

# ATV630U07N4

variable speed drive ATV630 - 0.75kW/1HP -  
380...480V - IP21/UL type 1



Price\* : 345.00 GBP



## Main

|                              |                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Range of product             | Altivar Process ATV600                                                                                                          |
| Product or component type    | Variable speed drive                                                                                                            |
| Product specific application | Process and utilities                                                                                                           |
| Device short name            | ATV630                                                                                                                          |
| Variant                      | Standard version                                                                                                                |
| Product destination          | Asynchronous motors<br>Synchronous motors                                                                                       |
| Mounting mode                | Wall mount                                                                                                                      |
| EMC filter                   | Integrated with 50 m conforming to EN/IEC 61800-3 category C2<br>Integrated with 150 m conforming to EN/IEC 61800-3 category C3 |
| IP degree of protection      | IP21 conforming to IEC 61800-5-1<br>IP21 conforming to IEC 60529                                                                |
| Degree of protection         | UL type 1 conforming to UL 508C                                                                                                 |
| Type of cooling              | Forced convection                                                                                                               |
| Supply frequency             | 50...60 Hz - 5...5 %                                                                                                            |
| Network number of phases     | 3 phases                                                                                                                        |
| [Us] rated supply voltage    | 380...480 V - 15...10 %                                                                                                         |
| Motor power kW               | 0.75 kW (normal duty)<br>0.37 kW (heavy duty)                                                                                   |
| Motor power hp               | 1 hp normal duty<br>0.5 hp heavy duty                                                                                           |
| Line current                 | 1.5 A at 380 V (normal duty)<br>1.3 A at 480 V (normal duty)<br>0.9 A at 380 V (heavy duty)<br>0.8 A at 480 V (heavy duty)      |
| Prospective line Isc         | 50 kA                                                                                                                           |
| Apparent power               | 1.1 kVA at 480 V (normal duty)<br>0.7 kVA at 480 V (heavy duty)                                                                 |
| Continuous output current    | 2.2 A at 4 kHz for normal duty<br>1.5 A at 4 kHz for heavy duty                                                                 |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum transient current          | 2.4 A during 60 s (normal duty)<br>2.3 A during 60 s (heavy duty)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Asynchronous motor control profile | Constant torque standard<br>Variable torque standard<br>Optimized torque mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Synchronous motor control profile  | Permanent magnet motor<br>Synchronous reluctance motor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Output frequency                   | 0.0001...0.5 kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Speed drive output frequency       | 0.1...599 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Nominal switching frequency        | 4 kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Switching frequency                | 2...12 kHz adjustable<br>4...12 kHz with derating factor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Safety function                    | STO (safe torque off) SIL 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Discrete input logic               | 16 preset speeds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Communication port protocol        | Modbus TCP<br>Ethernet<br>Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Option card                        | 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

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output voltage                      | $\leq$ power supply voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Permissible temporary current boost | 1.1 x $I_n$ during 60 s (normal duty)<br>1.5 x $I_n$ during 60 s (heavy duty)                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Motor slip compensation             | Not available in permanent magnet motor law<br>Can be suppressed<br>Automatic whatever the load<br>Adjustable                                                                                                                                                                                                                                                                                                                                                                                                                |
| Acceleration and deceleration ramps | 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: removable screw terminals 0.5...1.5 mm <sup>2</sup> /AWG 20...AWG 16<br>Motor: screw terminal 2.5...6 mm <sup>2</sup> /AWG 14...AWG 10<br>Line side: screw terminal 2.5...6 mm <sup>2</sup> /AWG 14...AWG 10                                                                                                                                                                                                                                                                                                        |
| Connector type                      | RJ45 (on the remote graphic terminal) for Ethernet/Modbus TCP<br>RJ45 (on the remote graphic terminal) for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                     |
| Physical interface                  | 2-wire RS 485 for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Transmission frame                  | RTU for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transmission rate                          | 10/100 Mbit/s for Ethernet IP/Modbus TCP<br>4.8, 9.6, 19.2, 38.4 kbit/s for Modbus serial                                                                                                                                                                                                                                                                                                                      |
| Exchange mode                              | Half duplex, full duplex, autonegotiation Ethernet/Modbus TCP                                                                                                                                                                                                                                                                                                                                                  |
| Data format                                | 8 bits, configurable odd, even or no parity for Modbus serial                                                                                                                                                                                                                                                                                                                                                  |
| Type of polarization                       | No impedance for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                 |
| Number of addresses                        | 1...247 for Modbus serial                                                                                                                                                                                                                                                                                                                                                                                      |
| Method of access                           | Slave Modbus TCP                                                                                                                                                                                                                                                                                                                                                                                               |
| Supply                                     | External supply for digital inputs: 24 V DC (19...30 V), <1.25 mA, protection type: overload and short-circuit protection<br>Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 mA, protection type: overload and short-circuit protection<br>Internal supply for digital inputs and STO: 24 V DC (21...27 V), <200 mA, protection type: overload and short-circuit protection |
| Local signalling                           | 3 LEDslocal diagnostic:<br>3 LEDs (dual colour)embedded communication status:<br>4 LEDs (dual colour)communication module status:<br>1 LED (red)presence of voltage:                                                                                                                                                                                                                                           |
| Width                                      | 144 mm                                                                                                                                                                                                                                                                                                                                                                                                         |
| Height                                     | 350 mm                                                                                                                                                                                                                                                                                                                                                                                                         |
| Depth                                      | 203 mm                                                                                                                                                                                                                                                                                                                                                                                                         |
| Product weight                             | 4.5 kg                                                                                                                                                                                                                                                                                                                                                                                                         |
| Analogue input number                      | 3                                                                                                                                                                                                                                                                                                                                                                                                              |
| Analogue input type                        | AI1, AI2, AI3 software-configurable voltage: 0...10 V DC, impedance: 30 kOhm, resolution 12 bits<br>AI1, AI2, AI3 software-configurable current: 0...20 mA/4...20 mA, impedance: 250 Ohm, resolution 12 bits                                                                                                                                                                                                   |
| Discrete input number                      | 8                                                                                                                                                                                                                                                                                                                                                                                                              |
| Discrete input type                        | DI1...DI6 programmable, 24 V DC (<= 30 V), impedance: 3.5 kOhm<br>DI5, DI6 programmable as pulse input: 0...30 kHz, 24 V DC (<= 30 V)<br>STOA, STOB safe torque off, 24 V DC (<= 30 V), impedance: > 2.2 kOhm                                                                                                                                                                                                  |
| Input compatibility                        | DI1...DI6: discrete input level 1 PLC conforming to EN/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 EN/IEC 61131-2                                                                                                                                                                                                     |
| Discrete input logic                       | Positive logic (source) (DI1...DI6), < 5 V (state 0), > 11 V (state 1)<br>Negative logic (sink) (DI1...DI6), > 16 V (state 0), < 10 V (state 1)<br>Positive logic (source) (DI5, DI6), < 0.6 V (state 0), > 2.5 V (state 1)<br>Positive logic (source) (STOA, STOB), < 5 V (state 0), > 11 V (state 1)                                                                                                         |
| Analogue output number                     | 2                                                                                                                                                                                                                                                                                                                                                                                                              |
| Analogue output type                       | Software-configurable voltage AO1, AO2: 0...10 V DC impedance 470 Ohm, resolution 10 bits<br>Software-configurable current AO1, AO2: 0...20 mA, resolution 10 bits                                                                                                                                                                                                                                             |
| Sampling duration                          | 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                                                                                                                                                                                                                            |
| Accuracy                                   | +/- 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                                                                                                                                                                                                                                                                     |
| Linearity error                            | AI1, AI2, AI3: +/- 0.15 % of maximum value for analog input<br>AO1, AO2: +/- 0.2 % for analog output                                                                                                                                                                                                                                                                                                           |
| Relay output number                        | 3                                                                                                                                                                                                                                                                                                                                                                                                              |
| Relay output type                          | Configurable relay logic R1: fault relay NO/NC electrical durability 100000 cycles<br>Configurable relay logic R2: sequence relay NO electrical durability 100000 cycles<br>Configurable relay logic R3: sequence relay NO electrical durability 100000 cycles                                                                                                                                                 |
| Refresh time                               | Relay output (R1, R2, R3): 5 ms (+/- 0.5 ms)                                                                                                                                                                                                                                                                                                                                                                   |
| Minimum switching current                  | Relay output R1, R2, R3: 5 mA at 24 V DC                                                                                                                                                                                                                                                                                                                                                                       |
| Maximum switching current                  | Relay output R1, 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                                                                       |
| Isolation                                  | Between power and control terminals                                                                                                                                                                                                                                                                                                                                                                            |
| Variable speed drive application selection | Compressor centrifugal Building - HVAC<br>Other application Food and beverage processing<br>Fan Mining mineral and metal<br>Pump Mining mineral and metal<br>Fan Oil and gas                                                                                                                                                                                                                                   |

Other application Water and waste water  
 Screw compressor Building - HVAC  
 Pump Food and beverage processing  
 Fan Food and beverage processing  
 Atomization Food and beverage processing  
 Electro submersible pump (ESP) Oil and gas  
 Water injection pump Oil and gas  
 Jet fuel pump Oil and gas  
 Compressor for refinery Oil and gas  
 Centrifuge pump Water and waste water  
 Positive displacement pump Water and waste water  
 Electro submersible pump (ESP) Water and waste water  
 Screw pump Water and waste water  
 Lobe compressor Water and waste water  
 Screw compressor Water and waste water  
 Compressor centrifugal Water and waste water  
 Fan Water and waste water  
 Conveyor Water and waste water  
 Mixer Water and waste water

|                        |                                                                            |
|------------------------|----------------------------------------------------------------------------|
| Motor power range AC-3 | 0.55...1 kW at 380...440 V 3 phases<br>0.55...1 kW at 480...500 V 3 phases |
|------------------------|----------------------------------------------------------------------------|

## Environment

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Insulation resistance                 | > 1 MOhm 500 V DC for 1 minute to earth                                                                                                                                                                                                                                                                                                                                                                                          |
| Noise level                           | 54.5 dB conforming to 86/188/EEC                                                                                                                                                                                                                                                                                                                                                                                                 |
| Power dissipation in W                | Natural convection: 26 W at 380 V, switching frequency 4 kHz<br>Forced convection: 21 W at 380 V, switching frequency 4 kHz                                                                                                                                                                                                                                                                                                      |
| Volume of cooling air                 | 38 m <sup>3</sup> /h                                                                                                                                                                                                                                                                                                                                                                                                             |
| Operating position                    | Vertical +/- 10 degree                                                                                                                                                                                                                                                                                                                                                                                                           |
| Maximum THDI                          | <48 % full load conforming to IEC 61000-3-12                                                                                                                                                                                                                                                                                                                                                                                     |
| Electromagnetic compatibility         | Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2<br>Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3<br>Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4<br>1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5<br>Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 |
| Pollution degree                      | 2 conforming to EN/IEC 61800-5-1                                                                                                                                                                                                                                                                                                                                                                                                 |
| Vibration resistance                  | 1.5 mm peak to peak (f= 2...13 Hz) conforming to IEC 60068-2-6<br>1 gn (f= 13...200 Hz) conforming to IEC 60068-2-6                                                                                                                                                                                                                                                                                                              |
| Shock resistance                      | 15 gn for 11 ms conforming to IEC 60068-2-27                                                                                                                                                                                                                                                                                                                                                                                     |
| Relative humidity                     | 5...95 % without condensation conforming to IEC 60068-2-3                                                                                                                                                                                                                                                                                                                                                                        |
| Ambient air temperature for operation | -15...50 °C (without)<br>50...60 °C (with derating factor)                                                                                                                                                                                                                                                                                                                                                                       |
| Ambient air temperature for storage   | -40...70 °C                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operating altitude                    | <= 1000 m without<br>1000...4800 m with current derating 1 % per 100 m                                                                                                                                                                                                                                                                                                                                                           |
| Environmental characteristic          | Chemical pollution resistance class 3C3 conforming to EN/IEC 60721-3-3<br>Dust pollution resistance class 3S3 conforming to EN/IEC 60721-3-3                                                                                                                                                                                                                                                                                     |
| Standards                             | UL 508C<br>EN/IEC 61800-3<br>Environment 1 category C2 EN/IEC 61800-3<br>Environment 2 category C3 EN/IEC 61800-3<br>EN/IEC 61800-5-1<br>IEC 61000-3-12<br>IEC 60721-3<br>IEC 61508<br>IEC 13849-1                                                                                                                                                                                                                               |
| Product certifications                | TÜV<br>ATEX zone 2/22<br>CSA<br>DNV-GL<br>UL<br>REACH<br>ATEX INERIS                                                                                                                                                                                                                                                                                                                                                             |
| Marking                               | CE                                                                                                                                                                                                                                                                                                                                                                                                                               |

### Offer Sustainability

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

### Contractual warranty

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

### Drives with IP21 Top Cover

Technical drawings of the 1000 Series handheld radio showing front and side views with dimensions in mm and inches.

**Front View Dimensions:**

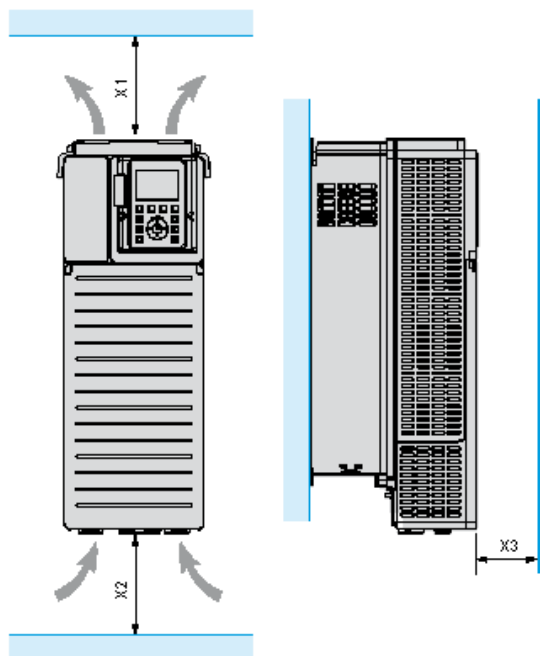
- Top width: 144 mm (5.67 in.)
- Bottom width: 130 mm (5.12 in.)
- Height: 350 mm (13.8 in.)

**Side View Dimensions:**

- Top width: 203 mm (8 in.)
- Height: 350 mm (13.8 in.)

[illegible]

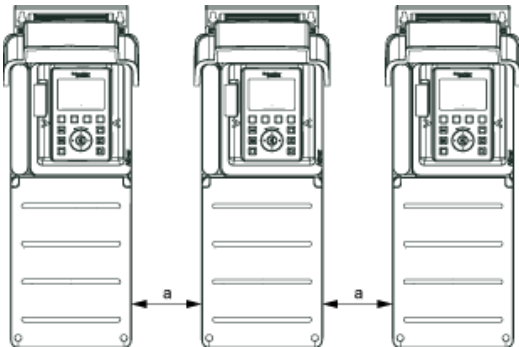
## Clearances



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

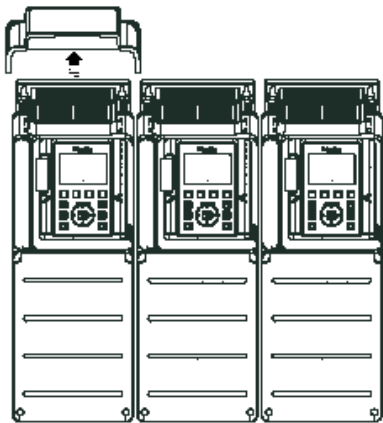
Mounting Types

Mounting Type A: Individual IP21

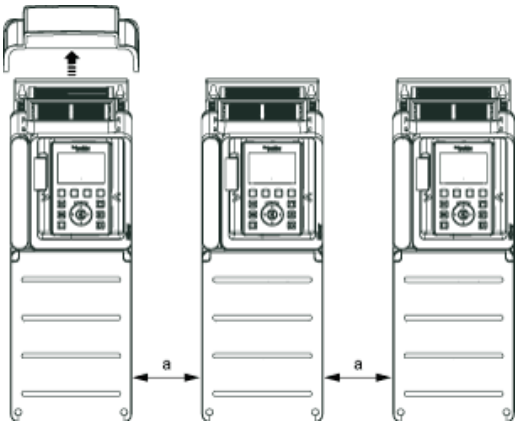


$a \geq 100 \text{ mm (3.94 in.)}$

Mounting Type B: Side by Side IP20



Mounting Type C: Individual IP20

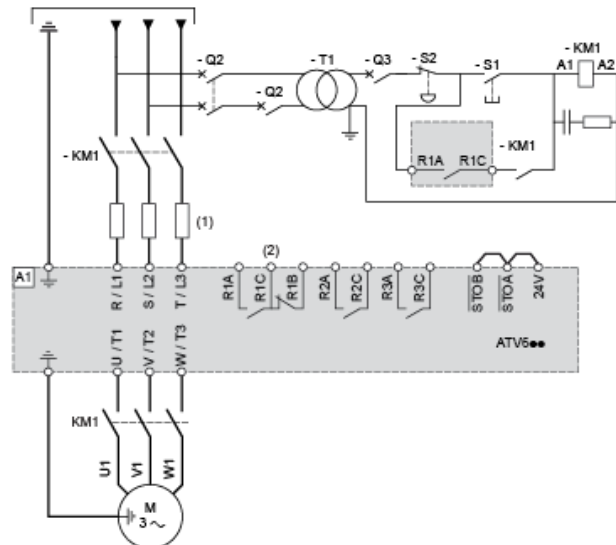


$a \geq 0$



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

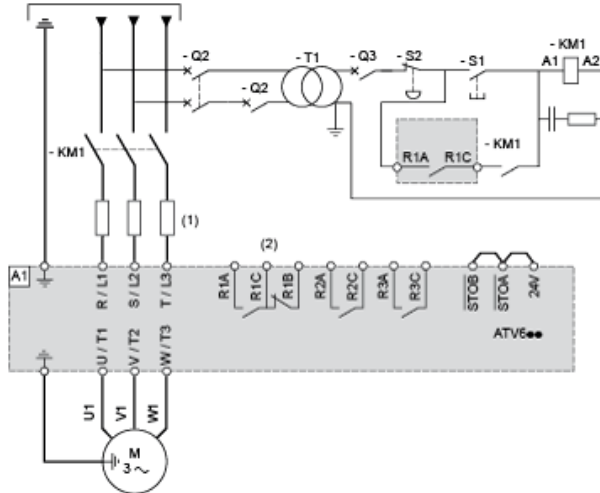
Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1



- (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

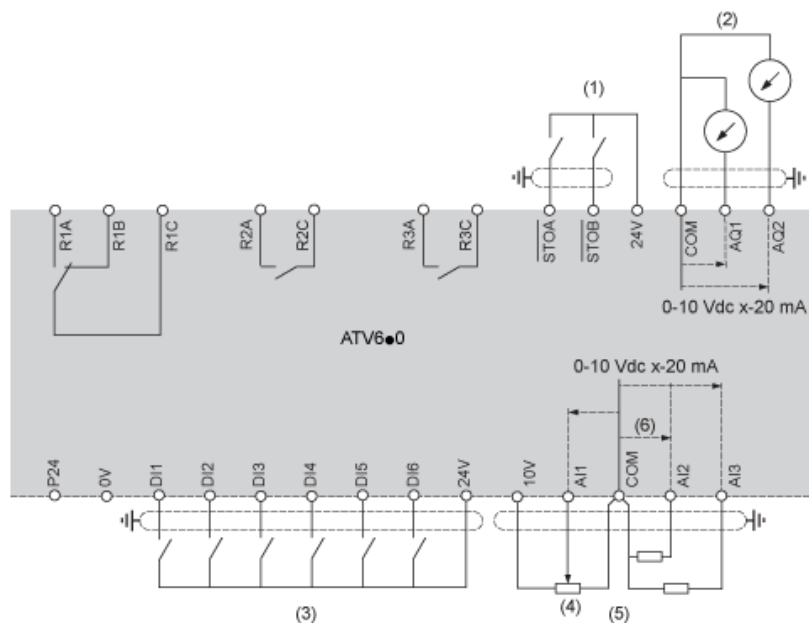
## Three-Phase Power Supply with Downstream Breaking via Contactor

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 61508-1



- (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

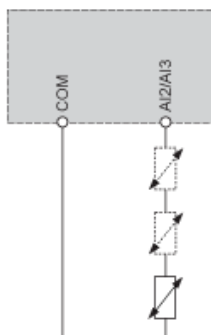
## Control Block Wiring Diagram



- (1) Safe Torque Off
- (2) Analog Output
- (3) Digital Input
- (4) Reference potentiometer
- (5) Analog Input
- R1A, R1B, R1C 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.

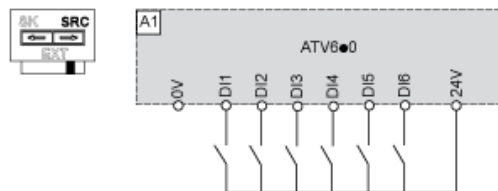


## Sink / Source Switch Configuration

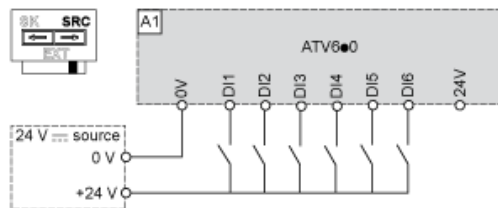
The switch is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs.

- 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.

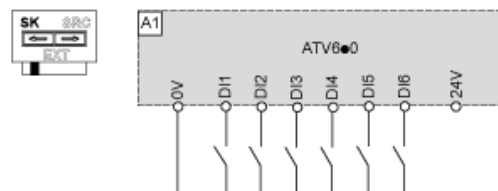
### Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs



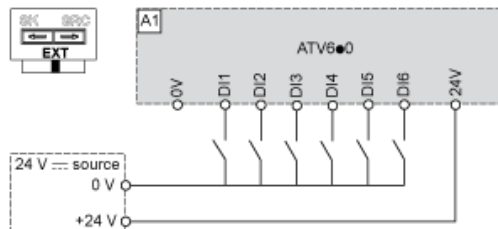
### Switch Set to SRC (Source) Position and Use of an External Power Supply for the DIs



### 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



### Derating Curves

