## Product data sheet

Specifications



# Variable speed drive, Altivar Machine ATV340, 30 kW Heavy Duty, 400 V, 3 phases, Ethernet 

ATV340D30N4E

| Main |  |
| :---: | :---: |
| Range of product | Altivar Machine ATV340 |
| Product or component type | Variable speed drive |
| Product specific application | Machine |
| Variant | Standard version |
| Mounting mode | Wall mount |
| Communication port protocol | EtherNet/IP Modbus TCP Modbus serial |
| Option card | Communication module, Profinet Communication module, DeviceNet Communication module, CANopen Communication module, EtherCAT |
| Network number of phases | 3 phases |
| Supply frequency | $50 . . .60 \mathrm{~Hz}+/-5 \%$ |
| [Us] rated supply voltage | 380... 480 V - 15... 10 \% |
| Nominal output current | 61.5 A |
| Motor power kW | 37 kW for normal duty 30 kW for heavy duty |
| Motor power hp | 50 hp for normal duty 40 hp for heavy duty |
| EMC filter | Class C3 EMC filter integrated |
| IP degree of protection | IP20 |
| Degree of protection | UL type 1 |
| Complementary |  |
| Discrete input number | 8 |
| Discrete input type | PTI safe torque off: $0 . . .30 \mathrm{kHz}, 24 \mathrm{~V}$ DC ( 30 V ) DI1...DI5 programmable as pulse input, 24 V DC ( 30 V ), impedance: 3.5 kOhm programmable |
| Number of preset speeds | 16 preset speeds |
| Discrete output number | $1.0$ |
| Discrete output type | Programmable output DQ1, DQ2 30 V DC 100 mA |
| Analogue input number | 3 |
| Analogue input type | Al1 software-configurable current: $0 \ldots .20 \mathrm{~mA}$, impedance: 250 Ohm, resolution 12 bits Al1 software-configurable temperature probe or water level sensor |


|  | Al1 software-configurable voltage: $0 \ldots 10 \mathrm{~V} \mathrm{DC}$, impedance: 31.5 kOhm , resolution 12 bits AI2 software-configurable voltage: - $10 \ldots 10 \mathrm{~V} \mathrm{DC}$, impedance: 31.5 kOhm , resolution 12 bits |
| :---: | :---: |
| Analogue output number | 2 |
| Analogue output type | Software-configurable voltage AQ1, AQ2: $0 \ldots 10 \mathrm{~V}$ DC impedance 470 Ohm , resolution 10 bits Software-configurable current AQ1, AQ2: $0 \ldots 20 \mathrm{~mA}$ impedance 500 Ohm , resolution 10 bits |
| Relay output number | 3 |
| Output voltage | <= power supply voltage |
| Relay output type | Relay outputs R1A <br> Relay outputs R1C electrical durability 100000 cycles <br> Relay outputs R2A <br> Relay outputs R2C electrical durability 100000 cycles |
| Maximum switching current | Relay output R1C on resistive load, cos phi $=1: 3 \mathrm{~A}$ at 250 V AC <br> Relay output R1C on resistive load, cos phi $=1: 3 \mathrm{~A}$ at 30 V DC <br> Relay output R1C on inductive load, cos phi $=0.4$ and $\mathrm{L} / \mathrm{R}=7 \mathrm{~ms}: 2 \mathrm{~A}$ at 250 V AC <br> Relay output R1C on inductive load, cos phi $=0.4$ and $\mathrm{L} / \mathrm{R}=7 \mathrm{~ms}$ : 2 A at 30 V DC <br> Relay output R2C on resistive load, cos phi $=1: 5 \mathrm{~A}$ at 250 V AC <br> Relay output R2C on resistive load, cos phi $=1: 5 \mathrm{~A}$ at 30 V DC <br> Relay output R2C on inductive load, cos phi $=0.4$ and $\mathrm{L} / \mathrm{R}=7 \mathrm{~ms}: 2 \mathrm{~A}$ at 250 V AC <br> Relay output R2C on inductive load, cos phi $=0.4$ and $\mathrm{L} / \mathrm{R}=7 \mathrm{~ms}: 2 \mathrm{~A}$ at 30 V DC |
| Minimum switching current | Relay output R1B: 5 mA at 24 V DC Relay output R2C: 5 mA at 24 V DC |
| Physical interface | 2-wire RS 485 |
| Connector type | $3 \mathrm{RJ45}$ |
| Method of access | Slave Modbus RTU <br> Slave Modbus TCP |
| Transmission rate | 4.8 kbit/s 9.6 kbit/s 19.2 kbit/s 38.4 kbit/s |
| Transmission frame | RTU |
| Number of addresses | 1... 247 |
| Data format | 8 bits, configurable odd, even or no parity |
| Type of polarization | No impedance |
| 4 quadrant operation possible | True |
| Asynchronous motor control profile | Variable torque standard Optimized torque mode Constant torque standard |
| Synchronous motor control profile | Reluctance motor Permanent magnet motor |
| Pollution degree | 2 conforming to EN/IEC 61800-5-1 |
| Maximum output frequency | 0.599 kHz |
| Acceleration and deceleration ramps | Linear adjustable separately from 0.01... 9999 s S, U or customized |
| Motor slip compensation | Automatic whatever the load Not available in permanent magnet motor law Adjustable Can be suppressed |
| Switching frequency | $2 . . .16 \mathrm{kHz}$ adjustable <br> $4 . . .16 \mathrm{kHz}$ with derating factor |
| Nominal switching frequency | 4 kHz |
| Braking to standstill | By DC injection |
| Brake chopper integrated | True |
| Line current | 66.2 A at 380 V (normal duty) 57.3 A at 480 V (normal duty) 54.8 A at 380 V (heavy duty) 48.3 A at 480 V (heavy duty) |
| Line current | 66.2 A at 380 V with internal line choke (normal duty) 57.3 A at 480 V with internal line choke (normal duty) 66.2 A at 380 V with internal line choke (heavy duty) 57.3 A at 480 V with internal line choke (heavy duty) 54.8 A |


| Maximum input current | 66.2 A |
| :--- | :--- |
| Maximum output voltage | 480 V |
| Apparent power | 47.6 kVA at 480 V (normal duty) |
|  | 40.2 kVA at 480 V (heavy duty) |
| Maximum transient current | 89.4 A during 60 s (normal duty) |
|  | 89.4 A during 2 s (normal duty) |
|  | 92.3 A during 60 s (heavy duty) |
|  | 92.3 A during 2 s (heavy duty) |


| Electrical connection | Screw terminal, clamping capacity: $35 . . .50 \mathrm{~mm}^{2}$ for line side Screw terminal, clamping capacity: $25 \ldots 50 \mathrm{~mm}^{2}$ for DC bus Screw terminal, clamping capacity: $35 . . .50 \mathrm{~mm}^{2}$ for motor Screw terminal, clamping capacity: $0.75 \ldots 1.5 \mathrm{~mm}^{2}$ for control |
| :---: | :---: |
| Prospective line Isc | 50 kA |
| Base load current at high overload | 61.5 A |
| Base load current at low overload | 74.5 A |
| Power dissipation in W | Natural convection: 77 W at 380 V , switching frequency 4 kHz (heavy duty) Forced convection: 640 W at 380 V , switching frequency 4 kHz (heavy duty) Natural convection: 90 W at 380 V , switching frequency 4 kHz (normal duty) Forced convection: 796 W at 380 V , switching frequency 4 kHz (normal duty) |
| Electrical connection | Line side: screw terminal $35 . . .50 \mathrm{~mm}^{2} /$ AWG 3...AWG 1 DC bus: screw terminal $25 \ldots . .50 \mathrm{~mm}^{2} /$ AWG $4 \ldots$...AWG 1 Motor: screw terminal $35 \ldots 50 \mathrm{~mm}^{2} /$ AWG 3 ...AWG 1 Control: screw terminal 0.75...1.5 mm²/AWG 18...AWG 16 |


| With safety function Safely <br> Limited Speed (SLS) | True |
| :--- | :--- |
| With safety function Safe brake <br> management (SBC/SBT) | True |


| 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) | True |
| 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 loss: motor <br> Thermal protection: drive <br> Safe torque off: drive <br> Overheating: drive <br> Overcurrent: drive <br> Output overcurrent between motor phase and earth: drive <br> Output overcurrent between motor phases: drive <br> Short-circuit between motor phase and earth: drive <br> Short-circuit between motor phases: drive <br> Motor phase loss: drive <br> DC Bus overvoltage: drive <br> Line supply overvoltage: drive <br> Line supply undervoltage: drive <br> Input supply loss: drive <br> Exceeding limit speed: drive <br> Break on the control circuit: drive |


| Width | 213.0 mm |
| :--- | :--- |
| Height | 660.0 mm |
| Depth | 262.0 mm |
| Net weight | 27.9 kg |
| Continuous output current | 74.5 A at 4 kHz for normal duty <br> 61.5 A at 4 kHz for heavy duty |

## Environment

| Operating altitude | <= 4800 m with current derating above 1000 m |
| :---: | :---: |
| Operating position | Vertical +/- 10 degree |
| Product certifications | UL CSA TÜV EAC CTick |
| Marking | CE |
| Standards | EN/IEC 61800-3 <br> EN/IEC 61800-5-1 <br> IEC 60721-3 <br> IEC 61508 <br> IEC 13849-1 <br> UL 618000-5-1 <br> UL 508C <br> IEC 61000-3-12 |
| Maximum THDI | <48 \% full load conforming to IEC 61000-3-12 <br> <48 \% 80 \% load conforming to IEC 61000-3-12 |
| Assembly style | With heat sink |
| 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> $1.2 / 50 \mu \mathrm{~s}-8 / 20 \mu \mathrm{~s}$ 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 |
| Environmental class (during operation) | Class 3C3 according to IEC 60721-3-3 Class 3S3 according to IEC 60721-3-3 |
| Maximum acceleration under shock impact (during operation) | $150 \mathrm{~m} / \mathrm{s}^{2}$ at 11 ms |
| Maximum acceleration under vibrational stress (during operation) | $10 \mathrm{~m} / \mathrm{s}^{2}$ at $13 \ldots 200 \mathrm{~Hz}$ |
| Maximum deflection under vibratory load (during operation) | 1.5 mm at $2 . . .13 \mathrm{~Hz}$ |
| Permitted relative humidity (during operation) | Class 3K5 according to EN 60721-3 |
| Volume of cooling air | 240.0 m3/h |
| Type of cooling | Forced convection |
| Overvoltage category | Class III |
| Regulation loop | Adjustable PID regulator |
| Noise level | 63.5 dB |
| Pollution degree | 2 |
| Ambient air transport temperature | $-40 . .70^{\circ} \mathrm{C}$ |
| Ambient air temperature for operation | $-15 . . .50^{\circ} \mathrm{C}$ without derating (vertical position) $50 \ldots 60^{\circ} \mathrm{C}$ with derating factor (vertical position) |
| Ambient air temperature for storage | $-40 . .70^{\circ} \mathrm{C}$ |
| Isolation | Between power and control terminals |

Packing Units

| Unit Type of Package 1 | PCE |
| :--- | :--- |
| Number of Units in Package 1 | 1 |
| Package 1 Weight | 30 kg |
| Package 1 Height | 51 cm |
| Package 1 width | 34 cm |
| Package 1 Length | 84 cm |
| Unit Type of Package 2 | BB 1 |
| Number of Units in Package 2 | 1 |
| Package 2 Weight | 38 kg |
| Package 2 Height | 53.4 cm |
| Package 2 width | 33.2 cm |
| Package 2 Length | 83.2 cm |
| Unit Type of Package 3 | PAL |
| Number of Units in Package 3 | 1 |
| Package 3 Weight | 35 kg |
| Package 3 Height | 52 cm |
| Package 3 width | 35 cm |
| Package 3 Length | 85 cm |

Offer Sustainability

| Sustainable offer status | Green Premium product |
| :--- | :--- |
| REACh Regulation | REACh Declaration |
| EU RoHS Directive | Pro-active compliance (Product out of EU RoHS legal scope) <br> EU RoHS Declaration |
| Mercury free | Yes |
| RoHS exemption information | Yes |
| China RoHS Regulation | China RoHS declaration |
| Environmental Disclosure | Product Environmental Profile |
| Circularity Profile | End of Life Information <br> WeEE product must be disposed on European Union markets following specific waste collection and <br> never up in rubbish bins |
| California proposition 65 | WARNING: This product can expose you to chemicals including: Lead and lead compounds, which <br> is known to the State of California to cause cancer and birth defects or other reproductive harm. For <br> more information go to www.P65Warnings.ca.gov |
| Upgradeability | Upgraded components available |

Product data sheet
Dimensions Drawings

Dimensions

## Views: Front - Left - Rear



Mounting and Clearance

Clearance


Dimensions in mm

| $X 1$ | X2 | X3 |
| :--- | :--- | :--- |
| $\geqslant$ | $\geqslant$ | $\geqslant$ |
| 100 | 100 | 10 |

Dimensions in in.

| X1 | X2 | X3 |
| :--- | :--- | :--- |
| $\geqslant$ | $\geqslant$ | $\geqslant$ |
| 3.94 | 3.94 | 0.39 |

Mounting and Clearance

Mounting Types
Mounting Type A: Side by Side IP20


Possible, up to $50^{\circ} \mathrm{C}, 2$ drives only
Mounting Type B: Individual IP20


Connections and Schema

## Connections and Schema

Three-Phase Power Supply with Upstream Breaking via Line Contactor Without Safety Function STO
Connection diagrams conforming to standards ISO13849 category 1 and IEC/EN 61508 capacitySIL1, stopping category 0 in accordance with standard IEC/EN 60204-1.

(1) Use relay output 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: Pushbutton
S2: Emergency stop
T1: Transformer for control part
Three-Phase Power Supply with Downstream Breaking via Switch Disconnector

(1) Use relay output R1 set to operating state Fault to switch Off the product once an error is detected.

A1: Drive
Q1 : Switch disconnector
Sensor Connection


It is possible to connect either 1 or 3 sensors on terminals AI1/AI3.

## Product data sheet

ATV340D30N4E
Connections and Schema

Control Block Wiring Diagram

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

A1: ATV340 Drive
R1A, R1E, ariticelay
R2A, R2CSequence relay
R3A, R3CSequence relay

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


Connections and Schema

Digital Outputs Wiring
Digital Outputs: Internal Supply
Positive Logic, Source, European Style, DQ switches to +24 V

(1)

Relay or valve
Negative Logic, Sink, Asian Style, DQ switches to OV

(1)

Relay or valve

Digital Outputs: External Supply
Positive Logic, Source, European Style, DQ switches to +24V

(1)

Relay or valve
Negative Logic, Sink, Asian Style, DQ switches to OV

(1)

Relay or valve

Performance Curves

Open Loop Applications


Performance Curves

Closed Loop Applications


