

# Product datasheet

Specifications



## Variable speed drive, Altivar Process ATV600, APM, single 690 V, 1000 kW

ATV6A0M10Q6

### 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                | Synchronous motors<br>Asynchronous motors                                                                                                      |
| mounting mode                      | Cabinet mount                                                                                                                                  |
| Kit composition                    | 1 control unit<br>mechanical mounting kits<br>power connection<br>set of fuses<br>5.0 power module 200 kW<br>4 front cover                     |
| EMC filter                         | Integrated with 300 m conforming to IEC 61800-3 category C3                                                                                    |
| IP degree of protection            | IP00 (for IP21 or IP54 cabinet integration) conforming to IEC 61800-5-1<br>IP00 (for IP21 or IP54 cabinet integration) conforming to IEC 60529 |
| Degree of protection               | UL type 1 conforming to UL 61800-5-1 (cabinet integration)<br>UL type 12 conforming to UL 61800-5-1 (cabinet integration)                      |
| Type of cooling                    | Forced convection                                                                                                                              |
| Supply frequency                   | 50...60 Hz - 5...5 %                                                                                                                           |
| Network number of phases           | 3 phases                                                                                                                                       |
| [Us] rated supply voltage          | 690 V - 15...10 %                                                                                                                              |
| Prospective line Isc               | 50 kA                                                                                                                                          |
| Asynchronous motor control profile | Constant torque standard<br>Variable torque standard<br>Optimized torque mode                                                                  |
| Synchronous motor control profile  | Permanent magnet motor<br>Synchronous reluctance motor                                                                                         |
| Speed drive output frequency       | 0...500 Hz                                                                                                                                     |
| Nominal switching frequency        | 2.5 kHz                                                                                                                                        |
| Switching frequency                | 2...4.9 kHz adjustable 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                                                                                                        |

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

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| 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, 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 |
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## Complementary

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| Motor power kW                      | 1000.0 kW at 690 V normal duty<br>800.0 kW at 690 V heavy duty                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Line current                        | 969.0 A at 690 V (normal duty)<br>779.0 A at 690 V (heavy duty)                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Apparent power                      | 1158 kVA at 690 V normal duty<br>931 kVA at 690 V heavy duty                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Continuous output current           | 1030.0 A at 2.5 kHz normal duty<br>830.0 A at 2.5 kHz heavy duty                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Maximum transient current           | 1133 A during 60 s (normal duty)<br>1245 A during 60 s (heavy duty)                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Permissible temporary current boost | 1.1 x I <sub>n</sub> during 60 s (normal duty)<br>1.5 x I <sub>n</sub> during 60 s (heavy duty)                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Output voltage                      | <= power supply voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Motor slip compensation             | Can be suppressed<br>Adjustable<br>Automatic whatever the load<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                     | 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: removable screw terminals 0.5...1.5 mm <sup>2</sup> /AWG 20...AWG 16<br>Line side: screw terminal<br>Motor: M10 x 2 bars                                                                                                                                                                                                                                                                                                                                                                                            |
| 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 Ethernet/Modbus TCP                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Data format                         | 8 bits, configurable odd, even or no parity for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Type of polarization                | No impedance for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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| Number of addresses                   | 1...247 for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Method of access                      | Slave Modbus TCP                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Environment</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Noise level                           | 74 dB conforming to 86/188/EEC                                                                                                                                                                                                                                                                                                                                                                                                             |
| Power dissipation in W                | Forced convection: 17700 W, switching frequency 2.5 kHz (normal duty)<br>Forced convection: 14200 W, switching frequency 2.5 kHz (heavy duty)                                                                                                                                                                                                                                                                                              |
| Maximum THDI                          | <48 % full load conforming to IEC 61000-3-12                                                                                                                                                                                                                                                                                                                                                                                               |
| 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 61000-4-3<br>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4<br>1.2/50 $\mu$ s - 8/20 $\mu$ s 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 |
| 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>0.5 gn (f= 13...200 Hz) conforming to IEC 60068-2-6                                                                                                                                                                                                                                                                                                                      |
| Shock resistance                      | 4 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 | -10...40 °C without derating<br>40...50 °C with derating factor                                                                                                                                                                                                                                                                                                                                                                            |
| Ambient air temperature for storage   | -40...70 °C                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Operating altitude                    | < 2000 m with current derating above 1000m                                                                                                                                                                                                                                                                                                                                                                                                 |
| Environmental characteristic          | Chemical pollution resistance class 3C3 conforming to IEC 60721-3-3<br>Dust pollution resistance class 3S3 conforming to IEC 60721-3-3<br>Humidity resistant class 3K3 conforming to IEC 60721-3-3                                                                                                                                                                                                                                         |
| Standards                             | IEC 61800-3<br>IEC 61800-5-1<br>IEC 61000-3-12<br>IEC 60721-3<br>IEC 61508<br>IEC 13849-1                                                                                                                                                                                                                                                                                                                                                  |
| product certifications                | cULus<br>TÜV                                                                                                                                                                                                                                                                                                                                                                                                                               |
| marking                               | CE                                                                                                                                                                                                                                                                                                                                                                                                                                         |