**Product data sheet**

**Characteristics**

ATV930U30N4  
variable speed drive - ATV930 - 3kW - 400/480V - with braking unit - IP21

---

**Main**

<table>
<thead>
<tr>
<th>Range of product</th>
<th>Altivar Process ATV900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product or component type</td>
<td>Variable speed drive</td>
</tr>
<tr>
<td>Device application</td>
<td>Industrial application</td>
</tr>
<tr>
<td>Device short name</td>
<td>ATV930</td>
</tr>
</tbody>
</table>
| Variant | With braking chopper  
Standard version |
| Product destination | Asynchronous motors  
Synchronous motors |
| Mounting mode | Wall mount |
| EMC filter | Integrated conforming to EN/IEC 61800-3 category C2 with 50 m motor cable maxi  
Integrated conforming to EN/IEC 61800-3 category C3 with 150 m motor cable maxi |
| IP degree of protection | IP21 conforming to IEC 61800-5-1  
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 %) |
| Network number of phases | 3 phases |
| [Us] rated supply voltage | 380...480 V (- 15...10 %) |
| Motor power kW | 3 kW (normal duty)  
2.2 kW (heavy duty) |
| Motor power hp | 3 hp (heavy duty)  
4 hp (normal duty) |
| Line current | 5.8 A at 380 V (normal duty)  
5.1 A at 480 V (normal duty)  
4.5 A at 380 V (heavy duty)  
4 A at 480 V (heavy duty) |
| Prospective line Isc | 50 kA |
| Apparent power | 4.2 kVA at 480 V (normal duty)  
3.3 kVA at 480 V (heavy duty) |
| Continuous output current | 7.2 A at 4 kHz (normal duty)  
5.6 A at 4 kHz (heavy duty) |
| **Maximum transient current** | 8.4 A during 60 s (heavy duty)  
| | 8.6 A during 60 s (normal duty) |
| **Asynchronous motor control profile** | Variable torque standard  
| | Constant torque standard  
| | Optimized torque mode |
| **Synchronous motor control profile** | Permanent magnet motor |
| **Speed drive output frequency** | 0.1...599 Hz |
| **Nominal switching frequency** | 4 kHz |
| **Switching frequency** | 2...16 kHz adjustable  
| | 4...16 kHz with derating factor |
| **Safety function** | STO (safe torque off) SIL 3 |
| **Discrete input logic** | 16 preset speeds |
| **Communication port protocol** | Modbus serial  
| | Ethernet/IP  
| | Modbus TCP |
| **Option card** | Slot A : communication module for Proﬁbus DP V1  
| | Slot A : communication module for Proﬁnet  
| | Slot A : communication module for DeviceNet  
| | Slot A : communication module for CANopen daisy chain RJ45  
| | Slot A : communication module for CANopen SUB-D 9  
| | Slot A : communication module for CANopen screw terminals  
| | Slot A : communication module for EtherCAT  
| | Slot A/slot B/slot C : digital and analog I/O extension module  
| | Slot A/slot B/slot C : output relay extension module  
| | Slot B : 5/12 V digital encoder interface module  
| | Slot B : analog encoder interface module  
| | Slot B : resolver encoder interface module |
| **Complementary** |  
| **Output voltage** | <= power supply voltage |
| **Motor slip compensation** | Automatic whatever the load  
| | Not available in permanent magnet motor law  
| | Adjustable  
| | Can be suppressed |
| **Acceleration and deceleration ramps** | Linear adjustable separately from 0.01...9999 s |
| **Braking to standstill** | By DC injection |
| **Protection type** | Motor : thermal protection  
| | Motor : safe torque off  
| | Motor : motor phase break  
| | Drive : thermal protection  
| | Drive : safe torque off  
| | Drive : overheating  
| | Drive : overcurrent between output phases and earth  
| | Drive : overload of output voltage  
| | Drive : short-circuit protection  
| | Drive : motor phase break  
| | Drive : overvoltages on the DC bus  
| | Drive : line supply overvoltage  
| | Drive : line supply undervoltage  
| | Drive : line supply phase loss  
| | Drive : overspeed  
| | Drive : break on the control circuit |
| **Frequency resolution** | Display unit : 0.1 Hz  
| | Analog input : 0.012/50 Hz |
| **Electrical connection** | Control, screw terminal : 0.5...1.5 mm² (AWG 20...AWG 16)  
| | DC bus, screw terminal : 2.5...6 mm² (AWG 14...AWG 10)  
| | Line side, screw terminal : 2.5...6 mm² (AWG 14...AWG 10)  
| | Motor, screw terminal : 2.5...6 mm² (AWG 14...AWG 10) |
| **Connector type** | 2 RJ45 (on the control block) for Ethernet IP/Modbus TCP  
| | 1 RJ45 (on the control block) for Modbus serial |
| **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  
| | 4.8, 9.6, 19.2, 38.4 kbit/s for Modbus serial |
| **Exchange mode** | Half duplex, full duplex, autonegotiation for Ethernet IP/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) current <= 1.25 mA (overload and short-circuit protection)
- Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 % current <= 10 mA (overload and short-circuit protection)
- Internal supply for digital inputs and STO: 24 V DC (21...27 V) current <= 200 mA (overload and short-circuit protection)

### Local signalling
- 3 mono/dual colour LED for local diagnostic
- 5 dual colour LED for embedded communication status
- 2 dual colour LED for communication module status
- 1 red LED for presence of voltage

### Dimension
- Width: 144 mm
- Height: 350 mm
- Depth: 206 mm
- Weight: 4.6 kg

### Analogue input number
3

<table>
<thead>
<tr>
<th>Analogue input type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software-configurable voltage AI1, AI2, AI3</td>
<td>0...10 V DC impedance 30 kOhm, resolution 12 bits</td>
</tr>
<tr>
<td>Software-configurable current AI1, AI2, AI3</td>
<td>0...20 mA/4...20 mA impedance 250 Ohm, resolution 12 bits</td>
</tr>
</tbody>
</table>

### Discrete input number
10

<table>
<thead>
<tr>
<th>Discrete input type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmable DI1...DI8</td>
<td>24 V DC (&lt;= 30 V) impedance 3.5 kOhm</td>
</tr>
<tr>
<td>Programmable as pulse input DI7, DI8</td>
<td>0...30 kHz: 24 V DC (&lt;= 30 V)</td>
</tr>
<tr>
<td>Safe torque off STOA, STOB</td>
<td>24 V DC (&lt;= 30 V) impedance &gt; 2.2 kOhm</td>
</tr>
</tbody>
</table>

### Input compatibility
- Discrete input STOA, STOB: level 1 PLC conforming to EN/IEC 61131-2
- Discrete input DI1...DI8: level 1 PLC conforming to EN/IEC 61131-2
- Pulse input DI7, DI8: level 1 PLC conforming to IEC 65A-68

### Analogue output number
2

<table>
<thead>
<tr>
<th>Analogue output type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software-configurable voltage AQ1, AQ2</td>
<td>0...10 V DC impedance 470 Ohm, resolution 10 bits</td>
</tr>
<tr>
<td>Software-configurable current AQ1, AQ2</td>
<td>0...20 mA impedance 500 Ohm, resolution 10 bits</td>
</tr>
</tbody>
</table>

### Discrete output number
2

<table>
<thead>
<tr>
<th>Discrete output type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logic output DQ+: 0...1 kHz (&lt;= 30 V) DC, &lt; 100 mA</td>
<td></td>
</tr>
<tr>
<td>Programmable as pulse output DQ+: 0...30 kHz (&lt;= 30 V) DC, &lt; 20 mA</td>
<td></td>
</tr>
<tr>
<td>Logic output DQ-: 0...1 kHz (&lt;= 30 V) DC, &lt; 100 mA</td>
<td></td>
</tr>
</tbody>
</table>

### Sampling duration
- Discrete input DI1...DI8: 2 ms (+/- 0.5 ms)
- Pulse input DI7, DI8: 5 ms (+/- 1 ms)
- Analog input AI1, AI2, AI3: 1 ms (+/- 1 ms)
- Analog output AQ1, AQ2: 5 ms (+/- 1 ms)

### Accuracy
- Analog input AI1, AI2, AI3: +/- 0.6 % for a temperature variation 60 °C
- Analog output AQ1, AQ2: +/- 1 % for a temperature variation 60 °C

### Linearity error
- Analog input AI1, AI2, AI3: +/- 0.15 % of maximum value
- Analog output AQ1, AQ2: +/- 0.2 %

### Maximum switching current
- Relay output R1 on inductive load: (cos phi = 0.4 and L/R = 7 ms): 2 A at 250 V AC
- Relay output R1 on inductive load: (cos phi = 0.4 and L/R = 7 ms): 2 A at 30 V DC
- Relay output R2, R3 on inductive load: (cos phi = 0.4 and L/R = 7 ms): 2 A at 250 V AC
- Relay output R2, R3 on inductive load: (cos phi = 0.4 and L/R = 7 ms): 2 A at 30 V DC
- Relay output R1 on resistive load: (cos phi = 1): 5 A at 250 V AC
- Relay output R1 on resistive load: (cos phi = 1): 3 A at 30 V DC
- Relay output R2, R3 on resistive load: (cos phi = 1): 5 A at 250 V AC
- Relay output R2, R3 on resistive load: (cos phi = 1): 5 A at 30 V DC

### Relay output number
3

<table>
<thead>
<tr>
<th>Relay output type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configurable relay logic R1</td>
<td>fault relay NO/NC electrical durability 100000 cycles</td>
</tr>
<tr>
<td>Configurable relay logic R2</td>
<td>sequence relay NO electrical durability 100000 cycles</td>
</tr>
<tr>
<td>Configurable relay logic R3</td>
<td>sequence relay NO electrical durability 100000 cycles</td>
</tr>
</tbody>
</table>

### Refresh time
- Relay output R1, R2, R3: 5 ms (+/- 0.5 ms)

### Minimum switching current
- Relay output R1, R2, R3: 5 mA at 24 V DC

### Isolation
Between power and control terminals
<table>
<thead>
<tr>
<th>Specific application</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP degree of protection</td>
<td>IP21</td>
</tr>
</tbody>
</table>

### Discrete and process manufacturing
- Food and beverage processing mixer
- Food and beverage processing conveyor
- Food and beverage processing shredder
- Hoisting process crane
- Marine thruster
- Marine winch
- Material working (wood, ceramic, stone, pvc, metal) press
- Material working (wood, ceramic, stone, pvc, metal) extruder
- Mining mineral and metal other application
- Oil and gas drilling rig
- Oil and gas progressive cavity pump
- Oil and gas rod pump
- Oil and gas swapping pump
- Oil and gas compressor for regasification
- Oil and gas separator
- Oil and gas other application
- Water and waste water separator

### Power range
- 2.2...3 kW 380...440 V 3 phases
- 2.2...3 kW 480...500 V 3 phases

### Motor starter type
- Variable speed drive

### Environment
- **Insulation resistance**: > 1 mOhm at 500 V DC for 1 minute to earth
- **Noise level**: 54.5 dB conforming to 86/188/EEC
- **Power dissipation in W**
  - 31 W (natural convection) at 380 V switching frequency 4 kHz
  - 78 W (forced convection) at 380 V switching frequency 4 kHz
- **Vibration resistance**
  - 1.5 mm peak to peak (f = 2...13 Hz) conforming to IEC 60068-2-6
  - 1 gn (f = 13...200 Hz) conforming to IEC 60068-2-6
- **Shock resistance**
  - 15 gn during 11 ms conforming to IEC 60068-2-27
- **Volume of cooling air**: 38 m3/h
- **Operating position**: Vertical +/- 10 degree
- **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
  - Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4
  - Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2
  - Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3
  - Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6
- **Environmental characteristic**
- **Pollution degree**: 2 EN/IEC 61800-5-1
- **Relative humidity**: 5...95 % without condensation conforming to IEC 60068-2-3
- **Ambient air temperature for operation**
  - -15...50 °C without derating
  - 50...60 °C with derating factor
- **Ambient air temperature for storage**: -40...70 °C
- **Operating altitude**
  - 1000...4800 m with current derating 1 % per 100 m
  - <= 1000 m without derating

### Standards
- EN/IEC 61800-3
- UL 508C
- EN/IEC 61800-5-1
- IEC 61000-3-12
- IEC 60721-3
- IEC 61508
- IEC 13849-1
- EN/IEC 61800-3 (environment 1 category C2)
- EN/IEC 61800-3 (environment 2 category C3)

### Product certifications
- TÜV
- UL
- CSA
- REACH

### Marking
- CE
<table>
<thead>
<tr>
<th>Offer Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable offer status</td>
</tr>
<tr>
<td>RoHS (date code: YYWW)</td>
</tr>
<tr>
<td>REACh</td>
</tr>
<tr>
<td>Product environmental profile</td>
</tr>
<tr>
<td>Product end of life instructions</td>
</tr>
</tbody>
</table>

ATV930U30N4
Dimensions

Right, Front and Rear View
Clearances

<table>
<thead>
<tr>
<th>X1</th>
<th>X2</th>
<th>X3</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 100 mm (3.94 in.)</td>
<td>≥ 100 mm (3.94 in.)</td>
<td>≥ 10 mm (0.39 in.)</td>
</tr>
</tbody>
</table>

- Mount the device in a vertical position (±10°). 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 and Clearance

Mounting Types

Mounting Type A: Individual IP21

Mounting Type B: Side by Side IP20

Mounting Type C: Individual IP20

a ≥ 100 mm (3.94 in.)

a ≥ 0
Three-Phase Power Supply with Upstream Breaking via Line Contactor

Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1

(1) Line choke if used
(2) Use relay R1 set to operating state Fault to switch Off the product once an error is detected.

A1: Drive
KM1: Line Contactor
Q2, Q3: Circuit breakers
S1, S2: Pushbuttons
T1: Transformer for control part
Three-Phase Power Supply with Downstream Breaking via Contactor

Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1.

(1) Line choke if used
(2) Use relay R1 set to operating state Fault to switch Off the product once an error is detected.

A1: Drive
KM1: Contactor
Control Block Wiring Diagram

(1)  Safe Torque Off  
(2)  Analog Output  
(3)  Digital Input  
(4)  Reference potentiometer  
(5)  Analog Input  
(6)  Digital Output  
(7)  0-10 Vdc, x-20 mA  
(8)  0-10 Vdc, -10 Vdc...+10 Vdc  

R1A, R1BFBLICRelay  
R2A, R2CSequence relay  
R3A, R3CSequence relay  

Sensor Connection

It is possible to connect either 1 or 3 sensors on terminals AI1 or AI3
Sink / Source Switch Configuration

The switch is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs.

- Set the switch to Source (factory setting) if using PLC outputs with PNP transistors.
- Set the switch to Ext if using PLC outputs with NPN transistors.

Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs

Switch Set to SRC (Source) Position and Use of an External Power Supply for the DIs

Switch Set to SK (Sink) Position Using the Output Power Supply for the Digital Inputs

Switch Set to EXT Position Using an External Power Supply for the DIs
Derating Curves

- 40 °C (104 °F) - Mounting type A, B and C
- 50 °C (122 °F) - Mounting type A, B and C
- 60 °C (140 °F) - Mounting type B and C

In : Nominal Drive Current
SF : Switching Frequency
Our Proposal: Circuit Breaker + Contactor + Drive for Motor Power 3 kW and 380 or 440 VAC

<table>
<thead>
<tr>
<th>Motor power (kW)</th>
<th>ICU (kA)</th>
<th>Breaker</th>
<th>Contactor (*)</th>
<th>Motor Starter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 kW for 380 V</td>
<td>100</td>
<td>GV2L14</td>
<td>LC1D09P7</td>
<td>ATV930U30N4</td>
</tr>
<tr>
<td>3 kW for 440 V</td>
<td>100</td>
<td>GV2L10</td>
<td>LC1D09P7</td>
<td>ATV930U30N4</td>
</tr>
</tbody>
</table>

Non contractual pictures.

(*) You can select the contactor proposed or variants. Please consider examples hereafter or follow the link to the complete offer.

<table>
<thead>
<tr>
<th>Motor power kW</th>
<th>Coil voltage VAC - 50/60 Hz</th>
<th>24</th>
<th>48</th>
<th>110</th>
<th>115</th>
<th>220</th>
<th>230</th>
<th>400</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>LC1D09 ..</td>
<td>B7</td>
<td>E7</td>
<td>F7</td>
<td>FE7</td>
<td>M7</td>
<td>P7</td>
<td>V7</td>
<td>Complete Offer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor power kW</th>
<th>Coil voltage VDC</th>
<th>24</th>
<th>48</th>
<th>110</th>
<th>125</th>
<th>220</th>
<th>230</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>LC1D09 ..</td>
<td>BD</td>
<td>ED</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor power kW</th>
<th>Coil voltage Low Consumption VDC - U 0.8…1.25</th>
<th>24</th>
<th>110</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>LC1D09 ..</td>
<td>BL</td>
<td>FL</td>
<td>Complete Offer</td>
</tr>
</tbody>
</table>

Non contractual pictures.

(Other) You can select the contactor proposed or variants. Please consider examples hereafter or follow the link to the complete offer.