

# Product datasheet

Specifications



variable speed drive, Altivar Process ATV600, ATV630, cabinet Integration, IP00, 45kW, 380 to 480V

ATV630D45N4Z

## Main

|   |   |
|---|---|
| <b>Range of product</b>                   | Altivar Process ATV600  |
| <b>Product or component type</b>          | Variable speed drive  |
| <b>Product specific application</b>       | Process and utilities   |
| <b>Device short name</b>                  | ATV630  |
| <b>Variant</b>                            | Standard version  |
| <b>Product destination</b>                | Asynchronous motors<br>Synchronous motors   |
| <b>EMC filter</b>                         | Integrated with 10 m conforming to IEC 61800-3 category C2<br>Integrated with 50 m conforming to IEC 61800-3 category C3<br>With EMC plate option |
| <b>IP degree of protection</b>            | IP20 conforming to IEC 61800-5-1<br>IP00 (at bottom terminals) conforming to IEC 60529  |
| <b>[Us] rated supply voltage</b>          | 380...480 V   |
| <b>Type of cooling</b>                    | Forced convection   |
| <b>Supply frequency</b>                   | 50...60 Hz - 5...5 %  |
| <b>[Us] rated supply voltage</b>          | 380...480 V - 15...10 %   |
| <b>Motor power kW</b>                     | 45 kW (normal duty)<br>37 kW (heavy duty)   |
| <b>Motor power hp</b>                     | 60 hp normal duty<br>50 hp heavy duty   |
| <b>Line current</b>                       | 79.8 A at 380 V (normal duty)<br>69.1 A at 480 V (normal duty)<br>67.1 A at 380 V (heavy duty)<br>59 A at 480 V (heavy duty)                      |
| <b>Prospective line Isc</b>               | 50 kA   |
| <b>Apparent power</b>                     | 57.4 kVA at 480 V (normal duty)<br>49.1 kVA at 480 V (heavy duty)   |
| <b>Continuous output current</b>          | 88 A at 4 kHz for normal duty<br>74.5 A at 4 kHz for heavy duty   |
| <b>Asynchronous motor control profile</b> | Optimized torque mode<br>Constant torque standard<br>Variable torque standard   |
| <b>Synchronous motor control profile</b>  | Permanent magnet motor<br>Synchronous reluctance motor  |
| <b>Speed drive output frequency</b>       | 0.1...500 Hz  |
| <b>Nominal switching frequency</b>        | 4 kHz   |
| <b>Switching frequency</b>                | 2...12 kHz adjustable<br>4...12 kHz with derating factor  |

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

|                                    |   |
|------------------------------------|---|
| <b>Safety function</b>             | STO (safe torque off) SIL 3   |
| <b>Discrete input logic</b>        | 16 preset speeds  |
| <b>Communication port protocol</b> | Modbus serial<br>Ethernet<br>Modbus TCP   |
| <b>Option card</b>                 | Slot A: communication module, Profibus DP V1<br>Slot A: communication module, PROFINET<br>Slot A: communication module, DeviceNet<br>Slot A: communication module, Modbus TCP/EtherNet/IP<br>Slot A: communication module, CANopen daisy chain RJ45<br>Slot A: communication module, CANopen SUB-D 9<br>Slot A: communication module, CANopen screw terminals<br>Slot A/slot B: digital and analog I/O extension module<br>Slot A/slot B: output relay extension module<br>Slot A: communication module, Ethernet IP/Modbus TCP/MD-Link<br>Communication module, BACnet MS/TP<br>Communication module, Ethernet Powerlink |

## Complementary

|  |  |
|--|--|
| <b>mounting mode</b>                       | Cabinet mount  |
| <b>Maximum transient current</b>           | 96.8 A during 60 s (normal duty)<br>111.8 A during 60 s (heavy duty)   |
| <b>Network number of phases</b>            | 3 phases   |
| <b>Discrete output number</b>              | 0  |
| <b>Discrete output type</b>                | Relay outputs R1A, R1B, R1C 250 V AC 3000 mA<br>Relay outputs R1A, R1B, R1C 30 V DC 3000 mA<br>Relay outputs R2A, R2C 250 V AC 5000 mA<br>Relay outputs R2A, R2C 30 V DC 5000 mA<br>Relay outputs R3A, R3C 250 V AC 5000 mA<br>Relay outputs R3A, R3C 30 V DC 5000 mA  |
| <b>Output voltage</b>                      | <= power supply voltage  |
| <b>Permissible temporary current boost</b> | 1.1 x I <sub>n</sub> during 60 s (normal duty)<br>1.5 x I <sub>n</sub> during 60 s (heavy duty)  |
| <b>Motor slip compensation</b>             | Adjustable<br>Not available in permanent magnet motor law<br>Automatic whatever the load<br>Can be suppressed  |
| <b>Acceleration and deceleration ramps</b> | Linear adjustable separately from 0.01...9999 s  |
| <b>Physical interface</b>                  | Ethernet<br>2-wire RS 485  |
| <b>Braking to standstill</b>               | By DC injection  |
| <b>Protection type</b>                     | Thermal protection: motor<br>Safe torque off: motor<br>Motor phase break: motor<br>Thermal protection: drive<br>Safe torque off: drive<br>Overheating: drive<br>Overcurrent between output phases and earth: drive<br>Overload of output voltage: drive<br>Short-circuit protection: drive<br>Motor phase break: drive<br>Overvoltages on the DC bus: drive<br>Line supply overvoltage: drive<br>Line supply undervoltage: drive<br>Line supply phase loss: drive<br>Overspeed: drive<br>Break on the control circuit: drive |
| <b>Transmission rate</b>                   | 10, 100 Mbits<br>4800 bps, 9600 bps, 19200 bps, 38.4 Kbps  |
| <b>Frequency resolution</b>                | Display unit: 0.1 Hz<br>Analog input: 0.012/50 Hz  |

|                               |  |
|-------------------------------|--|
| <b>Transmission frame</b>     | RTU  |
| <b>Electrical connection</b>  | Control: removable screw terminals 0.5...1.5 mm <sup>2</sup> /AWG 20...AWG 16<br>Line side: screw terminal 35...50 mm <sup>2</sup> /AWG 2...AWG 1<br>Motor: screw terminal 50 mm <sup>2</sup> /AWG 1   |
| <b>Connector type</b>         | RJ45 (on the remote graphic terminal) for Ethernet/Modbus TCP<br>RJ45 (on the remote graphic terminal) for Modbus serial   |
| <b>Data format</b>            | 8 bits, configurable odd, even or no parity  |
| <b>Type of polarization</b>   | No impedance   |
| <b>Exchange mode</b>          | Half duplex, full duplex, autonegotiation Ethernet/Modbus TCP  |
| <b>Number of addresses</b>    | 1...247 for Modbus serial  |
| <b>Method of access</b>       | Slave Modbus TCP   |
| <b>Supply</b>                 | 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 |
| <b>Local signalling</b>       | 3 LEDs for local diagnostic<br>3 LEDs (dual colour) for embedded communication status<br>4 LEDs (dual colour) for communication module status<br>1 LED (red) for presence of voltage   |
| <b>Width</b>                  | 210 mm   |
| <b>Height</b>                 | 597 mm   |
| <b>Depth</b>                  | 262 mm   |
| <b>Net weight</b>             | 26.5 kg  |
| <b>Analogue input number</b>  | 3  |
| <b>Analogue input type</b>    | AI1, AI2, AI3 software-configurable voltage: 0...10 V DC, impedance: 31.5 kOhm, resolution 12 bits<br>AI1, AI2, AI3 software-configurable current: 0...20 mA, impedance: 250 Ohm, resolution 12 bits<br>AI2 voltage analog input: - 10...10 V DC, impedance: 31.5 kOhm, resolution 12 bits   |
| <b>Discrete input number</b>  | 8  |
| <b>Discrete input type</b>    | DI7, DI8 programmable as pulse input: 0...30 kHz, 24 V DC (<= 30 V)  |
| <b>Input compatibility</b>    | DI1...DI6: discrete input level 1 PLC conforming to IEC 61131-2<br>DI5, DI6: discrete input level 1 PLC conforming to IEC 65A-68<br>STOA, STOB: discrete input level 1 PLC conforming to IEC 61131-2   |
| <b>Discrete input logic</b>   | 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)  |
| <b>Analogue output number</b> | 2  |
| <b>Analogue output type</b>   | Software-configurable voltage AQ1, AQ2: 0...10 V DC impedance 470 Ohm, resolution 10 bits<br>Software-configurable current AQ1, AQ2: 0...20 mA, resolution 10 bits<br>Software-configurable current DQ-, DQ+: 30 V DC<br>Software-configurable current DQ-, DQ+: 100 mA  |
| <b>Sampling duration</b>      | 2 ms +/- 0.5 ms (DI1...DI4) - discrete input<br>5 ms +/- 1 ms (DI5, DI6) - discrete input<br>5 ms +/- 0.1 ms (AI1, AI2, AI3) - analog input<br>10 ms +/- 1 ms (AO1) - analog output  |
| <b>Accuracy</b>               | +/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input<br>+/- 1 % AO1, AO2 for a temperature variation 60 °C analog output   |
| <b>Linearity error</b>        | AI1, AI2, AI3: +/- 0.15 % of maximum value for analog input<br>AO1, AO2: +/- 0.2 % for analog output   |
| <b>Relay output number</b>    | 3  |

|   |  |
|---|--|
| <b>Relay output type</b>                          | 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   |
| <b>Refresh time</b>                               | Relay output (R1, R2, R3): 5 ms (+/- 0.5 ms)   |
| <b>Minimum switching current</b>                  | Relay output R1, R2, R3: 5 mA at 24 V DC   |
| <b>Maximum switching current</b>                  | Relay output R1, R2, R3 on resistive load, cos phi = 1: 3 A at 250 V AC<br>Relay output R1, R2, R3 on resistive load, cos phi = 1: 3 A at 30 V DC<br>Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 250 V AC<br>Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 30 V DC   |
| <b>Isolation</b>                                  | Between power and control terminals  |
| <b>Maximum output frequency</b>                   | 500 kHz  |
| <b>Maximum input current</b>                      | 79.8 A   |
| <b>Variable speed drive application selection</b> | Building - HVAC compressor centrifugal<br>Food and beverage processing other application<br>Mining mineral and metal fan<br>Mining mineral and metal pump<br>Oil and gas fan<br>Water and waste water other application<br>Building - HVAC screw compressor<br>Food and beverage processing pump<br>Food and beverage processing fan<br>Food and beverage processing atomization<br>Oil and gas electro submersible pump (ESP)<br>Oil and gas water injection pump<br>Oil and gas jet fuel pump<br>Oil and gas compressor for refinery<br>Water and waste water centrifuge pump<br>Water and waste water positive displacement pump<br>Water and waste water electro submersible pump (ESP)<br>Water and waste water screw pump<br>Water and waste water lobe compressor<br>Water and waste water screw compressor<br>Water and waste water compressor centrifugal<br>Water and waste water fan<br>Water and waste water conveyor<br>Water and waste water mixer |
| <b>Motor power range AC-3</b>                     | 30...50 kW at 380...440 V 3 phases<br>30...50 kW at 480...500 V 3 phases   |
| <b>Quantity per set</b>                           | 1  |
| <b>enclosure mounting</b>                         | With heat sink   |

## Environment

|                                      |  |
|--------------------------------------|--|
| <b>Insulation resistance</b>         | > 1 MOhm 500 V DC for 1 minute to earth  |
| <b>Noise level</b>                   | 63.5 dB conforming to 86/188/EEC   |
| <b>Power dissipation in W</b>        | Natural convection: 121 W at 380 V, switching frequency 4 kHz<br>Forced convection: 943 W at 380 V, switching frequency 4 kHz  |
| <b>Volume of cooling air</b>         | 240 m <sup>3</sup> /h  |
| <b>Operating position</b>            | Vertical +/- 10 degree   |
| <b>Maximum THDI</b>                  | <48 % from 80...100 % of load conforming to IEC 61000-3-12   |
| <b>Electromagnetic compatibility</b> | 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 |
| <b>Pollution degree</b>              | 2 conforming to IEC 61800-5-1  |
| <b>Vibration resistance</b>          | 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  |

|  |   |
|--|---|
| <b>Shock resistance</b>                      | 15 gn for 11 ms conforming to IEC 60068-2-27  |
| <b>Relative humidity</b>                     | 5...95 % without condensation conforming to IEC 60068-2-3   |
| <b>Ambient air temperature for operation</b> | -15...50 °C (without derating)<br>50...60 °C (with derating factor)   |
| <b>Ambient air temperature for storage</b>   | -40...70 °C   |
| <b>Operating altitude</b>                    | <= 1000 m without derating<br>1000...4800 m with current derating 1 % per 100 m   |
| <b>product certifications</b>                | UL<br>ATEX zone 2/22<br>ATEX INERIS<br>CSA<br>TÜV<br>DNV-GL   |
| <b>marking</b>                               | CE  |
| <b>Standards</b>                             | UL 508C<br>IEC 61800-3<br>IEC 61800-3 environment 1 category C2<br>EN/IEC 61800-3 environment 2 category C3<br>IEC 61800-5-1<br>IEC 61000-3-12<br>IEC 60721-3<br>IEC 61508<br>IEC 13849-1 |
| <b>Assembly style</b>                        | With heat sink  |
| <b>Overvoltage category</b>                  | III   |
| <b>Regulation loop</b>                       | Adjustable PID regulator  |
| <b>Noise level</b>                           | 63.5 dB   |
| <b>Pollution degree</b>                      | 2   |

## Packing Units

|                                     |         |
|-------------------------------------|---------|
| <b>Unit Type of Package 1</b>       | PCE     |
| <b>Number of Units in Package 1</b> | 1       |
| <b>Package 1 Height</b>             | 54.5 cm |
| <b>Package 1 Width</b>              | 33.5 cm |
| <b>Package 1 Length</b>             | 80.0 cm |
| <b>Package 1 Weight</b>             | 30.0 kg |

## Sustainability

**Green Premium™ label** is Schneider Electric's commitment to delivering products with best-in-class environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO<sub>2</sub> products.

**Guide to assessing product sustainability** is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

[Learn more about Green Premium >](#)

[Guide to assess a product's sustainability >](#)



Transparency RoHS/REACH

## Resource performance

Upgraded Components Available

## Well-being performance

Mercury Free

Rohs Exemption Information Yes

## Certifications & Standards

**Reach Regulation** [REACH Declaration](#)

**Eu Rohs Directive** Pro-active compliance (Product out of EU RoHS legal scope)

**China Rohs Regulation** [China RoHS declaration](#)

**Environmental Disclosure** [Product Environmental Profile](#)

**Weee** The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins

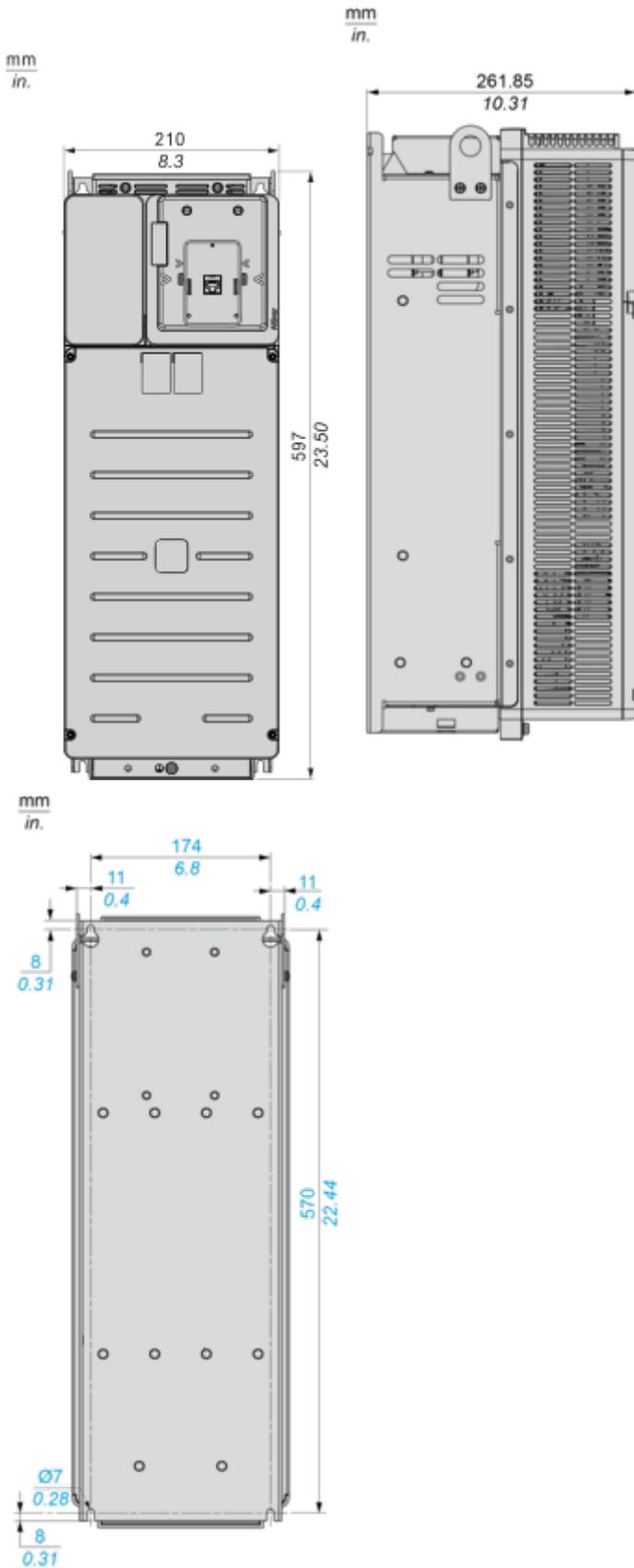
**Circularity Profile** [End of Life Information](#)

Dimensions Drawings

Dimensions

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Front, Left and Rear Views



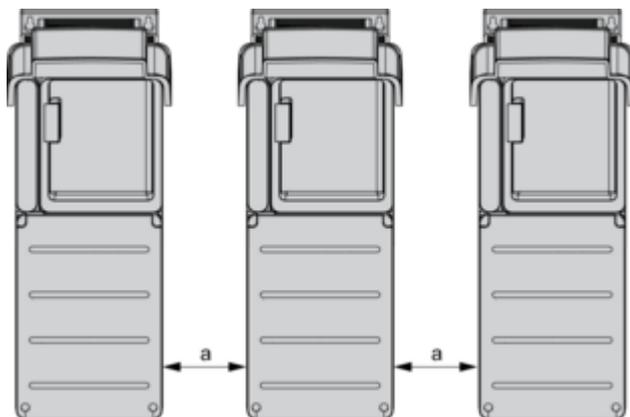


Mounting and Clearance

Mounting Types

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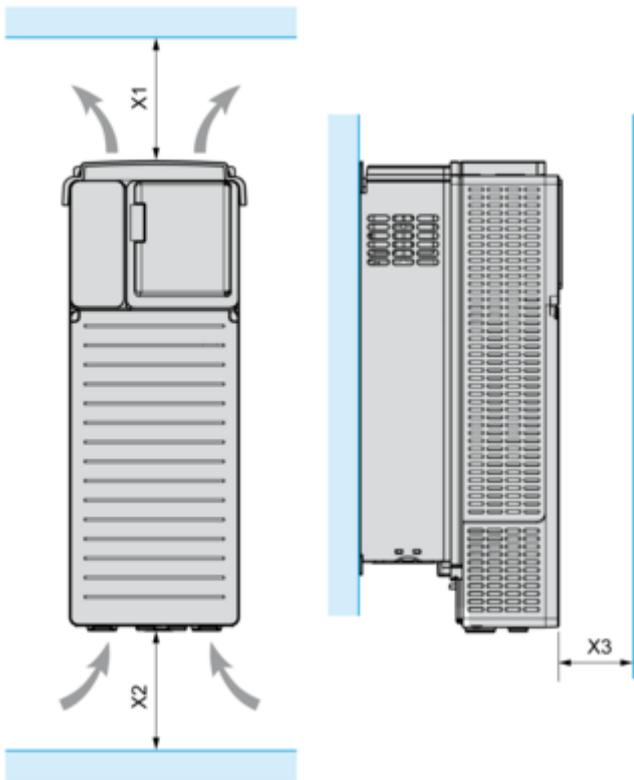
**Mounting Type A : Individual IP21 and IP55**



Frame sizes 1, 2, 3, 3S and 5S:  $a \geq 100 \text{ mm}$  (3.9 in.)

Frame sizes 4, 5 and 6:  $a \geq 110 \text{ mm}$  (4.33 in.)

Clearance

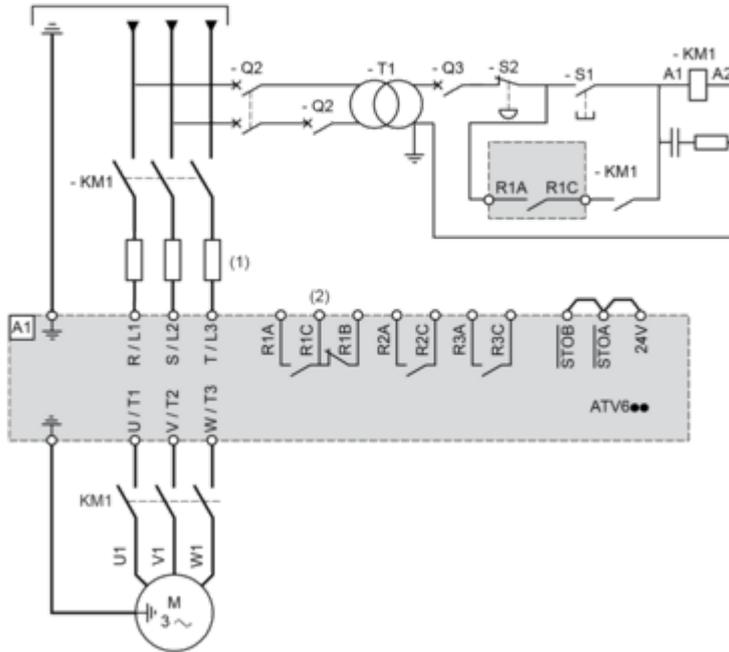


| Frame Size | X1    |        | X2    |        | X3    |        |
|------------|-------|--------|-------|--------|-------|--------|
|            | mm    | in.    | mm    | in.    | mm    | in.    |
| 1...5      | ≥ 100 | ≥ 3.94 | ≥ 100 | ≥ 3.94 | ≥ 10  | ≥ 0.39 |
| 6          | ≥ 250 | ≥ 10   | ≥ 250 | ≥ 10   | ≥ 100 | ≥ 3.94 |

Connections and Schema

**Three-Phase Power Supply with Upstream Breaking via Line Contactor**

Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1



(1) Line choke if used

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

A1 : Drive

KM1 : Line Contactor

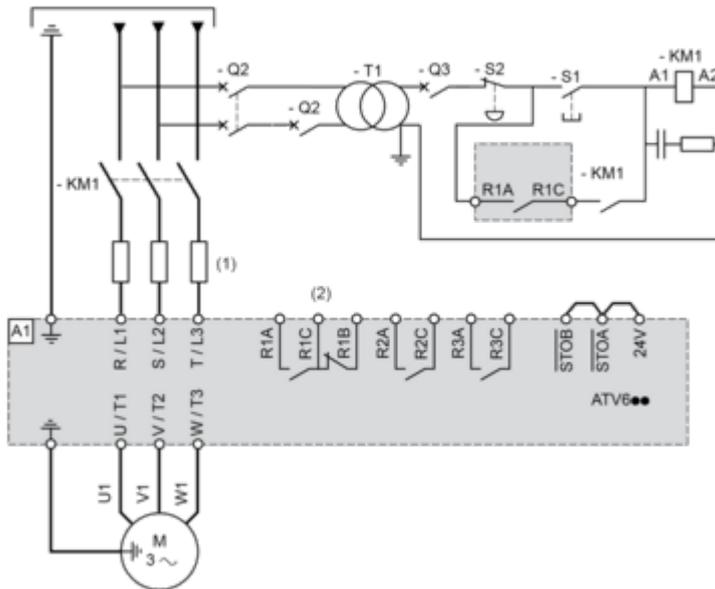
Q2, Q3 : Circuit breakers

S1, S2 : Pushbuttons

T1 : Transformer for control part

**Three-Phase Power Supply with Downstream Breaking via Contactor**

Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1



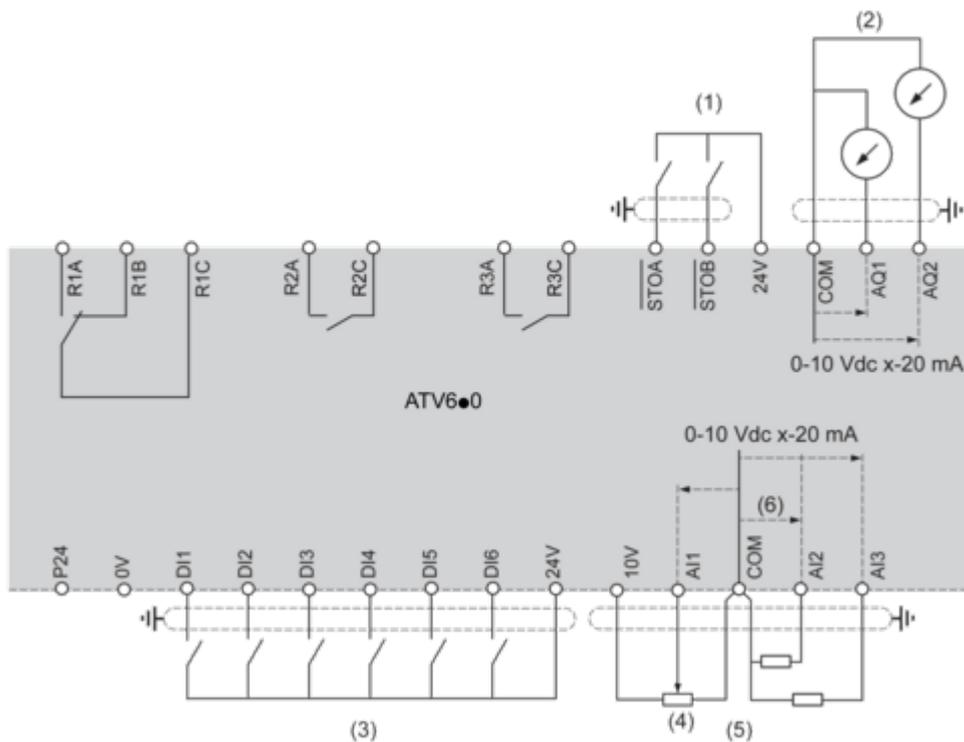
(1) Line choke if used

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

A1 : Drive

KM1 : Contactor

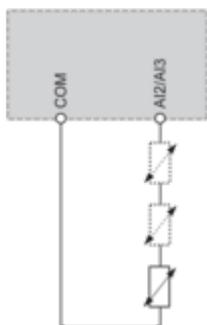
Control Block Wiring Diagram



- (1) Safe Torque Off
- (2) Analog Output
- (3) Digital Input
- (4) Reference potentiometer
- (5) Analog Input
- R1A, R1B, R1C : Fault relay
- R2A, R2C : Sequence relay
- R3A, R3C : Sequence relay

Sensor Connection

It is possible to connect either 1 or 3 sensors on terminals AI2 or AI3.

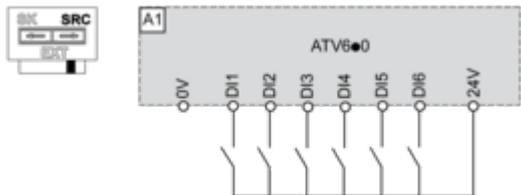


**Sink / Source Switch Configuration**

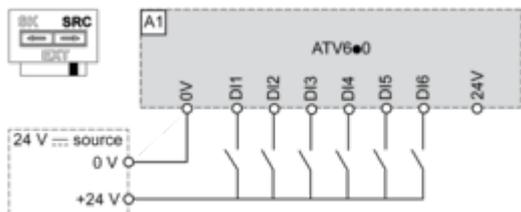
The switch is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs.

- Set the switch to Source (factory setting) if using PLC outputs with PNP transistors.
- Set the switch to Ext if using PLC outputs with NPN transistors.

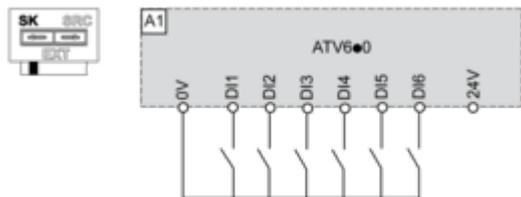
**Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs**



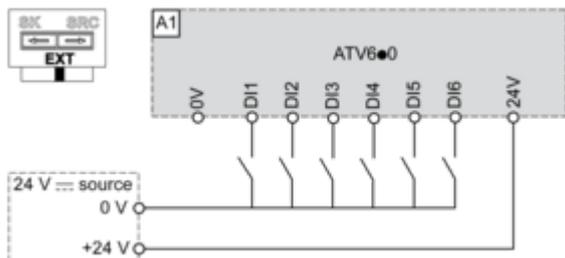
**Switch Set to SRC (Source) Position and Use of an External Power Supply for the DIs**



**Switch Set to SK (Sink) Position Using the Output Power Supply for the Digital Inputs**



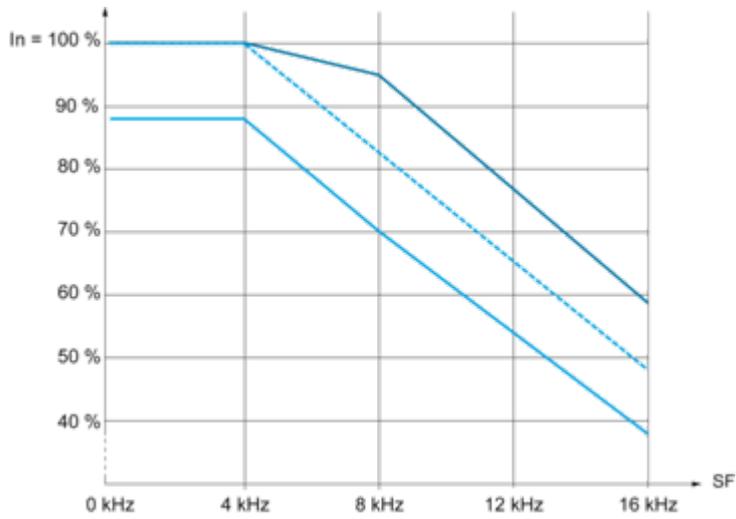
**Switch Set to EXT Position Using an External Power Supply for the DIs**



Performance Curves

Derating Curves

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- 40 °C (104 °F) - Mounting type A, B and C
  - - - 50 °C (122 °F) - Mounting type A, B and C
  - 60 °C (140 °F) - Mounting type B and C
- In : Nominal Drive Current  
SF : Switching Frequency