ATV630D30N4
variable speed drive ATV630 - 30kW/40HP - 380...480V - IP21/UL type 1

Main

Range of product: Altivar Process ATV600
Product or component type: Variable speed drive
Product specific application: Process and utilities
Device short name: ATV630
Variant: Standard version
Product destination: Asynchronous motors

Mounting mode: Wall mount
EMC filter: Integrated with 50 m conforming to EN/IEC 61800-3 category C2
Integrated with 150 m conforming to EN/IEC 61800-3 category C3

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...5 %

Network number of phases: 3 phases
[Us] rated supply voltage: 380...480 V - 15...10 %
Motor power kW: 30 kW (normal duty)
22 kW (heavy duty)
Motor power hp: 40 hp normal duty
30 hp heavy duty

Line current: 53.3 A at 380 V (normal duty)
45.9 A at 480 V (normal duty)
40.5 A at 380 V (heavy duty)
35.8 A at 480 V (heavy duty)

Prospective line Isc: 50 kA

Apparent power: 38.2 kVA at 480 V (normal duty)
29.8 kVA at 480 V (heavy duty)

Continuous output current: 61.5 A at 4 kHz for normal duty
46.3 A at 4 kHz for heavy duty

Maximum transient current: 67.7 A during 60 s (normal duty)

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.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
</table>
| Asynchronous motor control profile | Variable torque standard  
Optimized torque mode  
Constant torque standard |
| Synchronous motor control profile | Permanent magnet motor  
Synchronous reluctance motor |
| Output frequency                 | 0.0001…0.5 kHz                                                          |
| Speed drive output frequency     | 0.1…599 Hz                                                              |
| Nominal switching frequency      | 4 kHz                                                                   |
| Switching frequency              | 2…12 kHz adjustable  
4…12 kHz with derating factor                                           |
| Safety function                  | STO (safe torque off) SIL 3                                              |
| Discrete input logic             | 16 preset speeds                                                         |
| Communication port protocol      | Ethernet  
Modbus TCP  
Modbus serial                                                                 |
| Option card                      | Slot A: communication module, Profibus DP V1  
Slot A: communication module, Profinet  
Slot A: communication module, DeviceNet  
Slot A: communication module, Modbus TCP/EtherNet/IP  
Slot A: communication module, CANopen daisy chain RJ45  
Slot A: communication module, CANopen SUB-D 9  
Slot A: communication module, CANopen screw terminals  
Slot A/slot B: digital and analog I/O extension module  
Slot A/slot B: output relay extension module  
Slot A: communication module, Ethernet IP/Modbus TCP/MD-Link  
Communication module, BACnet MS/TP  
Communication module, Ethernet Powerlink |
| Complementary                    |                                                                         |
| Output voltage                   | <= power supply voltage                                                  |
| Permissible temporary current boost | 1.1 x In during 60 s (normal duty)  
1.5 x In during 60 s (heavy duty) |
| Motor slip compensation          | Adjustable  
Automatic whatever the load  
Can be suppressed  
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  
Safe torque off: motor  
Motor phase break: motor  
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: drive                                             |
| Frequency resolution             | Display unit: 0.1 Hz  
Analog input: 0.012/50 Hz                                                 |
| Electrical connection            | Control: removable screw terminals0.5…1.5 mm²/AWG 20…AWG 16  
Line side: screw terminal25…50 mm²/AWG 4…AWG 1  
Motor: screw terminal25…50 mm²/AWG 4…AWG 1                                      |
| Connector type                   | RJ45 (on the remote graphic terminal) for Ethernet/Modbus TCP  
RJ45 (on the remote graphic terminal) 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                                 |
### 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

### Number of addresses
1…247 for Modbus serial

### Method of access
Slave Modbus TCP

### Supply
- External supply for digital inputs: 24 V DC (19…30 V), <1.25 mA, protection type: overload and short-circuit protection
- Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 mA, protection type: overload and short-circuit protection
- Internal supply for digital inputs and STO: 24 V DC (21…27 V), <200 mA, protection type: overload and short-circuit protection

### Local signalling
- 3 LEDs local diagnostic:
- 3 LEDs (dual colour) embedded communication status:
- 4 LEDs (dual colour) communication module status:
- 1 LED (red) presence of voltage:

### Dimensions
- Width: 226 mm
- Height: 673 mm
- Depth: 271 mm

### Weight
Net weight: 28 kg

### Analogue input number
3

### Analogue input type
- AI1, AI2, AI3 software-configurable voltage: 0…10 V DC, impedance: 30 kOhm, resolution 12 bits
- AI1, AI2, AI3 software-configurable current: 0…20 mA/4…20 mA, impedance: 250 Ohm, resolution 12 bits

### Discrete input number
8

### Discrete input type
- DI1...DI6 programmable, 24 V DC (<= 30 V), impedance: 3.5 kOhm
- DI5, DI6 programmable as pulse input: 0…30 kHz, 24 V DC (<= 30 V)
- STOA, STOB safe torque off, 24 V DC (<= 30 V), impedance: > 2.2 kOhm

### Input compatibility
- DI1...DI6: discrete input level 1 PLC conforming to EN/IEC 61131-2
- DI5, DI6: discrete input level 1 PLC conforming to IEC 65A-68
- STOA, STOB: discrete input level 1 PLC conforming to EN/IEC 61131-2

### Discrete input logic
- Positive logic (source) (DI1...DI6), < 5 V (state 0), > 11 V (state 1)
- Negative logic (sink) (DI1...DI6), > 16 V (state 0), < 10 V (state 1)
- Positive logic (source) (STOA, STOB), < 5 V (state 0), > 11 V (state 1)

### Analogue output number
2

### Analogue output type
- Software-configurable voltage AO1, AO2: 0…10 V DC impedance 470 Ohm, resolution 10 bits
- Software-configurable current AO1, AO2: 0…20 mA, resolution 10 bits

### Sampling duration
- 2 ms +/- 0.5 ms (DI1…DI4) - discrete input
- 5 ms +/- 1 ms (DI5, DI6) - discrete input
- 5 ms +/- 0.1 ms (AI1, AI2, AI3) - analog input
- 10 ms +/- 1 ms (AO1) - analog output

### Accuracy
- +/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input
- +/- 1 % AO1, AO2 for a temperature variation 60 °C analog output

### Linearity error
AI1, AI2, AI3: +/- 0.15 % of maximum value for analog input
AO1, AO2: +/- 0.2 % for analog output

### Relay output number
3

### Relay output type
- Configurable relay logic R1: fault relay NO/NC electrical durability 100000 cycles
- Configurable relay logic R2: sequence relay NO electrical durability 100000 cycles
- Configurable relay logic R3: sequence relay NO electrical durability 100000 cycles

### 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

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

### Isolation
Between power and control terminals

### Variable speed drive application selection
- Building - HVAC Compressor centrifugal
- Food and beverage processing Other application
- Mining mineral and metal Fan
- Mining mineral and metal Pump
- Oil and gas Fan
- Water and waste water Other application
Building - HVAC Screw compressor
Food and beverage processing Pump
Food and beverage processing Fan
Food and beverage processing Atomization
Oil and gas Electro submersible pump (ESP)
Oil and gas Water injection pump
Oil and gas Jet fuel pump
Oil and gas Compressor for refinery
Water and waste water Centrifuge pump
Water and waste water Positive displacement pump
Water and waste water Electro submersible pump (ESP)
Water and waste water Screw pump
Water and waste water Lobe compressor
Water and waste water Screw compressor
Water and waste water Compressor centrifugal
Water and waste water Fan
Water and waste water Conveyor
Water and waste water Mixer

Motor power range AC-3
30…50 kW at 380…440 V 3 phases
30…50 kW at 480…500 V 3 phases

**Environment**

<table>
<thead>
<tr>
<th>Insulation resistance</th>
<th>&gt; 1 MOhm 500 V DC for 1 minute to earth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise level</td>
<td>63.5 dB conforming to 86/188/EEC</td>
</tr>
<tr>
<td>Power dissipation in W</td>
<td>Natural convection: 93 W at 380 V, switching frequency 4 kHz</td>
</tr>
<tr>
<td>Volume of cooling air</td>
<td>240 m3/h</td>
</tr>
<tr>
<td>Operating position</td>
<td>Vertical +/- 10 degree</td>
</tr>
<tr>
<td>Maximum THDI</td>
<td>&lt;48 % from 80…100 % of load conforming to IEC 61000-3-12</td>
</tr>
<tr>
<td>Electromagnetic compatibility</td>
<td>Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2</td>
</tr>
<tr>
<td></td>
<td>Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3</td>
</tr>
<tr>
<td></td>
<td>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4</td>
</tr>
<tr>
<td></td>
<td>1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5</td>
</tr>
<tr>
<td></td>
<td>Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2 conforming to EN/IEC 61800-5-1</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>1.5 mm peak to peak (f= 2…13 Hz) conforming to IEC 60068-2-6</td>
</tr>
<tr>
<td></td>
<td>1 gn (f= 13…200 Hz) conforming to IEC 60068-2-6</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>15 gn for 11 ms conforming to IEC 60068-2-27</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>5…95 % without condensation conforming to IEC 60068-2-3</td>
</tr>
<tr>
<td>Ambient air temperature for operation</td>
<td>-15…50 °C (without)</td>
</tr>
<tr>
<td></td>
<td>50…60 °C (with derating factor)</td>
</tr>
<tr>
<td>Ambient air temperature for storage</td>
<td>-40…70 °C</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>&lt;= 1000 m without</td>
</tr>
<tr>
<td></td>
<td>1000…4800 m with current derating 1 % per 100 m</td>
</tr>
<tr>
<td>Environmental characteristic</td>
<td>Chemical pollution resistance class 3C3 conforming to EN/IEC 60721-3-3</td>
</tr>
<tr>
<td></td>
<td>Dust pollution resistance class 3S3 conforming to EN/IEC 60721-3-3</td>
</tr>
<tr>
<td>Standards</td>
<td>UL 508C</td>
</tr>
<tr>
<td></td>
<td>EN/IEC 61800-3</td>
</tr>
<tr>
<td></td>
<td>Environment 1 category C2 EN/IEC 61800-3</td>
</tr>
<tr>
<td></td>
<td>Environment 2 category C3 EN/IEC 61800-3</td>
</tr>
<tr>
<td></td>
<td>EN/IEC 61800-5-1</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-3-12</td>
</tr>
<tr>
<td></td>
<td>IEC 60721-3</td>
</tr>
<tr>
<td></td>
<td>IEC 61508</td>
</tr>
<tr>
<td></td>
<td>IEC 13849-1</td>
</tr>
<tr>
<td>Product certifications</td>
<td>TÜV</td>
</tr>
<tr>
<td></td>
<td>ATEX INERIS</td>
</tr>
<tr>
<td></td>
<td>UL</td>
</tr>
<tr>
<td></td>
<td>CSA</td>
</tr>
<tr>
<td></td>
<td>ATEX zone 2/22</td>
</tr>
<tr>
<td></td>
<td>REACH</td>
</tr>
<tr>
<td></td>
<td>DNV-GL</td>
</tr>
<tr>
<td>Marking</td>
<td>CE</td>
</tr>
<tr>
<td>Offer Sustainability</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Sustainable offer status</td>
<td>Green Premium product</td>
</tr>
<tr>
<td>REACH Regulation</td>
<td>REACH Declaration</td>
</tr>
<tr>
<td>EU RoHS Directive</td>
<td>Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration</td>
</tr>
<tr>
<td>Mercury free</td>
<td>Yes</td>
</tr>
<tr>
<td>RoHS exemption information</td>
<td>Yes</td>
</tr>
<tr>
<td>China RoHS Regulation</td>
<td>China RoHS declaration</td>
</tr>
<tr>
<td>Environmental Disclosure</td>
<td>Product Environmental Profile</td>
</tr>
<tr>
<td>Circularity Profile</td>
<td>End of Life Information</td>
</tr>
<tr>
<td>WEEE</td>
<td>The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins</td>
</tr>
</tbody>
</table>
Dimensions

Drives with IP21 Top Cover
Front, Left and Rear Views

Drives Without IP21 Top Cover
Left and Rear Views
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>
Mounting Types

Mounting Type A: Individual IP21

Mounting Type B: Side by Side IP20 (Possible, 2 Drives Only)

Mounting Type C: Individual IP20

a ≥ = 110 mm (4.33 in.)
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
Product data sheet  
ATV630D30N4

Connections and Schema

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
R1A, R1BF, R1U: Relay
R2A, R2C: Sequence relay
R3A, R3C: Sequence relay

Sensor Connection
It is possible to connect either 1 or 3 sensors on terminals AI2 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