### Characteristics

**ATV31HU40M3X**

variable speed drive ATV31 - 4kW - 240V 3-phase supply - IP20

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**Main**

- **Range of product**: Altivar
- **Product or component type**: Variable speed drive
- **Product specific application**: Simple machine
- **Component name**: ATV31
- **Assembly style**: With heat sink
- **EMC filter**: Without EMC filter
- **[Us] rated supply voltage**: 200...240 V - 5...5 %
- **Supply frequency**: 50...60 Hz - 5...5 %
- **Network number of phases**: 3 phases
- **Motor power kW**: 4 kW 4 kHz
- **Motor power hp**: 5 hp 4 kHz
- **Line current**: 21.1 A at 240 V 24.2 A at 200 V, Isc = 1 kA
- **Apparent power**: 8.4 kVA
- **Prospective line Isc**: 1 kA
- **Nominal output current**: 17.5 A 4 kHz
- **Maximum transient current**: 26.3 A for 60 s
- **Power dissipation in W**: 180 W at nominal load
- **Asynchronous motor control profile**: Sensorless flux vector control with PWM type motor control signal
  Factory set : constant torque
- **Analogue input number**: 3

**Complementary**

- **Product destination**: Asynchronous motors
- **Supply voltage limits**: 170…264 V
- **Network frequency**: 47.5…63 Hz
- **Output frequency**: 0.0005…0.5 kHz
- **Nominal switching frequency**: 4 kHz
- **Switching frequency**: 2…16 kHz adjustable
- **Speed range**: 1…50
- **Transient overtorque**: 150…170 % of nominal motor torque
- **Braking torque**: <= 150 % during 60 s with braking resistor 100 % with braking resistor continuously

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Jun 18, 2020

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications.
150% without braking resistor

**Regulation loop**
- Frequency PI regulator

**Motor slip compensation**
- Suppressable
- Automatic whatever the load
- Adjustable

**Output voltage**
- <= power supply voltage

**Electrical connection**
- AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6 terminal 2.5 mm² AWG 14
- L1, L2, L3, U, V, W, PA, PB, PA/+ , PC/- terminal 2.5 mm² AWG 14

**Tightening torque**
- AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6: 0.6 N.m
- L1, L2, L3, U, V, W, PA, PB, PA/+ , PC/-: 0.8 N.m

**Insulation**
- Electrical between power and control

**Supply**
- Internal supply for logic inputs: 19...30 V 100 mA, protection type: overload and short-circuit protection
- Internal supply for reference potentiometer (2.2 to 10 kOhm): 10...10.8 V 10 mA, protection type: overload and short-circuit protection

**Analog input type**
- AI3 configurable current 0...20 mA, impedance: 250 Ohm
- AI1 configurable voltage 0...10 V, input voltage 30 V max, impedance: 30000 Ohm
- AI2 configurable voltage +/- 10 V, input voltage 30 V max, impedance: 30000 Ohm

**Sampling duration**
- LI1...LI6: 4 ms discrete
- AI1, AI2, AI3: 8 ms analog

**Response time**
- AOV, AOC 8 ms for analog
- R1A, R1B, R1C, R2A, R2B 8 ms for discrete

**Linearity error**
- +/- 0.2 % for output

**Analog output number**
- 2

**Analog output type**
- AOC configurable current: 0...20 mA, impedance: 800 Ohm, resolution: 8 bits
- AOV configurable voltage: 0...10 V, impedance: 470 Ohm, resolution: 8 bits

**Discrete input logic**
- Positive logic (source) (LI1...LI6), < 5 V (state 0), > 11 V (state 1)
- Logic input not wired (LI1...LI4), < 13 V (state 1)
- Negative logic (source) (LI1...LI6), > 19 V (state 0)

**Discrete output number**
- 2

**Discrete output type**
- Configurable relay logic: (R1A, R1B, R1C) 1 NO + 1 NC - 100000 cycles
- Configurable relay logic: (R2A, R2B) NC - 100000 cycles

**Minimum switching current**
- R1-R2 10 mA at 5 V DC

**Maximum switching current**
- R1-R2: 2 A at 250 V AC inductive load, cos phi = 0.4 and L/R = 7 ms
- R1-R2: 2 A at 30 V DC inductive load, cos phi = 0.4 and L/R = 7 ms
- R1-R2: 5 A at 250 V AC resistive load, cos phi = 1 and L/R = 0 ms
- R1-R2: 5 A at 30 V DC resistive load, cos phi = 1 and L/R = 0 ms

**Discrete input number**
- 6

**Discrete input type**
- (LI1...LI6) programmable at 24 V, 0...100 mA for PLC, impedance: 3500 Ohm

**Acceleration and deceleration ramps**
- Linear adjustable separately from 0.1 to 999.9 s
- S, U or customized

**Braking to standstill**
- By DC injection

**Protection type**
- Input phase breaks: drive
- Line supply overvoltage and undervoltage safety circuits: drive
- Line supply phase loss safety function, for three phases supply: drive
- Motor phase breaks: drive
- Overcurrent between output phases and earth (on power up only): drive
- Overheating protection: drive
- Short-circuit between motor phases: drive
- Thermal protection: motor

**Insulation resistance**
- >= 500 mOhm 500 V DC for 1 minute

**Display type**
- 1 LED (red) for drive voltage
- Four 7-segment display units for CANopen bus status

**Time constant**
- 5 ms for reference change

**Frequency resolution**
- Display unit: 0.1 Hz
- Analog input: 0.1...100 Hz

**Connector type**
- 1 RJ45 for CANopen via VW3 CANTAP2 adaptor
- 1 RJ45 for Modbus

**Physical interface**
- RS485 multidrop serial link for CANopen via VW3 CANTAP2 adaptor
- RS485 multidrop serial link for Modbus

**Transmission frame**
- RTU for CANopen via VW3 CANTAP2 adaptor
- RTU for Modbus
<table>
<thead>
<tr>
<th><strong>Transmission rate</strong></th>
<th>10, 20, 50, 125, 250, 500 kbps or 1 Mbps for CANopen via VW3 CANTAP2 adaptor 4800, 9600 or 19200 bps for Modbus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of addresses</strong></td>
<td>1…127 for CANopen via VW3 CANTAP2 adaptor 1…247 for Modbus</td>
</tr>
<tr>
<td><strong>Number of drive</strong></td>
<td>127 for CANopen via VW3 CANTAP2 adaptor 31 for Modbus</td>
</tr>
<tr>
<td><strong>Marking</strong></td>
<td>CE</td>
</tr>
<tr>
<td><strong>Operating position</strong></td>
<td>Vertical +/- 10 degree</td>
</tr>
<tr>
<td><strong>Outer dimension</strong></td>
<td>184 x 140 x 150 mm</td>
</tr>
<tr>
<td><strong>Net weight</strong></td>
<td>2.9 kg</td>
</tr>
</tbody>
</table>

**Environment**

<table>
<thead>
<tr>
<th><strong>Dielectric strength</strong></th>
<th>2040 V DC between earth and power terminals 2880 V AC between control and power terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electromagnetic compatibility</strong></td>
<td>1.2/50 µs - 8/20 µs 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 Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2 Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3</td>
</tr>
<tr>
<td><strong>Standards</strong></td>
<td>EN 50178</td>
</tr>
<tr>
<td><strong>Product certifications</strong></td>
<td>UL CSA N998 C-Tick</td>
</tr>
<tr>
<td><strong>Pollution degree</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Protective treatment</strong></td>
<td>TC</td>
</tr>
<tr>
<td><strong>Vibration resistance</strong></td>
<td>1 gn (f= 13…150 Hz) conforming to EN/IEC 60068-2-6 1.5 mm (f= 3…13 Hz) conforming to EN/IEC 60068-2-6</td>
</tr>
<tr>
<td><strong>Shock resistance</strong></td>
<td>15 gn for 11 ms conforming to EN/IEC 60068-2-27</td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
<td>5…95 % without condensation conforming to IEC 60068-2-3 5…95 % without dripping water conforming to IEC 60068-2-3</td>
</tr>
<tr>
<td><strong>Ambient air temperature for storage</strong></td>
<td>-25…70 °C</td>
</tr>
<tr>
<td><strong>Ambient air temperature for operation</strong></td>
<td>-10…50 °C without derating (with protective cover on top of the drive) -10…60 °C with derating factor (without protective cover on top of the drive)</td>
</tr>
<tr>
<td><strong>Operating altitude</strong></td>
<td>&lt;= 1000 m without derating &gt;= 1000 m with current derating 1 % per 100 m</td>
</tr>
</tbody>
</table>

**Packing Units**

<table>
<thead>
<tr>
<th><strong>Package 1 Weight</strong></th>
<th>2.676 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package 1 Height</strong></td>
<td>2.150 dm</td>
</tr>
<tr>
<td><strong>Package 1 width</strong></td>
<td>2.100 dm</td>
</tr>
<tr>
<td><strong>Package 1 Length</strong></td>
<td>2.620 dm</td>
</tr>
</tbody>
</table>

**Contractual warranty**

| **Warranty** | 18 months |

ATV31HU40M3X is replaced by:
Variable speed drives ATV312HU40M3
variable speed drive ATV312 - 4kW - 8.4kVA - 180 W - 200..240 V - 3-phase supply
Qty 1
Reason for Substitution: End of life | Substitution date: 20 April 2009