





## 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                | Synchronous motors<br>Asynchronous motors                                                                         |
| Mounting mode                      | Wall mount                                                                                                        |
| 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                     | 22 kW normal duty)<br>18.5 kW heavy duty)                                                                         |
| Maximum Horse Power Rating         | 30 Hp normal duty<br>25 hp heavy duty                                                                             |
| Line current                       | 39.6 A 380 V normal duty)<br>34.4 A 480 V normal duty)<br>34.1 A 380 V heavy duty)<br>29.9 A 480 V heavy duty)    |
| Prospective line Isc               | 50 kA                                                                                                             |
| Apparent power                     | 28.6 KVA 480 V normal duty)<br>24.9 kVA 480 V heavy duty)                                                         |
| Continuous output current          | 46.3 A 4 kHz normal duty<br>39.2 A 4 kHz heavy duty                                                               |
| Maximum transient current          | 55.6 A 60 s normal duty)<br>58.8 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 | Modbus serial<br>Ethernet/IP<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                      | $\leq$ 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>Line side screw terminal 10...16 mm <sup>2</sup> AWG 8...AWG 6<br>DC bus screw terminal 10...16 mm <sup>2</sup> AWG 8...AWG 6<br>Motor screw terminal 16 mm <sup>2</sup> AWG 6                                                                                                                                                                                                                                                            |
| 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                                      | 8.31 in (211 mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Height                                     | 21.49 in (545.9 mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Depth                                      | 9.25 in (235 mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Net weight                                 | 31.53 lb(US) (14.3 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 | Food and beverage processing Mixer<br>Food and beverage processing Conveyor<br>Food and beverage processing Shredder<br>Hoisting Process crane<br>Marine Thruster<br>Marine Winch<br>Material working (wood, ceramic, stone, pvc, metal) Press<br>Material working (wood, ceramic, stone, pvc, metal) Extruder<br>Mining mineral and metal Other application<br>Oil and gas Drilling rig<br>Oil and gas Progressive cavity pump<br>Oil and gas Rod pump<br>Oil and gas Swapping pump<br>Oil and gas Compressor for regasification<br>Oil and gas Separator<br>Oil and gas Other application<br>Water and waste water Separator |
| Power range                                | 15...25 KW 380...440 V 3 phase<br>15...25 kW 480...500 V 3 phase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Environment

|                                       |                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Insulation resistance                 | > 1 MOhm 500 V DC for 1 minute to earth                                                                                                                                                                                                                                                                                                                    |
| Noise level                           | 59.5 dB 86/188/EEC                                                                                                                                                                                                                                                                                                                                         |
| Power dissipation in W                | Natural convection 68 W 380 V 4 kHz<br>Forced convection 505 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                 | 56798.01 Gal/hr(US) (215 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<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<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                | CSA<br>REACH<br>UL<br>TÜV                                                                                                                                                                                                                                                                                                                                  |
| Marking                               | CE                                                                                                                                                                                                                                                                                                                                                         |

## Ordering and shipping details

|                     |                             |
|---------------------|-----------------------------|
| Category            | 22277 - ATV930 FRAMES 3 & 4 |
| Discount Schedule   | CP4E                        |
| GTIN                | 00785901659228              |
| Package weight(Lbs) | 17.02 kg (37.53 lb(US))     |
| Returnability       | Yes                         |
| Country of origin   | IN                          |

## Offer Sustainability

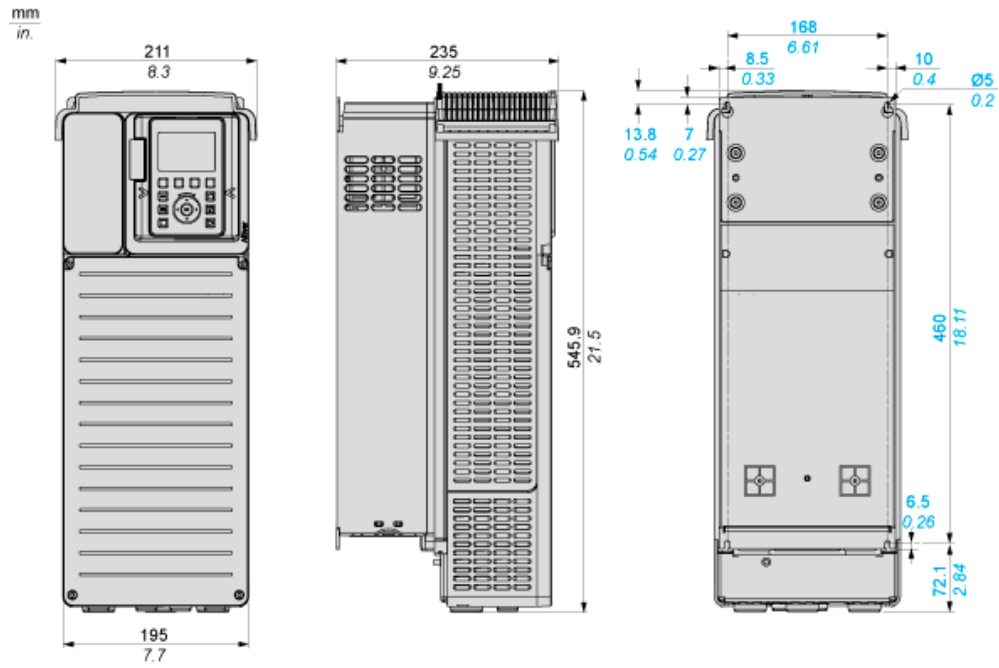
|                            |                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------|
| Sustainable offer status   | Green Premium product                                                                          |
| REACH Regulation           | <a href="#">REACH Declaration</a>                                                              |
| EU RoHS Directive          | Pro-active compliance (Product out of EU RoHS legal scope) <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>                                                  |

The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.

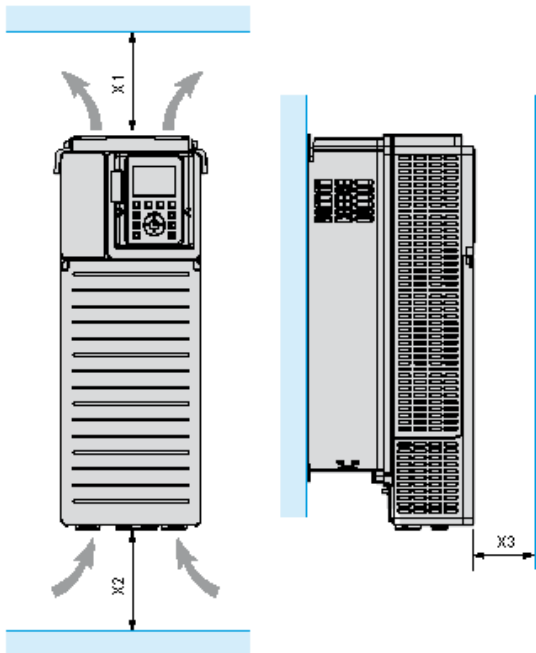
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Dimensions

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



Clearances

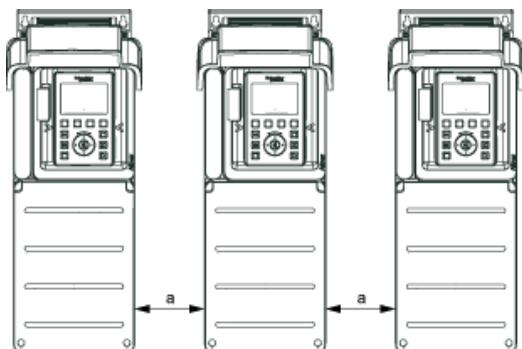


| X1                  | X2                  | X3                 |
|---------------------|---------------------|--------------------|
| ≥ 100 mm (3.94 in.) | ≥ 100 mm (3.94 in.) | ≥ 10 mm (0.39 in.) |

- 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

