# Product data sheet

## Specifications

variable speed drive, Altivar 212, 1.5kW, 2hp, 480V, 3 phases, with EMC, IP21

**ATV212HU1SN4**

Product availability: Stock - Normally stocked in distribution facility

**Price*: 662.40 USD

### Main

<table>
<thead>
<tr>
<th>Device short name</th>
<th>ATV212</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product destination</td>
<td>Asynchronous motors</td>
</tr>
<tr>
<td>Phase</td>
<td>3 phase</td>
</tr>
<tr>
<td>Motor power kW</td>
<td>1.5 kW</td>
</tr>
<tr>
<td>Maximum Horse Power Rating</td>
<td>2 hp</td>
</tr>
<tr>
<td>Supply voltage limits</td>
<td>323…528 V</td>
</tr>
<tr>
<td>Supply frequency</td>
<td>50...60 Hz - 6...5 %</td>
</tr>
</tbody>
</table>
| Line current | 2.5 A 480 V  
3.2 A 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 | APOGEE FLN  
BACnet  
Modbus  
LonWorks  
METASYS N2 |
| [Us] rated supply voltage | 380...480 V - 15...10 % |
| EMC filter | Class C2 EMC filter integrated |
| IP degree of protection | IP21 |

### Complementary

<table>
<thead>
<tr>
<th>Apparent power</th>
<th>2.8 kVA 380 V</th>
</tr>
</thead>
</table>
| Continuous output current | 3.7 A 380 V  
3.7 A 460 V |
| Maximum transient current | 4 A 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 | for DC bus energized 1 LED (red) |
| Output voltage | <= power supply voltage |

* Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.
## Isolation
- Electrical between power and control

## Type of cable
- Without mounting kit: 1 IEC cable 113°F (45°C), copper: 90°C / XLPE/EPR
- With UL Type 1 kit: 3 UL 508 cable 104°F (40°C), copper: 75°C / PVC

## Electrical connection
- VIA, VIB, FM, FLA, FLB, FLC, RC, R, RES terminal: 0.00 in² (2.5 mm²) / AWG 14
- L1/R, L2/S, L3/T terminal: 0.01 in² (6 mm²) / 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, RC, R, RES

## Supply
- Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 A overload and short-circuit protection
- Internal supply: 24 V DC 21…27 V), <200 A overload and short-circuit protection

## 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
- RC, R 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 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 type
- Configurable relay logic FLA, FLC) NO - 100000 cycles
- Configurable relay logic FLB, FLC) NC - 100000 cycles
- Configurable relay logic RC, R) 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

## Dielectric strength
- 3535 V DC between earth and power terminals
- 5092 V DC between control and power terminals
- >= 1 mOhm 500 V DC for 1 minute

## Insulation resistance
- 5092 V DC between control and power terminals

## Frequency resolution
- Display unit: 0.1 Hz
- Analog input: 0.024 Hz

## Communication Service
- Read device identification (43)
- Time out setting from 0.1 to 100 s
- Monitoring inhibitable
- Write single register (06)
- Read holding registers (03) 2 words maximum
- Write multiple registers (16) 2 words maximum

## Option card
- Communication card LonWorks

## Power dissipation in W
- 78 W

## Air flow
- 7132.77 Gal/hr (27 m³/h)

## Functionality
- HVAC

## Specific application
- HVAC

## Variable speed drive application selection
- Building - HVAC compressor for scroll
- Building - HVAC fan
- Building - HVAC pump

## Motor power range AC-3
- 1.1…2 kW 380…440 V 3 phase
- 1.1…2 kW 480…500 V 3 phase

## Motor starter type
- Variable speed drive
<table>
<thead>
<tr>
<th>Discrete output number</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analogue input number</td>
<td>2</td>
</tr>
</tbody>
</table>
| 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 |
| Analogue output number | 1 |
| Physical interface     | 2-wire RS 485 |
| Connector Type         | 1 open style  
                        | 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 - Energy Saving, quadratic U/f  
                             | Voltage/frequency ratio, 5 points  
                             | Voltage/frequency ratio, automatic IR compensation (U/f + automatic Uo)  
                             | Voltage/frequency ratio, 2 points  
                             | Flux vector control without sensor, standard |
| Torque accuracy        | +/- 15 % |
| Transient overtorque   | 120 % of nominal motor torque +/- 10 % 60 s |
| Acceleration and deceleration ramps | Linear adjustable separately from 0.01 to 3200 s  
                                       | Automatic based on the load |
| Motor slip compensation | Adjustable  
                         | Not available in voltage/frequency ratio motor control  
                         | Automatic whatever the load |
| Switching frequency    | 6…16 kHz adjustable  
                        | 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  
                        | 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 |
| Width                  | 4.21 in (107 mm) |
| Height                 | 5.63 in (143 mm) |
| Depth                  | 5.91 in (150 mm) |
| Net Weight             | 4.41 lb(US) (2 kg) |
| Environment            | 2 IEC 61800-5-1  
                        | IP20 on upper part without blanking plate on cover EN/IEC 61800-5-1  
                        | IP20 on upper part without blanking plate on cover EN/IEC 60529  
                        | IP21 EN/IEC 61800-5-1  
                        | IP21 EN/IEC 60529  
                        | IP41 on upper part EN/IEC 61800-5-1 |

Nov 18, 2023
Vibration resistance
1.5 mm 3…13 Hz/EN/IEC 60529-2-6
1 mm 13…200 Hz/EN/IEC 60529-2-8

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
51 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 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)
104…122 °F (40…50 °C) with derating factor)

Operating position
Vertical +/- 10 degree

Product Certifications
UL
NOM 117
C-tick
CSA

Marking
CE

Standards
EN 55011 class A group 1
EN 61800-3 environments 2 category C1
EN 61800-3 category C3
IEC 61800-3
IEC 61800-3 environments 2 category C2
IEC 61800-3 environments 2 category C1
IEC 61800-3 environments 1 category C3
UL Type 1
IEC 61800-3 environments 2 category C3
IEC 61800-3 environments 1 category C2
EN 61800-3 environments 1 category C3
EN 61800-3
EN 61800-3 environments 1 category C2
EN 61800-3 environments 2 category C3
IEC 61800-3 environments 1 category C1
EN 61800-5-1
IEC 61800-3 category C3
IEC 61800-3 category C2
IEC 61800-5-1
EN 61800-3 category C2
EN 61800-3 environments 1 category C1
EN 61800-3 environments 2 category C2

Assembly style
With heat sink

Electromagnetic compatibility
Electrostatic discharge immunity test level 3 IEC 61000-4-2
Radiated radio-frequency electromagnetic field immunity test level 3 IEC 61000-4-3
Electrical fast transient/burst immunity test level 4 IEC 61000-4-4
1.2/50 µs - 8/20 µs surge immunity test level 3 IEC 61000-4-5
Conducted radio-frequency immunity test level 3 IEC 61000-4-6
Voltage dips and interruptions immunity test IEC 61000-4-11

Regulation loop
Adjustable PI regulator

Ambient Air Temperature for Storage
-13…158 °F (-25…70 °C)

Ordering and shipping details
Category
22157-ATV212 1 - 25 HP 460 VOLT

Discount Schedule
CP4D

GTIN
3606480322457

Returnability
Yes

Country of origin
ID

Packing Units
Unit Type of Package 1
PCE

Number of Units in Package 1
1
**Package 1**

- **Height**: 7.68 in (19.500 cm)
- **Width**: 7.68 in (19.500 cm)
- **Length**: 8.86 in (22.500 cm)
- **Weight**: 4.26 lb(US) (1.933 kg)

**Unit Type of Package 2**: P06

- **Number of Units in Package 2**: 27
- **Height**: 29.53 in (75.000 cm)
- **Width**: 23.62 in (60.000 cm)
- **Length**: 31.50 in (80.000 cm)
- **Weight**: 143.72 lb(US) (65.191 kg)

**Offer Sustainability**

- **California proposition 65**: WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
- **REACh Regulation**: REACh Declaration
- **EU RoHS Directive**: Pro-active compliance (Product out of EU RoHS legal scope)
  - **EU RoHS Declaration**: EU RoHS Declaration
- **Mercury free**: Yes
- **China RoHS Regulation**: China RoHS declaration
- **RoHS exemption information**: Yes
- **WEEE**: The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.

**Contractual warranty**

- **Warranty**: 18 months
Dimensions

Dimensions in mm

<table>
<thead>
<tr>
<th>ATV212H</th>
<th>a</th>
<th>b</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>075M3X...U22M3X</td>
<td>107</td>
<td>143</td>
<td>93</td>
<td>121.5</td>
<td>5</td>
<td>16.5</td>
<td>2 x Ø5</td>
</tr>
<tr>
<td>075N4...U22N4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U30M3X, U40M3X</td>
<td>142</td>
<td>184</td>
<td>126</td>
<td>157</td>
<td>6.5</td>
<td>20.5</td>
<td>4 x Ø5</td>
</tr>
<tr>
<td>U30N4...U55N4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dimensions in in.

<table>
<thead>
<tr>
<th>ATV212H</th>
<th>a</th>
<th>b</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>075M3X...U22M3X</td>
<td>4.21</td>
<td>5.63</td>
<td>3.66</td>
<td>4.78</td>
<td>0.20</td>
<td>0.65</td>
<td>2 x Ø0.20</td>
</tr>
<tr>
<td>075N4...U22N4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U30M3X, U40M3X</td>
<td>5.59</td>
<td>7.24</td>
<td>4.96</td>
<td>6.18</td>
<td>0.26</td>
<td>0.81</td>
<td>4 x Ø0.20</td>
</tr>
<tr>
<td>U30N4...U55N4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Plate for EMC mounting (supplied with the drive)

Dimensions in mm

<table>
<thead>
<tr>
<th>ATV212H</th>
<th>b1</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>075M3X...U22M3X</td>
<td>49</td>
<td>67.3</td>
</tr>
<tr>
<td>075N4...U22N4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U30M3X, U40M3X</td>
<td>48</td>
<td>88.8</td>
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<tr>
<td>U30N4...U55N4</td>
<td></td>
<td></td>
</tr>
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Dimensions in in.

<table>
<thead>
<tr>
<th>ATV212H</th>
<th>b1</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>075M3X...U22M3X</td>
<td>1.93</td>
<td>2.65</td>
</tr>
<tr>
<td>075N4...U22N4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U30M3X, U40M3X</td>
<td>1.89</td>
<td>3.50</td>
</tr>
<tr>
<td>U30N4...U55N4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

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.
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: GBC2B05
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)

- VIA: U
- VIB: PTC

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

- I: U

Selection of logic type

- Sink: PLC
- Source: (1) negative logic
- (2) positive logic

Nov 18, 2023
Logic Inputs According to the Position of the Logic Type Switch

"Source" position

"Sink" position

"PLC" position with PLC transistor outputs

2-wire control

3-wire control

PTC probe

Analog Inputs

Voltage analog inputs

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

**Recommended replacement(s)**