

ATV212HU55N4

variable speed drive ATV212 - 5.5kW - 7.5hp -
480V - 3ph - 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 |
| Network number of phases | 3 phases |
| Motor power kW | 5.5 kW |
| Motor power hp | 7.5 hp |
| Power supply voltage | 380...480 V (- 15...10 %) |
| Power 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 | 8.6 A for 480 V 10.9 A for 380 V |

Complementary

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|---------------------------------------|--|
| Apparent power | 9.1 kVA for 380 V |
| Prospective line I _{sc} | 22 kA |
| Continuous output current | 12 A at 380/460 V |
| Maximum transient current | 13.2 A for 60 s |
| Speed drive output frequency | 0.5...200 Hz |
| Nominal switching frequency | 12 kHz |
| Switching frequency | 12...16 kHz with derating factor 6...16 kHz adjustable |
| Speed range | 1...10 |
| Speed accuracy | +/- 10 % of nominal slip for 0.2 T _n to T _n torque variation |
| Torque accuracy | +/- 15 % |
| Transient overtorque | 120 % of nominal motor torque, +/- 10 % for 60 s |
| Asynchronous motor control profile | Voltage/Frequency ratio, 2 points Voltage/Frequency ratio, 5 points Flux vector control without sensor, standard Voltage/Frequency ratio - Energy Saving, quadratic U/f Voltage/Frequency ratio, automatic IR compensation (U/f + automatic U ₀) |
| Regulation loop | Adjustable PI regulator |
| Motor slip compensation | Adjustable Automatic whatever the load 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 for external connection | UL 508 cable with UL Type 1 kit: 3 wire(s) - 40 °C, copper 75 °C / PVC IEC cable without mounting kit: 1 wire(s) - 45 °C, copper 70 °C / PVC IEC cable without mounting kit: 1 wire(s) - 45 °C, copper 90 °C / XLPE/EPR |

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| Electrical connection | Terminal 6 mm ² / AWG 10 (L1/R, L2/S, L3/T) Terminal 2.5 mm ² / AWG 14 (VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES) |
| Tightening torque | 1.3 N.m - 11.5 lb.in (L1/R, L2/S, L3/T) 0.6 N.m (VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES) |
| Supply | Internal supply: 24 V (21...27 V) DC - ≤ 200 A with overload and short-circuit protection Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC, +/- 5 % - ≤ 10 A with overload and short-circuit protection |
| Analogue input number | 2 |
| Analogue input type | Configurable voltage: (VIB) 0...10 V DC - 24 V max - 30000 Ohm - resolution: 10 bits Switch-configurable current: (VIA) 0...20 mA - 250 Ohm - resolution: 10 bits Switch-configurable voltage: (VIA) 0...10 V DC - 24 V max - 30000 Ohm - resolution: 10 bits Configurable PTC probe: (VIB) 0...6 probes - 1500 Ohm |
| Sampling duration | 22 ms +/- 0.5 ms (VIB) - analog input(s) 3.5 ms +/- 0.5 ms (VIA) - analog input(s) 2 ms +/- 0.5 ms (RES) - discrete input(s) 2 ms +/- 0.5 ms (R) - discrete input(s) 2 ms +/- 0.5 ms (F) - discrete input(s) |
| Response time | 7 ms +/- 0.5 ms (RY, RC) - discrete output(s) 7 ms +/- 0.5 ms (FLB, FLC) - discrete output(s) 7 ms +/- 0.5 ms (FLA, FLC) - discrete output(s) 2 ms +/- 0.5 ms (FM) - analog output(s) |
| Accuracy | +/- 1 % (FM) for a temperature variation 60 °C +/- 0.6 % (VIB) for a temperature variation 60 °C +/- 0.6 % (VIA) for a temperature variation 60 °C |
| Linearity error | +/- 0.2 % for output (FM) +/- 0.15 % of maximum value for input (VIB) +/- 0.15 % of maximum value for input (VIA) |
| Analogue output number | 1 |
| Analogue output type | Switch-configurable current: (FM) 0...20 mA - 970 Ohm - resolution: 10 bits Switch-configurable voltage: (FM) 0...10 V DC - 7620 Ohm - resolution: 10 bits |
| Discrete output number | 2 |
| Discrete output type | Configurable relay logic: (RY, RC) NO - 100000 cycles Configurable relay logic: (FLB, FLC) NC - 100000 cycles Configurable relay logic: (FLA, FLC) NO - 100000 cycles |
| Minimum switching current | 3 mA at 24 V DC (configurable relay logic) |
| Maximum switching current | 2 A at 30 V DC on inductive load - cos phi = 0.4 - L/R = 7 ms (FL, R) 2 A at 250 V AC on inductive load - cos phi = 0.4 - L/R = 7 ms (FL, R) 5 A at 30 V DC on resistive load - cos phi = 1 - L/R = 0 ms (FL, R) 5 A at 250 V AC on resistive load - cos phi = 1 - L/R = 0 ms (FL, R) |
| Discrete input type | Programmable (RES) 24 V DC, with level 1 PLC - 4700 Ohm Programmable (R) 24 V DC, with level 1 PLC - 4700 Ohm Programmable (F) 24 V DC, with level 1 PLC - 4700 Ohm |
| Discrete input logic | Negative logic (sink) (F, R, RES), ≥ 16 V (state 0), ≤ 10 V (state 1) Positive logic (source) (F, R, RES), ≤ 5 V (state 0), ≥ 11 V (state 1) |
| 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 | With PTC probes for motor Motor phase break for motor Thermal protection for motor Against input phase loss for drive Line supply undervoltage for drive Line supply overvoltage and undervoltage for drive Against exceeding limit speed for drive Break on the control circuit for drive Overvoltages on the DC bus for drive Overcurrent between output phases and earth for drive Input phase breaks for drive Short-circuit between motor phases for drive Thermal power stage for drive Overheating protection for drive |
| Dielectric strength | 5092 V DC between control and power terminals 3535 V DC between earth and power terminals |
| Insulation resistance | ≥ 1 MOhm at 500 V DC for 1 minute |
| Frequency resolution | 0.024/50 Hz for analog input 0.1 Hz for display unit |

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|-----------------------------|---|
| Communication port protocol | APOGEE FLN BACnet LonWorks METASYS N2 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 Read device identification (43) Read holding registers (03) 2 words maximum Time out setting from 0.1 to 100 s Write multiple registers (16) 2 words maximum Write single register (06) |
| Option card | Communication card for LonWorks |
| Operating position | Vertical +/- 10 degree |
| Width | 142 mm |
| Height | 184 mm |
| Depth | 150 mm |
| Product weight | 3.35 kg |
| Power dissipation in W | 215 W |
| Fan flow rate | 74 m3/h |

Environment

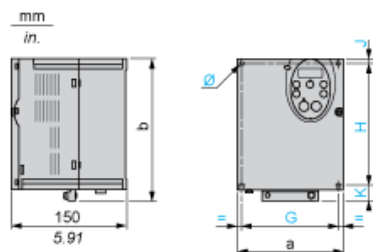
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| Electromagnetic compatibility | Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 1.2/50 μ s - 8/20 μ s surge immunity test level 3 conforming to IEC 61000-4-5 Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4 Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3 Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2 |
| Pollution degree | 3 IEC 61800-5-1 |
| IP degree of protection | IP20 on upper part without blanking plate on cover conforming to EN/IEC 60529 IP20 on upper part without blanking plate on cover conforming to EN/IEC 61800-5-1 IP41 on upper part conforming to EN/IEC 60529 IP41 on upper part conforming to EN/IEC 61800-5-1 IP21 conforming to EN/IEC 60529 IP21 conforming to EN/IEC 61800-5-1 |
| Vibration resistance | 1 gn (f = 13...200 Hz) conforming to EN/IEC 60068-2-8 1.5 mm (f = 3...13 Hz) conforming to EN/IEC 60068-2-6 |
| Shock resistance | 15 gn for 11 ms conforming to IEC 60068-2-27 |
| Environmental characteristic | Classes 3S2 conforming to IEC 60721-3-3 Classes 3C1 conforming to IEC 60721-3-3 |
| Noise level | 51 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 <= 1000 m without derating |
| Relative humidity | 5...95 % without dripping water conforming to IEC 60068-2-3 5...95 % without condensation conforming to IEC 60068-2-3 |
| Ambient air temperature for operation | > 40...50 °C with derating factor -10...40 °C without derating |
| Ambient air temperature for storage | -25...70 °C |

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|------------------------|---|
| Standards | EN 55011 class A group 1 EN 61800-3 EN 61800-3 category C2 EN 61800-3 category C3 EN 61800-3 environments 1 category C1 EN 61800-3 environments 1 category C2 EN 61800-3 environments 1 category C3 EN 61800-3 environments 2 category C1 EN 61800-3 environments 2 category C2 EN 61800-3 environments 2 category C3 EN 61800-5-1 IEC 61800-3 IEC 61800-3 category C2 IEC 61800-3 category C3 IEC 61800-3 environments 1 category C1 IEC 61800-3 environments 1 category C2 IEC 61800-3 environments 1 category C3 IEC 61800-3 environments 2 category C1 IEC 61800-3 environments 2 category C2 IEC 61800-3 environments 2 category C3 IEC 61800-5-1 UL Type 1 |
| Product certifications | CSA C-Tick NOM 117 UL |
| Marking | CE |

Offer Sustainability

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|----------------------------------|--|
| Sustainable offer status | Green Premium product |
| RoHS | Compliant - since 1051 - Schneider Electric declaration of conformity |
| REACH | Reference contains SVHC above the threshold - go to CaP for more details |
| Product environmental profile | Available Download Product Environmental |
| Product end of life instructions | Available Download End Of Life Manual |

Dimensions



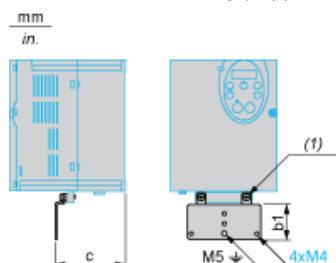
Dimensions in mm

| ATV212H | a | b | G | H | J | K | Ø |
|----------------------------------|-----|-----|-----|-------|-----|------|--------|
| 075M3X...U22M3X 075N4...U22N4 | 107 | 143 | 93 | 121.5 | 5 | 16.5 | 2 x Ø5 |
| U30M3X, U40M3X U30N4...U55N4 | 142 | 184 | 126 | 157 | 6.5 | 20.5 | 4 x Ø5 |

Dimensions in in.

| ATV212H | a | b | G | H | J | K | Ø |
|----------------------------------|------|------|------|------|------|------|-----------|
| 075M3X...U22M3X 075N4...U22N4 | 4.21 | 5.63 | 3.66 | 4.78 | 0.20 | 0.65 | 2 x Ø0.20 |
| U30M3X, U40M3X U30N4...U55N4 | 5.59 | 7.24 | 4.96 | 6.18 | 0.26 | 0.81 | 4 x Ø0.20 |

Plate for EMC mounting (supplied with the drive)



(1) 2 x M5 screws

Dimensions in mm

| ATV212H | b1 | c |
|----------------------------------|----|------|
| 075M3X...U22M3X 075N4...U22N4 | 49 | 67.3 |
| U30M3X, U40M3X U30N4...U55N4 | 48 | 88.8 |

Dimensions in in.

| ATV212H | b1 | c |
|----------------------------------|------|------|
| 075M3X...U22M3X 075N4...U22N4 | 1.93 | 2.65 |
| U30M3X, U40M3X U30N4...U55N4 | 1.89 | 3.50 |

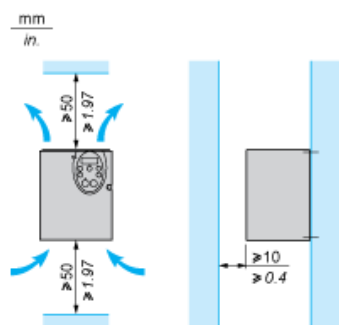
Mounting Recommendations

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.

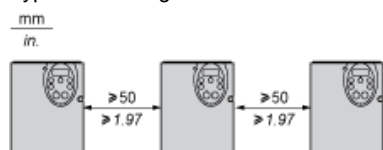
Install the unit vertically:

- 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.

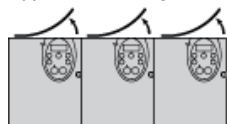


Mounting Types

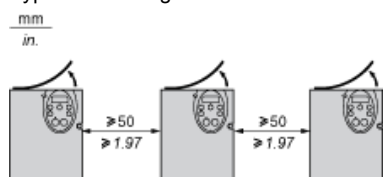
Type A mounting



Type B mounting



Type C mounting



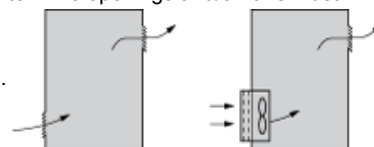
By removing the protective blanking cover from the top of the drive, the degree of protection for the drive becomes IP21. The protective blanking cover may vary according to the drive model, see opposite.

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).



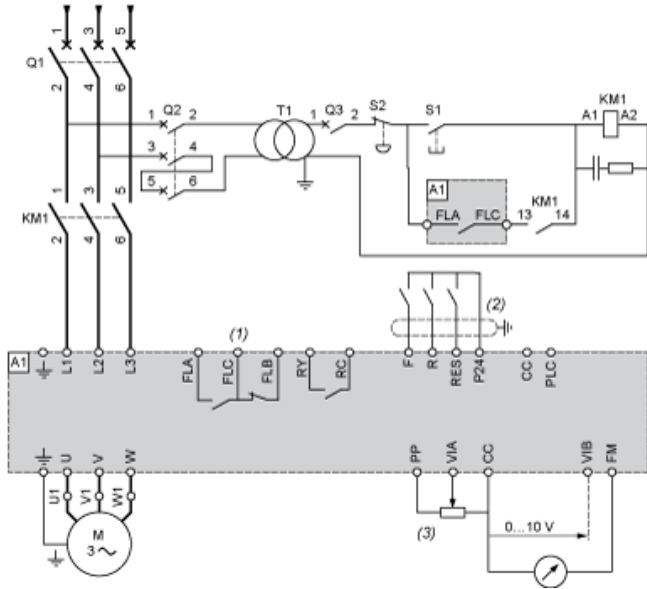
- Use special filters with UL Type 12/IP54 protection.
- Remove the blanking cover from the top of the drive.

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

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)

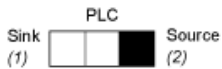
Voltage/current selection for analog I/O (VIA and VIB)



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



Selection of logic type

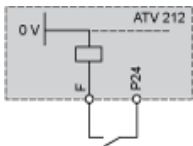


- (1) negative logic
- (2) positive logic

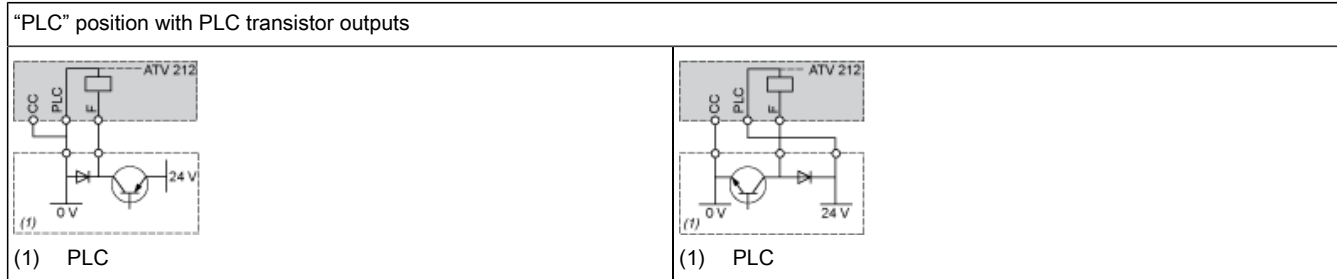
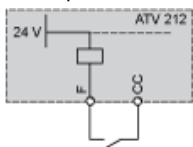
Other Possible Wiring Diagrams

Logic Inputs According to the Position of the Logic Type Switch

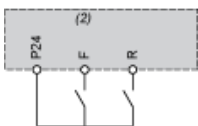
“Source” position



“Sink” position

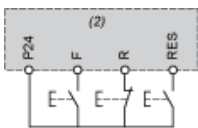


2-wire control



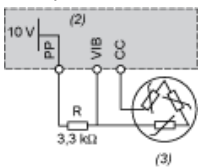
- F: Forward
- R: Preset speed
- (2) ATV 212 control terminals

3-wire control



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

PTC probe



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

Analogue Inputs

Voltage analogue inputs



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



(2) ATV 212 control terminals

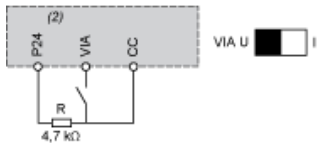
(5) Source 0-20 mA, 4-20 mA, X-Y mA

Analog input VIA configured as positive logic input ("Source" position)



(2) ATV 212 control terminals

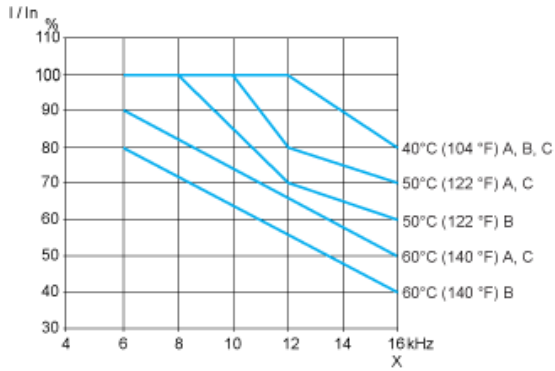
Analog input VIA configured as negative logic input ("Sink" position)



(2) ATV 212 control terminals

Derating Curves

The derating curves for the drive nominal current (I_n) depend on the temperature, 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