

# ATV340D45N4E

variable speed drive - 45kW- 400V - 3 phases -  
ATV340 Ethernet



## Main

|                           |                                                                                                                                                                                                                                                        |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Range of product          | Altivar Machine ATV340                                                                                                                                                                                                                                 |
| Product or component type | Variable speed drive                                                                                                                                                                                                                                   |
| Device application        | Machine                                                                                                                                                                                                                                                |
| Device short name         | ATV340                                                                                                                                                                                                                                                 |
| Variant                   | Standard version                                                                                                                                                                                                                                       |
| Product destination       | Asynchronous motors<br>Synchronous motors                                                                                                                                                                                                              |
| Mounting mode             | Wall mount                                                                                                                                                                                                                                             |
| EMC filter                | Integrated with 150 m conforming to EN/IEC 61800-3 category C3                                                                                                                                                                                         |
| IP degree of protection   | IP20 conforming to IEC 61800-5-1<br>IP20 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            | 55 kW for normal duty<br>45 kW for heavy duty                                                                                                                                                                                                          |
| Motor power hp            | 75 hp for normal duty<br>60 hp for heavy duty                                                                                                                                                                                                          |
| Line current              | 97.2 A at 380 V with internal line choke (normal duty)<br>84.2 A at 480 V with internal line choke (normal duty)<br>81.4 A at 380 V with internal line choke (heavy duty)<br>71.8 A at 480 V with internal line choke (heavy duty)<br>81.4 A<br>71.8 A |
| Prospective line Isc      | 50 kA                                                                                                                                                                                                                                                  |
| Apparent power            | 70 kVA at 480 V (normal duty)<br>59.7 kVA at 480 V (heavy duty)                                                                                                                                                                                        |
| Continuous output current | 106 A at 4 kHz for normal duty<br>88 A at 4 kHz for heavy duty                                                                                                                                                                                         |

|                                    |                                                                                                                                          |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum transient current          | 127.2 A during 60 s (normal duty)<br>132 A during 60 s (heavy duty)<br>127.2 A during 2 s (normal duty)<br>132 A during 2 s (heavy duty) |
| Asynchronous motor control profile | Constant torque standard<br>Optimized torque mode<br>Variable torque standard                                                            |
| Synchronous motor control profile  | Reluctance motor<br>Permanent magnet motor                                                                                               |
| Speed drive output frequency       | 0.1...500 Hz                                                                                                                             |
| Nominal switching frequency        | 2.5 kHz                                                                                                                                  |
| Switching frequency                | 1...8 kHz adjustable<br>2.5...8 kHz with derating factor                                                                                 |
| Safety function                    | STO (safe torque off) SIL 3                                                                                                              |

## Complementary

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of preset speeds             | 16 preset speeds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Communication port protocol         | Modbus TCP<br>Modbus serial<br>Ethernet/IP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Option card                         | Slot GP-X: digital and analog I/O extension module<br>Slot GP-X: output relay extension module<br>Slot GP-ENC: 5/12 V digital encoder interface module<br>Slot GP-ENC: analog encoder interface module<br>Slot GP-ENC: resolver encoder interface module                                                                                                                                                                                                                                                                                                                                                                          |
| Output voltage                      | <= power supply voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Permissible temporary current boost | 1.5 x I <sub>n</sub> during 60 s (heavy duty)<br>1.2 x I <sub>n</sub> during 60 s (normal duty)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Motor slip compensation             | Not available in permanent magnet motor law<br>Can be suppressed<br>Adjustable<br>Automatic whatever the load                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 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 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 |
| Frequency resolution                | Display unit: 0.1 Hz<br>Analog input: 0.012/50 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Electrical connection               | Control: screw terminal 0.75...1.5 mm <sup>2</sup> /AWG 18...AWG 16<br>Line side: screw terminal 70...120 mm <sup>2</sup> /AWG 1/0...250 kcmil<br>DC bus: screw terminal 70...120 mm <sup>2</sup> /AWG 1/0...250 kcmil<br>Motor: screw terminal 70...120 mm <sup>2</sup> /AWG 1/0...250 kcmil                                                                                                                                                                                                                                                                                                                                     |
| Connector type                      | connector(s) 1 x RJ45, Modbus serial on front face<br>connector(s) 1 x RJ45, Modbus serial for HMI on front face<br>connector(s) 2 x RJ45, Ethernet IP/Modbus TCP on front face                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Physical interface                  | 2-wire RS 485 for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Transmission frame                  | RTU for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Transmission rate                   | 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## 10/100 Mbit/s for Ethernet IP/Modbus TCP

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exchange mode             | Half duplex, full duplex, autonegotiation 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 Modbus RTU<br>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<br>Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 mA, protection type: overload and short-circuit protection<br>Internal supply for digital inputs and STO: 24 V DC (21...27 V), <200 mA, protection type: overload and short-circuit protection                                        |
| Local signalling          | Local diagnostic: 3 LED (mono/dual colour)<br>Embedded communication status: 5 LED (dual colour)<br>Communication module status: 2 LED (dual colour)<br>Presence of voltage: 1 LED (red)                                                                                                                                                                                                                                                              |
| Width                     | 271 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Height                    | 908 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Depth                     | 309 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Product weight            | 56.4 kg                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Analogue input number     | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Analogue input type       | AI1, AI2, AI3 software-configurable voltage: 0...10 V DC, impedance: 31.5 kOhm, resolution 12 bits<br>AI1, AI3 software-configurable current: 0...20 mA, impedance: 250 Ohm, resolution 12 bits<br>AI1, AI3 software-configurable temperature probe or water level sensor                                                                                                                                                                             |
| Discrete input number     | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Discrete input type       | STOA, STOB safe torque off, 24 V DC (<= 30 V), impedance: > 2.2 kOhm<br>DI7, DI8 programmable as pulse input: 0...30 kHz, 24 V DC (<= 30 V)<br>DI1...DI8 programmable, 24 V DC (<= 30 V), impedance: 4.4 kOhm                                                                                                                                                                                                                                         |
| Input compatibility       | STOA, STOB: discrete input level 1 PLC conforming to EN/IEC 61131-2<br>DI1...DI8: discrete input level 1 PLC conforming to EN/IEC 61131-2<br>DI7, DI8: pulse input level 1 PLC conforming to IEC 65A-68                                                                                                                                                                                                                                               |
| Discrete input logic      | Positive logic (source) (STOA, STOB), < 5 V (state 0), > 11 V (state 1)<br>Positive logic (source) (DI1...DI8), < 5 V (state 0), > 11 V (state 1)<br>Negative logic (sink) (DI1...DI8), > 16 V (state 0), < 10 V (state 1)<br>Positive logic (source) (DI7, DI8), < 0.6 V (state 0), > 2.5 V (state 1)                                                                                                                                                |
| Analogue output number    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Analogue output type      | Software-configurable voltage AQ1, AQ2: 0...10 V DC impedance 470 Ohm, resolution 10 bits<br>Software-configurable current AQ1, AQ2: 0...20 mA impedance 500 Ohm, resolution 10 bits                                                                                                                                                                                                                                                                  |
| Discrete output number    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Input/Output type         | Logic output DQ-: 0...1 kHz, <= 30 V DC, 100 mA<br>Logic output DQ+: 0...1 kHz, <= 30 V DC, 100 mA<br>Programmable as pulse output DQ+: 0...30 kHz, <= 30 V DC, 20 mA                                                                                                                                                                                                                                                                                 |
| Sampling duration         | 2 ms +/- 0.5 ms (DI1...DI8) - discrete input<br>5 ms +/- 1 ms (DI7, DI8) - pulse input<br>1 ms +/- 1 ms (AI1, AI2, AI3) - analog input<br>5 ms +/- 1 ms (AQ1, AQ2) - analog output                                                                                                                                                                                                                                                                    |
| Accuracy                  | +/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input<br>+/- 1 % AQ1, AQ2 for a temperature variation 60 °C analog output                                                                                                                                                                                                                                                                                                            |
| Linearity error           | AI1, AI2, AI3: +/- 0.15 % of maximum value for analog input<br>AQ1, AQ2: +/- 0.2 % for analog output                                                                                                                                                                                                                                                                                                                                                  |
| Relay output number       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Relay output type         | Configurable relay logic R1: fault relay NO/NC electrical durability 100000 cycles<br>Configurable relay logic R2: sequence relay NO electrical durability 100000 cycles<br>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 on resistive load, cos phi = 1: 3 A at 250 V AC<br>Relay output R1 on resistive load, cos phi = 1: 3 A at 30 V DC<br>Relay output R1 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 250 V AC<br>Relay output R1 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 30 V DC<br>Relay output R2, R3 on resistive load, cos phi = 1: 5 A at 250 V AC<br>Relay output R2, R3 on resistive load, cos phi = 1: 5 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

## Environment

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Isolation                             | Between power and control terminals                                                                                                                                                                                                                                                                                                                                                                                              |
| Insulation resistance                 | > 1 MOhm 500 V DC for 1 minute to earth                                                                                                                                                                                                                                                                                                                                                                                          |
| Noise level                           | 62.4 dB conforming to 86/188/EEC                                                                                                                                                                                                                                                                                                                                                                                                 |
| Power dissipation in W                | Natural convection: 105 W at 380 V, switching frequency 4 kHz (heavy duty)<br>Forced convection: 943 W at 380 V, switching frequency 4 kHz (heavy duty)<br>Natural convection: 115 W at 380 V, switching frequency 4 kHz (normal duty)<br>Forced convection: 917 W at 380 V, switching frequency 4 kHz (normal duty)                                                                                                             |
| Volume of cooling air                 | 295 m3/h                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Operating position                    | Vertical +/- 10 degree                                                                                                                                                                                                                                                                                                                                                                                                           |
| 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 µs - 8/20 µs 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 EN/IEC 61800-5-1                                                                                                                                                                                                                                                                                                                                                                                                 |
| Vibration resistance                  | 1.5 mm peak to peak (f= 2...13 Hz) conforming to IEC 60068-2-6<br>1 gn (f= 13...200 Hz) conforming to IEC 60068-2-6                                                                                                                                                                                                                                                                                                              |
| Shock resistance                      | 15 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 | 50...60 °C with current derating (heavy duty)<br>40...60 °C with current derating (normal duty)<br>-15...50 °C without current derating (heavy duty)<br>-15...40 °C without current derating (normal duty)                                                                                                                                                                                                                       |
| Ambient air temperature for storage   | -40...70 °C                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operating altitude                    | <= 1000 m without<br>1000...4800 m with current derating 1 % per 100 m                                                                                                                                                                                                                                                                                                                                                           |
| Environmental characteristic          | Chemical pollution resistance class 3C3 conforming to EN/IEC 60721-3-3<br>Dust pollution resistance class 3S3 conforming to EN/IEC 60721-3-3                                                                                                                                                                                                                                                                                     |
| Standards                             | UL 508C<br>EN/IEC 61800-3<br>Environment 1 category C2 EN/IEC 61800-3<br>Environment 2 category C3 EN/IEC 61800-3<br>EN/IEC 61800-5-1<br>IEC 61000-3-12<br>IEC 60721-3<br>IEC 61508<br>IEC 13849-1                                                                                                                                                                                                                               |
| Product certifications                | TÜV<br>UL<br>REACH<br>CSA                                                                                                                                                                                                                                                                                                                                                                                                        |
| Marking                               | CE                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Offer Sustainability

|                            |                                                                                                                             |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Sustainable offer status   | Green Premium product                                                                                                       |
| REACH Regulation           | <a href="#">REACH Declaration</a>                                                                                           |
| EU RoHS Directive          | Pro-active compliance (Product out of EU RoHS legal scope)<br><a href="#">EU RoHS Declaration</a>                           |
| Mercury free               | Yes                                                                                                                         |
| RoHS exemption information | <a href="#">Yes</a>                                                                                                         |
| China RoHS Regulation      | <a href="#">China RoHS declaration</a>                                                                                      |
| Environmental Disclosure   | <a href="#">Product Environmental Profile</a>                                                                               |
| Circularity Profile        | <a href="#">End of Life Information</a>                                                                                     |
| WEEE                       | The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins |

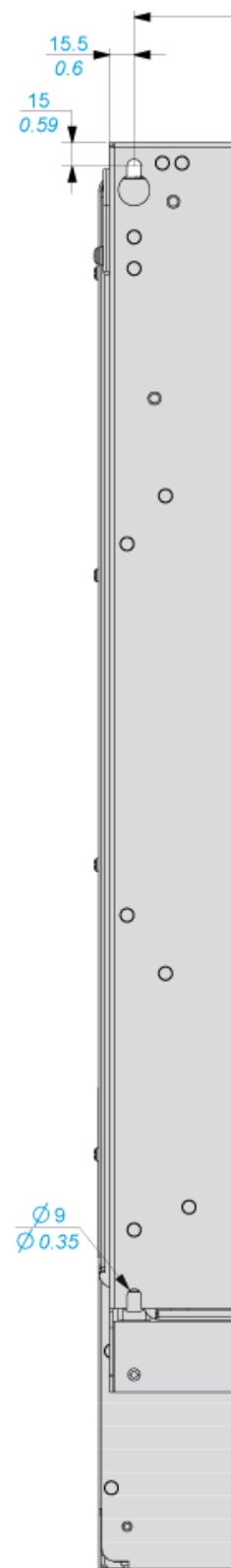
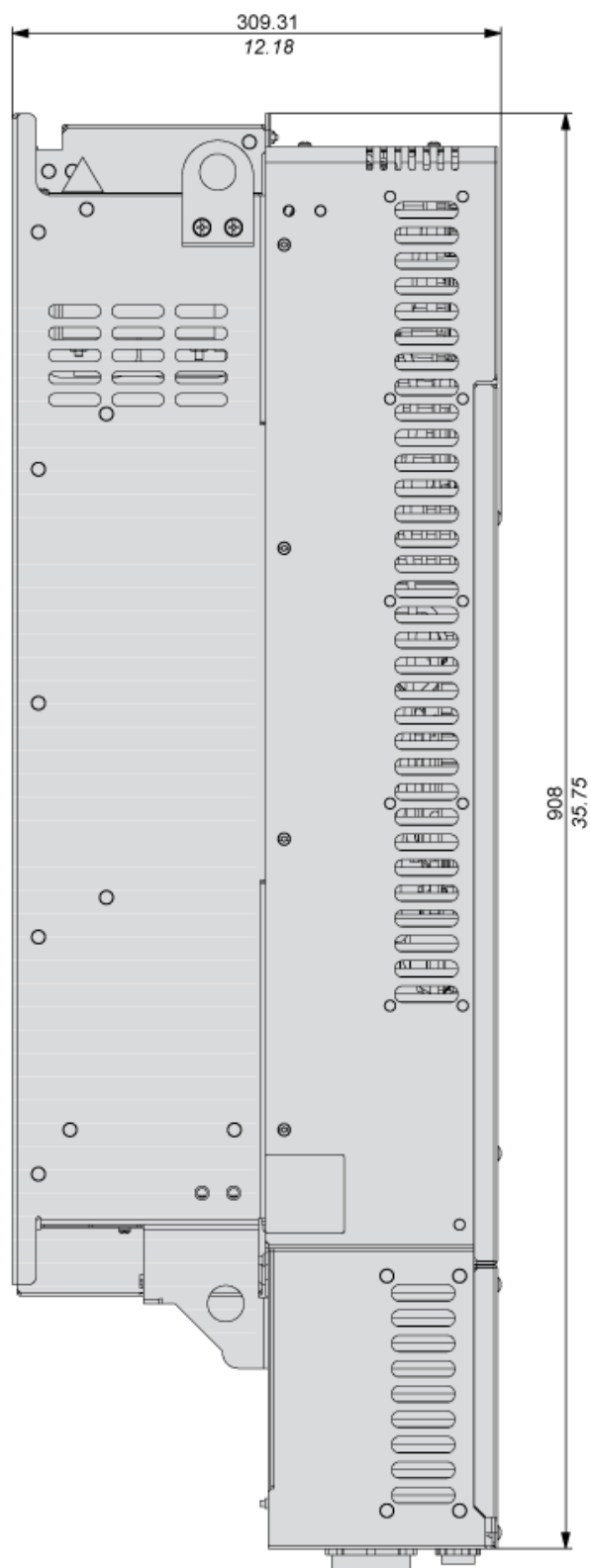
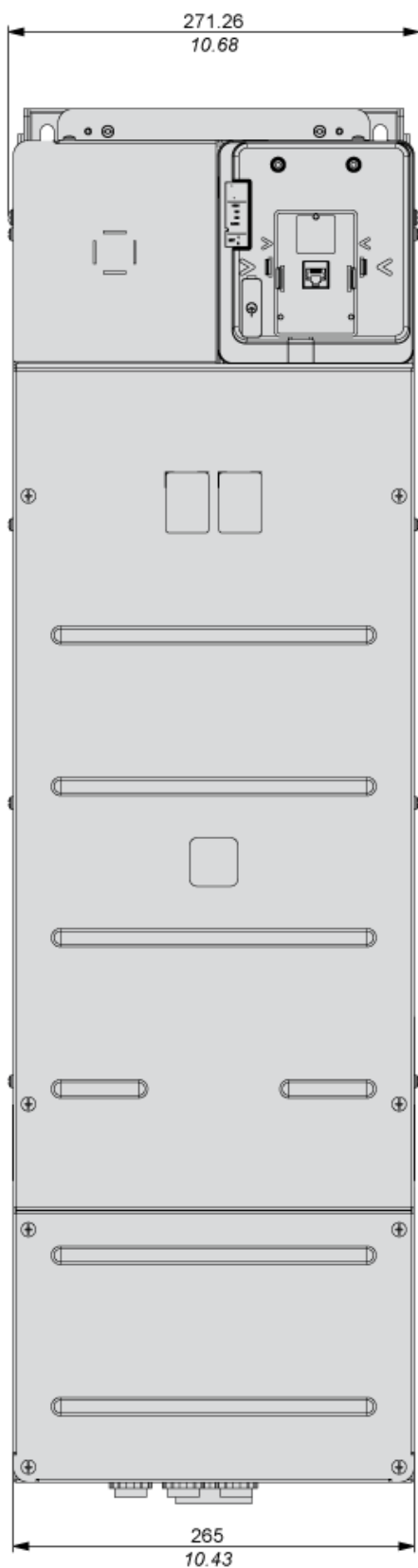
Contractual warranty

|          |           |
|----------|-----------|
| Warranty | 18 months |
|----------|-----------|

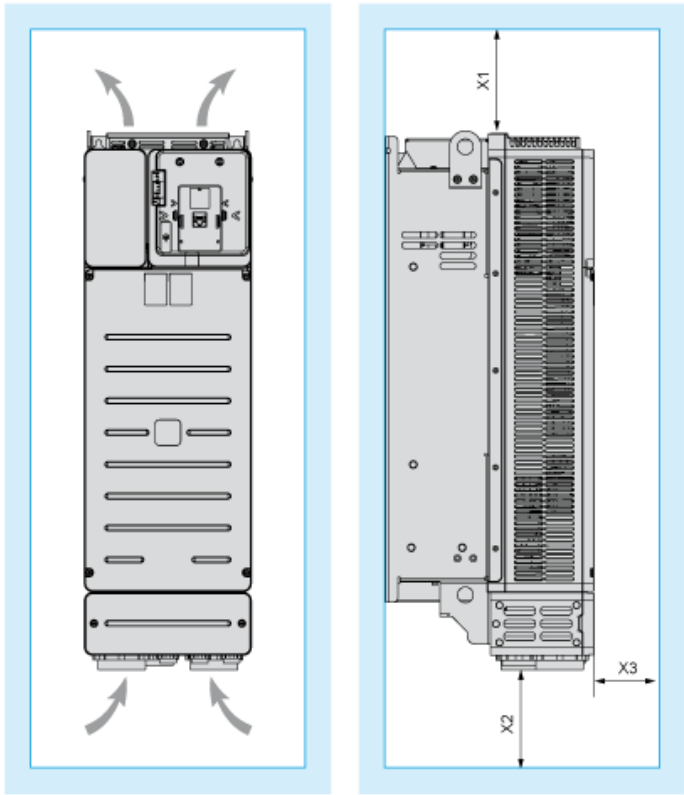
Dimensions

# Views: Front - Left - Rear

mm  
in



Clearance



Dimensions in mm

| X1    | X2    | X3   |
|-------|-------|------|
| ≥ 100 | ≥ 100 | ≥ 10 |

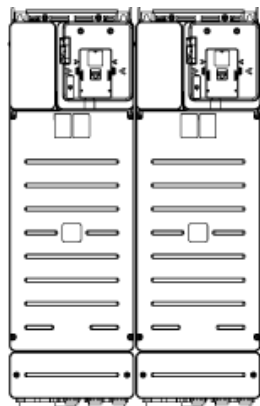
Dimensions in in.

| X1     | X2     | X3     |
|--------|--------|--------|
| ≥ 3.94 | ≥ 3.94 | ≥ 0.39 |



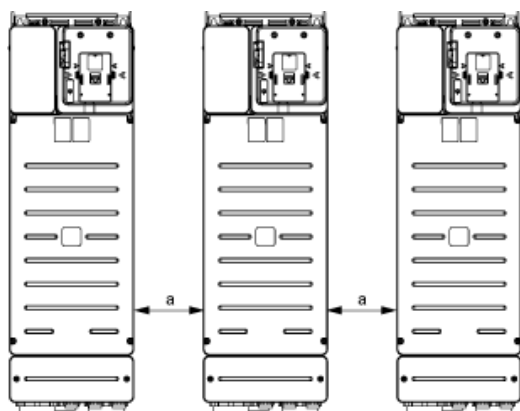
## Mounting Types

### Mounting Type A: Side by Side IP20



Possible, up to 50 °C, 2 drives only

### Mounting Type B: Individual IP20

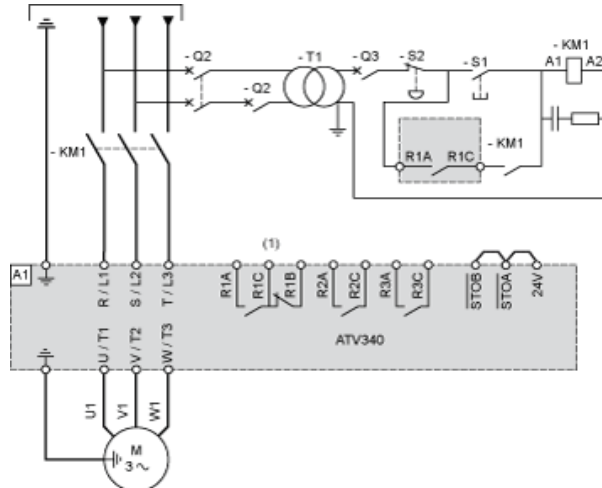


a ≥ 110 mm (4.33 in.)

## Connections and Schema

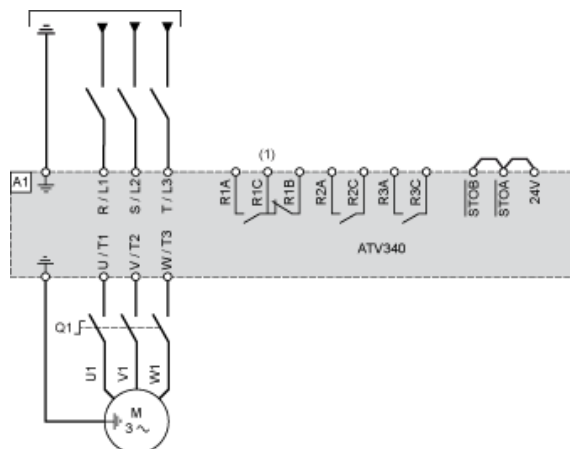
### Three-Phase Power Supply with Upstream Breaking via Line Contactor Without Safety Function STO

Connection diagrams conforming to standards ISO13849 category 1 and IEC/EN 61508 capacitySIL1, stopping category 0 in accordance with standard IEC/EN 60204-1.



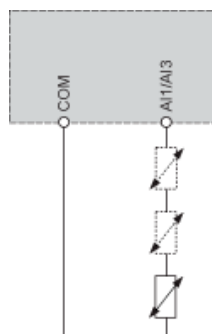
- (1) Use relay output R1 set to operating state Fault to switch Off the product once an error is detected.  
A1 : Drive  
KM1 : Line Contactor  
Q2, Q3 : Circuit breakers  
S1 : Pushbutton  
S2 : Emergency stop  
T1 : Transformer for control part

### Three-Phase Power Supply with Downstream Breaking via Switch Disconnecter



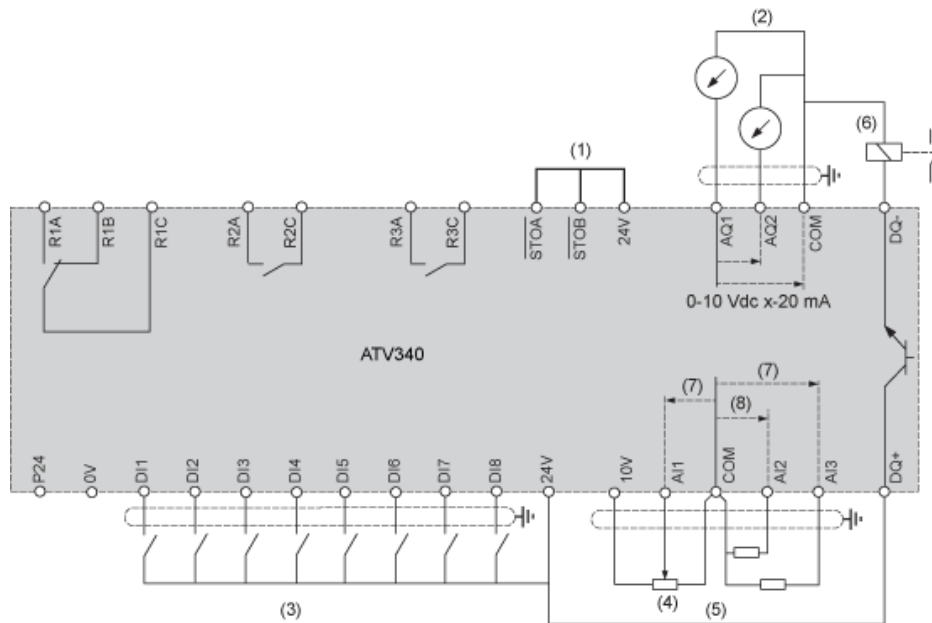
- (1) Use relay output R1 set to operating state Fault to switch Off the product once an error is detected.  
A1 : Drive  
Q1 : Switch disconnector

## Sensor Connection



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

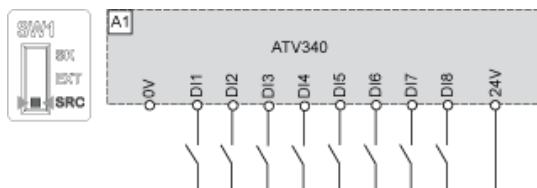
## Control Block Wiring Diagram



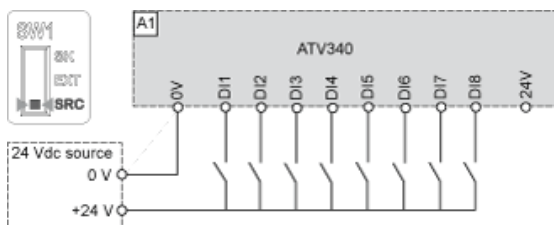
- (1) Safe Torque Off
- (2) Analog Output
- (3) Digital Input
- (4) Reference potentiometer
- (5) Analog Input
- (6) Digital Output
- (7) 0-10 Vdc, x-20 mA
- (8) 0-10 Vdc, -10 Vdc...+10 Vdc
- A1 : ATV340 Drive
- R1A, R1B, R1C relay
- R2A, R2C Sequence relay
- R3A, R3C Sequence relay

## Digital Inputs Wiring

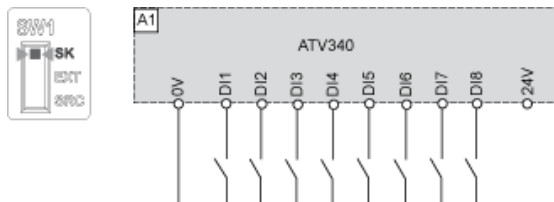
### Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs



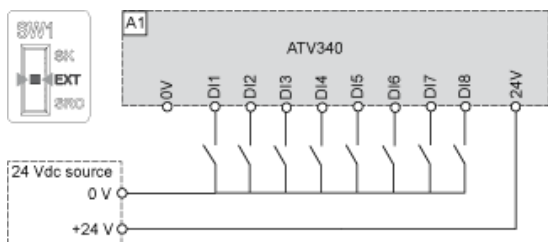
### Switch Set to SRC (Source) Position and Use of an External Power Supply for the DIs



### 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



## Digital Outputs Wiring

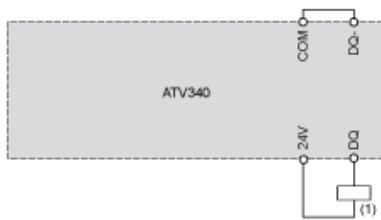
### Digital Outputs: Internal Supply

Positive Logic, Source, European Style, DQ switches to +24V



(1) Relay or valve

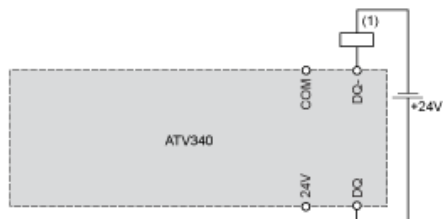
Negative Logic, Sink, Asian Style, DQ switches to 0V



(1) Relay or valve

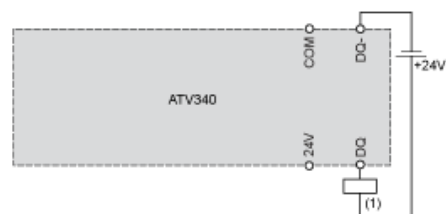
### Digital Outputs: External Supply

Positive Logic, Source, European Style, DQ switches to +24V



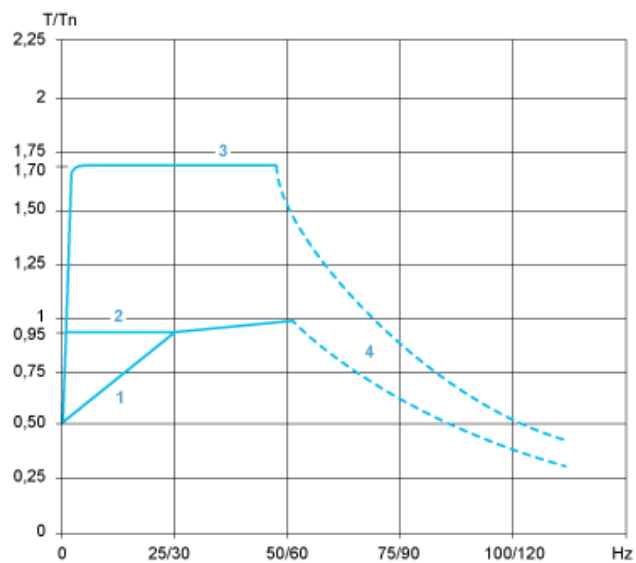
(1) Relay or valve

Negative Logic, Sink, Asian Style, DQ switches to 0V



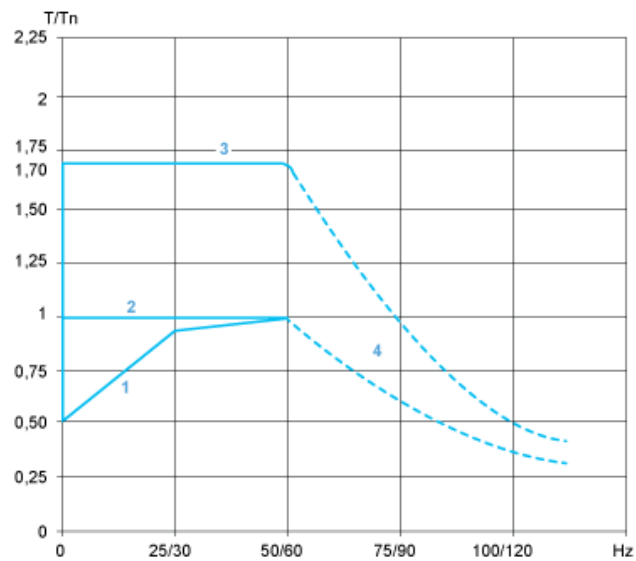
(1) Relay or valve

## Open Loop Applications



- 1 : Self-cooled motor: continuous useful torque
- 2 : Force-cooled motor: continuous useful torque
- 3 : Overtorque for 60 s maximum
- 4 : Torque in overspeed at constant power

## Closed Loop Applications



- 1 : Self-cooled motor: continuous useful torque
- 2 : Force-cooled motor: continuous useful torque
- 3 : Overtorque for 60 s maximum
- 4 : Torque in overspeed at constant power