type B



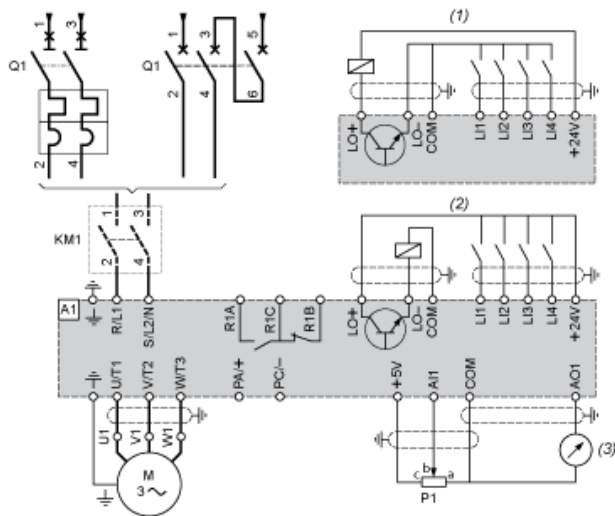
Remove the protective cover from the top of the drive.

### Mounting Type C



Remove the protective cover from the top of the drive.

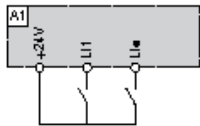
## Single-Phase Power Supply Wiring Diagram



- 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
- (1) Negative logic (Sink)
- (2) Positive logic (Source) (factory set configuration)
- (3) 0...10 V or 0...20 mA

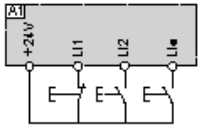
## Recommended Schemes

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



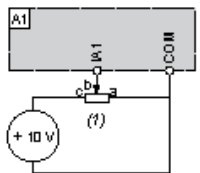
LI1 : Forward  
LI• : Reverse  
A1 : Drive

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



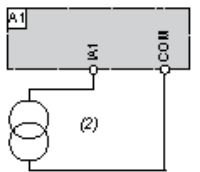
LI1 : Stop  
LI2 : Forward  
LI• : Reverse  
A1 : Drive

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



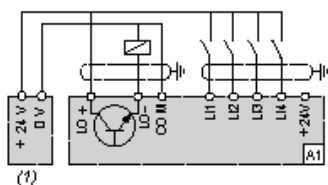
(1) 2.2 kΩ...10 kΩ reference potentiometer  
A1 : Drive

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



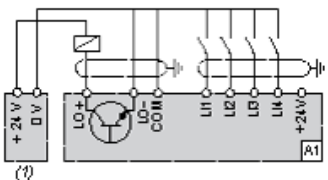
(2) 0-20 mA 4-20 mA supply  
A1 : Drive

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



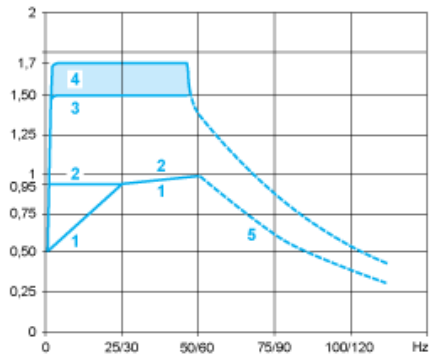
- (1) 24 vdc supply  
A1 : Drive

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.