



### Main

|                            |   |
|----------------------------|---|
| Range of product           | Altivar Process ATV900  |
| Product or component type  | Variable speed drive  |
| Device application         | Industrial application  |
| Device short name          | ATV930  |
| Variant                    | Standard version<br>With braking chopper  |
| Product destination        | Asynchronous motors<br>Synchronous motors   |
| EMC filter                 | Integrated 164.04 ft (50 m) EN/IEC 61800-3 category C2<br>Integrated 492.13 ft (150 m) EN/IEC 61800-3 category C3 |
| IP degree of protection    | IP21 IEC 61800-5-1<br>IP21 IEC 60529  |
| Degree of protection       | UL type 1 UL 508C   |
| Type of cooling            | Forced convection   |
| Supply frequency           | 50...60 Hz +/- 5 %  |
| Phase                      | 3 phase   |
| [Us] rated supply voltage  | 380...480 V - 15...10 %   |
| Motor power kW             | 11 kW normal duty)<br>7.5 kW heavy duty)  |
| Maximum Horse Power Rating | 15 hp normal duty<br>10 hp heavy duty   |
| Line current               | 19.8 A 380 V normal duty)<br>17 A 480 V normal duty)<br>14.1 A 380 V heavy duty)<br>12.5 A 480 V heavy duty)      |
| Prospective line Isc       | 50 kA   |
| Apparent power             | 14.1 kVA 480 V normal duty)<br>10.4 kVA 480 V heavy duty)   |
| Continuous output current  | 23.5 A 4 kHz normal duty  |

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

|                                    |  |
|------------------------------------|--|
|                                    | 16.5 A 4 kHz heavy duty  |
| Maximum transient current          | 28.2 A 60 s normal duty)<br>24.8 A 60 s heavy duty)  |
| Asynchronous motor control profile | Variable torque standard<br>Optimized torque mode<br>Constant torque standard  |
| Synchronous motor control profile  | Permanent magnet motor<br>Synchronous reluctance motor   |
| Speed drive output frequency       | 0.1...599 Hz   |
| Nominal switching frequency        | 4 kHz  |
| Switching frequency                | 2...16 kHz adjustable<br>4...16 kHz with derating factor   |
| Safety function                    | STO (safe torque off) SIL 3  |
| Number of preset speeds            | 16 preset speeds   |
| Communication port protocol        | Ethernet/IP<br>Modbus serial<br>Modbus TCP   |
| Option module                      | Slot A communication module Profibus DP V1<br>Slot A communication module Profinet<br>Slot A communication module DeviceNet<br>Slot A communication module EtherCAT<br>Slot A communication module CANopen daisy chain RJ45<br>Slot A communication module CANopen SUB-D 9<br>Slot A communication module CANopen screw terminals<br>Slot A/slot B/slot C digital and analog I/O extension module<br>Slot A/slot B/slot C output relay extension module<br>Slot B 5/12 V digital encoder interface module<br>Slot B analog encoder interface module<br>Slot B resolver encoder interface module<br>communication module Ethernet Powerlink |

## Complementary

|                                     |  |
|-------------------------------------|--|
| Output voltage                      | <= power supply voltage  |
| Motor slip compensation             | Adjustable<br>Automatic whatever the load<br>Can be suppressed<br>Not available in permanent magnet motor law  |
| Acceleration and deceleration ramps | Linear adjustable separately from 0.01...9999 s  |
| Braking to standstill               | By DC injection  |
| Protection type                     | Thermal protection motor<br>Safe torque off motor<br>Motor phase break motor<br>Thermal protection drive<br>Safe torque off drive<br>Overheating drive<br>Overcurrent between output phases and earth drive<br>Overload of output voltage drive<br>Short-circuit protection drive<br>Motor phase break drive<br>Overvoltages on the DC bus drive<br>Line supply overvoltage drive<br>Line supply undervoltage drive<br>Line supply phase loss drive<br>Overspeed drive<br>Break on the control circuit drive |
| Frequency resolution                | Display unit 0.1 Hz<br>Analog input 0.012/50 Hz  |
| Electrical connection               | Control screw terminal 0.5...1.5 mm <sup>2</sup> AWG 20...AWG 16<br>Motor screw terminal 6...10 mm <sup>2</sup> AWG 10...AWG 8<br>Line side screw terminal 6 mm <sup>2</sup> AWG 10<br>DC bus screw terminal 6 mm <sup>2</sup> AWG 10  |
| Connector type                      | 2 RJ45 Ethernet IP/Modbus TCP on the control block<br>1 RJ45 Modbus serial on the control block  |
| Physical interface                  | 2-wire RS 485 Modbus serial  |
| Transmission frame                  | RTU Modbus serial  |

|                           |  |
|---------------------------|--|
| Transmission rate         | 10/100 Mbit/s Ethernet IP/Modbus TCP<br>4.8, 9.6, 19.2, 38.4 kbit/s Modbus serial  |
| Exchange mode             | Half duplex, full duplex, autonegotiation Ethernet IP/Modbus TCP   |
| Data format               | 8 bits, configurable odd, even or no parity Modbus serial  |
| Type of polarization      | No impedance Modbus serial   |
| Number of addresses       | 1...247 Modbus serial  |
| Method of access          | Slave Modbus TCP   |
| Supply                    | External supply for digital inputs 24 V DC 19...30 V), <1.25 mA overload and short-circuit protection<br>Internal supply for reference potentiometer (1 to 10 kOhm) 10.5 V DC +/- 5 %, <10 mA overload and short-circuit protection<br>Internal supply for digital inputs and STO 24 V DC 21...27 V), <200 mA overload and short-circuit protection  |
| Local signalling          | Local diagnostic 3 LED mono/dual colour)<br>Embedded communication status 5 LED dual colour)<br>Communication module status 2 LED dual colour)<br>Presence of voltage 1 LED red)   |
| Width                     | 6.73 in (171 mm)   |
| Maximum Height            | 16.10 in (409 mm)  |
| Depth                     | 9.29 in (236 mm)   |
| Net weight                | 16.98 lb(US) (7.7 kg)  |
| Analogue input number     | 3  |
| Analogue input type       | AI1, AI2, AI3 software-configurable voltage 0...10 V DC 30 kOhm 12 bits<br>AI1, AI2, AI3 software-configurable current 0...20 mA/4...20 mA 250 Ohm 12 bits   |
| Discrete input number     | 10   |
| Discrete input type       | DI1...DI8 programmable, 24 V DC <= 30 V)3.5 kOhm<br>DI7, DI8 programmable as pulse input 0...30 kHz, 24 V DC <= 30 V)<br>STOA, STOB safe torque off, 24 V DC <= 30 V)> 2.2 kOhm  |
| Input compatibility       | DI1...DI8 discrete input level 1 PLC EN/IEC 61131-2<br>DI7, DI8 pulse input level 1 PLC IEC 65A-68<br>STOA, STOB discrete input level 1 PLC EN/IEC 61131-2   |
| Discrete input logic      | Positive logic (source) DI1...DI8), < 5 V, > 11 V<br>Negative logic (sink) DI1...DI8), > 16 V, < 10 V<br>Positive logic (source) DI7, DI8), < 0.6 V, > 2.5 V<br>Positive logic (source) STOA, STOB), < 5 V, > 11 V   |
| Analogue output number    | 2  |
| Analogue output type      | Software-configurable voltage AQ1, AQ2 0...10 V DC 470 Ohm 10 bits<br>Software-configurable current AQ1, AQ2 0...20 mA 500 Ohm 10 bits   |
| Discrete output number    | 2  |
| Discrete output type      | Logic output DQ+ 0...1 kHz <= 30 V DC 100 mA<br>Programmable as pulse output DQ+ 0...30 kHz <= 30 V DC 20 mA<br>Logic output DQ- 0...1 kHz <= 30 V DC 100 mA   |
| Sampling duration         | 2 ms +/- 0.5 ms DI1...DI8) - discrete input<br>5 ms +/- 1 ms DI7, DI8) - pulse input<br>1 ms +/- 1 ms AI1, AI2, AI3) - analog input<br>5 ms +/- 1 ms AQ1, AQ2) - analog output   |
| Accuracy                  | +/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input<br>+/- 1 % AQ1, AQ2 for a temperature variation 60 °C analog output   |
| Linearity error           | AI1, AI2, AI3 +/- 0.15 % of maximum value analog input<br>AQ1, AQ2 +/- 0.2 % analog output   |
| Maximum switching current | Relay output R1 resistive, cos phi = 1 3 A 250 V AC<br>Relay output R1 resistive, cos phi = 1 3 A 30 V DC<br>Relay output R1 inductive, cos phi = 0.4 7 ms 2 A 250 V AC<br>Relay output R1 inductive, cos phi = 0.4 7 ms 2 A 30 V DC<br>Relay output R2, R3 resistive, cos phi = 1 5 A 250 V AC<br>Relay output R2, R3 resistive, cos phi = 1 5 A 30 V DC<br>Relay output R2, R3 inductive, cos phi = 0.4 7 ms 2 A 250 V AC<br>Relay output R2, R3 inductive, cos phi = 0.4 7 ms 2 A 30 V DC |
| Relay output number       | 3  |
| Relay output type         | Configurable relay logic R1 fault relay NO/NC 100000 cycles<br>Configurable relay logic R2 sequence relay NO 1000000 cycles<br>Configurable relay logic R3 sequence relay NO 1000000 cycles  |
| Refresh time              | Relay output R1, R2, R3)5 ms +/- 0.5 ms)   |
| Minimum switching current | Relay output R1, R2, R3 5 mA 24 V DC   |

|  |  |
|--|--|
| Isolation                                  | Between power and control terminals  |
| Variable speed drive application selection | Mixer Food and beverage processing<br>Conveyor Food and beverage processing<br>Shredder Food and beverage processing<br>Process crane Hoisting<br>Thruster Marine<br>Winch Marine<br>Press Material working (wood, ceramic, stone, pvc, metal)<br>Extruder Material working (wood, ceramic, stone, pvc, metal)<br>Other application Mining mineral and metal<br>Drilling rig Oil and gas<br>Progressive cavity pump Oil and gas<br>Rod pump Oil and gas<br>Swapping pump Oil and gas<br>Compressor for regasification Oil and gas<br>Separator Oil and gas<br>Other application Oil and gas<br>Separator Water and waste water |
| Power range                                | 7...11 kW 380...440 V 3 phase<br>7...11 kW 480...500 V 3 phase   |
| Mounting mode                              | Wall mount   |

## Environment

|                                       |  |
|---------------------------------------|--|
| Insulation resistance                 | > 1 MOhm 500 V DC for 1 minute to earth  |
| Noise level                           | 56 dB 86/188/EEC   |
| Power dissipation in W                | Natural convection 51 W 380 V 4 kHz<br>Forced convection 255 W 380 V 4 kHz   |
| Vibration resistance                  | 1.5 mm peak to peak 2...13 Hz)IEC 60068-2-6<br>1 gn 13...200 Hz)IEC 60068-2-6  |
| Shock resistance                      | 15 gn 11 ms IEC 60068-2-27   |
| Volume of cooling air                 | 27210.21 Gal/hr(US) (103 m3/h)   |
| Operating position                    | Vertical +/- 10 degree   |
| Maximum THDI                          | <48 % from 80...100 % of load IEC 61000-3-12   |
| Electromagnetic compatibility         | 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>Electrical fast transient/burst immunity test level 4 IEC 61000-4-4<br>1.2/50 µs - 8/20 µs surge immunity test level 3 IEC 61000-4-5<br>Conducted radio-frequency immunity test level 3 IEC 61000-4-6 |
| Environmental characteristic          | Chemical pollution resistance class 3C3 EN/IEC 60721-3-3<br>Dust pollution resistance class 3S3 EN/IEC 60721-3-3   |
| Pollution degree                      | 2 EN/IEC 61800-5-1   |
| Relative humidity                     | 5...95 % without condensation IEC 60068-2-3  |
| Ambient air temperature for operation | 5...122 °F (-15...50 °C) without derating)<br>122...140 °F (50...60 °C) with derating factor)  |
| Ambient air temperature for storage   | -40...158 °F (-40...70 °C)   |
| Operating altitude                    | <= 3280.84 ft (1000 m) without derating<br>1000...4800 m with current derating 1 % per 100 m   |
| Standards                             | UL 508C<br>EN/IEC 61800-3<br>Environment 1 category C2 EN/IEC 61800-3<br>Environment 2 category C3 EN/IEC 61800-3<br>EN/IEC 61800-5-1<br>IEC 61000-3-12<br>IEC 60721-3<br>IEC 61508<br>IEC 13849-1   |
| Product certifications                | UL<br>REACH<br>TÜV<br>CSA  |
| Marking                               | CE   |

## Ordering and shipping details

|                       |                             |
|-----------------------|-----------------------------|
| Category              | 22276 - ATV930 FRAMES 1 & 2 |
| Discount Schedule     | CP4E                        |
| GTIN                  | 00785901472124              |
| Nbr. of units in pkg. | 1                           |
| Package weight(Lbs)   | 23.13 lb(US) (10.49 kg)     |
| Returnability         | Yes                         |
| Country of origin     | ID                          |

## Packing Units

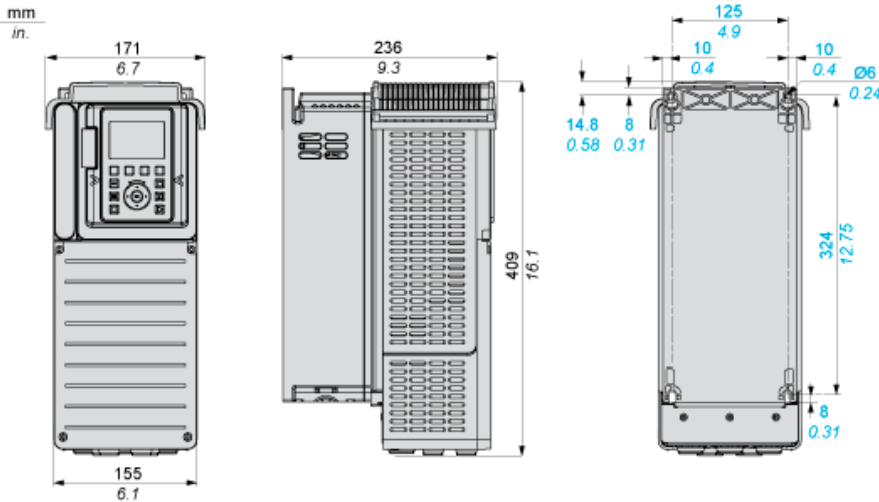
|                              |                         |
|------------------------------|-------------------------|
| Unit Type of Package 1       | PCE                     |
| Package 1 Height             | 13.78 in (35 cm)        |
| Package 1 width              | 8.46 in (21.5 cm)       |
| Package 1 Length             | 22.83 in (58 cm)        |
| Unit Type of Package 2       | P06                     |
| Number of Units in Package 2 | 3                       |
| Package 2 Weight             | 97.93 lb(US) (44.42 kg) |
| Package 2 Height             | 31.50 in (80 cm)        |
| Package 2 width              | 31.50 in (80 cm)        |
| Package 2 Length             | 23.62 in (60 cm)        |

## Offer Sustainability

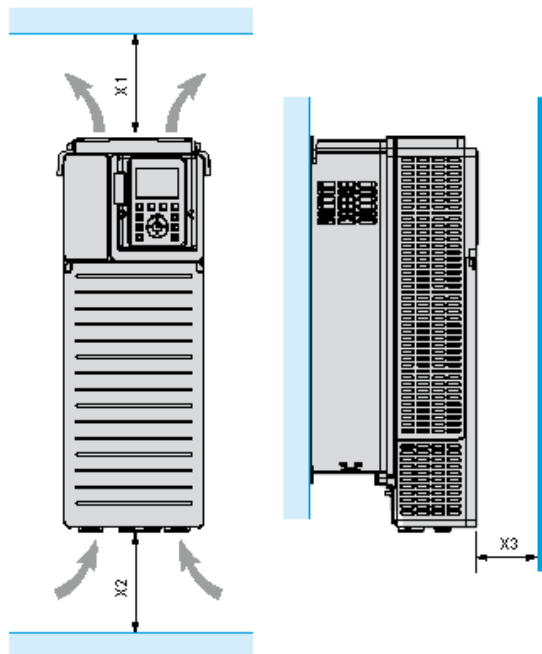
|                            |  |
|----------------------------|--|
| Sustainable offer status   | Green Premium product  |
| EU RoHS Directive          | Pro-active compliance (Product out of EU RoHS legal scope)<br><a href="#">EU RoHS Declaration</a>                            |
| Mercury free               | Yes  |
| RoHS exemption information | <a href="#">Yes</a>  |
| China RoHS Regulation      | <a href="#">China RoHS declaration</a>   |
| Environmental Disclosure   | <a href="#">Product Environmental Profile</a>  |
| Circularity Profile        | <a href="#">End of Life Information</a>  |
| WEEE                       | The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins. |

Dimensions

IP21 / UL Type 1 Drives - Front, Left Side and Rear View



Clearances

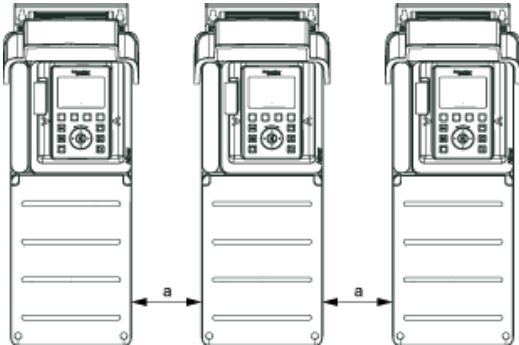


| X1                  | X2                  | X3                 |
|---------------------|---------------------|--------------------|
| ≥ 100 mm (3.94 in.) | ≥ 100 mm (3.94 in.) | ≥ 10 mm (0.39 in.) |

- Mount the device in a vertical position ( $\pm 10^\circ$ ). This is required for cooling the device.
- Do not mount the device close to heat sources.
- Leave sufficient free space so that the air required for cooling purposes can circulate from the bottom to the top of the drive.

Mounting Types

Mounting Type A: Individual IP21



$a \geq 100 \text{ mm (3.94 in.)}$

Mounting Type B: Side by Side IP20

