

# Product data sheet

Specifications



variable speed drive ATV12 -  
0.37kW - 0.55hp - 100..120V - 1ph -  
with heat sink

ATV12H037F1

## Main

Range of product	Altivar 12
Product or component type	Variable speed drive
Product specific application	Simple machine
Mounting mode	Cabinet mount
Communication port protocol	Modbus
Supply frequency	50/60 Hz +/- 5 %
[Us] rated supply voltage	100...120 V - 15...10 %
Nominal output current	2.4 A
Motor power hp	0.55 hp
Motor power kW	0.37 kW 0.55 hp
EMC filter	Without EMC filter
IP degree of protection	IP20

## Complementary

Discrete input number	4
Discrete output number	2
Analogue input number	1
Analogue output number	1
Relay output number	1
Physical interface	2-wire RS 485
Connector type	1 RJ45
Continuous output current	2.4 A at 4 kHz
Method of access	Server Modbus serial
Speed drive output frequency	0.5...400 Hz
Speed range	1...20
Sampling duration	20 ms, tolerance +/- 1 ms for logic input 10 ms for analogue input
Linearity error	+/- 0.3 % of maximum value for analogue input
Frequency resolution	Analog input: converter A/D, 10 bits

Display unit: 0.1 Hz

<b>Time constant</b>	20 ms +/- 1 ms for reference change
<b>Transmission rate</b>	9.6 kbit/s 19.2 kbit/s 38.4 kbit/s
<b>Transmission frame</b>	RTU
<b>Number of addresses</b>	1...247
<b>Data format</b>	8 bits, configurable odd, even or no parity
<b>Communication service</b>	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)
<b>Type of polarization</b>	No impedance
<b>4 quadrant operation possible</b>	False
<b>Asynchronous motor control profile</b>	Voltage/frequency ratio (V/f) Quadratic voltage/frequency ratio Sensorless flux vector control
<b>Maximum output frequency</b>	4 kHz
<b>Transient overtorque</b>	150...170 % of nominal motor torque depending on drive rating and type of motor
<b>Acceleration and deceleration ramps</b>	S U Linear from 0 to 999.9 s
<b>Motor slip compensation</b>	Preset in factory Adjustable
<b>Switching frequency</b>	2...16 kHz adjustable 4...16 kHz with derating factor
<b>Nominal switching frequency</b>	4 kHz
<b>Braking to standstill</b>	By DC injection
<b>Brake chopper integrated</b>	False
<b>Line current</b>	11.4 A at 100 V (heavy duty) 9.3 A at 120 V (heavy duty)
<b>Maximum input current</b>	9.3 A
<b>Maximum output voltage</b>	240 V
<b>Apparent power</b>	1.1 kVA at 240 V (heavy duty)
<b>Maximum transient current</b>	3.6 A during 60 s (heavy duty) 4.0 A during 2 s (heavy duty)
<b>Network frequency</b>	50...60 Hz
<b>Relative symmetric network frequency tolerance</b>	5 %
<b>Prospective line I<sub>sc</sub></b>	1 kA
<b>Base load current at high overload</b>	2.4 A
<b>Power dissipation in W</b>	Natural: 29.0 W
<b>With safety function Safely Limited Speed (SLS)</b>	False
<b>With safety function Safe brake management (SBC/SBT)</b>	False
<b>With safety function Safe Operating Stop (SOS)</b>	False
<b>With safety function Safe Position (SP)</b>	False
<b>With safety function Safe programmable logic</b>	False

With safety function Safe Speed Monitor (SSM)	False
With safety function Safe Stop 1 (SS1)	False
With sft fct Safe Stop 2 (SS2)	False
With safety function Safe torque off (STO)	False
With safety function Safely Limited Position (SLP)	False
With safety function Safe Direction (SDI)	False
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 I <sup>2</sup> t
Tightening torque	0.8 N.m
Insulation	Electrical between power and control
Quantity per set	Set of 1
Width	72 mm
Height	143 mm
Depth	121.2 mm
Net weight	0.8 kg

## Environment

Operating altitude	> 1000...2000 m with current derating 1 % per 100 m <= 1000 m without derating
Operating position	Vertical +/- 10 degree
Product certifications	NOM CSA C-Tick UL GOST RCM KC
Marking	CE
Standards	UL 508C UL 618000-5-1 EN/IEC 61800-5-1 EN/IEC 61800-3
Assembly style	With heat sink
Electromagnetic compatibility	Electrical fast transient/burst immunity test level 4 conforming to EN/IEC 61000-4-4 Electrostatic discharge immunity test level 3 conforming to EN/IEC 61000-4-2 Immunity to conducted disturbances level 3 conforming to EN/IEC 61000-4-6 Radiated radio-frequency electromagnetic field immunity test level 3 conforming to EN/IEC 61000-4-3 Surge immunity test level 3 conforming to EN/IEC 61000-4-5 Voltage dips and interruptions immunity test conforming to EN/IEC 61000-4-11
Environmental class (during operation)	Class 3C3 according to IEC 60721-3-3 Class 3S2 according to IEC 60721-3-3
Maximum acceleration under shock impact (during operation)	150 m/s <sup>2</sup> at 11 ms
Maximum acceleration under vibrational stress (during operation)	10 m/s <sup>2</sup> at 13...200 Hz
Maximum deflection under vibratory load (during operation)	1.5 mm at 2...13 Hz
Overvoltage category	Class III

<b>Regulation loop</b>	Adjustable PID regulator
<b>Electromagnetic emission</b>	Radiated emissions environment 1 category C2 conforming to EN/IEC 61800-3 2...16 kHz shielded motor cable Conducted emissions with additional EMC filter environment 1 category C1 conforming to EN/IEC 61800-3 4...12 kHz shielded motor cable <5 m Conducted emissions with additional EMC filter environment 1 category C2 conforming to EN/IEC 61800-3 4...12 kHz shielded motor cable <20 m Conducted emissions with additional EMC filter environment 2 category C3 conforming to EN/IEC 61800-3 4...12 kHz shielded motor cable <20 m
<b>Vibration resistance</b>	1 gn (f = 13...200 Hz) conforming to EN/IEC 60068-2-6 1.5 mm peak to peak (f = 3...13 Hz) - drive unmounted on symmetrical DIN rail - conforming to EN/IEC 60068-2-6
<b>Shock resistance</b>	15 gn conforming to EN/IEC 60068-2-27 for 11 ms
<b>Relative humidity</b>	5...95 % without condensation conforming to IEC 60068-2-3 5...95 % without dripping water conforming to IEC 60068-2-3
<b>Noise level</b>	0 dB
<b>Pollution degree</b>	2
<b>Ambient air transport temperature</b>	-25...70 °C
<b>Ambient air temperature for operation</b>	-10...40 °C without derating 40...60 °C with current derating 2.2 % per °C
<b>Ambient air temperature for storage</b>	-25...70 °C

## Packing Units

<b>Unit Type of Package 1</b>	PCE
<b>Number of Units in Package 1</b>	1
<b>Package 1 Height</b>	10.600 cm
<b>Package 1 Width</b>	18.600 cm
<b>Package 1 Length</b>	18.600 cm
<b>Package 1 Weight</b>	1.031 kg
<b>Unit Type of Package 2</b>	P06
<b>Number of Units in Package 2</b>	45
<b>Package 2 Height</b>	75.000 cm
<b>Package 2 Width</b>	60.000 cm
<b>Package 2 Length</b>	80.000 cm
<b>Package 2 Weight</b>	59.395 kg

## Offer Sustainability

<b>Sustainable offer status</b>	Green Premium product
<b>REACH Regulation</b>	<a href="#">REACH Declaration</a>
<b>EU RoHS Directive</b>	Pro-active compliance (Product out of EU RoHS legal scope) <a href="#">EU RoHS Declaration</a>
<b>Mercury free</b>	Yes
<b>China RoHS Regulation</b>	<a href="#">China RoHS declaration</a>
<b>RoHS exemption information</b>	<a href="#">Yes</a>
<b>Environmental Disclosure</b>	<a href="#">Product Environmental Profile</a>
<b>Circularity Profile</b>	<a href="#">End of Life Information</a>
<b>WEEE</b>	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

**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 [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

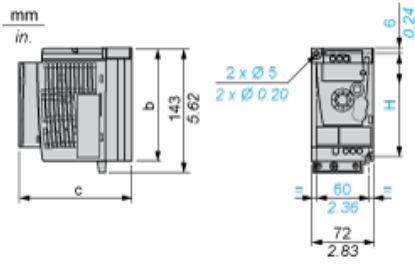
**Contractual warranty**

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Warranty 18 months

**Dimensions**

**Drive without EMC Conformity Kit**



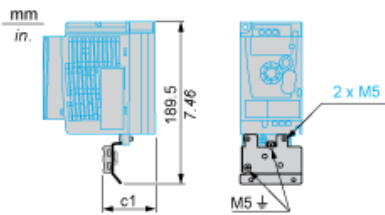
Dimensions in mm

b	c	H
130	121.2	120

Dimensions in in.

b	c	H
5.12	4.77	4.72

**Drive with EMC Conformity Kit**



Dimensions in mm

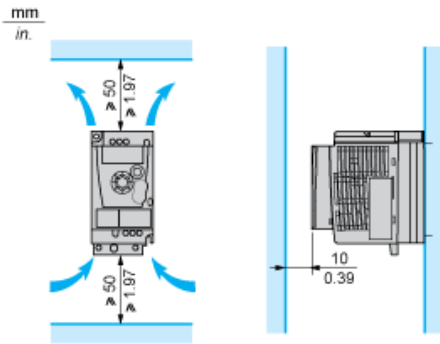
c1
53

Dimensions in in.

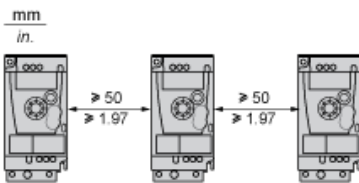
c1
2.09

Mounting Recommendations

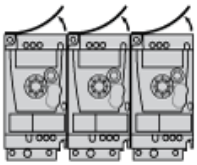
Clearance for Vertical Mounting



Mounting Type A

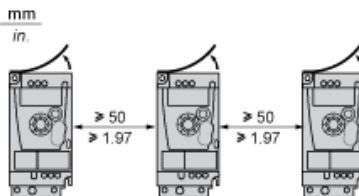


Mounting Type B



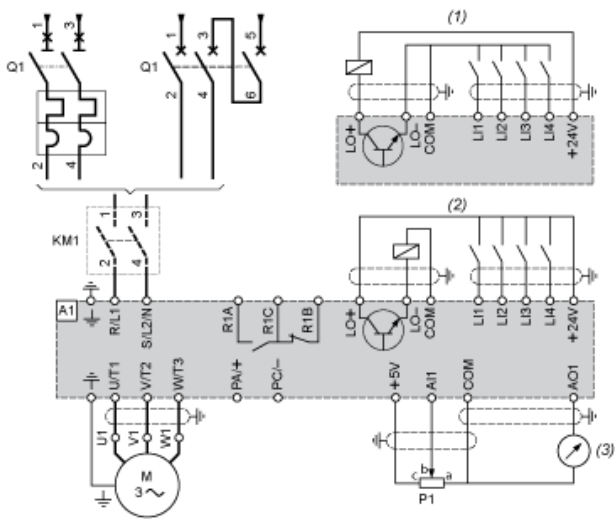
Remove the protective cover from the top of the drive.

Mounting Type C



Remove the protective cover from the top of the drive.

Single-Phase Power Supply Wiring Diagram

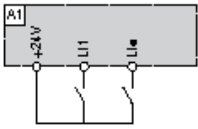


- A1** Drive
- KM1** Contactor (only if a control circuit is needed)
- P1** 2.2 kΩ reference potentiometer. This can be replaced by a 10 kΩ potentiometer (maximum).
- Q1** Circuit breaker
- (1)** Negative logic (Sink)
- (2)** Positive logic (Source) (factory set configuration)
- (3)** 0...10 V or 0...20 mA



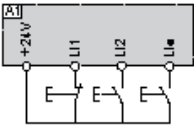
**Recommended Schemes**

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



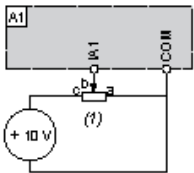
LI1 : Forward  
LIe : Reverse  
A1 : Drive

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



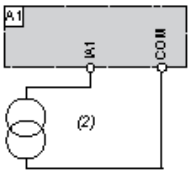
LI1 : Stop  
LI2 : Forward  
LIe : Reverse  
A1 : Drive

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



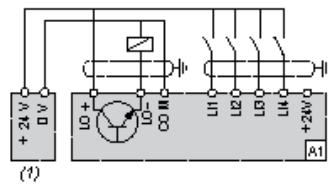
(1) 2.2 kΩ...10 kΩ reference potentiometer  
A1 : Drive

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



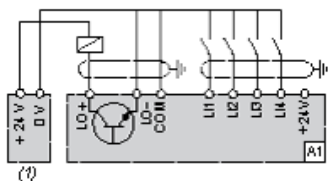
(2) 0-20 mA 4-20 mA supply  
A1 : Drive

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



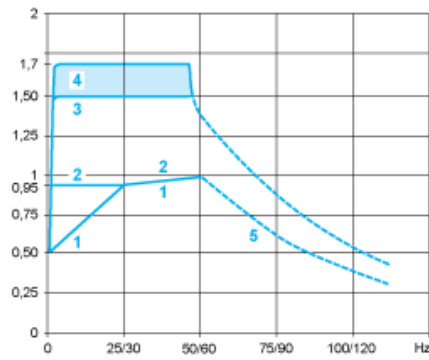
(1) 24 vdc supply  
A1 : Drive

**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 motor is 150%.

Recommended replacement(s)