Specifications



Variable speed drive, Altivar Machine ATV320, 0.37 kW, 380...500 V, 3 phases, enclosed, IP65

ATV320U04N4WS

Main

| wain | |
|------------------------------|---|
| Range of product | Altivar Machine ATV320 |
| Product or component type | Variable speed drive |
| Product specific application | Complex machines |
| Variant | With disconnect switch |
| Format of the drive | Enclosed |
| Mounting mode | Wall mount |
| Communication port protocol | Modbus serial CANopen |
| Option card | Communication module, CANopen Communication module, EtherCAT Communication module, Profibus DP V1 Communication module, PROFINET Communication module, Ethernet Powerlink Communication module, EtherNet/IP Communication module, DeviceNet |
| [Us] rated supply voltage | 380500 V - 1510 % |
| Nominal output current | 1.5 A |
| Motor power kW | 0.37 kW for heavy duty |
| EMC filter | Class C2 EMC filter integrated |
| IP degree of protection | IP65 |

Complementary

| Discrete input number | 7 |
|------------------------|--|
| Discrete input type | STO safe torque off, 24 V DC, impedance: 1.5 kOhm DI1DI6 logic inputs, 24 V DC (30 V) DI5 programmable as pulse input: 030 kHz, 24 V DC (30 V) |
| Discrete input logic | Positive logic (source) Negative logic (sink) |
| Discrete output number | 3 |
| Discrete output type | Open collector DQ+ 0…1 kHz 30 V DC 100 mA Open collector DQ- 0…1 kHz 30 V DC 100 mA |
| Analogue input number | 3 |
| Analogue input type | Al1 voltage: 010 V DC, impedance: 30 kOhm, resolution 10 bits Al2 bipolar differential voltage: +/- 10 V DC, impedance: 30 kOhm, resolution 10 bits Al3 current: 020 mA (or 4-20 mA, x-20 mA, 20-x mA or other patterns by configuration), impedance: 250 Ohm, resolution 10 bits |
| Analogue output number | 1 |



| Analogue output type Estivate configurable current A01 0. 20 mA regedance 000 One, resolution 10 bits Reiny output type Configurable may bots PEAL 10. 000 Checks Configurable may bots PEAL 10. 000 Checks Reiny output type Configurable may bots PEAL 10. 000 Checks Configurable may bots PEAL 10. 000 Checks Reiny output type Configurable may bots PEAL 10. 000 Checks Configurable may bots PEAL 10. 000 Checks Maximum switching current Resy output FEAL REIL REIL CAR PEAC 000 Checks PEAR 200 CHECK Method of access Some CoNEpon FEAR 200 CHECK PEAR 200 CHECK 4 quadrant operation possible True PEAR 200 CHECK PEAR 200 CHECK PEAR 200 CHECK 5 profile Some CoNEpon True PEAR 200 CHECK PEAR 200 CHECK PEAR 200 CHECK 4 quadrant operation possible True PEAR 200 CHECKS PEAR 200 CHECKS PEAR 200 CHECKS 5 profile Some CoNEpon True PEAR 200 CHECKS PEAR 200 CHECKS PEAR 200 CHECKS 6 profile Some CoNEpon True PEAR 200 CHECKS PEAR 200 CHECKS 7 profile Some CoNEpon PEAR 200 CHECKS PEAR 200 CHECKS <t< th=""><th></th><th></th></t<> | | |
|---|-------------------------------|--|
| Configurate eign gie R10 Configurate eign gie R10 Maximum switching current Reiz coups R1A, R18, R1C cate industation automatike 100000 cycles Generation automatic eign plage R20 International automatike industation automatike 100000 cycles Generation automatic eign plage R20 International automatike industation automatike industatindustatindustation automatike industatindustation automatike ind | Analogue output type | |
| Maximum switching current Relay output R1A, R1B, R1C on resistive load, cos pH = 1: 3 A at 230 V AC Relay output R1A, R1B, R1C, R1B, R1C, on maketive load, cos pH = 1: 3 A at 230 V AC Relay output R1A, R1B, R1C, R2A, R2C on micketive load, cos pH = 1: 0 A and LR = 7 ms 2 A at 30 V Cost put R1A, R1B, R1C, R2A, R2C on micketive load, cos pH = 1: 6 A and LR = 7 ms 2 A at 30 V Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 A at 20 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 At 30 V AC Relay output R2A, R2C on resistive load, cos pH = 1: 6 At 30 V AC Relay output R2A, R2C on resistive load, R2A, R2C on resistive load, Cos PH = 1: 6 At 30 V AC Relay output R2A, R2C on resistive load R2A output R2A, R2C on resistive R2A output R2A, R2C output R2A, R2 | Relay output type | Configurable relay logic R1B 1 NC electrical durability 100000 cycles Configurable relay logic R1C Configurable relay logic R2A 1 NO electrical durability 100000 cycles |
| AC AC Reby output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 1.5 A at 230 V AC Reby output R2A, R2C on resistive load, cos phi = 1.5 A at 230 V AC Reby output R2A, R2C on resistive load, cos phi = 1.5 A at 230 V AC Minimum switching current Reby output R2A, R2C on resistive load, cos phi = 1.5 A at 230 V AC Method of access Slave CANopen 4 quadrant operation possible True Asynchronous motor control Voltage#requency ratio. 5 points Flave wedto control without sensor Synchronous motor control Vector control without sensor Profile Voltage#requency ratio. 2 points Synchronous motor control Vector control without sensor Profile Vector control without sensor Maximum output frequency 0.599 Mit2 Transient overtorque 170200 % of nominal motor torque Acceleration and deceleration Linear U S Culs S Culs S Culs S Culs S Culs S Synchronous motor control Vector control without sensor B ket aduption Acceleration and deceleration | Maximum switching current | Relay output R1A, R1B, R1C on resistive load, cos phi = 1: 3 A at 250 V AC Relay output R1A, R1B, R1C on resistive load, cos phi = 1: 3 A at 30 V DC |
| DC Relay output R2A, R2C on reliative load, cas pH = 1: 5 A at 350 V AC Relay output R2A, R2C on reliative load, cas pH = 1: 5 A at 30 V BC Minimum switching current Relay output R2A, R2C on reliative load, cas pH = 1: 5 A at 30 V BC Minimum switching current Relay output R2A, R2C on reliative load, cas pH = 1: 5 A at 30 V BC 4 quadrant operation possible True Asynchronous motor control profile Voltage/faguency valo. 5 points Flav vector control without sensor Synchronous motor control profile Vector control without sensor Maximum output frequency 0.589 Hrz Transient overforque 170. 200 % of nominal motor torque Acceleration and deceleration ramps Linear US Signal frequency Acceleration and deceleration dataset in involtage/frequency ratio. 2 points Switching frequency 0.589 Hrz Transient overforque 170. 200 % of nominal motor torque Acceleration and deceleration and deceleration deceleration and pagatation Accelerationideceleration and pagatation Accelerationideceleration and pagatation Maximum output traquecy 4.18 Hz Vector control Who frequency 2.14 K to 300 % Not assiltable in voltage/frequency ato (2 or 5 points) Switching frequency 4.12 <td></td> <td>AC</td> | | AC |
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| 4 quadrant operation possible True Asynchronous motor control profile Voltage/requency ratio. 5 points Flux vector control without sensor: standard Votage/requency ratio. Energy Saving Vortage/requency ratio. 2 marks Saving Vortage/requency ratio. 2 marks Synchronous motor control Profile Maximum output frequency 0.599 kHz Transient overtorque 170200 % of nominal motor torque Acceleration and deceleration ramps Linear U Suts Vector control Uses Structure 170200 % of nominal motor torque Acceleration and deceleration ramps Linear U Suts Vector salip compensation Acceleration/deceleration automatic stop with DC injecton Motor slip compensation Adjustable in votage/requency ratio (2 or 5 points) Switching frequency 216 kHz distable Vector indiction there and Adjustable in votage/requency ratio (2 or 5 points) Switching frequency 4.16 kHz with derating factor Nominal switching frequency 4.16 kHz with derating factor Nominal switching frequency 1.14 kHz adistable Proke chopper integrated True Line current 2.14 Adistable (Prokeny duty) 1.6 A at 300 V (heavy duty) 1.6 At 300 V (heavy duty) Maximum output voltage 500 V | Minimum switching current | |
| Asynchronous motor control profile Voltage/frequency ratio. 5 points Flux vector control without sensor - Energy Saving, quadratic Utf Flux, vector control without sensor - Energy Saving, quadratic Utf Flux, vector control without sensor - Energy Saving, quadratic Utf Flux, vector control without sensor Synchronous motor control profile Vector control without sensor Maximum output frequency 0.599 kHz Transient overtorque 170200 % of nominal motor torque Acceleration and deceleration ramps Linear U g Guis Ramp switching Acceleration/deceleration ramp adaptation Acceleration/deceleration automatic stop with DC injection Motor slip compensation Automatic whatever the load Adjustable 0300 % Not available 0300 % Switching frequency 216 kHz adjustable 416 kHz with derating factor Nominal switching frequency 4 kHz Braking to standstill By DC injection Brake chopper integrated True Line current 2.1.4 at 380 V (heavy duty) 1.6 At 3600 V (heavy duty) Adjustable Apparent power 1.4 kVA at 500 V (heavy duty) Natimum output voltage 5 % Prospective line lasc 5 kA Base load current at high overroad 5 % Prospective line lasc 5 kA Base load current at high overoad <td>Method of access</td> <td>Slave CANopen</td> | Method of access | Slave CANopen |
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| Transient overtorque 170200 % of nominal motor torque Acceleration and deceleration ramps Linear U S CUS Ramp switching Acceleration/deceleration Acceleration/deceleration Acceleration/deceleration acceleration/deceleration Acceleration/deceleration Motor slip compensation Automatic whatever the load Adjustable 0300 % Not available in voltage/frequency ratio (2 or 5 points) Switching frequency 216 kHz adjustable 416 kHz Braking to standstill By DC injection Brake chopper integrated True Line current 2.1 A at 380 V (heavy duty) 1.6 A at 500 V (heavy duty) Maximum output voltage 500 V Apparent power 1.4 kVA at 500 V (heavy duty) Network frequency 5% Prospective line los 5 kA Base load current at high overload 54.0 A Power dissipation in W Self-cooled: 23.0 W at 380 V, switching frequency 4 kHz With safety function Safeb yrue True With safety function Safeb xeta False With safety function Safeb xeta False | | Vector control without sensor |
| Acceleration and deceleration ramps Linear U Scuss Ramp switching Acceleration/deceleration Acceleration/deceleration Acceleration/deceleration Motor slip compensation Automatic whatever the load Adjustable 0300 % Not available in voltage/frequency ratio (2 or 5 points) Switching frequency 216 kHz adjustable 414 kHz Braking to standstill By DC injection Brake chopper integrated True Line current 2.1 A at 380 V (heavy duty) 1.6 A at 500 V (heavy duty) Maximum output voltage 500 V Apparent power 1.4 kVA at 500 V (heavy duty) Network frequency 5% Prospective line los 5 kA Base load current at high overload 54.0 A Power dissipation in W Self-cooled: 23.0 W at 380 V, switching frequency 4 kHz With safety function Safeb yrue True With safety function Safe brake management (SBC/SBT) False | Maximum output frequency | 0.599 kHz |
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| Braking to standstill By DC injection Brake chopper integrated True Line current 2.1 A at 380 V (heavy duty) 1.6 A at 500 V (heavy duty) Maximum input current 2.1 A Maximum output voltage 500 V Apparent power 1.4 kVA at 500 V (heavy duty) Network frequency 5060 Hz Relative symmetric network frequency tolerance 5 % Prospective line Isc 5 kA Base load current at high overload 54.0 A Power dissipation in W Self-cooled: 23.0 W at 380 V, switching frequency 4 kHz With safety function Safely Limited Speed (SLS) True With safety function Safe brake management (SBC/SBT) False | Switching frequency | |
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| Maximum output voltage 500 V Apparent power 1.4 kVA at 500 V (heavy duty) Network frequency 5060 Hz Relative symmetric network frequency tolerance 5 % Prospective line lsc 5 kA Base load current at high overload 54.0 A Power dissipation in W Self-cooled: 23.0 W at 380 V, switching frequency 4 kHz With safety function Safely Limited Speed (SLS) True With safety function Safe brake management (SBC/SBT) False With safety function Safe False | Line current | |
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| Network frequency 5060 Hz Relative symmetric network frequency tolerance 5 % Prospective line lsc 5 kA Base load current at high overload 54.0 A Power dissipation in W Self-cooled: 23.0 W at 380 V, switching frequency 4 kHz With safety function Safely Limited Speed (SLS) True With safety function Safe brake management (SBC/SBT) False With safety function Safe False | Maximum output voltage | 500 V |
| Relative symmetric network frequency tolerance 5 % Prospective line lsc 5 kA Base load current at high overload 54.0 A Power dissipation in W Self-cooled: 23.0 W at 380 V, switching frequency 4 kHz With safety function Safely Limited Speed (SLS) True With safety function Safe brake management (SBC/SBT) False With safety function Safe False | Apparent power | 1.4 kVA at 500 V (heavy duty) |
| frequency tolerance Prospective line lsc 5 kA Base load current at high overload 54.0 A Power dissipation in W Self-cooled: 23.0 W at 380 V, switching frequency 4 kHz With safety function Safely Limited Speed (SLS) True With safety function Safe brake management (SBC/SBT) False With safety function Safe False | Network frequency | 5060 Hz |
| Base load current at high overload 54.0 A Power dissipation in W Self-cooled: 23.0 W at 380 V, switching frequency 4 kHz With safety function Safely Limited Speed (SLS) True With safety function Safe brake management (SBC/SBT) False With safety function Safe False | | 5 % |
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| With safety function Safely True With safety function Safe brake False With safety function Safe False With safety function Safe False | _ | 54.0 A |
| Limited Speed (SLS) With safety function Safe brake management (SBC/SBT) With safety function Safe False | Power dissipation in W | Self-cooled: 23.0 W at 380 V, switching frequency 4 kHz |
| management (SBC/SBT) With safety function Safe False | | True |
| | | False |
| | | 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 | Input phase breaks: drive Overcurrent between output phases and earth: drive Overheating protection: drive Short-circuit between motor phases: drive Thermal protection: drive |
| Width | 250 mm |
| Height | 340 mm |
| Depth | 200 mm |
| Net weight | 6.3 kg |
| Environment | |
| Operating position | Vertical +/- 10 degree |
| Product certifications | CE ATEX NOM GOST EAC RCM KC |
| Marking | CE ATEX UL CSA EAC RCM |
| Standards | EN/IEC 61800-5-1 |
| Electromagnetic compatibility | 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 Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4 1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5 Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 |
| Environmental class (during operation) | Class 3C3 according to IEC 60721-3-3 Class 3S2 according to IEC 60721-3-3 |
| Maximum acceleration under shock impact (during operation) | 150 m/s² at 11 ms |
| Maximum acceleration under vibrational stress (during operation) | 10 m/s² at 13200 Hz |
| Maximum deflection under vibratory load (during operation) | 1.5 mm at 213 Hz |
| Permitted relative humidity (during operation) | Class 3K5 according to EN 60721-3 |
| Overvoltage category | 111 |
| Regulation loop | Adjustable PID regulator |

| Speed accuracy | +/- 10 % of nominal slip 0.2 Tn to Tn |
|---------------------------------------|---|
| Pollution degree | 3 |
| Ambient air transport temperature | -2570 °C |
| Ambient air temperature for operation | -1040 °C without derating 4060 °C with derating factor |
| Ambient air temperature for storage | -2570 °C |

Packing Units

| Unit Type of Package 1 | PCE |
|------------------------------|---------|
| Number of Units in Package 1 | 1 |
| Package 1 Height | 25.8 cm |
| Package 1 Width | 30.5 cm |
| Package 1 Length | 45.0 cm |
| Package 1 Weight | 8.3 kg |

Offer Sustainability

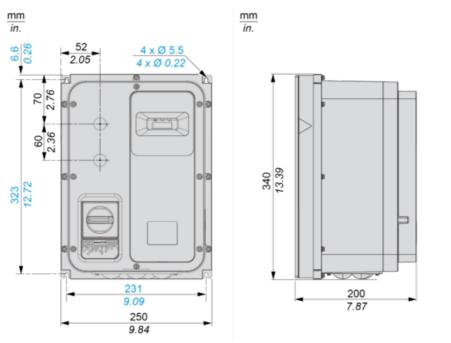
| Sustainable offer status | Green Premium product |
|----------------------------|---|
| REACh Regulation | REACh Declaration |
| EU RoHS Directive | Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration |
| Mercury free | Yes |
| China RoHS Regulation | China RoHS declaration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

Dimensions Drawings

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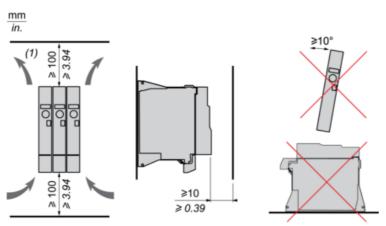
Dimensions

Front and Left View



Mounting and Clearance

Mounting and Clearance



(1) Minimum value corresponding to thermal constraints.

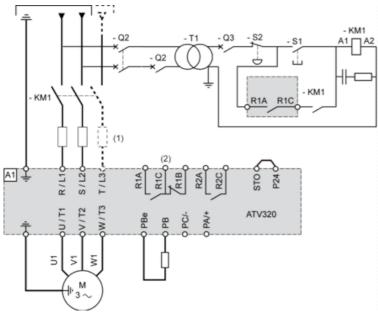
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Connections and Schema

Connection Diagrams

Diagram with Line Contactor

Connection diagrams conforming to standards ISO13849 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1.

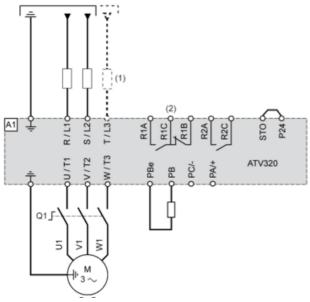


(1) Line choke (if used)

(2) Fault relay contacts, for remote signaling of drive status

Diagram with Switch Disconnect

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.

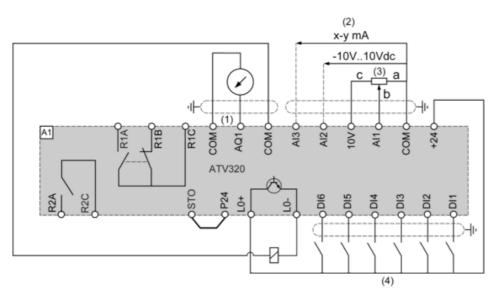


(1) Line choke (if used)

(2) Fault relay contacts, for remote signaling of drive status

Connections and Schema

Control Connection Diagram in Source Mode



(1) Analog output

(2) Analog inputs

(3) Reference potentiometer (10 kOhm maxi)

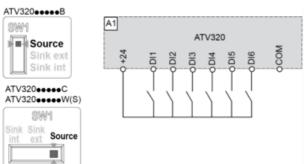
(4) Digital inputs

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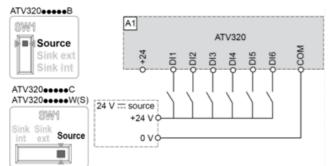
Connections and Schema

Digital Inputs Wiring

The logic input switch (SW1) is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs. Switch SW1 set to "Source" position and use of the output power supply for the DIs.

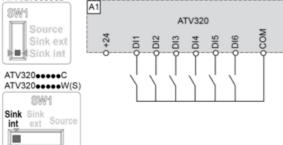


Switch SW1 set to "Source" position and use of an external power supply for the DIs.

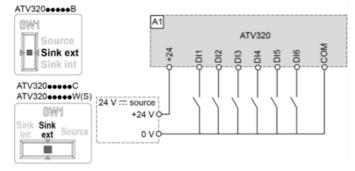


Switch SW1 set to "Sink Int" position and use of the output power supply for the DIs.

ATV320



Switch SW1 set to "Sink Ext" position and use of an external power supply for the DIs.



Recommended replacement(s)

