# Product datasheet

Specifications

## variable speed drive, Altivar 212, 0.75kW, 1hp, 480V, 3 phases, with EMC class C2, IP55

ATV212W075N4

## Main

| | |
|---|---|
| **Device Short Name** | ATV212 |
| **Product Destination** | Asynchronous motors |
| **Network Number Of Phases** | 3 phases |
| **Motor Power Kw** | 0.75 kW |
| **Motor Power Hp** | 1 hp |
| **Supply Voltage Limits** | 323…528 V |
| **Supply Frequency** | 50...60 Hz - 5...5 % |
| **Line Current** | 1.4 A at 480 V<br>1.7 A at 380 V |
| **Range Of Product** | Altivar 212 |
| **Product Or Component Type** | Variable speed drive |
| **Product Specific Application** | Pumps and fans in HVAC |
| **Communication Port Protocol** | Modbus<br>BACnet<br>METASYS N2<br>LonWorks<br>APOGEE FLN |
| **[Us] Rated Supply Voltage** | 380...480 V - 15...10 % |
| **Emc Filter** | Class C2 EMC filter integrated |
| **Ip Degree Of Protection** | IP55 |

## Complementary

| | |
|---|---|
| **Apparent Power** | 1.6 kVA at 380 V |
| **Continuous Output Current** | 2.2 A at 380 V<br>2.2 A at 460 V |
| **Maximum Transient Current** | 2.4 A for 60 s |
| **Speed Drive Output Frequency** | 0.5…200 Hz |
| **Speed Range** | 1…10 |
| **Speed Accuracy** | +/- 10 % of nominal slip 0.2 Tn to Tn |
| **Local Signalling** | 1 LED (red) for DC bus energized |
| **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<br>Without mounting kit: 1 wire(s)IEC cable at 45 °C, copper 70 °C / PVC<br>With UL Type 1 kit: 3 wire(s)UL 508 cable at 40 °C, copper 75 °C / PVC |

| | |
|---|---|
| **Electrical Connection** | VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES: terminal 2.5 mm² / AWG 14<br>L1/R, L2/S, L3/T: terminal 6 mm² / AWG 10 |
| **Tightening Torque** | 1.3 N.m, 11.5 lb.in (L1/R, L2/S, L3/T)<br>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<br>Internal supply: 24 V DC (21…27 V), <200 A, protection type: overload and short-circuit protection |
| **Sampling Duration** | 2 ms +/- 0.5 ms F discrete<br>2 ms +/- 0.5 ms R discrete<br>2 ms +/- 0.5 ms RES discrete<br>3.5 ms +/- 0.5 ms VIA analog<br>22 ms +/- 0.5 ms VIB analog |
| **Response Time** | FM 2 ms, tolerance +/- 0.5 ms for analog output(s)<br>FLA, FLC 7 ms, tolerance +/- 0.5 ms for discrete output(s)<br>FLB, FLC 7 ms, tolerance +/- 0.5 ms for discrete output(s)<br>RY, RC 7 ms, tolerance +/- 0.5 ms for discrete output(s) |
| **Accuracy** | +/- 0.6 % (VIA) for a temperature variation 60 °C<br>+/- 0.6 % (VIB) for a temperature variation 60 °C<br>+/- 1 % (FM) for a temperature variation 60 °C |
| **Linearity Error** | VIA: +/- 0.15 % of maximum value for input<br>VIB: +/- 0.15 % of maximum value for input<br>FM: +/- 0.2 % for output |
| **Analogue Output Type** | FM switch-configurable voltage 0...10 V DC, impedance: 7620 Ohm, resolution 10 bits<br>FM switch-configurable current 0...20 mA, impedance: 970 Ohm, resolution 10 bits |
| **Discrete Output Type** | Configurable relay logic: (FLA, FLC) NO - 100000 cycles<br>Configurable relay logic: (FLB, FLC) NC - 100000 cycles<br>Configurable relay logic: (RY, RC) NO - 100000 cycles |
| **Minimum Switching Current** | 3 mA at 24 V DC for configurable relay logic |
| **Maximum Switching Current** | 5 A at 250 V AC on resistive load - cos phi = 1 - L/R = 0 ms (FL, R)<br>5 A at 30 V DC on resistive load - cos phi = 1 - L/R = 0 ms (FL, R)<br>2 A at 250 V AC on inductive load - cos phi = 0.4 - L/R = 7 ms (FL, R)<br>2 A at 30 V DC on inductive load - cos phi = 0.4 - L/R = 7 ms (FL, R) |
| **Discrete Input Type** | F programmable 24 V DC, with level 1 PLC, impedance: 4700 Ohm<br>R programmable 24 V DC, with level 1 PLC, impedance: 4700 Ohm<br>RES programmable 24 V DC, with level 1 PLC, impedance: 4700 Ohm |
| **Discrete Input Logic** | Positive logic (source) (F, R, RES), <= 5 V (state 0), >= 11 V (state 1)<br>Negative logic (sink) (F, R, RES), >= 16 V (state 0), <= 10 V (state 1) |
| **Dielectric Strength** | 3535 V DC between earth and power terminals<br>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<br>Analog input: 0.024/50 Hz |
| **Communication Service** | Monitoring inhibitable<br>Time out setting from 0.1 to 100 s<br>Read device identification (43)<br>Read holding registers (03) 2 words maximum<br>Write multiple registers (16) 2 words maximum<br>Write single register (06) |
| **Option Card** | Communication card for LonWorks |
| **Functionality** | Mid |
| **Specific Application** | HVAC |
| **Discrete Output Number** | 2 |
| **Analogue Input Number** | 2 |

| | |
|---|---|
| **Analogue Input Type** | VIA switch-configurable voltage: 0...10 V DC 24 V max, impedance: 30000 Ohm, resolution 10 bits<br>VIB configurable voltage: 0...10 V DC 24 V max, impedance: 30000 Ohm, resolution 10 bits<br>VIB configurable PTC probe: 0...6 probes, impedance: 1500 Ohm<br>VIA switch-configurable current: 0...20 mA, impedance: 250 Ohm, resolution 10 bits |
| **Analogue Output Number** | 1 |
| **Physical Interface** | 2-wire RS 485 |
| **Connector Type** | 1 open style<br>1 RJ45 |
| **Transmission Rate** | 9600 bps or 19200 bps |
| **Transmission Frame** | RTU |
| **Number Of Addresses** | 1…247 |
| **Data Format** | 8 bits, 1 stop, odd even or no configurable parity |
| **Type Of Polarization** | No impedance |
| **Asynchronous Motor Control Profile** | Voltage/frequency ratio, 2 points<br>Voltage/frequency ratio, automatic IR compensation (U/f + automatic Uo)<br>Voltage/frequency ratio - Energy Saving, quadratic U/f<br>Flux vector control without sensor, standard<br>Voltage/frequency ratio, 5 points |
| **Torque Accuracy** | +/- 15 % |
| **Transient Overtorque** | 120 % of nominal motor torque +/- 10 % for 60 s |
| **Acceleration And Deceleration Ramps** | Linear adjustable separately from 0.01 to 3200 s<br>Automatic based on the load |
| **Motor Slip Compensation** | Automatic whatever the load<br>Not available in voltage/frequency ratio motor control<br>Adjustable |
| **Switching Frequency** | 6...16 kHz adjustable<br>12...16 kHz with derating factor |
| **Nominal Switching Frequency** | 12 kHz |
| **Braking To Standstill** | By DC injection |
| **Network Frequency** | 47.5...63 Hz |
| **Prospective Line Isc** | 5 kA |
| **Protection Type** | Overheating protection: drive<br>Thermal power stage: drive<br>Short-circuit between motor phases: drive<br>Input phase breaks: drive<br>Overcurrent between output phases and earth: drive<br>Overvoltages on the DC bus: drive<br>Break on the control circuit: drive<br>Against exceeding limit speed: drive<br>Line supply overvoltage and undervoltage: drive<br>Line supply undervoltage: drive<br>Against input phase loss: drive<br>Thermal protection: motor<br>Motor phase break: motor<br>With PTC probes: motor |
| **Width** | 215 mm |
| **Height** | 297 mm |
| **Depth** | 192 mm |
| **Net Weight** | 7 kg |

## Environment

| | |
|---|---|
| **Pollution Degree** | 2 conforming to IEC 61800-5-1 |

| | |
|---|---|
| **Ip Degree Of Protection** | IP55 conforming to IEC 61800-5-1<br>IP55 conforming to IEC 60529 |
| **Vibration Resistance** | 1.5 mm (f= 3…13 Hz) conforming to IEC 60068-2-6<br>1 gn (f= 13…200 Hz) conforming to EN/IEC 60068-2-8 |
| **Shock Resistance** | 15 gn for 11 ms conforming to IEC 60068-2-27 |
| **Environmental Characteristic** | Classes 3C1 conforming to IEC 60721-3-3<br>Classes 3S2 conforming to IEC 60721-3-3 |
| **Noise Level** | 48 dB conforming to 86/188/EEC |
| **Operating Altitude** | 1000...3000 m limited to 2000 m for the Corner Grounded distribution network with current derating 1 % per 100 m<br><= 1000 m without derating |
| **Relative Humidity** | 5…95 % without condensation conforming to IEC 60068-2-3<br>5…95 % without dripping water conforming to IEC 60068-2-3 |
| **Ambient Air Temperature For Operation** | -10…40 °C (without derating)<br>40…50 °C (with derating factor) |
| **Operating Position** | Vertical +/- 10 degree |
| **Product Certifications** | CSA<br>UL<br>C-Tick<br>NOM 117 |
| **Marking** | CE |
| **Standards** | IEC 61800-3 environments 2 category C1<br>IEC 61800-5-1<br>IEC 61800-3 environments 1 category C2<br>IEC 61800-3 category C2<br>IEC 61800-3 environments 2 category C2<br>IEC 61800-3 environments 1 category C1<br>IEC 61800-3 environments 1 category C3<br>IEC 61800-3 environments 1 category C3<br>IEC 61800-3 environments 2 category C1<br>IEC 61800-3<br>IEC 61800-3<br>IEC 61800-3 environments 1 category C1<br>IEC 61800-3 environments 2 category C3<br>IEC 61800-5-1<br>EN 61800-3 category C3<br>IEC 61800-3 environments 2 category C3<br>IEC 61800-3 environments 1 category C2<br>EN 55011 class A group 1<br>IEC 61800-3 category C3<br>IEC 61800-3 category C2<br>IEC 61800-3 environments 2 category C2 |
| **Assembly Style** | With heat sink |
| **Electromagnetic Compatibility** | Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3<br>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4<br>1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5<br>Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6<br>Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 |
| **Regulation Loop** | Adjustable PI regulator |
| **Ambient Air Temperature For Storage** | -25…70 °C |

# Packing Units

| | |
|---|---|
| **Unit Type Of Package 1** | PCE |
| **Number Of Units In Package 1** | 1 |
| **Package 1 Height** | 28.000 cm |
| **Package 1 Width** | 26.000 cm |

| | |
|---|---|
| **Package 1 Length** | 37.000 cm |
| **Package 1 Weight** | 6.706 kg |
| **Unit Type Of Package 2** | P06 |
| **Number Of Units In Package 2** | 5 |
| **Package 2 Height** | 75.000 cm |
| **Package 2 Width** | 60.000 cm |
| **Package 2 Length** | 80.000 cm |
| **Package 2 Weight** | 46.530 kg |

## Contractual warranty

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

## Sustainability

**Green Premium™ label** is Schneider Electric's commitment to delivering products with best-in-class environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-$CO_2$ products.

**Guide to assessing product sustainability** is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >

Transparency

RoHS/REACh

## Well-being performance

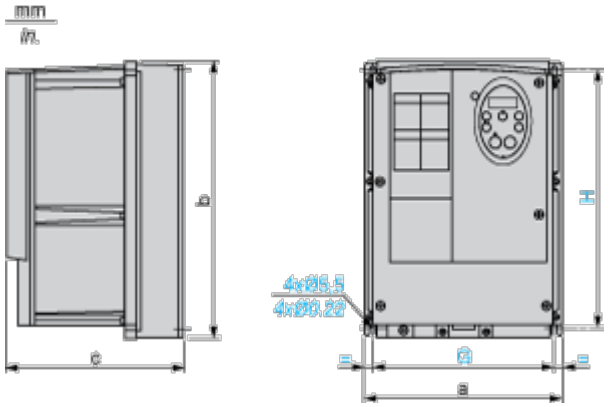
| | |
|---|---|
| Mercury Free | |
| Rohs Exemption Information | Yes |

## Certifications & Standards

| | |
|---|---|
| **Reach Regulation** | REACh Declaration |
| **Eu Rohs Directive** | Pro-active compliance (Product out of EU RoHS legal scope) |
| **China Rohs Regulation** | China RoHS declaration |
| **Environmental Disclosure** | Product Environmental Profile |
| **Weee** | The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins |
| **Circularity Profile** | End of Life Information |

## Dimensions Drawings

### Dimensions




Dimensions in mm

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

Dimensions in in.

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

# Mounting and Clearance

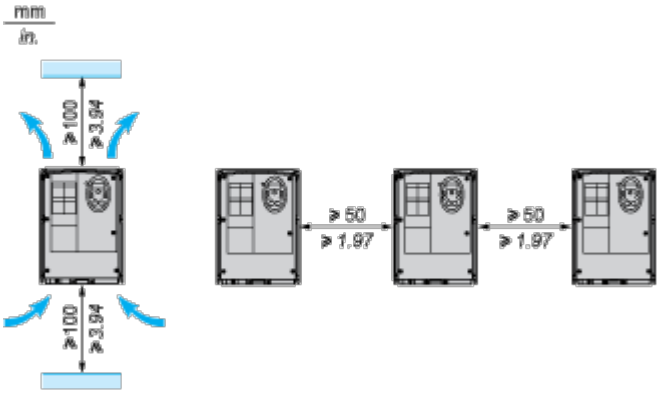
## Mounting Recommendations

### 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.

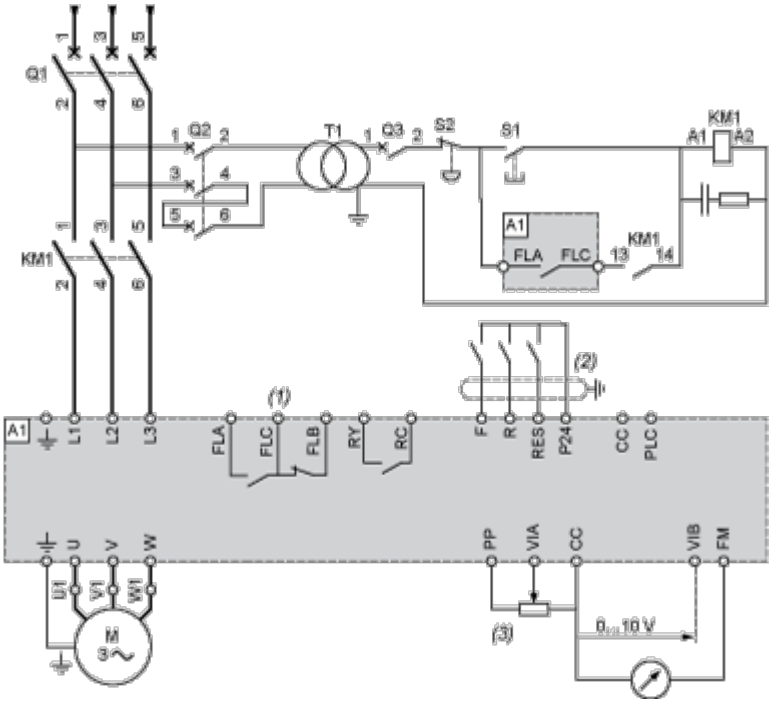
**Type A Mounting**



Connections and Schema

## 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, S2: XB4 B or XB5 A pushbuttons

T1: 100 VA transformer 220 V secondary

(1) Fault relay contacts for remote signalling of the drive status

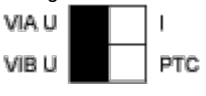
(2) Connection of the common for the logic inputs depends on the positioning of the switch (Source, PLC, Sink)

(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

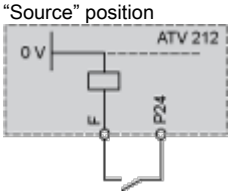

(1) negative logic

(2) positive logic

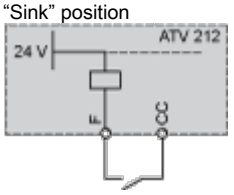
## Other Possible Wiring Diagrams

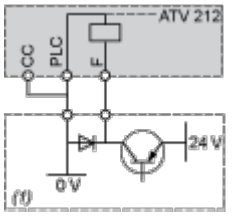
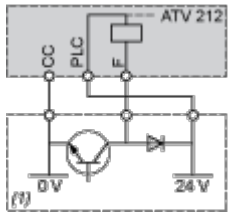
### Logic Inputs According to the Position of the Logic Type Switch

"Source" position

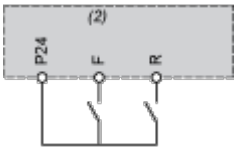



"Sink" position




| "PLC" position with PLC transistor outputs | |
|---|---|
|  |  |
| (1) PLC | (1) PLC |

2-wire control

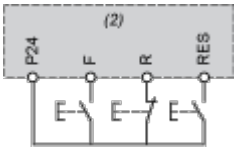



F: Forward

R: Preset speed

(2) ATV 212 control terminals

3-wire control



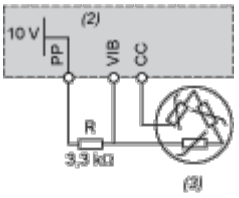

F: Forward

R: Stop

RES: Reverse

(2) ATV 212 control terminals

PTC probe



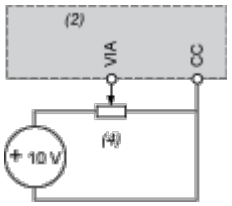

(2) ATV 212 control terminals

(3) Motor

### Analog Inputs

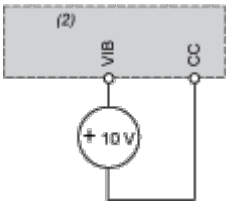
Voltage analog inputs

External +10 V



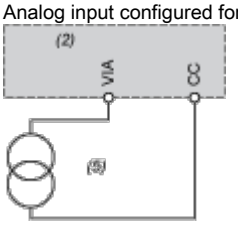

(2) ATV 212 control terminals

(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



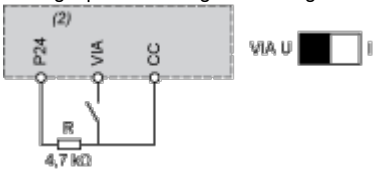

(2) ATV 212 control terminals

(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)

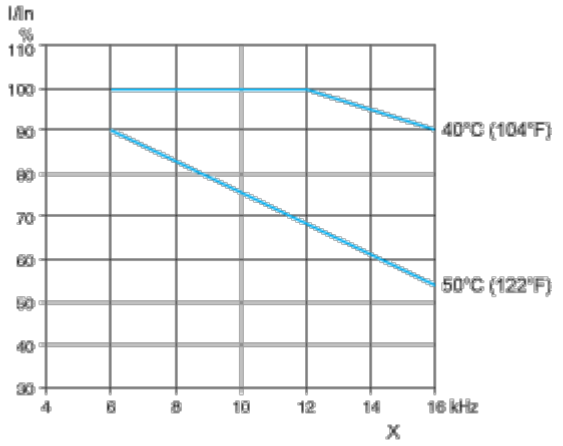



(2) ATV 212 control terminals

## Performance Curves

### Derating Curves

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




X Switching frequency