

# Product data sheet

Specifications



variable speed drive, Altivar Process ATV900, ATV930, 4kW, 400 to 480V, with braking unit, IP21

ATV930U40N4

Product availability: Stock - Normally stocked in distribution facility

Price\*: 1,952.40 USD

## Main

|                                    |  |
|------------------------------------|--|
| Range of Product                   | Altivar Process ATV900   |
| Device Application                 | Industrial Application   |
| Product or Component Type          | Variable speed drive   |
| product destination                | Synchronous motors<br>Asynchronous motors  |
| Product Specific Application       | Process for industrial   |
| variant                            | Standard version<br>With braking chopper   |
| Phase                              | 3 phase  |
| Mounting Mode                      | Wall mount   |
| Communication Port Protocol        | Modbus serial<br>Modbus TCP<br>EtherNet/IP   |
| [Us] rated supply voltage          | 380...480 V - 15...10 %  |
| Motor power kW                     | 4.0 kW normal duty<br>3.0 kW heavy duty  |
| Continuous output current          | 9.3 A 4 kHz normal duty<br>7.2 A 4 kHz heavy duty  |
| EMC filter                         | Integrated<br>With EMC plate option  |
| IP degree of protection            | IP21   |
| Degree of protection               | UL type 1  |
| option module                      | Slot A communication module Profibus DP V1<br>Slot A communication module PROFINET<br>Slot A communication module DeviceNet<br>Slot A communication module EtherCAT<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/slot C digital and analog I/O extension module<br>Slot A/slot B/slot C output relay extension module<br>Slot B 5/12 V digital encoder interface module<br>Slot B analog encoder interface module<br>Slot B resolver encoder interface module<br>communication module Ethernet Powerlink |
| Discrete input logic               | 16 preset speeds   |
| Asynchronous motor control profile | Optimized torque mode<br>Constant torque standard<br>Variable torque standard  |

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

|  |  |
|--|--|
| <b>Synchronous motor control profile</b> | Permanent magnet motor<br>Synchronous reluctance motor   |
| <b>Maximum output frequency</b>          | 599 Hz   |
| <b>Switching frequency</b>               | 2...16 kHz adjustable<br>4...16 kHz with derating factor   |
| <b>Nominal switching frequency</b>       | 4 kHz  |
| <b>Line current</b>                      | 7.6 A 380 V normal duty)<br>6.0 A 380 V heavy duty)<br>6.7 A 480 V normal duty)<br>5.4 A 480 V heavy duty) |
| <b>Apparent power</b>                    | 5.6 kVA 480 V normal duty)<br>4.5 kVA 480 V heavy duty)  |
| <b>Maximum transient current</b>         | 11.2 A 60 s normal duty)<br>10.8 A 60 s heavy duty)  |
| <b>Network Frequency</b>                 | 50-60 Hz   |
| <b>Prospective line Isc</b>              | 50 kA  |

## Complementary

|                                  |  |
|----------------------------------|--|
| <b>Discrete input number</b>     | 10   |
| <b>Discrete input type</b>       | DI1...DI8 programmable, 24 V DC $\leq$ 30 V)3.5 kOhm<br>DI7, DI8 programmable as pulse input 0...30 kHz, 24 V DC $\leq$ 30 V)<br>STOA, STOB safe torque off, 24 V DC $\leq$ 30 V) $>$ 2.2 kOhm   |
| <b>Discrete output number</b>    | 2  |
| <b>Discrete output type</b>      | Logic output DQ+ 0...1 kHz $\leq$ 30 V DC 100 mA<br>Programmable as pulse output DQ+ 0...30 kHz $\leq$ 30 V DC 20 mA<br>Logic output DQ- 0...1 kHz $\leq$ 30 V DC 100 mA   |
| <b>Analogue input number</b>     | 3  |
| <b>Analogue input type</b>       | AI1, AI2, AI3 software-configurable voltage 0...10 V DC 30 kOhm 12 bits<br>AI1, AI2, AI3 software-configurable current 0...20 mA/4...20 mA 250 Ohm 12 bits   |
| <b>Analogue output number</b>    | 2  |
| <b>Analogue output type</b>      | Software-configurable voltage AQ1, AQ2 0...10 V DC 470 Ohm 10 bits<br>Software-configurable current AQ1, AQ2 0...20 mA 500 Ohm 10 bits   |
| <b>Relay output number</b>       | 3  |
| <b>Relay output type</b>         | Configurable relay logic R1 fault relay NO/NC 100000 cycles<br>Configurable relay logic R2 sequence relay NO 1000000 cycles<br>Configurable relay logic R3 sequence relay NO 1000000 cycles  |
| <b>Maximum switching current</b> | Relay output R1 resistive, $\cos \phi = 1$ 3 A 250 V AC<br>Relay output R1 resistive, $\cos \phi = 1$ 3 A 30 V DC<br>Relay output R1 inductive, $\cos \phi = 0.4$ 7 ms 2 A 250 V AC<br>Relay output R1 inductive, $\cos \phi = 0.4$ 7 ms 2 A 30 V DC<br>Relay output R2, R3 resistive, $\cos \phi = 1$ 5 A 250 V AC<br>Relay output R2, R3 resistive, $\cos \phi = 1$ 5 A 30 V DC<br>Relay output R2, R3 inductive, $\cos \phi = 0.4$ 7 ms 2 A 250 V AC<br>Relay output R2, R3 inductive, $\cos \phi = 0.4$ 7 ms 2 A 30 V DC |
| <b>Minimum switching current</b> | Relay output R1, R2, R3 5 mA 24 V DC   |
| <b>Physical interface</b>        | Ethernet<br>2-wire RS 485  |
| <b>Connector Type</b>            | 2 RJ45<br>1 RJ45   |
| <b>Method of access</b>          | Slave Modbus TCP   |
| <b>Transmission Rate</b>         | 10, 100 Mbits<br>4.8 kbps<br>9600 bit/s<br>19200 bit/s   |

|   |  |
|---|--|
| <b>Transmission frame</b>                                   | RTU  |
| <b>Number of addresses</b>                                  | 1...247  |
| <b>Data format</b>  | 8 bits, configurable odd, even or no parity  |
| <b>Type of polarization</b>                                 | No impedance   |
| <b>4 quadrant operation possible</b>                        | True   |
| <b>Acceleration and deceleration ramps</b>                  | Linear adjustable separately from 0.01...9999 s  |
| <b>Motor slip compensation</b>                              | Not available in permanent magnet motor law<br>Can be suppressed<br>Adjustable<br>Automatic whatever the load  |
| <b>Braking to standstill</b>                                | By DC injection  |
| <b>Brake chopper integrated</b>                             | True   |
| <b>Maximum Input Current per Phase</b>                      | 7.6 A  |
| <b>Maximum output voltage</b>                               | 480.0 V  |
| <b>Relative symmetric network frequency tolerance</b>       | 5 %  |
| <b>Base load current at high overload</b>                   | 7.2 A  |
| <b>Base load current at low overload</b>                    | 9.3 A  |
| <b>Power dissipation in W</b>                               | Natural convection 33 W 380 V 4 kHz<br>Forced convection 97 W 380 V 4 kHz  |
| <b>With safety function Safely Limited Speed (SLS)</b>      | True   |
| <b>With safety function Safe brake management (SBC/SBT)</b> | True   |
| <b>With safety function Safe Operating Stop (SOS)</b>       | False  |
| <b>With safety function Safe Position (SP)</b>              | False  |
| <b>With safety function Safe programmable logic</b>         | False  |
| <b>With safety function Safe Speed Monitor (SSM)</b>        | False  |
| <b>With safety function Safe Stop 1 (SS1)</b>               | True   |
| <b>With sft fct Safe Stop 2 (SS2)</b>                       | False  |
| <b>With safety function Safe torque off (STO)</b>           | True   |
| <b>With safety function Safely Limited Position (SLP)</b>   | False  |
| <b>With safety function Safe Direction (SDI)</b>            | False  |
| <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>Quantity per Set</b>                                     | 1  |
| <b>Width</b>  | 5.7 in (144 mm)  |

|                              |   |
|------------------------------|---|
| <b>Height</b>                | 13.8 in (350 mm)  |
| <b>Depth</b>                 | 8.1 in (206 mm)   |
| <b>Net Weight</b>            | 10.1 lb(US) (4.6 kg)  |
| <b>Electrical connection</b> | Control screw terminal 0.5...1.5 mm <sup>2</sup> AWG 20...AWG 16<br>Line side screw terminal 2.5...6 mm <sup>2</sup> AWG 14...AWG 10<br>Motor screw terminal 2.5...6 mm <sup>2</sup> AWG 14...AWG 10<br>DC bus screw terminal 2.5...6 mm <sup>2</sup> AWG 14...AWG 10   |
| <b>Transmission Rate</b>     | 10/100 Mbit/s Ethernet IP/Modbus TCP<br>4.8, 9.6, 19.2, 38.4 kbit/s Modbus serial   |
| <b>Exchange mode</b>         | Half duplex, full duplex, autonegotiation Ethernet IP/Modbus TCP  |
| <b>Data format</b>           | 8 bits, configurable odd, even or no parity Modbus serial   |
| <b>Type of polarization</b>  | No impedance Modbus serial  |
| <b>Number of addresses</b>   | 1...247 Modbus serial   |
| <b>Supply</b>                | External supply for digital inputs 24 V DC 19...30 V), <1.25 mA overload and short-circuit protection<br>Internal supply for reference potentiometer (1 to 10 kOhm) 10.5 V DC +/- 5 %, <10 mA overload and short-circuit protection<br>Internal supply for digital inputs and STO 24 V DC 21...27 V), <200 mA overload and short-circuit protection |
| <b>Local signalling</b>      | 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)  |
| <b>Input compatibility</b>   | DI1...DI8 discrete input level 1 PLC IEC 61131-2<br>DI7, DI8 pulse input level 1 PLC IEC 65A-68<br>STOA, STOB discrete input level 1 PLC IEC 61131-2  |
| <b>Discrete input logic</b>  | Positive logic (source) DI1...DI8), < 5 V, > 11 V<br>Negative logic (sink) DI1...DI8), > 16 V, < 10 V<br>Positive logic (source) DI7, DI8), < 0.6 V, > 2.5 V<br>Positive logic (source) STOA, STOB), < 5 V, > 11 V  |
| <b>Sampling duration</b>     | 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  |
| <b>Accuracy</b>              | +/- 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  |
| <b>Linearity error</b>       | AI1, AI2, AI3 +/- 0.15 % of maximum value analog input<br>AQ1, AQ2 +/- 0.2 % analog output  |
| <b>Refresh time</b>          | Relay output R1, R2, R3)5 ms +/- 0.5 ms)  |
| <b>Isolation</b>             | Between power and control terminals   |

## Environment

|                               |  |
|-------------------------------|--|
| <b>Operating altitude</b>     | <= 3280.84 ft (1000 m) without derating<br>1000...4800 m with current derating 1 % per 100 m         |
| <b>Operating position</b>     | Vertical +/- 10 degree   |
| <b>Product Certifications</b> | CSA<br>UL<br>TÜV   |
| <b>marking</b>                | CE   |
| <b>Standards</b>              | UL 508C<br>IEC 61800-3<br>IEC 61800-5-1<br>IEC 61000-3-12<br>IEC 60721-3<br>IEC 61508<br>IEC 13849-1 |

|  |  |
|--|--|
| Maximum THDI   | <48 % full load IEC 61000-3-12   |
| Assembly style   | Enclosed   |
| Electromagnetic compatibility                                    | Electrostatic discharge immunity test level 3 IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 IEC 61000-4-3<br>Electrical fast transient/burst immunity test level 4 IEC 61000-4-4<br>1.2/50 µs - 8/20 µs surge immunity test level 3 IEC 61000-4-5<br>Conducted radio-frequency immunity test level 3 IEC 61000-4-6 |
| Environmental class (during operation)                           | Class 3C3 according to IEC 60721-3-3<br>Class 3S3 according to IEC 60721-3-3   |
| Maximum acceleration under shock impact (during operation)       | 150 m/s <sup>2</sup> at 11 ms  |
| Maximum acceleration under vibrational stress (during operation) | 10 m/s <sup>2</sup> 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  | 10038.7 Gal/hr(US) (38 m <sup>3</sup> /h)  |
| Overvoltage category   | III  |
| Regulation loop  | Adjustable PID regulator   |
| Insulation resistance  | > 1 MOhm 500 V DC for 1 minute to earth  |
| Noise level  | 54.5 dB 86/188/EEC   |
| Vibration resistance   | 1.5 mm peak to peak 2...13 Hz)IEC 60068-2-6<br>1 gn 13...200 Hz)IEC 60068-2-6  |
| Shock resistance   | 15 gn 11 ms IEC 60068-2-27   |
| Environmental characteristic                                     | Chemical pollution resistance class 3C3 IEC 60721-3-3<br>Dust pollution resistance class 3S3 IEC 60721-3-3   |
| Relative humidity  | 5...95 % without condensation IEC 60068-2-3  |
| Ambient air temperature for operation                            | 5...122 °F (-15...50 °C) without derating)<br>122...140 °F (50...60 °C) with derating factor)  |
| Noise level  | 54.5 dB  |
| Pollution degree   | 2  |
| Ambient air transport temperature                                | -40...158 °F (-40...70 °C)   |
| Ambient Air Temperature for Storage                              | -40...158 °F (-40...70 °C)   |

## Ordering and shipping details

|                   |               |
|-------------------|---------------|
| Category          | US1CP4E22276  |
| Discount Schedule | CP4E          |
| GTIN              | 3606480883293 |
| Returnability     | Yes           |
| Country of origin | ID            |

## Packing Units

|                              |                       |
|------------------------------|-----------------------|
| Unit Type of Package 1       | PCE                   |
| Number of Units in Package 1 | 1                     |
| Package 1 Height             | 12.205 in (31.000 cm) |
| Package 1 Width              | 7.480 in (19.000 cm)  |
| Package 1 Length             | 16.142 in (41.000 cm) |

|                                     |                            |
|-------------------------------------|----------------------------|
| <b>Package 1 Weight</b>             | 13.735 lb(US) (6.230 kg)   |
| <b>Unit Type of Package 2</b>       | P06                        |
| <b>Number of Units in Package 2</b> | 6                          |
| <b>Package 2 Height</b>             | 29.528 in (75.000 cm)      |
| <b>Package 2 Width</b>              | 23.622 in (60.000 cm)      |
| <b>Package 2 Length</b>             | 31.496 in (80.000 cm)      |
| <b>Package 2 Weight</b>             | 110.103 lb(US) (49.942 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.

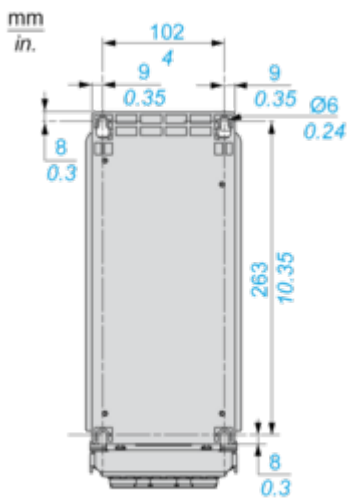
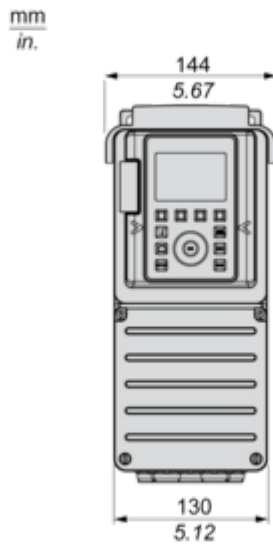
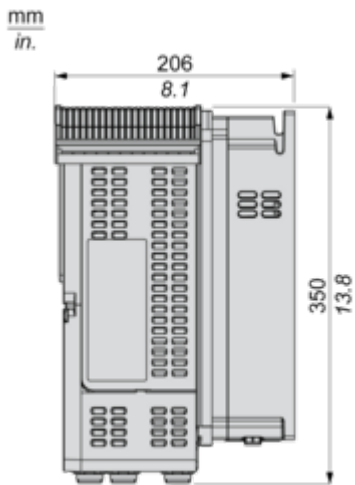
**Circularity Profile** [End of Life Information](#)

**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](http://www.P65Warnings.ca.gov)

Dimensions Drawings

Dimensions

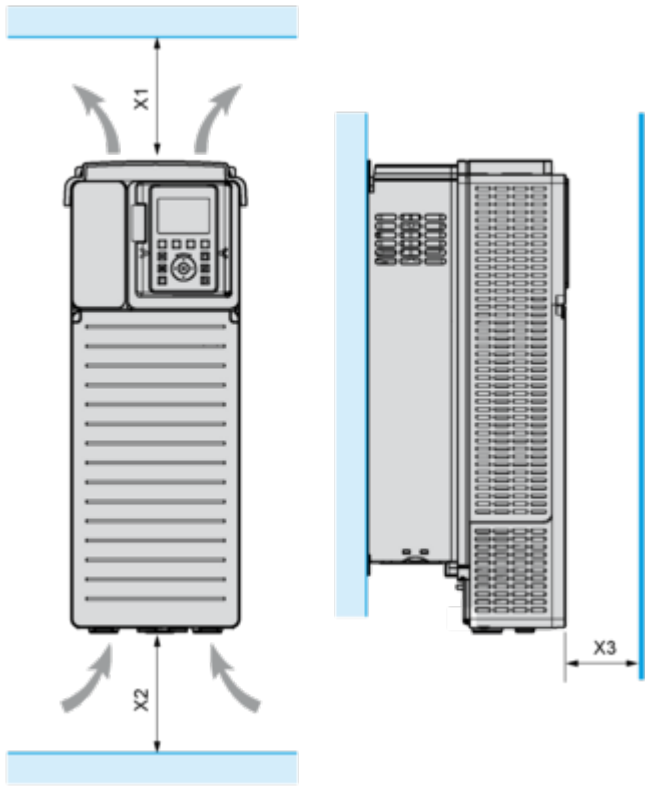
Right, Front and Rear View





Mounting and Clearance

Clearances



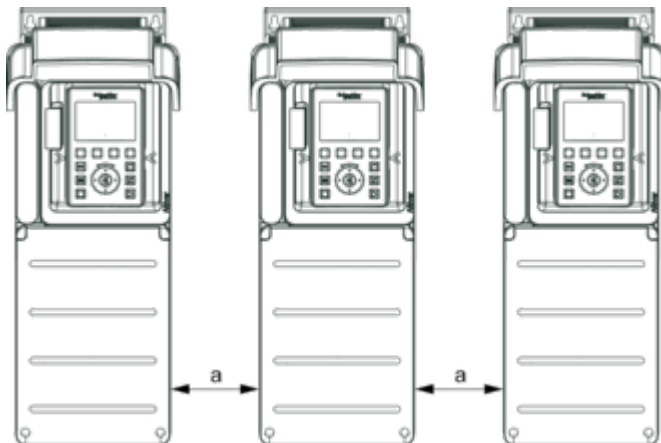
| X1                  | X2                  | X3                 |
|---------------------|---------------------|--------------------|
| ≥ 100 mm (3.94 in.) | ≥ 100 mm (3.94 in.) | ≥ 10 mm (0.39 in.) |

- Mount the device in a vertical position ( $\pm 10^\circ$ ). This is required for cooling the device.
- Do not mount the device close to heat sources.
- Leave sufficient free space so that the air required for cooling purposes can circulate from the bottom to the top of the drive.

**Mounting Types**

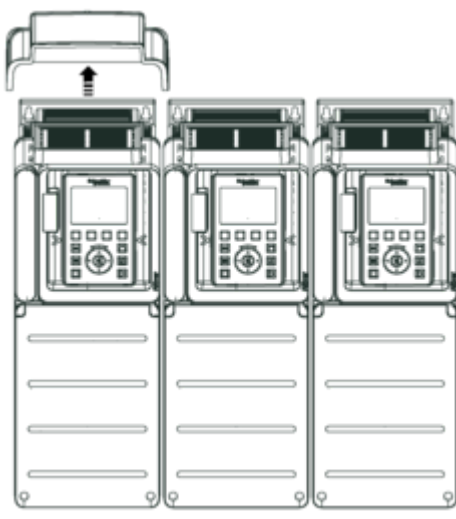
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**Mounting Type A: Individual IP21**

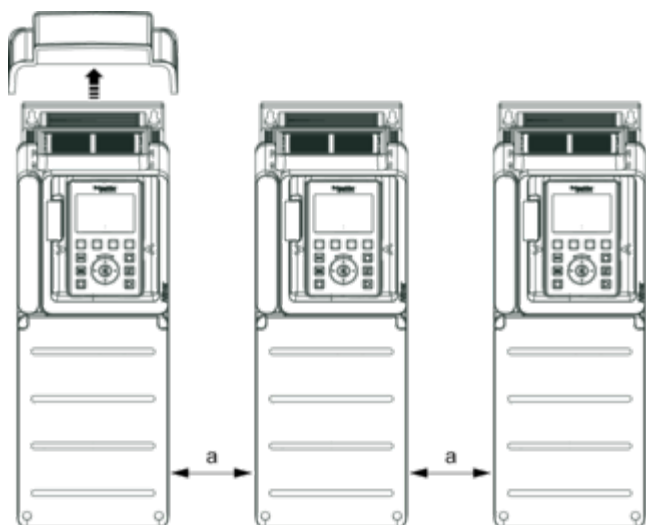


$a \geq 100 \text{ mm (3.94 in.)}$

**Mounting Type B: Side by Side IP20**



**Mounting Type C: Individual IP20**

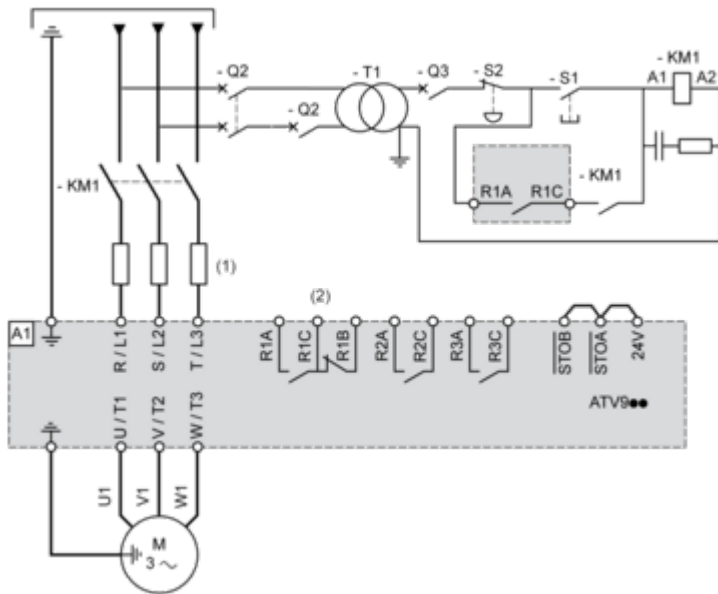


$a \geq 0$

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

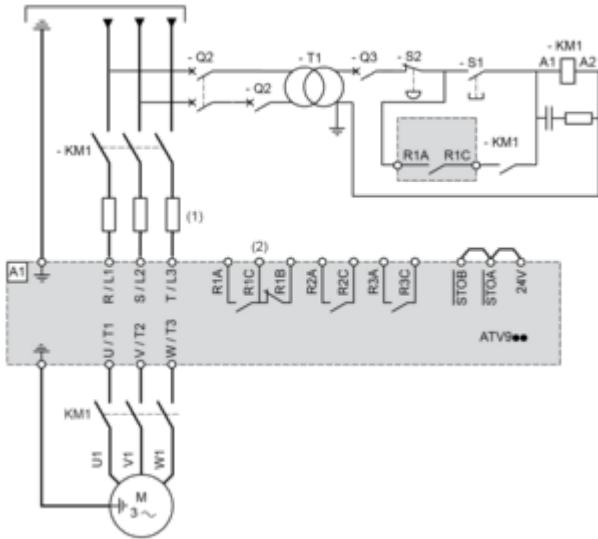
Q2, Q3 : Circuit breakers

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



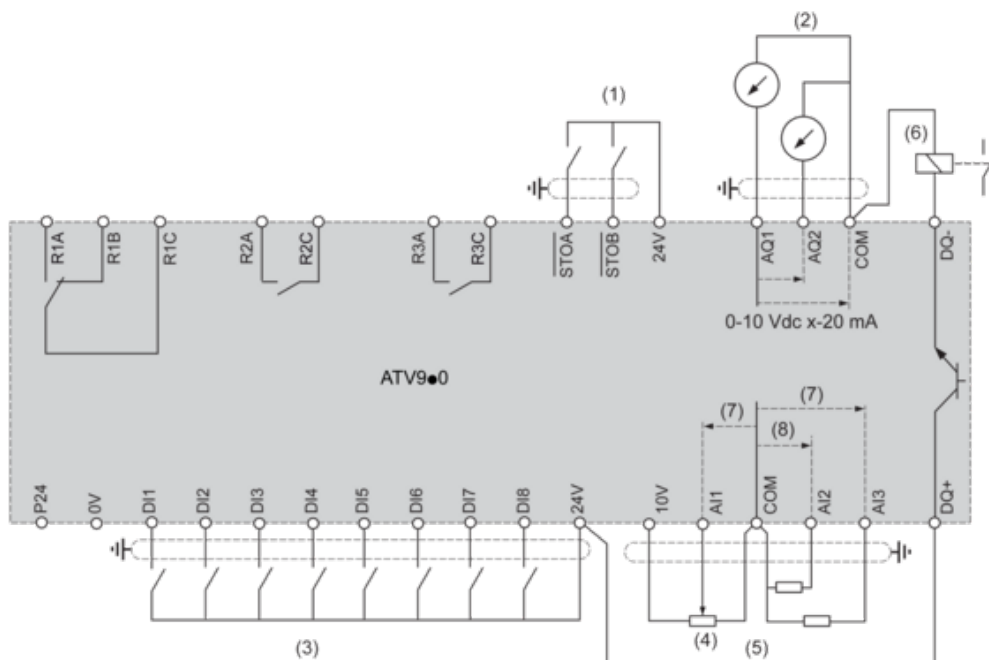
(1) Line choke if used

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

A1 : Drive

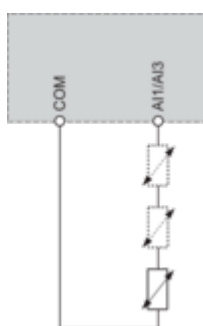
KM1 : Contactor

Control Block Wiring Diagram



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

Sensor Connection



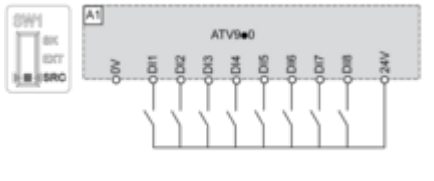
It is possible to connect either 1 or 3 sensors on terminals AI1 or AI3

**Sink / Source Switch Configuration**

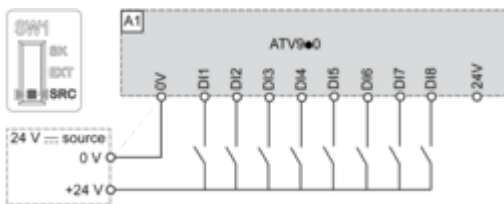
The switch is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs.

- 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.

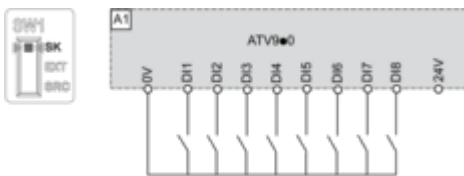
**Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs**



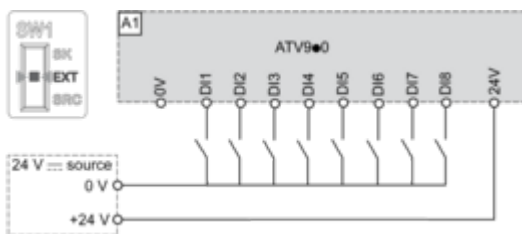
**Switch Set to SRC (Source) Position and Use of an External Power Supply for the DIs**



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

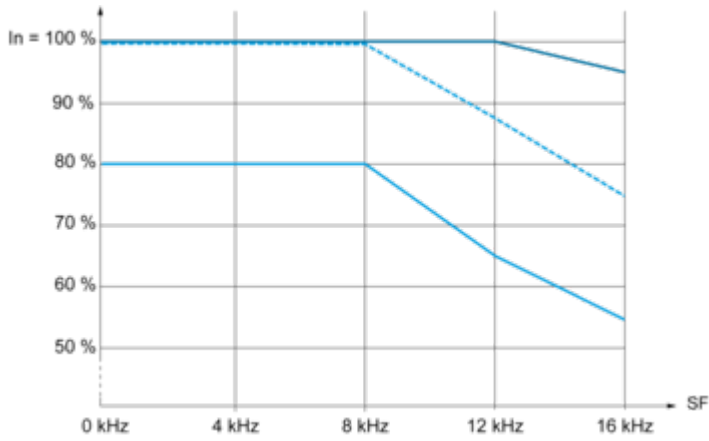


**Switch Set to EXT Position Using an External Power Supply for the DIs**



Performance Curves

Derating Curves



- 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