

# ATV930D22Y6

variable speed drive, ATV930, 22kW/30HP,  
500V/690V, IP00

Product availability : Stock - Normally stocked in distribution facility



Price\*\* : 4,569.00 USD



## Main

|                            |                                                                                                                  |
|----------------------------|------------------------------------------------------------------------------------------------------------------|
| Range of product           | Altivar Process ATV900                                                                                           |
| Product or component type  | Variable speed drive                                                                                             |
| Device application         | Industrial application                                                                                           |
| Device short name          | ATV930                                                                                                           |
| Variant                    | Standard version<br>With braking chopper                                                                         |
| Product destination        | Asynchronous motors<br>Synchronous motors                                                                        |
| Mounting mode              | Wall mount                                                                                                       |
| EMC filter                 | Integrated 82.02 ft (25 m) EN/IEC 61800-3 category C3                                                            |
| IP degree of protection    | IP00 IEC 61800-5-1<br>IP00 IEC 60529<br>IP20 IEC 61800-5-1 with kit VW3A9705<br>IP20 IEC 60529 with kit VW3A9705 |
| Type of cooling            | Forced convection                                                                                                |
| Supply frequency           | 50...60 Hz +/- 5 %                                                                                               |
| Phase                      | 3 phase                                                                                                          |
| [Us] rated supply voltage  | 500...690 V - 15...10 %                                                                                          |
| Motor power kW             | 18.5 kW 500 V normal duty)<br>15 kW 500 V heavy duty)<br>22 kW 690 V normal duty)<br>18.5 kW 690 V heavy duty)   |
| Maximum Horse Power Rating | 25 hp 500 V normal duty<br>20 hp 500 V heavy duty<br>30 hp 690 V normal duty<br>25 hp 690 V heavy duty           |
| Line current               | 27.6 A 500 V normal duty)<br>26 A 690 V normal duty)<br>23.2 A 500 V heavy duty)<br>23 A 690 V heavy duty)       |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prospective line I <sub>sc</sub>   | 70 kA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Apparent power                     | 31.1 kVA 690 V normal duty)<br>27.5 kVA 690 V heavy duty)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Continuous output current          | 29 A 4 kHz normal duty<br>24 A 4 kHz heavy duty                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Maximum transient current          | 34.8 A 60 s normal duty)<br>36 A 60 s heavy duty)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Asynchronous motor control profile | Constant torque standard<br>Optimized torque mode<br>Variable torque standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Synchronous motor control profile  | Permanent magnet motor<br>Synchronous reluctance motor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Speed drive output frequency       | 0.1...599 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Nominal switching frequency        | 4 kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Switching frequency                | 2...8 kHz adjustable<br>4...8 kHz with derating factor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Safety function                    | STO (safe torque off) SIL 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Number of preset speeds            | 16 preset speeds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Communication port protocol        | Modbus serial<br>Modbus TCP<br>Ethernet/IP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 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 |

## Complementary

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output voltage                      | <= power supply voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Motor slip compensation             | Not available in permanent magnet motor law<br>Adjustable<br>Automatic whatever the load<br>Can be suppressed                                                                                                                                                                                                                                                                                                                                                                                                 |
| 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 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 |
| Frequency resolution                | Display unit 0.1 Hz<br>Analog input 0.012/50 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Electrical connection               | Control screw terminal 0.5...1.5 mm <sup>2</sup> AWG 20...AWG 16<br>Motor screw terminal 10 mm <sup>2</sup> AWG 8<br>Line side screw terminal 10 mm <sup>2</sup> AWG 8<br>DC bus screw terminal 10 mm <sup>2</sup> AWG 8                                                                                                                                                                                                                                                                                      |

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connector type            | 2 RJ45 Ethernet IP/Modbus TCP on the control block<br>1 RJ45 Modbus serial on the control block                                                                                                                                                                                                                                                                                                                                                                                              |
| Physical interface        | 2-wire RS 485 Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Transmission frame        | RTU Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Transmission rate         | 10/100 Mbit/s Ethernet IP/Modbus TCP<br>4.8, 9.6, 19.2, 38.4 kbit/s Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                            |
| Exchange mode             | Half duplex, full duplex, autonegotiation Ethernet IP/Modbus TCP                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Data format               | 8 bits, configurable odd, even or no parity Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Type of polarization      | No impedance Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Number of addresses       | 1...247 Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Method of access          | Slave Modbus TCP                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Supply                    | 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                                                                                                                                          |
| Local signalling          | Local diagnostic 3 LED mono/dual colour)<br>Presence of voltage 1 LED red)<br>Embedded communication status 3 LED dual colour)<br>Communication module status 4 LED dual colour)                                                                                                                                                                                                                                                                                                             |
| Width                     | 9.69 in (246 mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Height                    | 16.54 in (420 mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Depth                     | 9.53 in (242 mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Net weight                | 48.50 lb(US) (22 kg)                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Analogue input number     | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Analogue input type       | 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                                                                                                                                                                                                                                                                                                                                   |
| Discrete input number     | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Discrete input type       | DI1...DI8 programmable, 24 V DC <= 30 V)3.5 kOhm<br>DI7, DI8 programmable as pulse input 0...30 kHz, 24 V DC <= 30 V)<br>STOA, STOB safe torque off, 24 V DC <= 30 V)> 2.2 kOhm                                                                                                                                                                                                                                                                                                              |
| Input compatibility       | DI1...DI8 discrete input level 1 PLC EN/IEC 61131-2<br>DI7, DI8 pulse input level 1 PLC IEC 65A-68<br>STOA, STOB discrete input level 1 PLC EN/IEC 61131-2                                                                                                                                                                                                                                                                                                                                   |
| Discrete input logic      | 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                                                                                                                                                                                                                                                                           |
| Analogue output number    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Analogue output type      | 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                                                                                                                                                                                                                                                                                                                                                       |
| Discrete output number    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Discrete output type      | 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<br>Logic output DQ- 0...1 kHz <= 30 V DC 100 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 analog input<br>AQ1, AQ2 +/- 0.2 % analog output                                                                                                                                                                                                                                                                                                                                                                                                   |
| Maximum switching current | 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 |
| Relay output number       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Relay output type         | Configurable relay logic R1 fault relay NO/NC 100000 cycles                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|                           |                                                                                                                              |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------|
|                           | Configurable relay logic R2 sequence relay NO 1000000 cycles<br>Configurable relay logic R3 sequence relay NO 1000000 cycles |
| Refresh time              | Relay output R1, R2, R3)5 ms +/- 0.5 ms)                                                                                     |
| Minimum switching current | Relay output R1, R2, R3 5 mA 24 V DC                                                                                         |
| Isolation                 | Between power and control terminals                                                                                          |

## Environment

|                                       |                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Insulation resistance                 | > 1 MOhm 500 V DC for 1 minute to earth                                                                                                                                                                                                                                                                                                                    |
| Noise level                           | 58 dB 86/188/EEC                                                                                                                                                                                                                                                                                                                                           |
| Power dissipation in W                | Forced convection 463 W 500 V 4 kHz<br>Natural convection 138 W 500 V 4 kHz                                                                                                                                                                                                                                                                                |
| 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                                                                                                                                                                                                                                                                                                                                 |
| Volume of cooling air                 | 87178.34 Gal/hr(US) (330 m3/h)                                                                                                                                                                                                                                                                                                                             |
| Operating position                    | Vertical +/- 10 degree                                                                                                                                                                                                                                                                                                                                     |
| 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 characteristic          | Chemical pollution resistance class 3C3 EN/IEC 60721-3-3<br>Dust pollution resistance class 3S3 EN/IEC 60721-3-3                                                                                                                                                                                                                                           |
| Pollution degree                      | 2 EN/IEC 61800-5-1                                                                                                                                                                                                                                                                                                                                         |
| Relative humidity                     | 5...95 % without condensation IEC 60068-2-3                                                                                                                                                                                                                                                                                                                |
| Ambient air temperature for operation | 5...122 °F (-15...50 °C) without)<br>122...140 °F (50...60 °C) with derating factor)                                                                                                                                                                                                                                                                       |
| Ambient air temperature for storage   | -40...158 °F (-40...70 °C)                                                                                                                                                                                                                                                                                                                                 |
| Operating altitude                    | <= 3280.84 ft (1000 m) without<br>1000...4800 m with current derating 1 % per 100 m                                                                                                                                                                                                                                                                        |
| Standards                             | UL 508C<br>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>REACH<br>CSA<br>UL                                                                                                                                                                                                                                                                                                                                  |
| Marking                               | CE                                                                                                                                                                                                                                                                                                                                                         |

## Ordering and shipping details

|                     |                             |
|---------------------|-----------------------------|
| Category            | 22276 - ATV930 FRAMES 1 & 2 |
| Discount Schedule   | CP4E                        |
| GTIN                | 00785901022602              |
| Package weight(Lbs) | 9525.43 kg (21000 lb(US))   |
| Returnability       | Yes                         |
| Country of origin   | IN                          |

## Offer Sustainability

|                           |                                                                                                                                                                                                                                                                       |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sustainable offer status  | Green Premium product                                                                                                                                                                                                                                                 |
| 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 Carcinogen & Reproductive harm. For more information go to <a href="http://www.p65warnings.ca.gov">www.p65warnings.ca.gov</a> |
| REACH Regulation          | <a href="#">REACH Declaration</a>                                                                                                                                                                                                                                     |
| EU RoHS Directive         | Pro-active compliance (Product out of EU RoHS legal scope)                                                                                                                                                                                                            |

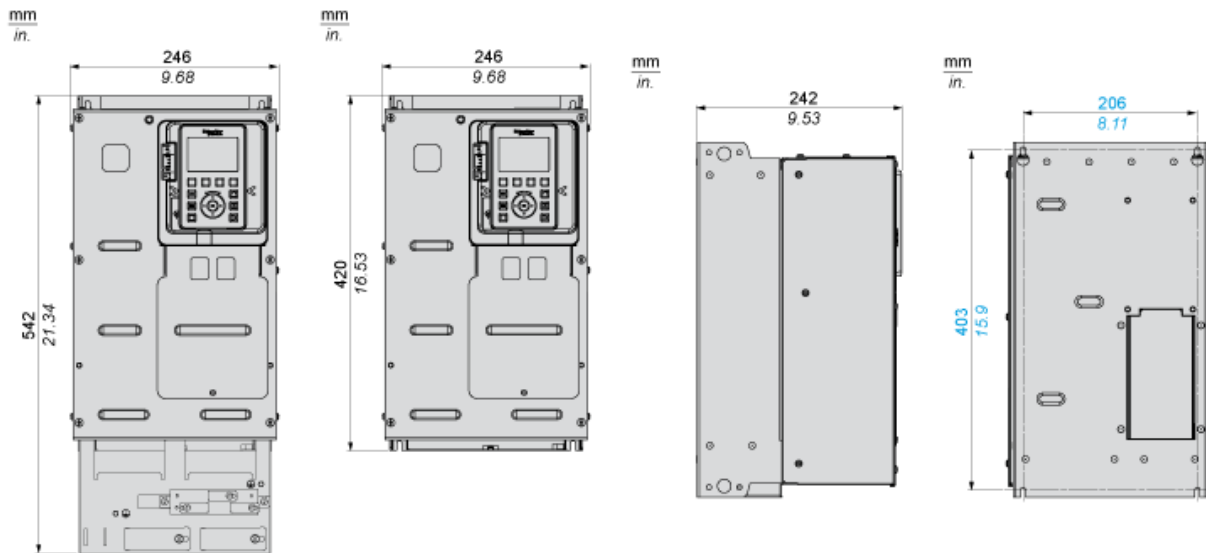
#### EU RoHS Declaration

|                            |                                                                                                                              |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 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. |

## Dimensions

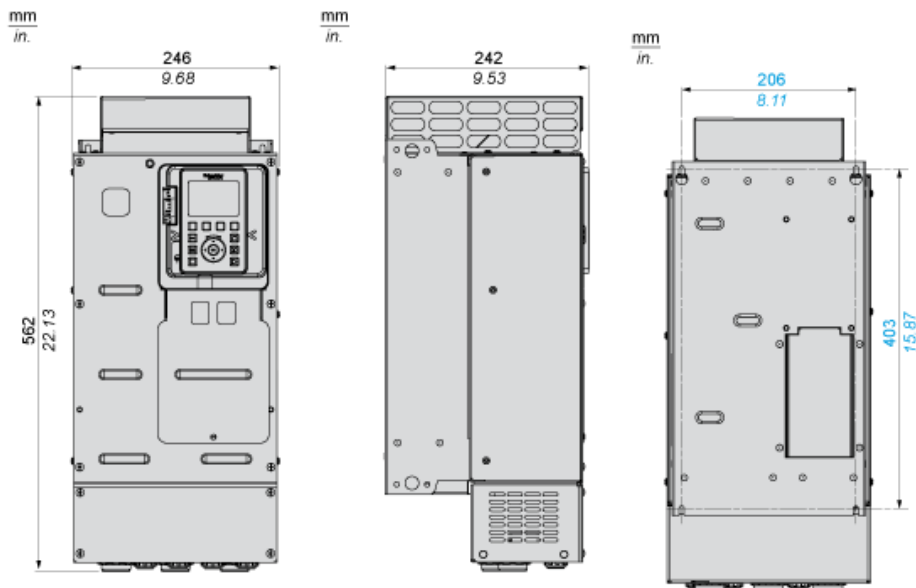
### Drives without Top Cover

Front View with EMC Plate, Front, Left and Rear View without EMC Plate

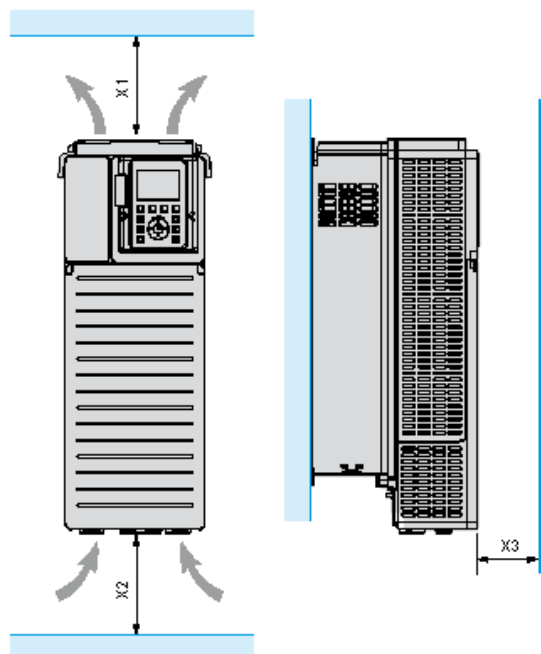


### Drives with IP20 Top Cover

Front, Left and Rear View



## Clearances

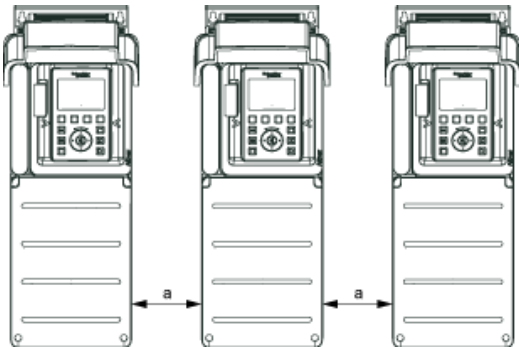


| X1                  | X2                  | X3                 |
|---------------------|---------------------|--------------------|
| ≥ 100 mm (3.94 in.) | ≥ 100 mm (3.94 in.) | ≥ 10 mm (0.39 in.) |

- 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.

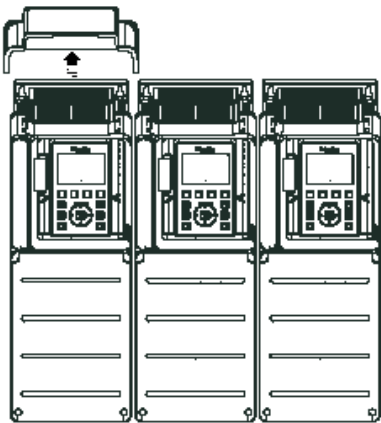
Mounting Types

Mounting Type A: Individual IP21

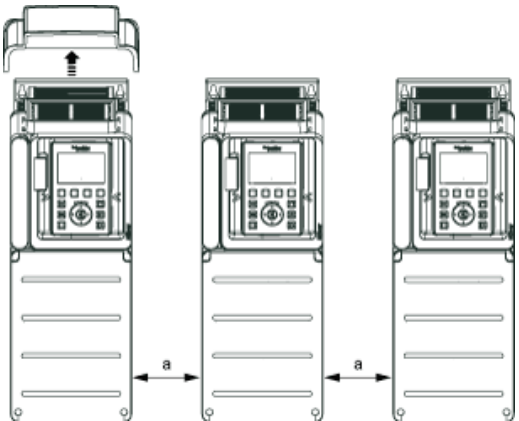


$a \geq 0$

Mounting Type B: Side by Side IP20



Mounting Type C: Individual IP20

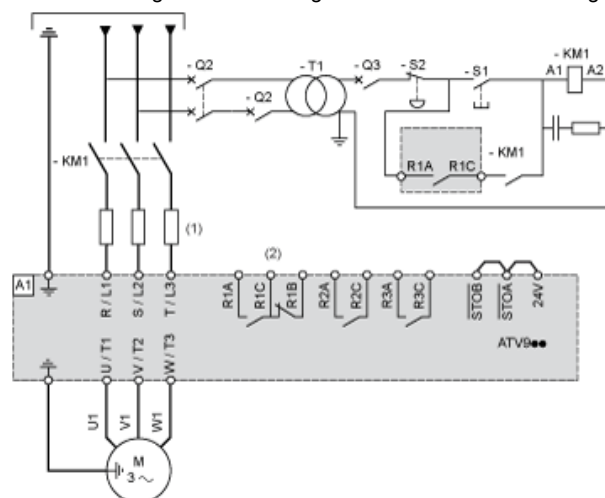


$a \geq 0$



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

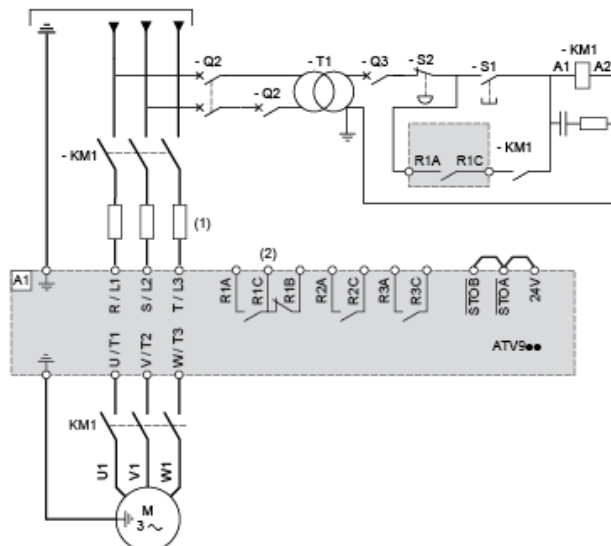
Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1



- (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

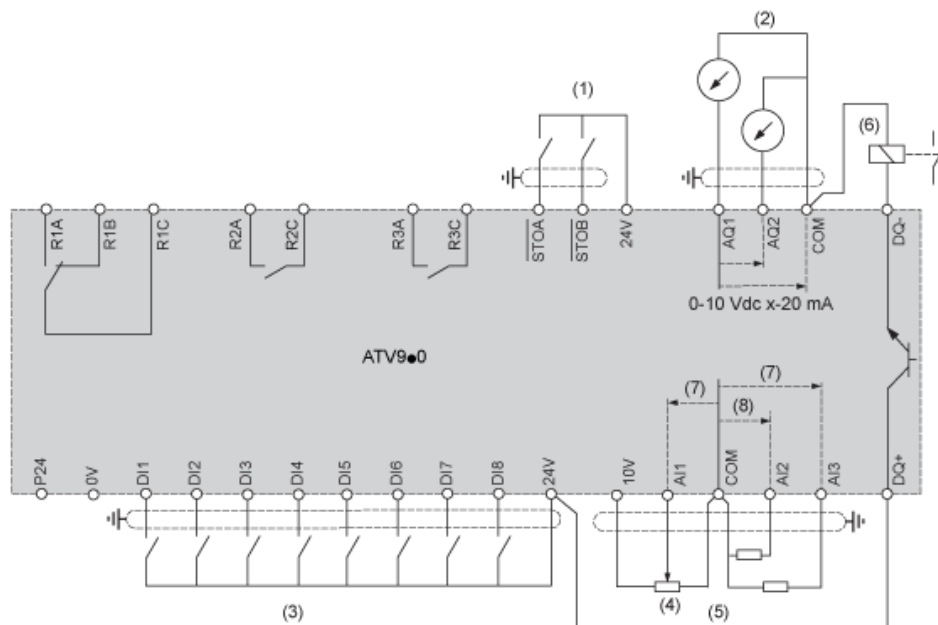
### Three-Phase Power Supply with Downstream Breaking via Contactor

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 6



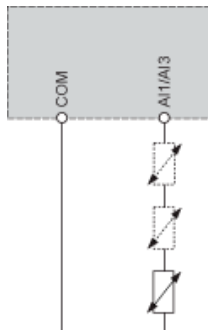
- (1) Line choke if used  
(2) Use relay R1 set to operating state Fault to switch Off the product once an error is detected.
- A1 : Drive  
KM1 : Contactor

## 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 Relay  
R2A, R2C Sequence relay  
R3A, R3C Sequence relay

## Sensor Connection



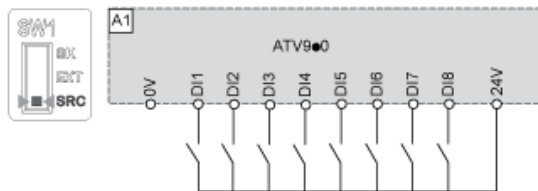
It is possible to connect either 1 or 3 sensors on terminals AI1 or AI3

## Sink / Source Switch Configuration

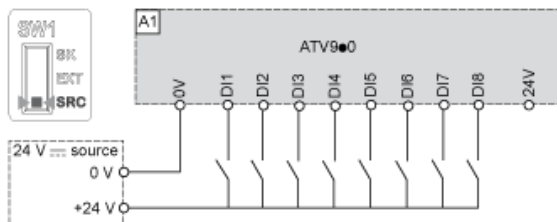
The switch is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs.

- 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.

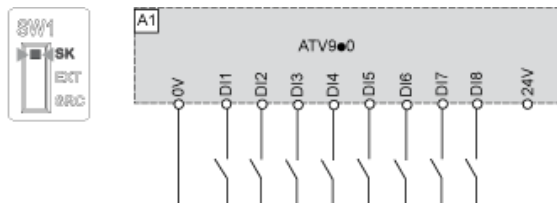
### Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs



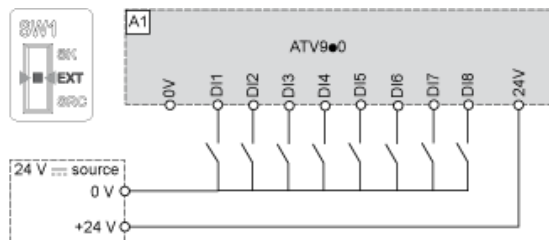
### Switch Set to SRC (Source) Position and Use of an External Power Supply for the DIs



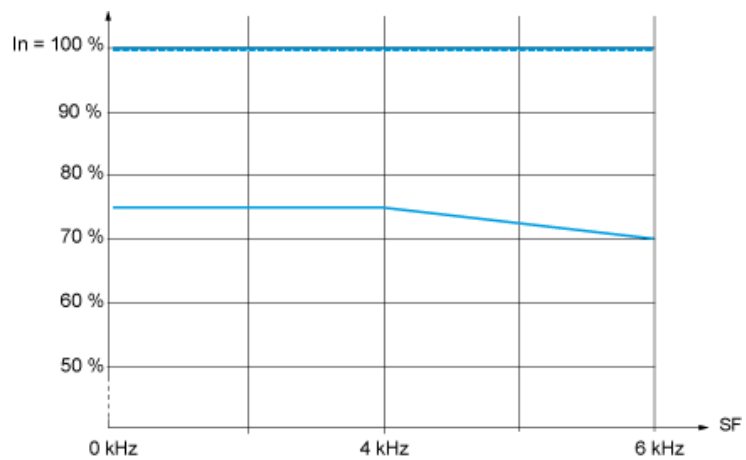
### Switch Set to SK (Sink) Position Using the Output Power Supply for the Digital Inputs



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



### 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