

# ATV630U55S6X

variable speed drive, Altivar Process ATV600,  
ATV630, 7.5hp, 600V, IP21





## 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  |
| EMC filter                         | Without EMC filter   |
| IP degree of protection            | IP21IEC 61800-5-1<br>IP21IEC 60529   |
| [Us] rated supply voltage          | 600 V  |
| Degree of protection               | UL type 1 UL 508C  |
| Type of cooling                    | Forced convection  |
| Supply frequency                   | 50...60 Hz - 5...5 %   |
| [Us] rated supply voltage          | 600 V - 15...10 %  |
| Maximum Horse Power Rating         | 7.5 Hp 600 V normal duty<br>5 hp 600 V heavy duty  |
| Line current                       | 7 A 600 V normal duty)<br>5.3 A 600 V heavy duty)  |
| Prospective line I <sub>sc</sub>   | 70 kA  |
| Apparent power                     | 7.3 KVA 600 V normal duty)<br>5.5 kVA 600 V heavy duty)  |
| Continuous output current          | 7.2 A 4 kHz heavy duty<br>9.5 A 4 kHz normal duty  |
| Asynchronous motor control profile | Variable torque standard<br>Constant torque standard<br>Optimized torque mode  |
| Synchronous motor control profile  | Permanent magnet motor<br>Synchronous reluctance motor   |
| Speed drive output frequency       | 0.1...500 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 serial<br>Modbus TCP<br>Ethernet  |
| 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/<br>EtherNet/IP<br>Slot A communication module, CANopen daisy<br>chain RJ45<br>Slot A communication module, CANopen SUB-D 9<br>Slot A communication module, CANopen screw<br>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<br>TCP/MD-Link<br>Communication module, BACnet MS/TP<br>Communication module, Ethernet Powerlink |

## Complementary

|                                     |  |
|-------------------------------------|--|
| Mounting Mode                       | Wall mount   |
| Maximum transient current           | 10.8 A 60 s heavy duty)<br>10.5 A 60 s normal duty)  |
| Phase                               | 3 phase  |
| Discrete output number              | 0  |
| Discrete output type                | Relay outputs R1A, R1B, R1C 250 V AC 3000 mA<br>Relay outputs R1A, R1B, R1C 30 V DC 3000 mA<br>Relay outputs R2A, R2C 250 V AC 5000 mA<br>Relay outputs R2A, R2C 30 V DC 5000 mA<br>Relay outputs R3A, R3C 250 V AC 5000 mA<br>Relay outputs R3A, R3C 30 V DC 5000 mA  |
| Output voltage                      | <= power supply voltage  |
| Permissible temporary current boost | 1.1 x In 60 s normal duty)<br>1.5 x In 60 s heavy duty)  |
| 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 | Linear adjustable separately from 0.01...9999 s<br>S, U or customized  |
| Physical interface                  | Ethernet<br>2-wire RS 485  |
| 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 |
| Transmission Rate                   | 10, 100 Mbits<br>4800 bps, 9600 bps, 19200 bps, 38.4 Kbps  |
| Frequency resolution                | Display unit 0.1 Hz<br>Analog input 0.012/50 Hz  |
| Transmission frame                  | RTU  |
| Electrical connection               | Control removable screw terminals 0.5...1.5 mm <sup>2</sup> AWG 20...AWG 16<br>Motor screw terminal 6...10 mm <sup>2</sup> AWG 10...AWG 8<br>Line side screw terminal 6...10 mm <sup>2</sup> AWG 10...AWG 8  |
| Connector type                      | RJ45 on the remote graphic terminal)Ethernet/Modbus TCP<br>RJ45 on the remote graphic terminal)Modbus serial   |
| Data format                         | 8 bits, configurable odd, even or no parity  |
| Type of polarization                | No impedance   |
| Exchange mode                       | Half duplex, full duplex, autonegotiation Ethernet/Modbus TCP  |
| 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                    | For local diagnostic 3 LEDs<br>For embedded communication status 3 LEDs (dual colour)<br>For communication module status 4 LEDs (dual colour)<br>For presence of voltage 1 LED (red)   |
| Width                               | 6.73 in (171 mm)   |
| Height                              | 16.10 in (409 mm)  |

|                                 |  |
|---------------------------------|--|
| Depth                           | 9.17 in (233 mm)   |
| Net Weight                      | 12.13 lb(US) (5.5 kg)  |
| Analogue input number           | 3  |
| Analogue input type             | AI1, AI2, AI3 software-configurable voltage 0...10 V DC 31.5 kOhm 12 bits<br>AI1, AI2, AI3 software-configurable current 0...20 mA 250 Ohm 12 bits<br>AI2 voltage analog input - 10...10 V DC 31.5 kOhm 12 bits  |
| Discrete input number           | 8  |
| Discrete input type             | DI7, DI8 programmable as pulse input 0...30 kHz, 24 V DC <= 30 V)  |
| Input compatibility             | DI1...DI6 discrete input level 1 PLC IEC 61131-2<br>DI5, DI6 discrete input level 1 PLC IEC 65A-68<br>STOA, STOB discrete input level 1 PLC 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  |
| 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 10 bits<br>Software-configurable current DQ-, DQ+ 30 V DC<br>Software-configurable current DQ-, DQ+ 100 mA                                    |
| 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 analog input<br>AO1, AO2 +/- 0.2 % analog output   |
| Relay output number             | 3  |
| Relay output type               | Configurable relay logic R1 fault relay NO/NC 100000 cycles<br>Configurable relay logic R2 sequence relay NO 100000 cycles<br>Configurable relay logic R3 sequence relay NO 100000 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   |
| Maximum switching current       | Relay output R1, R2, R3 resistive, cos phi = 1 3 A 250 V AC<br>Relay output R1, R2, R3 resistive, cos phi = 1 3 A 30 V DC<br>Relay output R1, R2, R3 inductive, cos phi = 0.4 7 ms 2 A 250 V AC<br>Relay output R1, R2, R3 inductive, cos phi = 0.4 7 ms 2 A 30 V DC |
| Isolation                       | Between power and control terminals  |
| Maximum output frequency        | 500 kHz  |
| Maximum Input Current per Phase | 7.0 A  |
| Quantity per Set                | 1  |
| Enclosure mounting              | Wall mounted   |

## Environment

|                                       |  |
|---------------------------------------|--|
| Insulation resistance                 | > 1 MOhm 500 V DC for 1 minute to earth  |
| Noise level                           | 52 dB 86/188/EEC   |
| Power dissipation in W                | Natural convection 102 W 600 V 4 kHz<br>Forced convection 74 W 600 V 4 kHz   |
| Volume of cooling air                 | 27210.21 Gal/hr(US) (103 m3/h)   |
| Operating position                    | Vertical +/- 10 degree   |
| Maximum THDI                          | <48 % with external line choke IEC 61000-3-12  |
| 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 |
| Pollution degree                      | 2 IEC 61800-5-1  |
| 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   |
| Relative humidity                     | 5...95 % without condensation IEC 60068-2-3  |
| Ambient air temperature for operation | 5...122 °F (-15...50 °C) without derating)<br>122...140 °F (50...60 °C) with derating factor)  |
| Ambient Air Temperature for Storage   | -40...158 °F (-40...70 °C)   |

|                        |  |
|------------------------|--|
| Operating altitude     | <= 3280.84 ft (1000 m) without derating<br>1000...4800 m with current derating 1 % per 100 m         |
| Product Certifications | CSA[RETURN]UL[RETURN]TÜV   |
| Standards              | UL 508C<br>IEC 61800-3<br>IEC 61800-5-1<br>IEC 61000-3-12<br>IEC 60721-3<br>IEC 61508<br>IEC 13849-1 |
| Overvoltage category   | III  |
| Regulation loop        | Adjustable PID regulator   |
| Noise level            | 56 dB  |
| Pollution degree       | 2  |

## Ordering and shipping details

|                   |                           |
|-------------------|---------------------------|
| Category          | 22276-ATV930 FRAMES 1 & 2 |
| Discount Schedule | CP4E                      |
| GTIN              | 3606481324856             |
| Returnability     | Yes                       |
| Country of origin | ID                        |

## Packing Units

|                              |                       |
|------------------------------|-----------------------|
| Unit Type of Package 1       | PCE                   |
| Number of Units in Package 1 | 1                     |
| Package 1 Height             | 13.39 in (34.0 cm)    |
| Package 1 Width              | 8.66 in (22.0 cm)     |
| Package 1 Length             | 22.83 in (58.0 cm)    |
| Package 1 Weight             | 19.40 lb(US) (8.8 kg) |

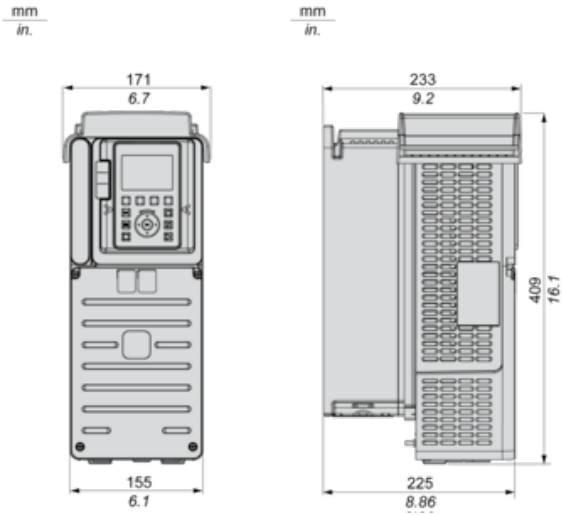
## Offer Sustainability

|                            |   |
|----------------------------|---|
| 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 cancer and birth defects or other 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)  |
| Mercury free               | Yes   |
| China RoHS Regulation      | <a href="#">China RoHS Declaration</a>  |
| RoHS exemption information | <a href="#">Yes</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.  |
| Upgradeability             | Upgraded components available   |

Dimensions

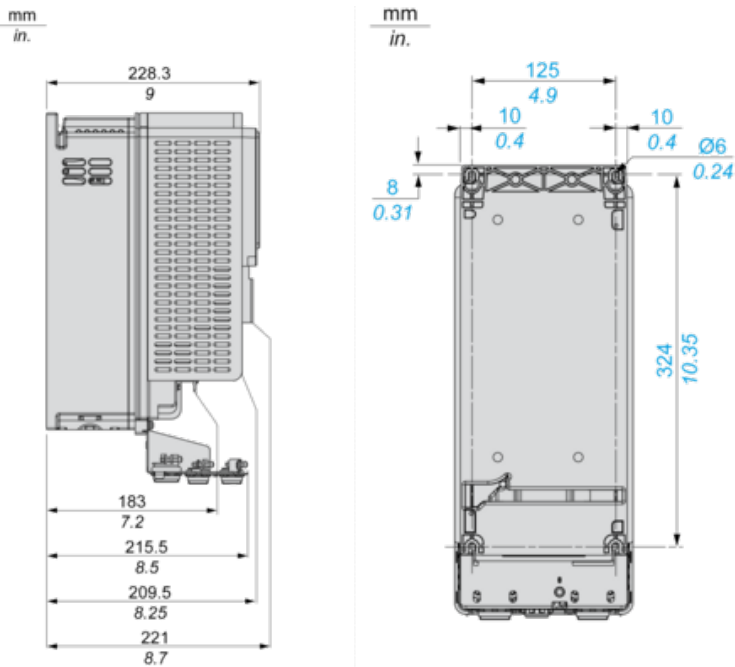
Drives with IP21 Top Cover

Front and Left Views

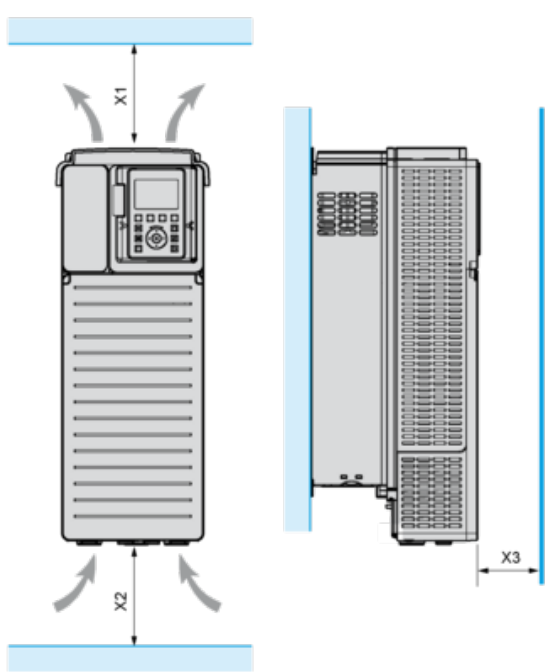


Drives Without IP21 Top Cover

Left and Rear Views



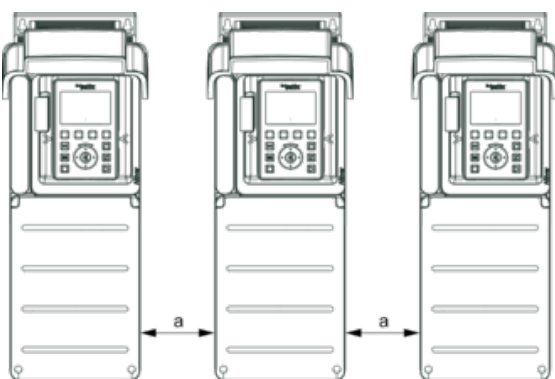
Clearances



| X1                               | X2                               | X3                              |
|----------------------------------|----------------------------------|---------------------------------|
| $\geq 100 \text{ mm (3.94 in.)}$ | $\geq 100 \text{ mm (3.94 in.)}$ | $\geq 10 \text{ mm (0.39 in.)}$ |

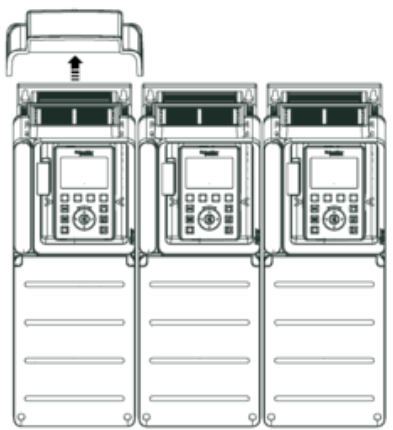
Mounting Types

Mounting Type A: Individual IP21

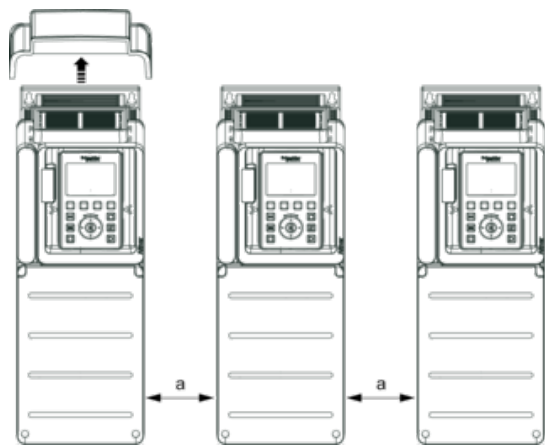


$a \geq 100 \text{ mm (3.94 in.)}$

Mounting Type B: Side by Side IP20



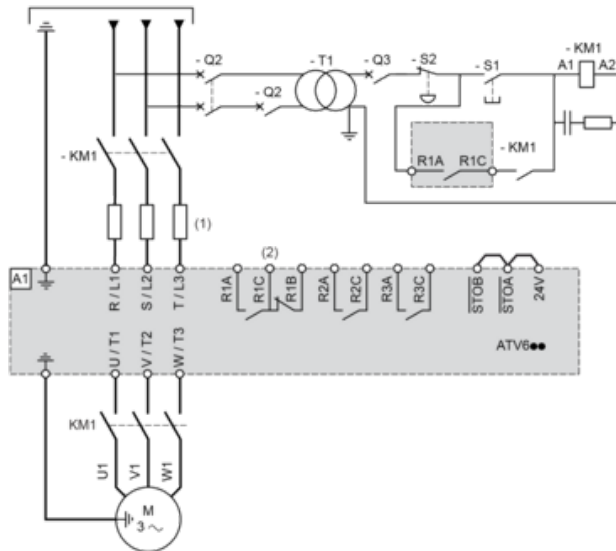
Mounting Type C: Individual IP20



$a \geq 0$

Three-Phase Power Supply with Upstream Breaking via Line Contactor

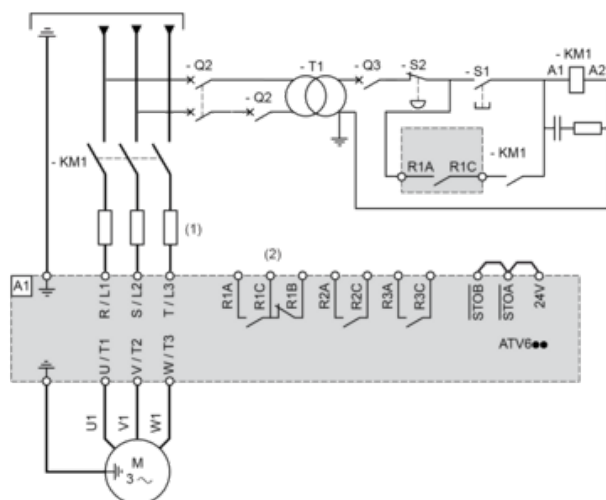
Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1



- (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

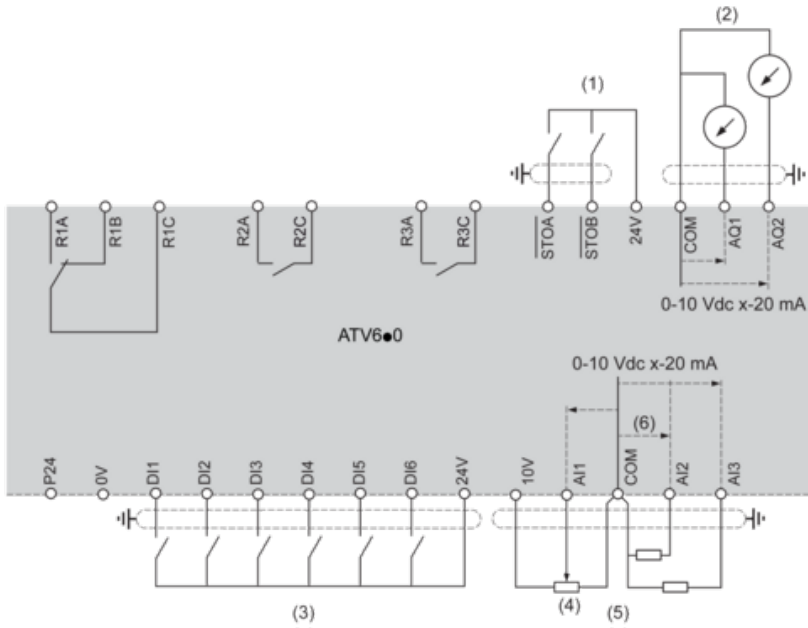
Three-Phase Power Supply with Downstream Breaking via Contactor

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 60204-1



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

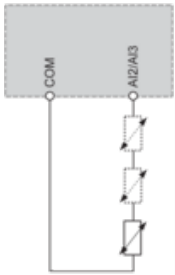
## Control Block Wiring Diagram



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

## Sensor Connection

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

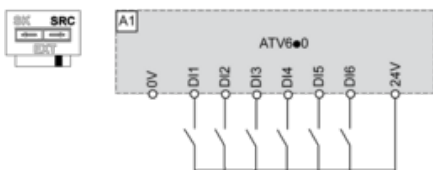


## Sink / Source Switch Configuration

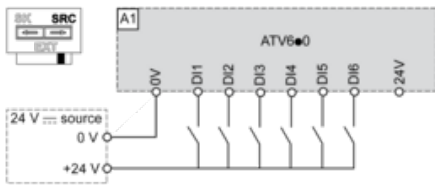
The switch is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs.

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

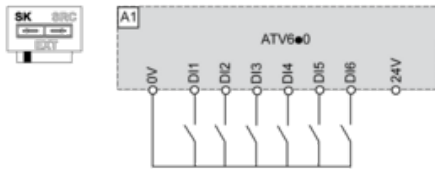
## Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs



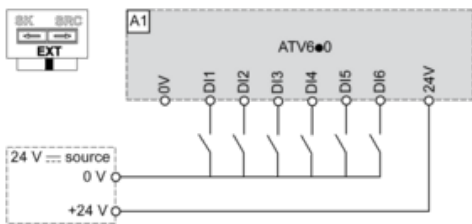
### Switch Set to SRC (Source) Position and Use of an External Power Supply for the DIs



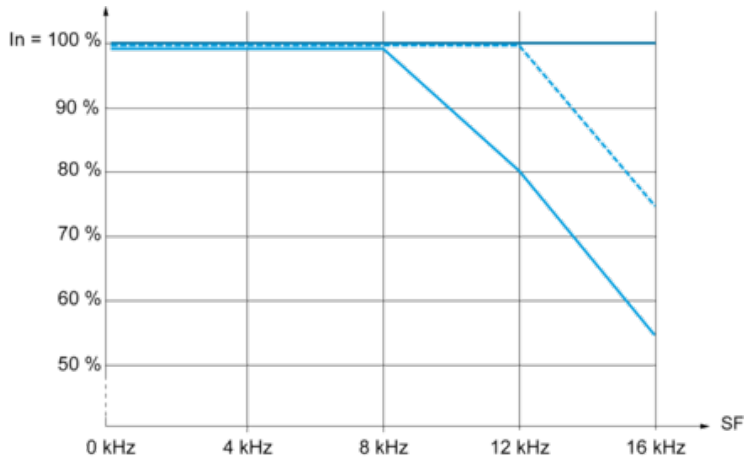
### Switch Set to SK (Sink) Position Using the Output Power Supply for the Digital Inputs



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



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