



## 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	2.2 kW
Maximum Horse Power Rating	3 hp
[Us] rated supply voltage	380...480 V - 15...10 %
Supply voltage limits	323...528 V
Supply frequency	50...60 Hz - 5...5 %
EMC filter	Class C1 EMC filter integrated
Line current	4.6 A 380 V 3.7 A 480 V

## Complementary

Apparent power	3.9 kVA 380 V
Prospective line I <sub>sc</sub>	5 kA
Continuous output current	5.1 A 380 V 5.1 A 460 V
Maximum transient current	5.6 A for 60 s
Speed drive output frequency	0.5...200 Hz
Nominal switching frequency	12 kHz
Switching frequency	6...16 kHz adjustable 12...16 kHz with derating factor
Speed range	1...10
Speed accuracy	+/- 10 % of nominal slip 0.2 T <sub>n</sub> to T <sub>n</sub>
Torque accuracy	+/- 15 %
Transient overtorque	120 % of nominal motor torque +/- 10 % 60 s
Asynchronous motor control profile	Voltage/Frequency ratio, automatic IR compensation (U/f + automatic U <sub>0</sub> ) Voltage/Frequency ratio, 5 points Voltage/Frequency ratio - Energy Saving, quadratic U/f Flux vector control without sensor, standard Voltage/frequency ratio, 2 points
Regulation loop	Adjustable PI regulator
Motor slip compensation	Adjustable Automatic whatever the load Not available in voltage/frequency ratio motor control
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

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Electrical connection	VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES terminal 0.00 in <sup>2</sup> (2.5 mm <sup>2</sup> ) / AWG 14 L1/R, L2/S, L3/T terminal 0.01 in <sup>2</sup> (6 mm <sup>2</sup> ) / AWG 10
Tightening torque	11.51 Lbf.in (1.3 N.m), 11.5 lb.in L1/R, L2/S, L3/T 5.31 lbf.in (0.6 N.m) VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES)
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	3535 V DC between earth and power terminals 5092 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	LonWorks METASYS N2 Modbus BACnet APOGEE FLN
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 single register (06) Read holding registers (03) 2 words maximum Monitoring inhibitible Write multiple registers (16) 2 words maximum Read device identification (43) Time out setting from 0.1 to 100 s
Option card	Communication card LonWorks
Operating position	Vertical +/- 10 degree
Width	8.46 in (215 mm)
Height	11.69 in (297 mm)
Depth	7.56 in (192 mm)
Net weight	16.53 lb(US) (7.5 kg)
Specific application	HVAC
IP degree of protection	IP55

## 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 $\mu$ s - 8/20 $\mu$ s 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	IP55 EN/IEC 61800-5-1 IP55 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	48 dB 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	EN 61800-5-1 IEC 61800-3 environments 2 category C2 IEC 61800-3 environments 2 category C3 IEC 61800-3 category C1 EN 61800-3 environments 2 category C1 EN 61800-3 environments 1 category C2 IEC 61800-5-1 EN 61800-3 environments 1 category C3 EN 61800-3 environments 2 category C2 IEC 61800-3 environments 1 category C3 EN 61800-3 EN 61800-3 environments 1 category C1 EN 55011 group 1 class B EN 61800-3 category C1 IEC 61800-3 environments 1 category C1 IEC 61800-3 environments 2 category C1 IEC 61800-3 IEC 61800-3 environments 1 category C2 EN 61800-3 environments 2 category C3
Product certifications	NOM 117 CSA C-tick UL
Marking	CE

## Ordering and shipping details

Category	22157 - ATV212 1 - 25 HP 460 VOLT
Discount Schedule	CP4D
GTIN	03606480322624
Nbr. of units in pkg.	1
Package weight(Lbs)	16.5 lb(US) (7.48 kg)
Returnability	No
Country of origin	ID

## Packing Units

Unit Type of Package 1	PCE
Package 1 Height	11.22 in (28.5 cm)
Package 1 width	10.04 in (25.5 cm)
Package 1 Length	14.37 in (36.5 cm)
Unit Type of Package 2	P06
Number of Units in Package 2	5
Package 2 Weight	108.64 lb(US) (49.28 kg)
Package 2 Height	31.50 in (80 cm)
Package 2 width	31.50 in (80 cm)
Package 2 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) <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>

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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.

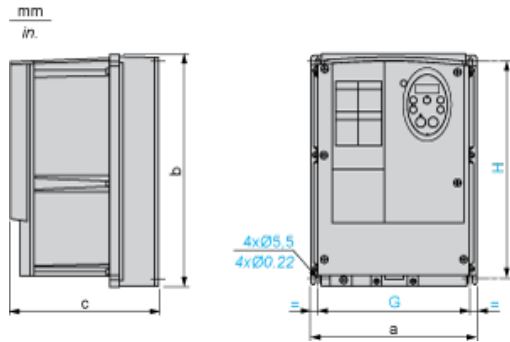
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**Contractual warranty**

Warranty	18 months
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Dimensions



Dimensions in mm

ATV212W	a	b	c	G	H
075N4...U22N4 075N4C...U22N4C	215	297	192	197	277
U30N4...U75N4 U30N4C...U75N4C	230	340	208	212	318

Dimensions in in.

ATV212W	a	b	c	G	H
075N4...U22N4 075N4C...U22N4C	8.46	11.69	7.56	7.76	10.91
U30N4...U75N4 U30N4C...U75N4C	9.06	13.39	8.19	8.35	12.52

## Mounting Recommendations

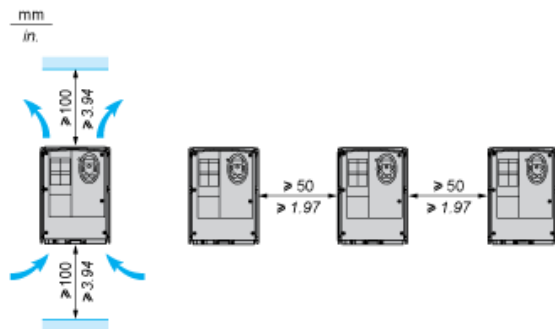
### Clearance

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:

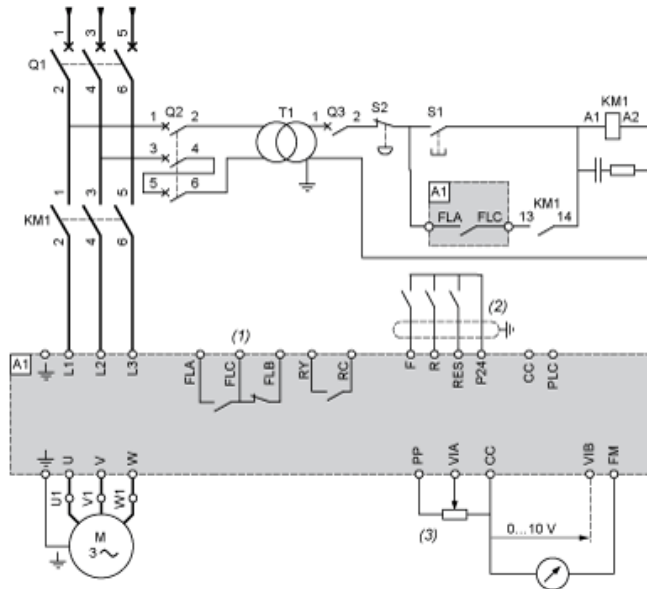
- Do not place it close to heating elements.
- Leave sufficient free space to ensure that the air required for cooling purposes can circulate from bottom to the top of the unit.

### Type A Mounting



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)

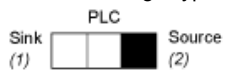
Voltage/current selection for analog I/O (VIA and VIB)



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



Selection of logic type

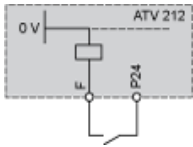


- (1) negative logic
- (2) positive logic

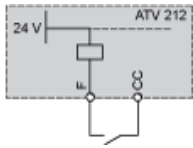
Other Possible Wiring Diagrams

## Logic Inputs According to the Position of the Logic Type Switch

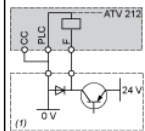
“Source” position



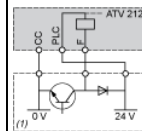
“Sink” position



“PLC” position with PLC transistor outputs

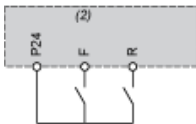


(1) PLC



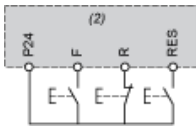
(1) PLC

2-wire control



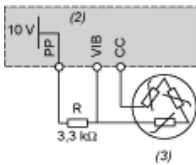
F: Forward  
R: Preset speed  
(2) ATV 212 control terminals

3-wire control



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

PTC probe

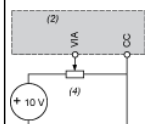


(2) ATV 212 control terminals  
(3) Motor

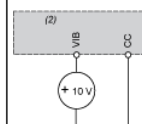
## Analog Inputs

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)



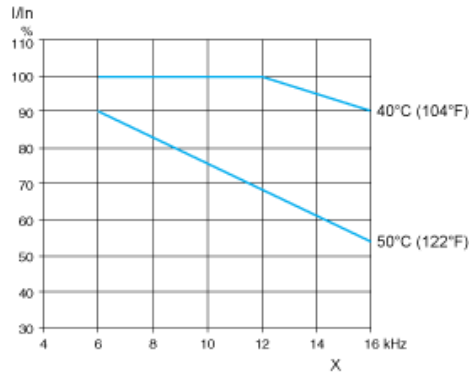
(2) ATV 212 control terminals

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### Derating Curves

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The derating curves for the drive nominal current ( $I_n$ ) depend on the temperature and the switching frequency.  
For intermediate temperatures (45°C for example), interpolate between 2 curves.



X Switching frequency