# Product data sheet
## Characteristics

# ATV630D45N4
variable speed drive, Altivar Process ATV600, ATV630, 45kW, 60hp, 380 to 480V, IP21, UL type 1



## Main

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|---|---|
| Range of product | Altivar Process ATV600 |
| Product specific application | Process and utilities |
| Product or component type | Variable speed drive |
| Variant | Standard version |
| Device short name | ATV630 |
| Mounting mode | Wall mount |
| Communication port protocol | Modbus serial<br>Ethernet<br>Modbus TCP |
| [Us] rated supply voltage | 380...480 V - 15...10 % |
| [Us] rated supply voltage | 380...480 V |
| Relative symmetric mains voltage tolerance | 10 % |
| Relative symmetric network frequency tolerance | 5 % |
| Nominal output current | 88.0 A |
| IP degree of protection | IP21 |
| Product destination | Asynchronous motors<br>Synchronous motors |
| EMC filter | Integrated with 50 m conforming to IEC 61800-3 category C2<br>Integrated with 150 m conforming to IEC 61800-3 category C3 |
| IP degree of protection | IP21 conforming to IEC 61800-5-1<br>IP21 conforming to IEC 60529 |
| Degree of protection | UL type 1 conforming to UL 508C |
| Type of cooling | Forced convection |
| Supply frequency | 50...60 Hz - 5...5 % |
| Motor power kW | 45 KW (normal duty)<br>37 KW (heavy duty) |
| Motor power hp | 60 Hp normal duty<br>50 Hp heavy duty |
| Line current | 79.8 A at 380 V (normal duty)<br>69.1 A at 480 V (normal duty)<br>67.1 A at 380 V (heavy duty)<br>59 A at 480 V (heavy duty) |
| Continuous output current | 88 A at 4 kHz for normal duty<br>74.5 A at 4 kHz for heavy duty |
| Speed drive output frequency | 0.1…500 Hz |

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| Safety function | STO (safe torque off) SIL 3 |
| Option card | Slot A: communication module, Profibus DP V1<br>Slot A: communication module, PROFINET<br>Slot A: communication module, DeviceNet<br>Slot A: communication module, Modbus TCP/EtherNet/IP<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: digital and analog I/O extension module<br>Slot A/slot B: output relay extension module<br>Slot A: communication module, Ethernet IP/Modbus TCP/MD-Link<br>Communication module, BACnet MS/TP<br>Communication module, Ethernet Powerlink |

## Complementary

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| Discrete input number | 8 |
| Discrete input type | DI7, DI8 programmable as pulse input: 0…30 kHz, 24 V DC (<= 30 V) |
| Discrete input logic | 16 preset speeds |
| Discrete output number | 0 |
| Discrete output type | Relay outputs R1A, R1B, R1C 250 V AC 3000 mA<br>Relay outputs R1A, R1B, R1C 30 V DC 3000 mA<br>Relay outputs R2A, R2C 250 V AC 5000 mA<br>Relay outputs R2A, R2C 30 V DC 5000 mA<br>Relay outputs R3A, R3C 250 V AC 5000 mA<br>Relay outputs R3A, R3C 30 V DC 5000 mA |
| Analogue input number | 3 |
| Analogue input type | AI1, AI2, AI3 software-configurable voltage: 0...10 V DC, impedance: 31.5 kOhm, resolution 12 bits<br>AI1, AI2, AI3 software-configurable current: 0...20 mA, impedance: 250 Ohm, resolution 12 bits<br>AI2 voltage analog input: - 10...10 V DC, impedance: 31.5 kOhm, resolution 12 bits |
| Analogue output number | 2 |
| Analogue output type | Software-configurable voltage AQ1, AQ2: 0...10 V DC impedance 470 Ohm, resolution 10 bits<br>Software-configurable current AQ1, AQ2: 0...20 mA, resolution 10 bits<br>Software-configurable current DQ-, DQ+: 30 V DC<br>Software-configurable current DQ-, DQ+: 100 mA |
| Relay output number | 3 |
| Relay output type | Configurable relay logic R1: fault relay NO/NC electrical durability 100000 cycles<br>Configurable relay logic R2: sequence relay NO electrical durability 100000 cycles<br>Configurable relay logic R3: sequence relay NO electrical durability 100000 cycles |
| Maximum switching current | Relay output R1, R2, R3 on resistive load, cos phi = 1: 3 A at 250 V AC<br>Relay output R1, R2, R3 on resistive load, cos phi = 1: 3 A at 30 V DC<br>Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 250 V AC<br>Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 30 V DC |
| Minimum switching current | Relay output R1, R2, R3: 5 mA at 24 V DC |
| Network number of phases | 3 phases |
| Physical interface | Ethernet<br>2-wire RS 485 |
| Method of access | Slave Modbus TCP |
| Transmission rate | 10, 100 Mbits<br>4800 bps, 9600 bps, 19200 bps, 38.4 Kbps |
| Transmission frame | RTU |
| Output voltage | <= power supply voltage |
| Permissible temporary current boost | 1.1 x In during 60 s (normal duty)<br>1.5 x In during 60 s (heavy duty) |
| Data format | 8 bits, configurable odd, even or no parity |
| Type of polarization | No impedance |
| Frequency resolution | Display unit: 0.1 Hz<br>Analog input: 0.012/50 Hz |
| Electrical connection | Control: removable screw terminals 0.5...1.5 mm²/20 AWG...16 AWG<br>Line side: screw terminal 35...50 mm²/2 AWG...1 AWG<br>Motor: screw terminal 50 mm²/1 AWG |
| Connector type | RJ45 (on the remote graphic terminal) for Ethernet/Modbus TCP<br>RJ45 (on the remote graphic terminal) for Modbus serial |
| Exchange mode | Half duplex, full duplex, autonegotiation Ethernet/Modbus TCP |
| Number of addresses | 1…247 for Modbus serial |
| Supply | External supply for digital inputs: 24 V DC (19…30 V), <1.25 mA, protection type: overload and sh<br>Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 mA, protectio<br>Internal supply for digital inputs and STO: 24 V DC (21…27 V), <200 mA, protection type: overloa |

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| Local signalling | 3 LEDs for local diagnostic<br>3 LEDs (dual colour) for embedded communication status<br>4 LEDs (dual colour) for communication module status<br>1 LED (red) for presence of voltage |
| Input compatibility | DI1...DI6: discrete input level 1 PLC conforming to IEC 61131-2<br>DI5, DI6: discrete input level 1 PLC conforming to IEC 65A-68<br>STOA, STOB: discrete input level 1 PLC conforming to IEC 61131-2 |
| Discrete input logic | Positive logic (source) (DI1...DI8), < 5 V (state 0), > 11 V (state 1)<br>Negative logic (sink) (DI1...DI8), > 16 V (state 0), < 10 V (state 1) |
| Sampling duration | 2 Ms +/- 0.5 ms (DI1...DI4) - discrete input<br>5 Ms +/- 1 ms (DI5, DI6) - discrete input<br>5 Ms +/- 0.1 ms (AI1, AI2, AI3) - analog input<br>10 Ms +/- 1 ms (AO1) - analog output |
| Accuracy | +/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input<br>+/- 1 % AO1, AO2 for a temperature variation 60 °C analog output |
| Linearity error | AI1, AI2, AI3: +/- 0.15 % of maximum value for analog input<br>AO1, AO2: +/- 0.2 % for analog output |
| Refresh time | Relay output (R1, R2, R3): 5 ms (+/- 0.5 ms) |
| Isolation | Between power and control terminals |
| Discrete and process manufacturing | Building - HVAC compressor centrifugal<br>Food and beverage processing other application<br>Mining mineral and metal fan<br>Mining mineral and metal pump<br>Oil and gas fan<br>Water and waste water other application<br>Building - HVAC screw compressor<br>Food and beverage processing pump<br>Food and beverage processing fan<br>Food and beverage processing atomization<br>Oil and gas electro submersible pump (ESP)<br>Oil and gas water injection pump<br>Oil and gas jet fuel pump<br>Oil and gas compressor for refinery<br>Water and waste water centrifuge pump<br>Water and waste water positive displacement pump<br>Water and waste water electro submersible pump (ESP)<br>Water and waste water screw pump<br>Water and waste water lobe compressor<br>Water and waste water screw compressor<br>Water and waste water compressor centrifugal<br>Water and waste water fan<br>Water and waste water conveyor<br>Water and waste water mixer |
| Power range | 30…50 KW at 380…440 V 3 phases<br>30…50 KW at 480…500 V 3 phases |
| Enclosure mounting | Wall mounted |
| 4 quadrant operation possible | False |
| Asynchronous motor control profile | Constant torque standard<br>Optimized torque mode<br>Variable torque standard |
| Synchronous motor control profile | Permanent magnet motor<br>Synchronous reluctance motor |
| Maximum output frequency | 500 KHz |
| Acceleration and deceleration ramps | Linear adjustable separately from 0.01...9999 s |
| Motor slip compensation | Adjustable<br>Can be suppressed<br>Not available in permanent magnet motor law<br>Automatic whatever the load |
| Switching frequency | 2...12 kHz adjustable<br>4...12 kHz with derating factor |
| Nominal switching frequency | 4 kHz |
| Braking to standstill | By DC injection |
| Brake chopper integrated | False |
| Maximum input current | 79.8 A |
| Maximum output voltage | 480.0 V |
| Apparent power | 57.4 KVA at 480 V (normal duty)<br>49.1 KVA at 480 V (heavy duty) |
| Maximum transient current | 96.8 A during 60 s (normal duty)<br>111.8 A during 60 s (heavy duty) |
| Network frequency | 50...60 Hz |

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| Prospective line Isc | 50 KA |
| Base load current at high overload | 74.5 A |
| Base load current at low overload | 88.0 A |
| Power dissipation in W | Natural convection: 121 W at 380 V, switching frequency 4 kHz<br>Forced convection: 943 W at 380 V, switching frequency 4 kHz |
| With safety function Safely Limited Speed (SLS) | False |
| With safety function Safe brake management (SBC/SBT) | False |
| With safety function Safe Operating Stop (SOS) | False |
| With safety function Safe Position (SP) | False |
| With safety function Safe programmable logic | False |
| With safety function Safe Speed Monitor (SSM) | False |
| With safety function Safe Stop 1 (SS1) | False |
| With sft fct Safe Stop 2 (SS2) | False |
| With safety function Safe torque off (STO) | True |
| With safety function Safely Limited Position (SLP) | False |
| With safety function Safe Direction (SDI) | False |
| 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 |
| Quantity per set | 1 |
| Width | 226 Mm |
| Height | 673 Mm |
| Depth | 271 Mm |
| Net weight | 28.7 Kg |

## Environment

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|---|---|
| Insulation resistance | > 1 MOhm 500 V DC for 1 minute to earth |
| Noise level | 63.5 DB conforming to 86/188/EEC |
| Pollution degree | 2 conforming to IEC 61800-5-1 |
| Vibration resistance | 1.5 mm peak to peak (f= 2…13 Hz) conforming to IEC 60068-2-6<br>1 gn (f= 13…200 Hz) conforming to IEC 60068-2-6 |
| Shock resistance | 15 gn for 11 ms conforming to IEC 60068-2-27 |
| Relative humidity | 5…95 % without condensation conforming to IEC 60068-2-3 |
| Ambient air temperature for operation | -15…50 °C (without derating)<br>50…60 °C (with derating factor) |
| Operating altitude | <= 1000 m without derating<br>1000...4800 m with current derating 1 % per 100 m |
| Operating position | Vertical +/- 10 degree |
| Product certifications | UL[RETURN]ATEX zone 2/22[RETURN]ATEX INERIS[RETURN]CSA[RETURN]TÜV[RETURN]D |
| Marking | CE |
| Standards | UL 508C<br>IEC 61800-3<br>IEC 61800-3 environment 1 category C2<br>EN/IEC 61800-3 environment 2 category C3<br>IEC 61800-5-1<br>IEC 61000-3-12<br>IEC 60721-3<br>IEC 61508<br>IEC 13849-1 |
| Maximum THDI | <48 % from 80...100 % of load conforming to IEC 61000-3-12 |

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| Electromagnetic compatibility | Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-<br>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4<br>1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5<br>Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 |
| Environmental class (during operation) | Class 3C3 according to IEC 60721-3-3<br>Class 3S3 according to IEC 60721-3-3 |
| Maximum acceleration under shock impact (during operation) | 150 m/s² at 11 ms |
| Maximum acceleration under vibrational stress (during operation) | 10 m/s² at 13...200 Hz |
| Maximum deflection under vibratory load (during operation) | 1.5 mm at 2...13 Hz |
| Permitted relative humidity (during operation) | Class 3K5 according to EN 60721-3 |
| Volume of cooling air | 240 M3/H |
| Overvoltage category | III |
| Regulation loop | Adjustable PID regulator |
| Noise level | 63.5 DB |
| Pollution degree | 2 |
| Ambient air transport temperature | -40…70 °C |
| Ambient air temperature for storage | -40…70 °C |

## Packing Units

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|---|---|
| Unit Type of Package 1 | PCE |
| Number of Units in Package 1 | 1 |
| Package 1 Height | 55.000 Cm |
| Package 1 Width | 33.000 Cm |
| Package 1 Length | 84.000 Cm |
| Package 1 Weight | 39.000 Kg |

## Offer Sustainability

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|---|---|
| Recyclability potential, in % | 85 |
| Total lifecycle Carbon footprint | 12 788 kg CO2 eq. |
| Carbon footprint of the manufacturing phase [A1 to A3] | 286.3093939331844 |
| Carbon footprint of the manufacturing phase [A1 to A3] | 286 kg CO2 eq. |
| Carbon footprint of the distribution phase [A4] | 6.538650340428996 |
| Carbon footprint of the distribution phase [A4] | 7 kg CO2 eq. |
| Carbon footprint of the installation phase [A5] | 9.989579328299397 |
| Carbon footprint of the installation phase [A5] | 10 kg CO2 eq. |
| Carbon footprint of the use phase [B2, B3, B4, B6] | 12445.28463579653 |
| Carbon footprint of the use phase [B2, B3, B4, B6] | 12 445 kg CO2 eq. |
| Mercury free | Yes |
| Sustainable packaging | No |
| Carbon footprint of the end-of-life phase [C1 to C4] | 39.48541924541709 |
| Carbon footprint of the end-of-life phase [C1 to C4] | 39 kg CO2 eq. |
| Environmental Disclosure | Product Environmental Profile |
| Total lifecycle Carbon footprint | 12788 |
| Average percentage of recycled plastic content | 1 % |
| Average percentage of ASI certified metals | 96 % |
| Packaging made with recycled cardboard | Yes |
| Packaging without single use plastic | No |
| SCIP Number | 8ac43dc1-9e7e-4e1a-a3ee-665587b07cd7 |
| REACh Regulation | Reference contains Substances of Very High Concern above the threshold |
| EU RoHS Directive | Compliant By Exemption |
| California proposition 65 | WARNING: This product can expose you to chemicals including: Lead and lead compounds, wi |
| Product contributes to saved and avoided emissions | Yes |
| End of life manual availability | End Of Life Information |
| Removable battery | Yes |

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|---|---|
| Take-back | No |
| WEEE Label | The product must be disposed on European Union markets following specific waste collection and |

## Contractual warranty

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|---|---|
| Warranty (in months) | 18 |

Product Life Status : Commercialised