Product data sheet
Characteristics

ATV212HD30M3X
variable speed drive ATV212 - 30kW - 40hp - 240V - 3ph - wo EMC - IP21

Main

Range of product	Altivar 212
Product or component type	Variable speed drive
Device short name	ATV212
Product destination	Asynchronous motors
Product specific application	Pumps and fans in HVAC
Assembly style	With heat sink
Phase	3 phase
Motor power kW	30 kW
Maximum Horse Power Rating	40 hp
[Us] rated supply voltage	200...240 V - 15...10 %
Supply voltage limits	170…264 V
Supply frequency	50...60 Hz - 5...5 %
EMC filter	Without EMC filter
Line current	113.3 A 200 V 89.5 A 240 V

Complementary

Apparent power	44.6 kVA 240 V
Prospective line Isc	22 kA
Continuous output current	117 A 230 V
Maximum transient current	128.7 A 60 s
Speed drive output frequency	0.5…200 Hz
Nominal switching frequency	8 kHz
Switching frequency	6...16 kHz adjustable 8...16 kHz with derating factor
Speed range	1…10
Speed accuracy	+/- 10 % of nominal slip 0.2 Tn to Tn
Torque accuracy	+/- 15 %
Transient overtorque	120 % of nominal motor torque +/- 10 % 60 s
Asynchronous motor control profile	Voltage/Frequency ratio, 2 points Voltage/Frequency ratio, automatic IR compensation (U/f + automatic Uo) Voltage/Frequency ratio - Energy Saving, quadratic U/f Flux vector control without sensor, standard Voltage/frequency ratio, 5 points
Regulation loop	Adjustable PI regulator
Motor slip compensation	Not available in voltage/frequency ratio motor control Adjustable Automatic whatever the load
Local signalling	DC bus energized 1 LED red)
Output voltage	<= power supply voltage
Isolation	Electrical between power and control
Type of cable	Without mounting kit: 1 wire(s)IEC cable at 45 °C, copper 90 °C / XLPE/EPR Without mounting kit: 1 wire(s)IEC cable at 45 °C, copper 70 °C / PVC With UL Type 1 kit 3 UL 508 cable 104 °F (40 °C), copper 75 °C / PVC
Electrical connection	VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES terminal 0.00 in² (2.5 mm²) / AWG 14 L1/R, L2/S, L3/T terminal 0.23 in² (150 mm²) 300 kcmil)

Tightening torque	5.31 Lbf.In (0.6 N.m) VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES) 362.88 lbf.in (41 N.m), 360 lb.in L1/R, L2/S, L3/T)
Supply	Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 A, protection type: overload and short-circuit protection Internal supply: 24 V DC (21…27 V), <200 A, protection type: overload and short-circuit protection
Analogue input number	2
Analogue input type	VIA switch-configurable voltage 0...10 V DC 24 V max 30000 Ohm 10 bits VIB configurable voltage 0...10 V DC 24 V max 30000 Ohm 10 bits VIB configurable PTC probe 0...6 probes 1500 Ohm VIA switch-configurable current 0...20 mA 250 Ohm 10 bits
Sampling duration	2 Ms +/- 0.5 ms F discrete 2 Ms +/- 0.5 ms R discrete 2 Ms +/- 0.5 ms RES discrete 3.5 Ms +/- 0.5 ms VIA analog 22 ms +/- 0.5 ms VIB analog
Response time	FM 2 ms +/- 0.5 ms analog FLA, FLC 7 ms +/- 0.5 ms discrete FLB, FLC 7 ms +/- 0.5 ms discrete RY, RC 7 ms +/- 0.5 ms discrete
Accuracy	+/- 0.6 % VIA) for a temperature variation 60 °C +/- 0.6 % VIB) for a temperature variation 60 °C +/- 1 % FM) for a temperature variation 60 °C
Linearity error	VIA +/- 0.15 % of maximum value input VIB +/- 0.15 % of maximum value input FM +/- 0.2 % output
Analogue output number	1
Analogue output type	FM switch-configurable voltage 0...10 V DC 7620 Ohm 10 bits FM switch-configurable current 0...20 mA 970 Ohm 10 bits
Discrete output number	2
Discrete output type	Configurable relay logic FLA, FLC) NO - 100000 cycles Configurable relay logic FLB, FLC) NC - 100000 cycles Configurable relay logic RY, RC) NO - 100000 cycles
Minimum switching current	3 mA 24 V DC configurable relay logic
Maximum switching current	5 A 250 V AC resistive cos phi = 1 L/R = 0 ms FL, R) 5 A 30 V DC resistive cos phi = 1 L/R = 0 ms FL, R) 2 A 250 V AC inductive cos phi = 0.4 L/R = 7 ms FL, R) 2 A 30 V DC inductive cos phi = 0.4 L/R = 7 ms FL, R)
Discrete input type	F programmable 24 V DC level 1 PLC 4700 Ohm R programmable 24 V DC level 1 PLC 4700 Ohm RES programmable 24 V DC level 1 PLC 4700 Ohm
Discrete input logic	Positive logic (source) F, R, RES), <= 5 V, >= 11 V Negative logic (sink) F, R, RES), >= 16 V, <= 10 V
Acceleration and deceleration ramps	Automatic based on the load Linear adjustable separately from 0.01 to 3200 s
Braking to standstill	By DC injection
Protection type	Overheating protection: drive Thermal power stage drive Short-circuit between motor phases: drive Input phase breaks drive Overcurrent between output phases and earth: drive Overvoltages on the DC bus: drive Break on the control circuit: drive Against exceeding limit speed: drive Line supply overvoltage and undervoltage drive Line supply undervoltage: drive Against input phase loss: drive Thermal protection: motor Motor phase break: motor With PTC probes motor
Dielectric strength	2830 V DC between earth and power terminals 4230 V DC between control and power terminals
Insulation resistance	>= 1 mOhm 500 V DC for 1 minute
Frequency resolution	Display unit: 0.1 Hz Analog input 0.024/50 Hz
Communication port protocol	METASYS N2 APOGEE FLN BACnet LonWorks Modbus

Connector type	1 RJ45 1 open style
Physical interface	2-wire RS 485
Transmission frame	RTU
Transmission rate	9600 bps or 19200 bps
Data format	8 bits, 1 stop, odd even or no configurable parity
Type of polarization	No impedance
Number of addresses	1…247
Communication service	Write multiple registers (16) 2 words maximum Monitoring inhibitable Time out setting from 0.1 to 100 s Read holding registers (03) 2 words maximum Read device identification (43) Write single register (06)
Option card	Communication card LonWorks
Operating position	Vertical +/- 10 degree
Width	12.60 in (320 mm)
Height	24.80 in (630 mm)
Depth	11.42 in (290 mm)
Net weight	85.21 lb(US) (38.65 kg)
Power dissipation in W	1085 W
Air flow	98009.59 Gal/hr(US) (371 m3/h)
Specific application	HVAC
IP degree of protection	IP21
Variable speed drive application selection	Compressor for scroll Building - HVAC Fan Building - HVAC Pump Building - HVAC
Motor power range AC-3	30…50 kW at 200…240 V 3 phases
Motor starter type	Variable speed drive

Environment

Electromagnetic compatibility	Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2 Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3 Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4 1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5 Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 Voltage dips and interruptions immunity test conforming to IEC 61000-4-11
Pollution degree	3 IEC 61800-5-1
IP degree of protection	IP20 on upper part without blanking plate on cover EN/IEC 61800-5-1 IP20 on upper part without blanking plate on cover EN/IEC 60529 IP21 EN/IEC 61800-5-1 IP21 EN/IEC 60529 IP41 on upper part EN/IEC 61800-5-1 IP41 on upper part EN/IEC 60529
Vibration resistance	1.5 mm (f= 3…13 Hz) conforming to EN/IEC 60068-2-6 1 gn 13…200 Hz)EN/IEC 60068-2-8
Shock resistance	15 gn 11 ms IEC 60068-2-27
Environmental characteristic	Classes 3C1 IEC 60721-3-3 Classes 3S2 IEC 60721-3-3
Noise level	63.7 dB conforming to 86/188/EEC
Operating altitude	3280.84...9842.52 ft (1000...3000 m) limited to 2000 m for the Corner Grounded distribution network with current derating 1 % per 100 m <= 3280.84 ft (1000 m) without derating
Relative humidity	5…95 % without condensation conforming to IEC 60068-2-3 5…95 % without dripping water IEC 60068-2-3
Ambient air temperature for operation	14…104 °F (-10…40 °C) without derating) 40…50 °C (with derating factor)
Ambient air temperature for storage	-13…158 °F (-25…70 °C)

Standards	IEC 61800-3 environments 2 category C1 IEC 61800-3 environments 2 category C2 IEC 61800-3 environments 1 category C2 EN 61800-3 IEC 61800-5-1 EN 61800-3 environments 1 category C3 EN 61800-3 environments 1 category C1 UL Type 1 EN 61800-3 environments 1 category C2 IEC 61800-3 environments 1 category C1 IEC 61800-3 environments 2 category C3 EN 61800-3 environments 2 category C1 IEC 61800-3 environments 1 category C3 IEC 61800-3 EN 61800-3 environments 2 category C3 EN 61800-3 environments 2 category C2 EN 61800-5-1
Product certifications	NOM 117 CSA C-tick UL
Marking	CE

Ordering and shipping details

Category	22156 - ATV212 30 - 40 HP 230 VOLT
Discount Schedule	CP4D
GTIN	00785901921981
Nbr. of units in pkg.	1
Package weight(Lbs)	95.7 lb(US) (43.41 kg)
Returnability	Yes
Country of origin	FR

Packing Units

Unit Type of Package 1	PCE
Package 1 Height	12.99 in (33 cm)
Package 1 width	21.26 in (54 cm)
Package 1 Length	31.50 in (80 cm)

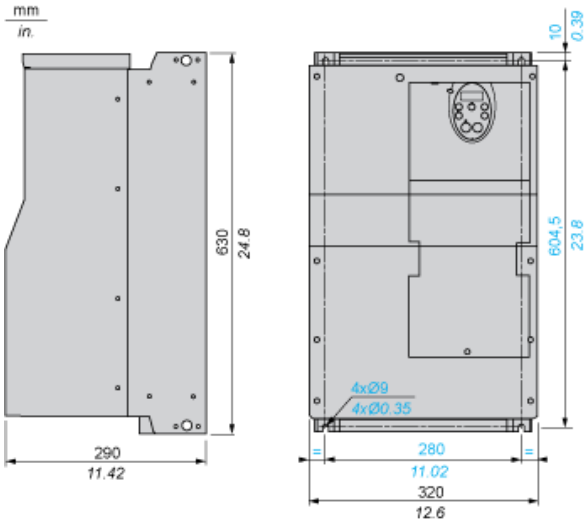
Offer Sustainability

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 www.P65Warnings.ca.gov
REACh Regulation	REACh Declaration
EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS Declaration
Environmental Disclosure	Product Environmental Profile
Circularity Profile	End Of Life Information
WEEE	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.

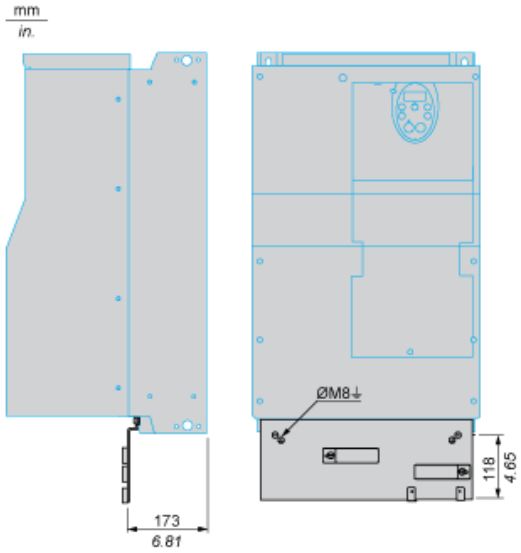
Contractual warranty

Warranty	18 months

Dimensions



EMC mounting plate (supplied with drive)



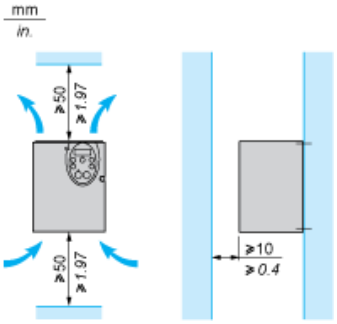
Mounting Recommendations

Clearance

Depending on the conditions in which the drive is to be used, its installation will require certain precautions and the use of appropriate accessories.

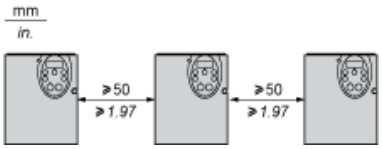
Install the unit vertically:

- Do not place it close to heating elements.
- Leave sufficient free space to ensure that the air required for cooling purposes can circulate from bottom to the top of the unit.

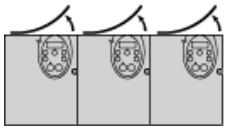


Mounting Types

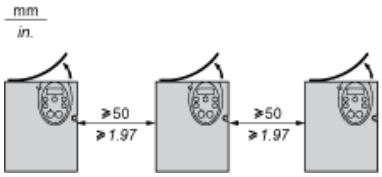
Type A mounting



Type B mounting



Type C mounting

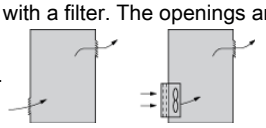


By removing the protective blanking cover from the top of the drive, the degree of protection for the drive becomes IP21. The protective blanking cover may vary according to the drive model, see opposite.

Specific Recommendations for Mounting in an Enclosure

To help ensure proper air circulation in the drive:

- Fit ventilation grilles.
- Check that there is sufficient ventilation. If there is not, install a forced ventilation unit with a filter. The openings and/or fans must provide a flow rate at least equal to that of the drive fans (refer to the product characteristics).



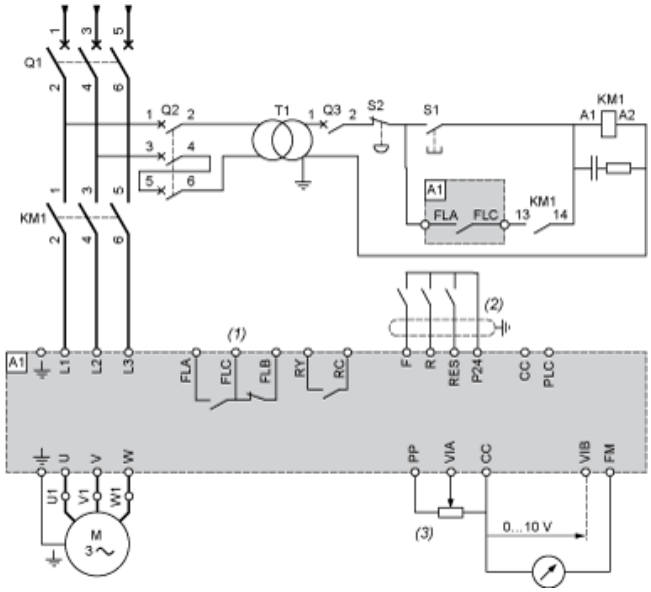
- Use special filters with UL Type 12/IP54 protection.
- Remove the blanking cover from the top of the drive.

Sealed Metal Enclosure (IP54 Degree of Protection)

The drive must be mounted in a dust and damp proof enclosure in certain environmental conditions, such as dust, corrosive gases, high humidity with risk of condensation and dripping water, splashing liquid, etc.This enables the drive to be used in an enclosure where the maximum internal temperature reaches 50°C.

Recommended Wiring Diagram

3-Phase Power Supply



A1: ATV 212 drive
KM1: Contactor
Q1: Circuit breaker
Q2: GV2 L rated at twice the nominal primary current of T1
Q3: GB2CB05
S1, XB4 B or XB5 A pushbuttons
S2:
T1: 100 VA transformer 220 V secondary
(1) Fault relay contacts for remote signalling of the drive status
(2) Connection of the common for the logic inputs depends on the positioning of the switch (Source, PLC, Sink)
(3) Reference potentiometer SZ1RV1202

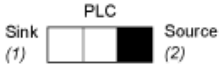
NOTE: All terminals are located at the bottom of the drive. Install interference suppressors on all inductive circuits near the drive or connected on the same circuit, such as relays, contactors, solenoid valves, fluorescent lighting, etc.

Switches (Factory Settings)

Voltage/current selection for analog I/O (VIA and VIB)

Voltage/current selection for analog I/O (FM)

Selection of logic type

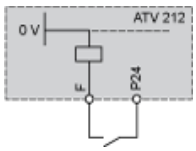


(1) negative logic
(2) positive logic

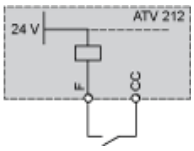
Other Possible Wiring Diagrams

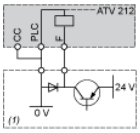
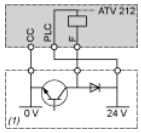
Logic Inputs According to the Position of the Logic Type Switch

“Source” position

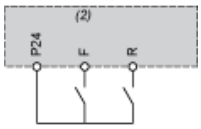


“Sink” position



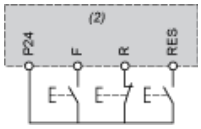
“PLC” position with PLC transistor outputs	
	
(1) PLC	(1) PLC

2-wire control



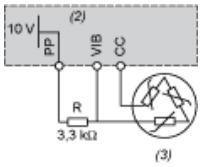
F: Forward
R: Preset speed
(2) ATV 212 control terminals

3-wire control



F: Forward
R: Stop
RES: Reverse
(2) ATV 212 control terminals

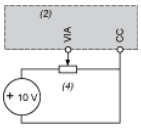
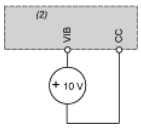
PTC probe



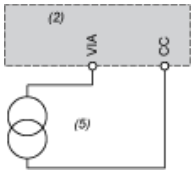
(2) ATV 212 control terminals
(3) Motor

Analog Inputs

Voltage analog inputs

External +10 V	
	
(2) ATV 212 control terminals (4) Speed reference potentiometer 2.2 to 10 kΩ	(2) ATV 212 control terminals

Analog input configured for current: 0-20 mA, 4-20 mA, X-Y mA

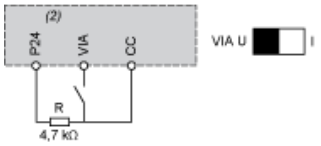


(2) ATV 212 control terminals
(5) Source 0-20 mA, 4-20 mA, X-Y mA

Analog input VIA configured as positive logic input (“Source” position)

(2) ATV 212 control terminals

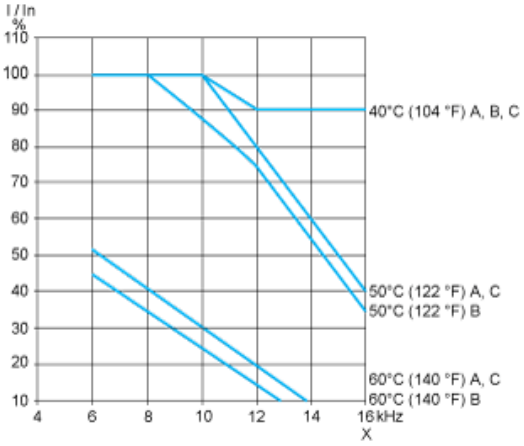
Analog input VIA configured as negative logic input (“Sink” position)



(2) ATV 212 control terminals

Derating Curves

The derating curves for the drive nominal current (In) depend on the temperature, the switching frequency and the mounting type (A, B or C). For intermediate temperatures (45°C for example), interpolate between 2 curves.



X Switching frequency