



## Main

|                                    |  |
|------------------------------------|--|
| Range of product                   | Altivar Process ATV600   |
| Product or component type          | Variable speed drive   |
| Product specific application       | Process and utilities  |
| Device short name                  | ATV6A0   |
| Variant                            | Modular version  |
| Product destination                | Asynchronous motors<br>Synchronous motors  |
| Mounting mode                      | Cabinet mount  |
| Kit composition                    | Mechanical mounting kits<br>Power connection<br>Set of fuses<br>1 control unit<br>5 power module 160 kW<br>4 front cover                   |
| EMC filter                         | Integrated conforming to EN/IEC 61800-3 category C3 with 300 m   |
| IP degree of protection            | IP00 conforming to IEC 61800-5-1 for IP21 or IP54 cabinet integration<br>IP00 conforming to IEC 60529 for IP21 or IP54 cabinet integration |
| Type of cooling                    | Forced convection  |
| Supply frequency                   | 50...60 Hz - 5...5 %   |
| Network number of phases           | 3 phases   |
| [Us] rated supply voltage          | 440 V - 15...10 %  |
| Motor power kW                     | 800 kW at 400 V (normal duty)<br>630 kW at 400 V (heavy duty)  |
| Line current                       | 1216 A at 440 V (normal duty)<br>968 A at 440 V (heavy duty)   |
| Prospective line I <sub>sc</sub>   | 50 kA  |
| Apparent power                     | 927 kVA at 440 V (normal duty)<br>738 kVA at 440 V (heavy duty)  |
| Continuous output current          | 1420 A at 2.5 kHz (normal duty)<br>1140 A at 2.5 kHz (heavy duty)  |
| Maximum transient current          | 1562 A during 60 s (normal duty)<br>1710 A during 60 s (heavy duty)  |
| Asynchronous motor control profile | Constant torque standard<br>Variable torque standard<br>Optimized torque mode  |
| Synchronous motor control profile  | Permanent magnet motor   |

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

|                              |   |
|------------------------------|---|
| Speed drive output frequency | 0.1...500 Hz  |
| Nominal switching frequency  | 2.5 kHz   |
| Switching frequency          | 2...8 kHz adjustable<br>2.5...8 kHz with derating factor  |
| Safety function              | STO (safe torque off) SIL 3   |
| Number of preset speeds      | 16 preset speeds  |
| Communication port protocol  | Ethernet<br>Modbus serial<br>Modbus TCP   |
| Option module                | Slot A : communication module for Profibus DP V1<br>Slot A : communication module for Profinet<br>Slot A : communication module for DeviceNet<br>Slot A : communication module for Modbus TCP/EtherNet/IP<br>Slot A : communication module for CANopen daisy chain RJ45<br>Slot A : communication module for CANopen SUB-D 9<br>Slot A : communication module for CANopen screw terminals<br>Slot A/slot B : digital and analog I/O extension module<br>Slot A/slot B : output relay extension module |

## Complementary

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|-------------------------------------|--|
| Output voltage                      | <= power supply voltage  |
| Permissible temporary current boost | 1.1 x In[Sapce]during 60 s (normal duty)<br>1.5 x In[Sapce]during 60 s (heavy duty)  |
| 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 | S, U or customized<br>Linear adjustable separately from 0.01...9999 s  |
| Braking to standstill               | By DC injection  |
| Protection type                     | Safe torque off motor<br>Motor phase break motor<br>Safe torque off drive<br>Overheating drive<br>Short-circuit protection drive<br>Motor phase break drive<br>Overspeed drive<br>Break on the control circuit drive<br>Overvoltages on the DC bus drive<br>Overload of output voltage drive<br>Line supply overvoltage drive<br>Line supply phase loss drive<br>Line supply undervoltage drive<br>Overcurrent between output phases and earth drive<br>Thermal protection motor<br>Thermal protection drive |
| Frequency resolution                | 0.012/50 Hz analog input<br>0.1 Hz display unit  |
| Electrical connection               | Removable screw terminals 0.5...1.5 mm <sup>2</sup> AWG 20...AWG 16 control<br>Screw terminal line side<br>M10 x 2 bars motor  |
| Connector type                      | RJ45 for Ethernet/Modbus TCP on the remote graphic terminal<br>RJ45 for Modbus serial on the remote graphic terminal   |
| Physical interface                  | 2-wire RS 485 for Modbus serial  |
| Transmission frame                  | RTU for Modbus serial  |
| Transmission rate                   | 10/100 Mbit/s for Ethernet IP/Modbus TCP<br>4.8, 9.6, 19.2, 38.4 kbit/s for Modbus serial  |
| Exchange mode                       | Half duplex, full duplex, autonegotiation for Ethernet/Modbus TCP  |
| Data format                         | 8 bits, configurable odd, even or no parity for Modbus serial  |
| Type of polarization                | No impedance for Modbus serial   |
| Number of addresses                 | 1...247 for Modbus serial  |
| Method of access                    | Slave for Modbus TCP   |
| Supply                              | External supply for digital inputs : 24 V DC 19...30 V <= 1.25 mA overload and short-circuit protection  |

Internal supply for reference potentiometer (1 to 10 kOhm) : 10.5 V DC +/- 5 % <= 10 mA overload and short-circuit protection  
 Internal supply for digital inputs and STO : 24 V DC 21...27 V <= 200 mA overload and short-circuit protection

|                           |   |
|---------------------------|---|
| 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   |
| Analogue input number     | 3   |
| Analogue input type       | Software-configurable voltage AI1, AI2, AI3 0...10 V DC 30 kOhm 12 bits<br>Software-configurable current AI1, AI2, AI3 0...20 mA/4...20 mA 250 Ohm 12 bits  |
| Discrete input number     | 8   |
| Discrete input type       | Programmable DI1...DI6 24 V DC <= 30 V 3.5 kOhm<br>Programmable as pulse input DI5, DI6 0...30 kHz 24 V DC <= 30 V<br>Safe torque off STOA, STOB 24 V DC <= 30 V > 2.2 kOhm   |
| Input compatibility       | Discrete input DI1...DI6 : level 1 PLC conforming to EN/IEC 61131-2<br>Discrete input DI5, DI6 : level 1 PLC conforming to IEC 65A-68<br>Discrete input STOA, STOB : level 1 PLC conforming to EN/IEC 61131-2   |
| Discrete input logic      | DI1...DI6, positive logic (source) : < 5 V (state 0) > 11 V<br>DI1...DI6, negative logic (sink) : > 16 V (state 0) < 10 V<br>DI5, DI6, positive logic (source) : < 0.6 V (state 0) > 2.5 V<br>STOA, STOB, positive logic (source) : < 5 V (state 0) > 11 V        |
| Analogue output number    | 2   |
| Analogue output type      | Software-configurable current AO1, AO2 : 0...20 mA, resolution 10 bits<br>Software-configurable voltage AO1, AO2 : 0...10 V DC impedance 470 Ohm, resolution 10 bits  |
| Sampling duration         | Discrete input DI1...DI4 : 2 ms (+/- 0.5 ms)<br>Discrete input DI5, DI6 : 5 ms (+/- 1 ms)<br>Analog input AI1, AI2, AI3 : 5 ms (+/- 0.1 ms)<br>Analog output AO1 : 10 ms (+/- 1 ms)   |
| Accuracy                  | Analog input AI1, AI2, AI3 : +/- 0.6 % for a temperature variation 60 °C<br>Analog output AO1, AO2 : +/- 1 % for a temperature variation 60 °C  |
| Relay output number       | 3   |
| Linearity error           | Analog input AI1, AI2, AI3 : +/- 0.15 % of maximum value<br>Analog output AO1, AO2 : +/- 0.2 %  |
| 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 |
| Refresh time              | Relay output R1, R2, R3 : 5 ms (+/- 0.5 ms)   |
| Maximum switching current | 3 A 250 V AC resistive 1 R1, R2, R3 relay output<br>3 A 30 V DC resistive 1 R1, R2, R3 relay output<br>2 A 250 V AC inductive 0.4 7 ms R1, R2, R3 relay output<br>2 A 30 V DC inductive 0.4 7 ms R1, R2, R3 relay output  |
| Minimum switching current | Relay output R1, R2, R3 : 5 mA at 24 V DC   |
| Isolation                 | Between power and control terminals   |
| Number of power modules   | 5   |

## Environment

|                                       |  |
|---------------------------------------|--|
| Insulation resistance                 | > 1 mOhm 500 V DC for 1 minute to earth  |
| Noise level                           | 74 dB 86/188/EEC   |
| Power dissipation in W                | 18300 W forced convection 2.5 kHz  |
| THDI                                  | <= 48 % full load conforming to IEC 61000-3-12   |
| Electromagnetic compatibility         | 1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5<br>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4<br>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 61000-4-3<br>Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 |
| Pollution degree                      | 2 EN/IEC 61800-5-1   |
| Vibration resistance                  | 1.5 mm peak to peak 2...13 Hz IEC 60068-2-6<br>0.5 gn 13...200 Hz IEC 60068-2-6  |
| Shock resistance                      | 7 gn 11 ms IEC 60068-2-27  |
| Relative humidity                     | 5...95 % without condensation conforming to IEC 60068-2-3  |
| Ambient air temperature for operation | 40...50 °C with derating factor<br>-10...40 °C without derating  |

|                                     |  |
|-------------------------------------|--|
| Ambient air temperature for storage | -40...70 °C  |
| Operating altitude                  | 1000...4800 m with current derating 1 % per 100 m<br><= 1000 m without derating  |
| Environmental characteristic        | Chemical pollution resistance class 3C3 conforming to EN/IEC 60721-3-3<br>Dust pollution resistance class 3S3 conforming to EN/IEC 60721-3-3 |
| Product certifications              | TÜV<br>REACH   |
| Standards                           | 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  |
| Marking                             | CE   |