

# ATV212WU40N4

variable speed drive ATV212 - 4kW - 5hp - 480V - 3ph - EMC class C2 - IP55



## 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                 |
| Network number of phases     | 3 phases                       |
| Motor power kW               | 4 kW                           |
| Motor power hp               | 5 hp                           |
| [Us] rated supply voltage    | 380...480 V - 15...10 %        |
| Supply voltage limits        | 323...528 V                    |
| Supply frequency             | 50...60 Hz - 5...5 %           |
| Network frequency            | 47.5...63 Hz                   |
| EMC filter                   | Class C2 EMC filter integrated |
| Line current                 | 6.4 A 480 V<br>8.1 A 380 V     |

## Complementary

|                                    |                                                                                                                                                                                                                                                             |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Apparent power                     | 6.9 kVA 380 V                                                                                                                                                                                                                                               |
| Prospective line Isc               | 5 kA                                                                                                                                                                                                                                                        |
| Continuous output current          | 9.1 A 380 V<br>9.1 A 460 V                                                                                                                                                                                                                                  |
| Maximum transient current          | 10 A 60 s                                                                                                                                                                                                                                                   |
| Speed drive output frequency       | 0.5...200 Hz                                                                                                                                                                                                                                                |
| Nominal switching frequency        | 12 kHz                                                                                                                                                                                                                                                      |
| Switching frequency                | 12...16 kHz with derating factor<br>6...16 kHz adjustable                                                                                                                                                                                                   |
| 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<br>Voltage/frequency ratio, 5 points<br>Flux vector control without sensor, standard<br>Voltage/frequency ratio - Energy Saving, quadratic U/f<br>Voltage/frequency ratio, automatic IR compensation (U/f + automatic Uo) |
| Regulation loop                    | Adjustable PI regulator                                                                                                                                                                                                                                     |
| Motor slip compensation            | Adjustable<br>Automatic whatever the load<br>Not available in voltage/frequency ratio motor control                                                                                                                                                         |
| Local signalling                   | 1 LED red DC bus energized                                                                                                                                                                                                                                  |
| Output voltage                     | <= power supply voltage                                                                                                                                                                                                                                     |
| Isolation                          | Electrical between power and control                                                                                                                                                                                                                        |
| Type of cable                      | IEC cable without mounting kit 1 45 °C copper 90 °C XLPE/EPR<br>IEC cable without mounting kit 1 45 °C copper 70 °C PVC<br>UL 508 cable with UL Type 1 kit 3 40 °C copper 75 °C PVC                                                                         |
| Electrical connection              | Terminal 2.5 mm² AWG 14 VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES<br>Terminal 6 mm² AWG 10 L1/R, L2/S, L3/T                                                                                                                                            |
| Tightening torque                  | 1.3 N.m 11.5 lb.in L1/R, L2/S, L3/T                                                                                                                                                                                                                         |

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|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply                              | Internal supply for reference potentiometer (1 to 10 kOhm) 10.5 V DC +/- 5 % <= 10 A overload and short-circuit protection<br>Internal supply 24 V DC 21...27 V <= 200 A overload and short-circuit protection                                                                                                                                                                                                                                                                                                |
| Analogue input number               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Analogue input type                 | Switch-configurable voltage VIA 0...10 V DC 24 V max 30000 Ohm 10 bits<br>Configurable voltage VIB 0...10 V DC 24 V max 30000 Ohm 10 bits<br>Configurable PTC probe VIB 0...6 probes 1500 Ohm<br>Switch-configurable current VIA 0...20 mA 250 Ohm 10 bits                                                                                                                                                                                                                                                    |
| 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                       | 2 ms +/- 0.5 ms FM analog<br>7 ms +/- 0.5 ms FLA, FLC discrete<br>7 ms +/- 0.5 ms FLB, FLC discrete<br>7 ms +/- 0.5 ms RY, RC discrete                                                                                                                                                                                                                                                                                                                                                                        |
| 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                     | +/- 0.15 % of maximum value input VIA<br>+/- 0.15 % of maximum value input VIB<br>+/- 0.2 % output FM                                                                                                                                                                                                                                                                                                                                                                                                         |
| Analogue output number              | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Analogue output type                | Switch-configurable voltage FM 0...10 V DC 7620 Ohm 10 bits<br>Switch-configurable current FM 0...20 mA 970 Ohm 10 bits                                                                                                                                                                                                                                                                                                                                                                                       |
| Discrete output number              | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 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 24 V DC configurable relay logic                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Maximum switching current           | 5 A 250 V AC resistive cos phi = 1 L/R = 0 ms FL, R<br>5 A 30 V DC resistive cos phi = 1 L/R = 0 ms FL, R<br>2 A 250 V AC inductive cos phi = 0.4 L/R = 7 ms FL, R<br>2 A 30 V DC inductive cos phi = 0.4 L/R = 7 ms FL, R                                                                                                                                                                                                                                                                                    |
| Discrete input type                 | Programmable F 24 V DC level 1 PLC 4700 Ohm<br>Programmable R 24 V DC level 1 PLC 4700 Ohm<br>Programmable RES 24 V DC level 1 PLC 4700 Ohm                                                                                                                                                                                                                                                                                                                                                                   |
| Discrete input logic                | Positive logic (source) F, R, RES <= 5 V >= 11 V<br>Negative logic (sink) F, R, RES >= 16 V <= 10 V                                                                                                                                                                                                                                                                                                                                                                                                           |
| Acceleration and deceleration ramps | Automatic based on the load<br>Linear adjustable separately from 0.01 to 3200 s                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Braking to standstill               | By DC injection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Protection type                     | Input phase breaks drive<br>Line supply overvoltage and undervoltage drive<br>Line supply undervoltage drive<br>Overcurrent between output phases and earth drive<br>Overheating protection drive<br>Short-circuit between motor phases drive<br>Thermal protection motor<br>Motor phase break motor<br>Break on the control circuit drive<br>Thermal power stage drive<br>Overvoltages on the DC bus drive<br>Against exceeding limit speed drive<br>Against input phase loss drive<br>With PTC probes motor |
| 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                | 0.1 Hz display unit<br>0.024/50 Hz analog input                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Communication port protocol         | APOGEE FLN<br>BACnet<br>LonWorks<br>METASYS N2<br>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   | Monitoring inhibitable<br>Read device identification (43)<br>Read holding registers (03) 2 words maximum<br>Time out setting from 0.1 to 100 s<br>Write multiple registers (16) 2 words maximum<br>Write single register (06) |
| Option card             | Communication card LonWorks                                                                                                                                                                                                   |
| Operating position      | Vertical +/- 10 degree                                                                                                                                                                                                        |
| Width                   | 230 mm                                                                                                                                                                                                                        |
| Height                  | 340 mm                                                                                                                                                                                                                        |
| Depth                   | 208 mm                                                                                                                                                                                                                        |
| Product weight          | 9.65 kg                                                                                                                                                                                                                       |
| Functionality           | Mid                                                                                                                                                                                                                           |
| Specific application    | HVAC                                                                                                                                                                                                                          |
| IP degree of protection | IP55                                                                                                                                                                                                                          |

## Environment

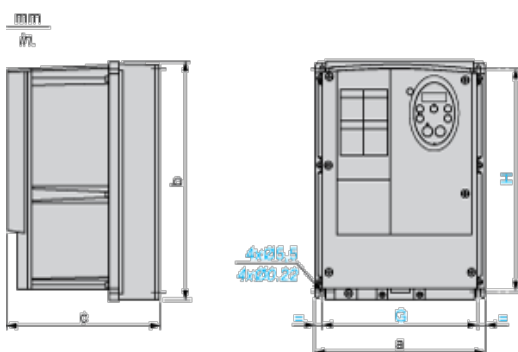
|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| electromagnetic compatibility         | 1.2/50 $\mu$ s - 8/20 $\mu$ s surge immunity test level 3 IEC 61000-4-5<br>Electrical fast transient/burst immunity test level 4 IEC 61000-4-4<br>Electrostatic discharge immunity test level 3 IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 IEC 61000-4-3<br>Conducted radio-frequency immunity test level 3 IEC 61000-4-6<br>Voltage dips and interruptions immunity test IEC 61000-4-11                                                                                                                                                                                                                     |
| pollution degree                      | 3 IEC 61800-5-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| IP degree of protection               | IP55 EN/IEC 61800-5-1<br>IP55 EN/IEC 60529                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| vibration resistance                  | 1.5 mm 3...13 Hz EN/IEC 60068-2-6<br>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<br>Classes 3S2 IEC 60721-3-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| noise level                           | 55 dB 86/188/EEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| operating altitude                    | <= 1000 m without derating<br>1000...3000 m limited to 2000 m for the Corner Grounded distribution network with current derating 1 % per 100 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| relative humidity                     | 5...95 % without condensation IEC 60068-2-3<br>5...95 % without dripping water IEC 60068-2-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| ambient air temperature for operation | -10...40 °C without derating<br>> 40...50 °C with derating factor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ambient air temperature for storage   | -25...70 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| standards                             | EN 55011 class A group 1<br>EN 61800-3<br>EN 61800-3 category C2<br>EN 61800-3 category C3<br>EN 61800-3 environments 1 category C1<br>EN 61800-3 environments 1 category C2<br>EN 61800-3 environments 1 category C3<br>EN 61800-3 environments 2 category C1<br>EN 61800-3 environments 2 category C2<br>EN 61800-3 environments 2 category C3<br>EN 61800-5-1<br>IEC 61800-3<br>IEC 61800-3 category C2<br>IEC 61800-3 category C3<br>IEC 61800-3 environments 1 category C1<br>IEC 61800-3 environments 1 category C2<br>IEC 61800-3 environments 1 category C3<br>IEC 61800-3 environments 2 category C1<br>IEC 61800-3 environments 2 category C2 |

|                        |                                |
|------------------------|--------------------------------|
| product certifications | CSA<br>C-Tick<br>NOM 117<br>UL |
| marking                | CE                             |

## Offer Sustainability

|                                  |                                                                       |
|----------------------------------|-----------------------------------------------------------------------|
| Sustainable offer status         | Green Premium product                                                 |
| RoHS (date code: YYWW)           | Compliant - since 1112 - Schneider Electric declaration of conformity |
| REACH                            | Reference not containing SVHC above the threshold                     |
| Product environmental profile    | Available                                                             |
| Product end of life instructions | Available                                                             |

## 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 Recommendations

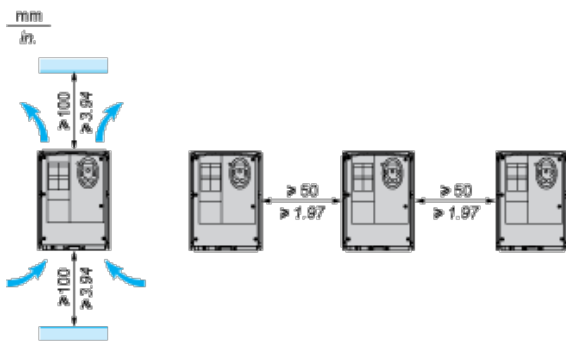
### Clearance

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:

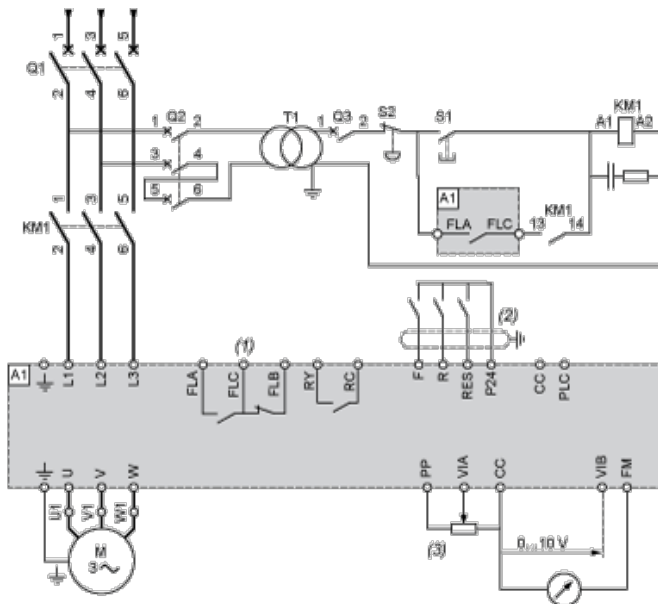
- Do not place it close to heating elements.
- Leave sufficient free space to ensure that the air required for cooling purposes can circulate from bottom to the top of the unit.

### 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)

VIA U ☐ I  
VIB U ☐ PTC

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

I ☐ U

Selection of logic type

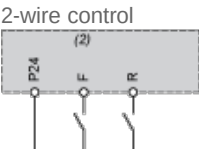
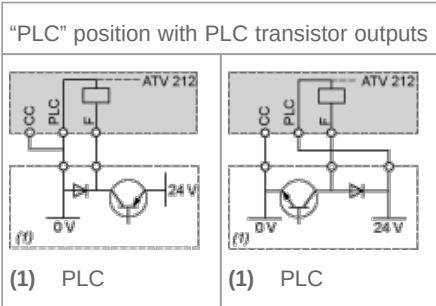
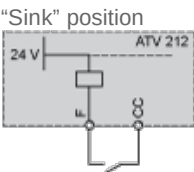
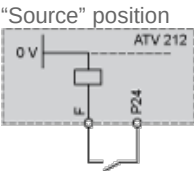
PLC  
Sink ☐ Source ☐  
(1) (2)

(1) negative logic

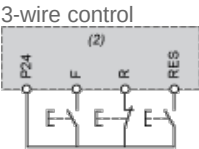
(2) positive logic

Other Possible Wiring Diagrams

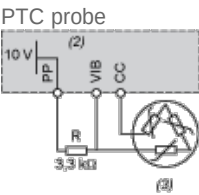
Logic Inputs According to the Position of the Logic Type Switch



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



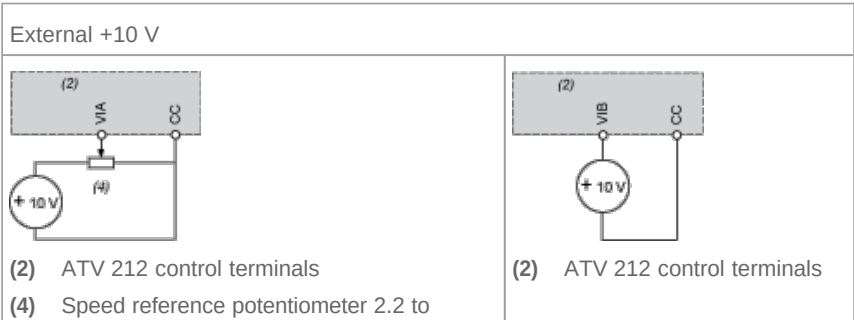
- F: Forward  
R: Stop  
RES: Reverse  
(2) ATV 212 control terminals



- (2) ATV 212 control terminals  
(3) Motor

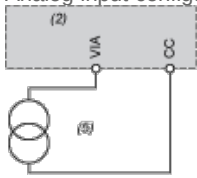
Analog Inputs

Voltage analog inputs



10 k $\Omega$

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



(2) ATV 212 control terminals

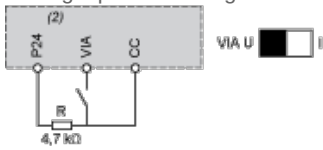
(5) Source 0-20 mA, 4-20 mA, X-Y mA

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)

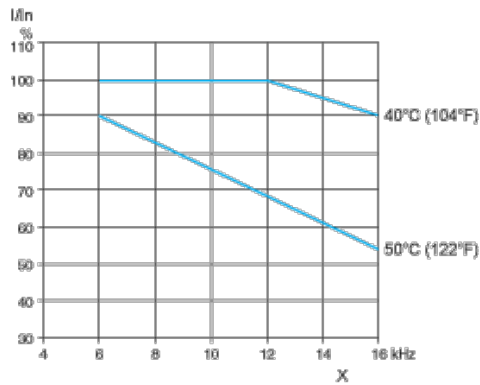


(2) ATV 212 control terminals

## Derating Curves

The derating curves for the drive nominal current ( $I_n$ ) depend on the temperature and the switching frequency.

For intermediate temperatures (45°C for example), interpolate between 2 curves.



X Switching frequency