# Product data sheet

Specifications



## variable speed drive, Altivar Machine ATV320, 4kW, 380 to 500V, 3 phases, compact

ATV320U40N4C

**Product availability: Stock - Normally stocked in distribution facility**

## Main

| | |
|---|---|
| **Range of Product** | Altivar Machine ATV320 |
| **Product or Component Type** | Variable speed drive |
| **Product Specific Application** | Complex machines |
| **Variant** | Standard version |
| **Format of the drive** | Compact |
| **Mounting Mode** | Wall mount |
| **Communication Port Protocol** | Modbus serial<br>CANopen |
| **Option card** | communication module, CANopen<br>communication module, EtherCAT<br>communication module, Profibus DP V1<br>communication module, PROFINET<br>communication module, Ethernet Powerlink<br>communication module, EtherNet/IP<br>communication module, DeviceNet |
| **[Us] rated supply voltage** | 380...500 V - 15...10 % |
| **nominal output current** | 9.5 A |
| **Motor power kW** | 4.0 kW heavy duty |
| **Maximum Horse Power Rating** | 5 hp |
| **EMC filter** | Class C2 EMC filter integrated |
| **IP degree of protection** | IP20 |

## Complementary

| | |
|---|---|
| **Discrete input number** | 7 |
| **Discrete input type** | STO safe torque off, 24 V DC1.5 kOhm<br>DI1...DI6 logic inputs, 24 V DC 30 V)<br>DI5 programmable as pulse input 0…30 kHz, 24 V DC 30 V) |
| **Discrete input logic** | Positive logic (source)<br>Negative logic (sink) |
| **Discrete output number** | 3 |
| **Discrete output type** | Open collector DQ+ 0…1 kHz 30 V DC 100 mA<br>Open collector DQ- 0…1 kHz 30 V DC 100 mA |
| **Analogue input number** | 3 |
| **Analogue input type** | AI1 voltage 0...10 V DC 30 kOhm 10 bits<br>AI2 bipolar differential voltage +/- 10 V DC 30 kOhm 10 bits<br>AI3 current 0...20 mA (or 4-20 mA, x-20 mA, 20-x mA or other patterns by configuration) 250 Ohm 10 bits |
| **Analogue output number** | 1 |

Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.

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

| | |
|---|---|
| **Analogue output type** | Software-configurable current AQ1 0...20 mA 800 Ohm 10 bits<br>Software-configurable voltage AQ1 0...10 V DC 470 Ohm 10 bits |
| **Relay output type** | Configurable relay logic R1A 1 NO 100000 cycles<br>Configurable relay logic R1B 1 NC 100000 cycles<br>Configurable relay logic R1C<br>Configurable relay logic R2A 1 NO 100000 cycles<br>Configurable relay logic R2C |
| **Maximum switching current** | Relay output R1A, R1B, R1C resistive, cos phi = 1 3 A 250 V AC<br>Relay output R1A, R1B, R1C resistive, cos phi = 1 3 A 30 V DC<br>Relay output R1A, R1B, R1C, R2A, R2C inductive, cos phi = 0.4 7 ms 2 A 250 V AC<br>Relay output R1A, R1B, R1C, R2A, R2C inductive, cos phi = 0.4 7 ms 2 A 30 V DC<br>Relay output R2A, R2C resistive, cos phi = 1 5 A 250 V AC<br>Relay output R2A, R2C resistive, cos phi = 1 5 A 30 V DC |
| **Minimum switching current** | Relay output R1A, R1B, R1C, R2A, R2C 5 mA 24 V DC |
| **Method of access** | Slave CANopen |
| **4 quadrant operation possible** | True |
| **Asynchronous motor control profile** | Voltage/frequency ratio, 5 points<br>Flux vector control without sensor, standard<br>Voltage/frequency ratio - Energy Saving, quadratic U/f<br>Flux vector control without sensor - Energy Saving<br>Voltage/frequency ratio, 2 points |
| **Synchronous motor control profile** | Vector control without sensor |
| **Maximum output frequency** | 0.599 kHz |
| **Acceleration and deceleration ramps** | Linear<br>U<br>S<br>CUS<br>Ramp switching<br>Acceleration/deceleration ramp adaptation<br>Acceleration/deceleration automatic stop with DC injection |
| **Motor slip compensation** | Automatic whatever the load<br>Adjustable 0...300 %<br>Not available in voltage/frequency ratio (2 or 5 points) |
| **Switching frequency** | 2...16 kHz adjustable<br>4...16 kHz with derating factor |
| **Nominal switching frequency** | 4 kHz |
| **Braking to standstill** | By DC injection |
| **Brake chopper integrated** | True |
| **Line current** | 13.7 A 380 V heavy duty)<br>10.6 A 500 V heavy duty) |
| **Maximum Input Current per Phase** | 13.7 A |
| **Maximum output voltage** | 500 V |
| **Apparent power** | 9.2 kVA 500 V heavy duty) |
| **Network Frequency** | 50-60 Hz |
| **Relative symmetric network frequency tolerance** | 5 % |
| **Prospective line Isc** | 5 kA |
| **Base load current at high overload** | 9.5 A |
| **Power dissipation in W** | Fan 111 W 380 V 4 kHz |
| **With safety function Safely Limited Speed (SLS)** | True |
| **With safety function Safe brake management (SBC/SBT)** | False |
| **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** | Input phase breaks drive<br>Overcurrent between output phases and earth drive<br>Overheating protection drive<br>Short-circuit between motor phases drive<br>Thermal protection drive |
| **Width** | 5.5 in (140 mm) |
| **Height** | 7.2 in (184.0 mm) |
| **Depth** | 6.2 in (158.0 mm) |
| **Product Weight** | 4.9 lb(US) (2.2 kg) |
| **Transient overtorque** | 170…200 % of nominal motor torque |

# Environment

| | |
|---|---|
| **Operating position** | Vertical +/- 10 degree |
| **Product Certifications** | CE<br>ATEX<br>NOM<br>GOST<br>EAC<br>RCM<br>KC |
| **Marking** | CE<br>ATEX<br>UL<br>CSA<br>EAC<br>RCM |
| **Standards** | IEC 61800-5-1 |
| **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<br>Voltage dips and interruptions immunity test conforming to IEC 61000-4-11 |
| **Environmental class (during operation)** | Class 3C3 according to IEC 60721-3-3<br>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 13...200 Hz |
| **Maximum deflection under vibratory load (during operation)** | 1.5 mm at 2...13 Hz |
| **Permitted relative humidity (during operation)** | Class 3K5 according to EN 60721-3 |
| **Volume of cooling air** | 9959.5 Gal/hr(US) (37.7 m3/h) |
| **Overvoltage category** | III |

| | |
|---|---|
| **Regulation loop** | Adjustable PID regulator |
| **Speed accuracy** | +/- 10 % of nominal slip 0.2 Tn to Tn |
| **Pollution degree** | 2 |
| **Ambient air transport temperature** | -13…158 °F (-25…70 °C) |
| **Ambient air temperature for operation** | 14…122 °F (-10…50 °C) without derating<br>122…140 °F (50…60 °C) with derating factor |
| **Ambient Air Temperature for Storage** | -13…158 °F (-25…70 °C) |

## Ordering and shipping details

| | |
|---|---|
| **Category** | US1CP4B22152 |
| **Discount Schedule** | CP4B |
| **GTIN** | 3606480966781 |
| **Returnability** | Yes |
| **Country of origin** | ID |

## Packing Units

| | |
|---|---|
| **Unit Type of Package 1** | PCE |
| **Nbr. of units in pkg.** | 1 |
| **Package 1 Height** | 9.646 in (24.500 cm) |
| **Package 1 Width** | 7.520 in (19.100 cm) |
| **Package 1 Length** | 10.630 in (27.000 cm) |
| **Package weight(Lbs)** | 6.105 lb(US) (2.769 kg) |
| **Unit Type of Package 2** | S06 |
| **Number of Units in Package 2** | 12 |
| **Package 2 Height** | 29.528 in (75.000 cm) |
| **Package 2 Width** | 23.622 in (60.000 cm) |
| **Package 2 Length** | 31.496 in (80.000 cm) |
| **Package 2 Weight** | 102.550 lb(US) (46.516 kg) |

## Contractual warranty

| | |
|---|---|
| **Warranty (in months)** | 18 |

## Environmental Data

Schneider Electric aims to achieve Net Zero status by 2050 through supply chain partnerships, lower impact materials, and circularity via our ongoing “Use Better, Use Longer, Use Again” campaign to extend product lifetimes and recyclability.

Environmental Data explained >

How we assess product sustainability >

### Environmental footprint

| | |
|---|---|
| Total lifecycle Carbon footprint | **2 476 kg CO2 eq.** |
| Carbon footprint of the manufacturing phase [A1 to A3] | **51 kg CO2 eq.** |
| Carbon footprint of the distribution phase [A4] | **0.5 kg CO2 eq.** |
| Carbon footprint of the installation phase [A5] | **0.5 kg CO2 eq.** |
| Carbon footprint of the use phase [B2, B3, B4, B6] | **2 420 kg CO2 eq.** |
| Carbon footprint of the end-of-life phase [C1 to C4] | **5 kg CO2 eq.** |
| Environmental Disclosure | Product Environmental Profile |

## Use Better

### Materials and Substances

| | |
|---|---|
| Packaging made with recycled cardboard | **Yes** |
| Packaging without single use plastic | **Yes** |
| SCIP Number | **6bbbffbe-8a69-47e2-9c29-bc773d0b789b** |
| EU RoHS Directive | Compliant By Exemption |
| REACh Regulation | Reference contains Substances of Very High Concern above the threshold |
| 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** |

### Energy efficiency

| | |
|---|---|
| Product contributes to saved and avoided emissions | **Yes** |

## Use Longer

### Lifetime extension

| | |
|---|---|
| Repair | **No** |

## Use Again

### Repack and remanufacture

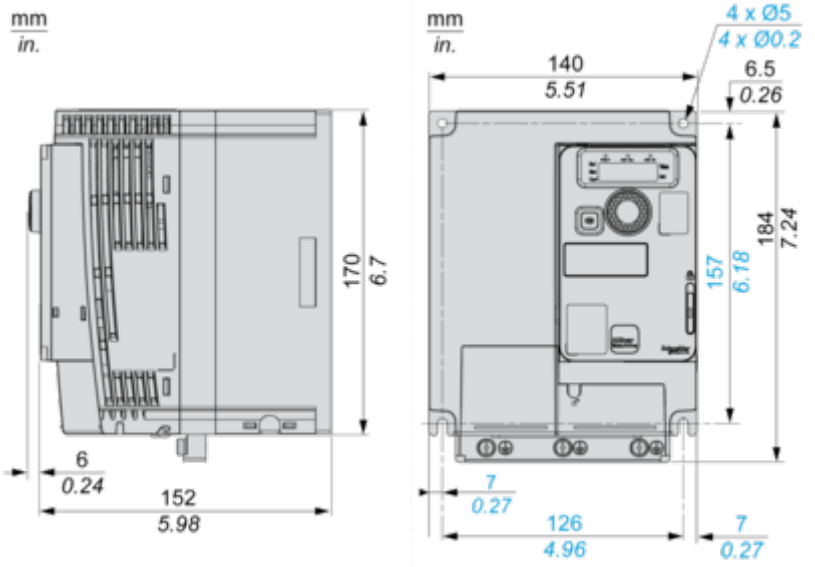
| | |
|---|---|
| Recyclability potential, in % | **58** |
| Circularity Profile | End of Life Information |
| Take-back | **No** |

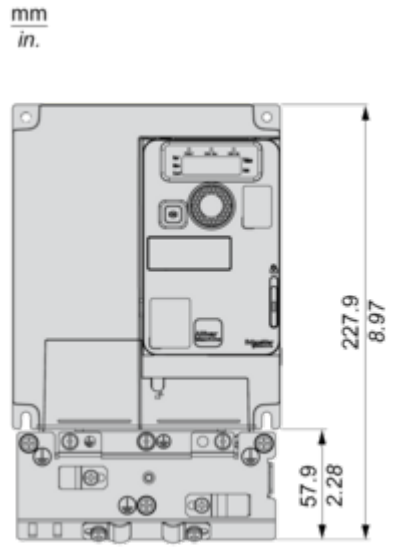
| | |
|---|---|
| WEEE Label |  **The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.** |

Dimensions Drawings

## Dimensions

### Right View, Front View and Front View with EMC Plate

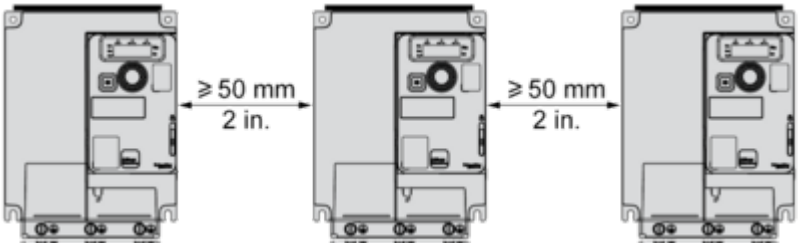


## Mounting and Clearance

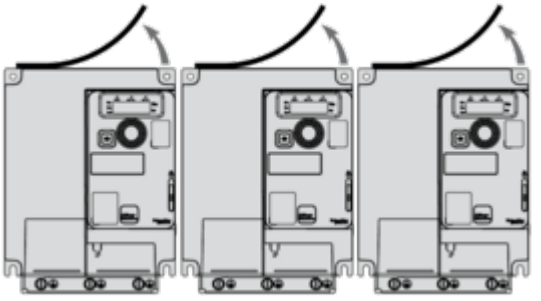
### Mounting Types

#### Mounting Type A: Individual with Ventilation Cover

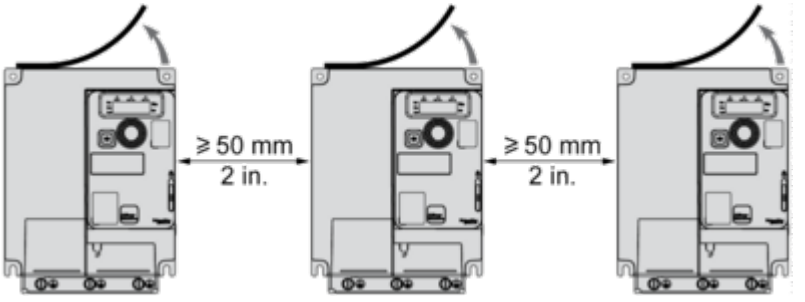



Only Possible at Ambient Temperature Less or Equal to 50 °C (122 °F)

#### Mounting Type B: Side by Side, Ventilation Cover Removed



#### Mounting Type C: Individual, Ventilation Cover Removed

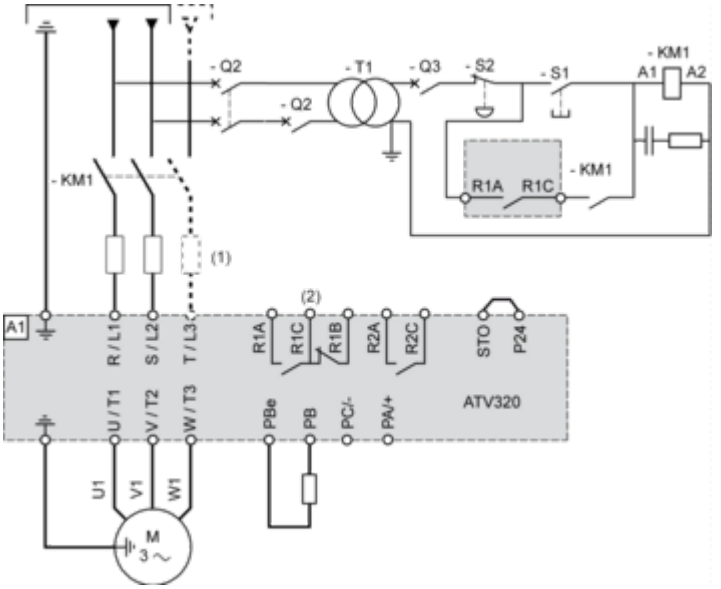



For Operation at Ambient Temperature Above 50 °C (122 °F)

Connections and Schema

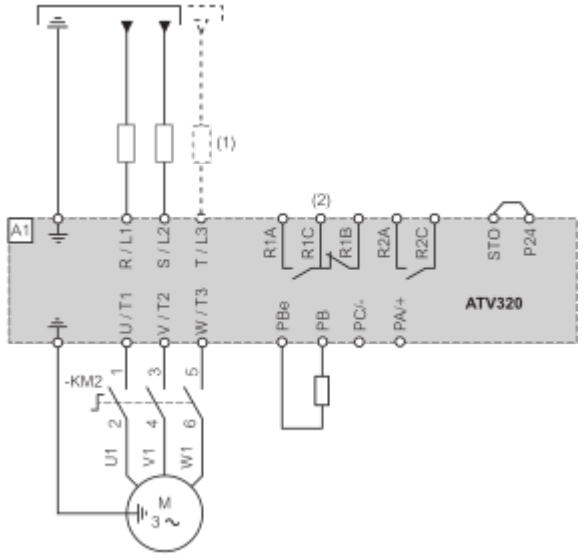
## Connection Diagrams

### Single or Three-phase Power Supply - Diagram With Line Contactor



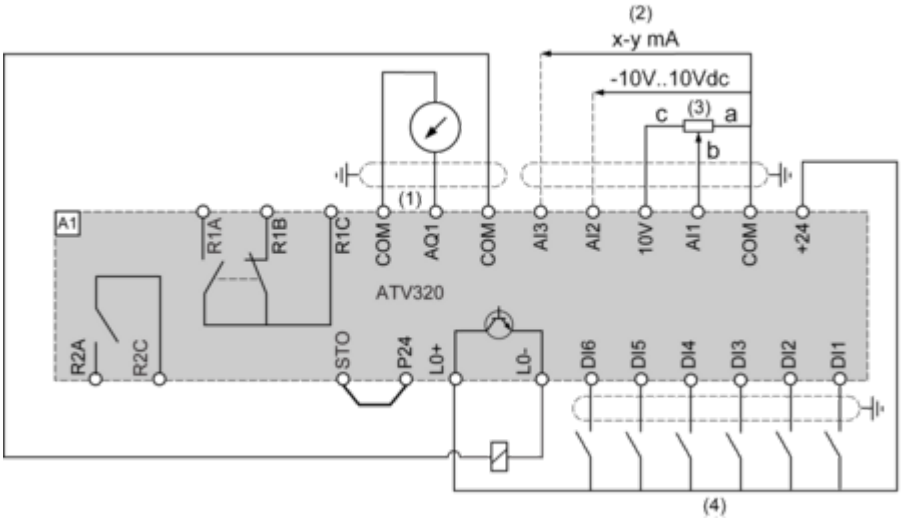

**(1)** Line choke (if used)
**(2)** Use relay output R1 set to operating state Fault to switch Off the product once an error is detected.

### Single or Three-phase Power Supply - Diagram With Downstream Contactor




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

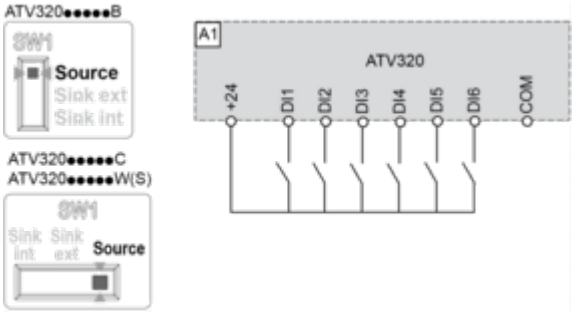
## Control Block Wiring Diagram



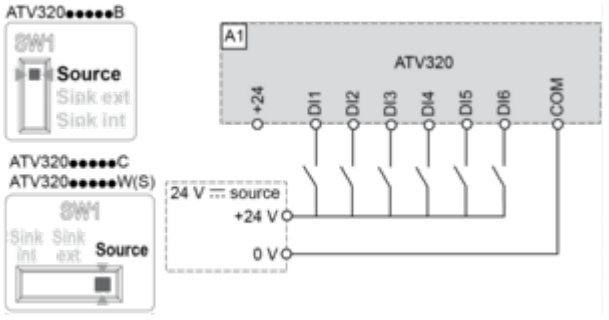

**(1)** Analog output
**(2)** Analog inputs
**(3)** Potentiometer SZ1RV1202 (2.2 kΩ) or similar (10 kΩ maximum)
**(4)** Digital Inputs - Shielding instructions are given in the Electromagnetic Compatibility section

## Digital Inputs Wiring

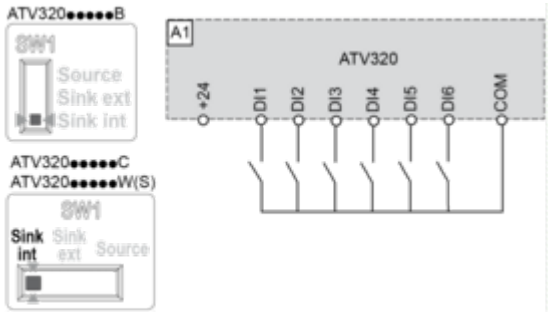
**Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs**



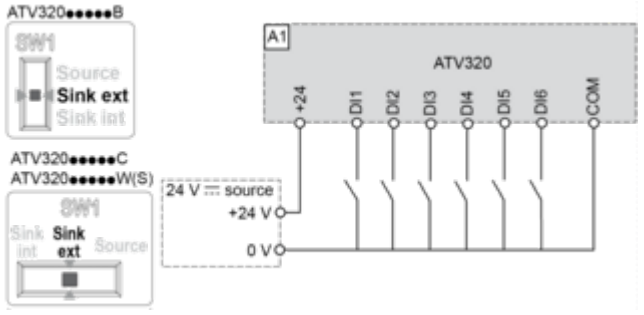

**Switch Set to SRC (Source) Position and Use of an External Power Supply for the Digital Inputs**




**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 Digital Inputs**



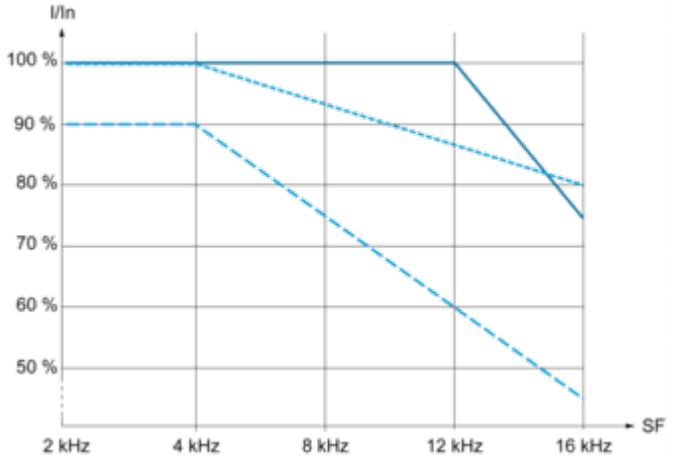

**NOTE :**

• STO input is also connected by default on a 24 Vdc terminal. If the external power supply is switched off, the function STO will be triggered.

• To avoid triggering the STO function when switching-on the product, the external power supply must be previously switched on.

Performance Curves

## Derating Curves

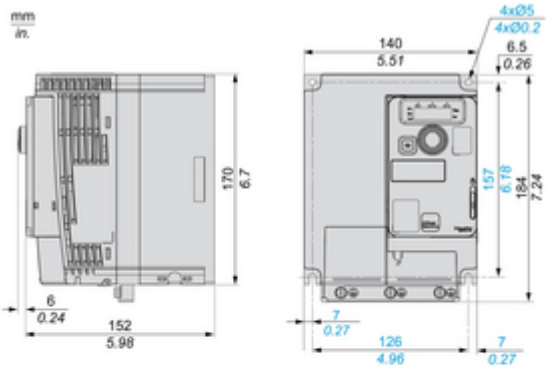



40 °C (104 °F) - Mounting type A, B and C
50 °C (122 °F) - Mounting type C
60 °C (140 °F) - Mounting type C

**In :** Nominal Drive Current
**SF :** Switching Frequency

Technical Illustration

**Dimensions**




With EMC Plate

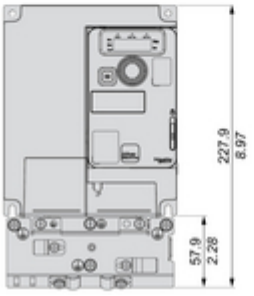


Image of product / Alternate images

**Alternative**








ESC
DANGER





