Product datasheet

Specification





variable speed drive, ATV320, 1.5 kW, 380...500 V, 3 phases, compact

ATV320U15N4C

Main

Range of product	Altivar Machine ATV320
product or component type	Variable speed drive
Product specific application	Complex machines
variant	Standard version
Format of the drive	Compact
mounting mode	Wall mount
Communication port protocol	Modbus serial CANopen
Option card	Communication module, CANopen Communication module, EtherCAT Communication module, Profibus DP V1 Communication module, PROFINET Communication module, Ethernet Powerlink Communication module, EtherNet/IP Communication module, DeviceNet
[Us] rated supply voltage	380500 V - 1510 %
Nominal output current	4.1 A
Motor power kW	1.5 kW for heavy duty
EMC filter	Class C2 EMC filter integrated
IP degree of protection	IP20

Complementary

Discrete input number	7
Discrete input type	STO safe torque off, 24 V DC, impedance: 1.5 kOhm DI1DI6 logic inputs, 24 V DC (30 V) DI5 programmable as pulse input: 030 kHz, 24 V DC (30 V)
Discrete input logic	Positive logic (source) Negative logic (sink)
Discrete output number	3
Discrete output type	Open collector DQ+ 01 kHz 30 V DC 100 mA Open collector DQ- 01 kHz 30 V DC 100 mA
Analogue input number	3
Analogue input type	Al1 voltage: 010 V DC, impedance: 30 kOhm, resolution 10 bits Al2 bipolar differential voltage: +/- 10 V DC, impedance: 30 kOhm, resolution 10 bits Al3 current: 020 mA (or 4-20 mA, x-20 mA, 20-x mA or other patterns by configuration), impedance: 250 Ohm, resolution 10 bits
Analogue output number	1

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Analogue output type Software-configurable current AQ1: 020 mA impedance 800 Ohm, resolution 10 bits Software-configurable voltage AQ1: 010 V DC impedance 470 Ohm, resolution 10 bits Software-configurable voltage AQ1: 010 V DC impedance 470 Ohm, resolution 10 bits Software-configurable voltage AQ1: 010 V DC impedance 470 Ohm, resolution 10 bits Software-configurable voltage AQ1: 010 V DC impedance 470 Ohm, resolution 10 bits Software-configurable voltage AQ1: 010 V DC impedance 470 Ohm, resolution 10 object Software-configurable voltage AQ1: 010 V DC impedance 470 Ohm, resolution 10 object Software-configurable relay logic R2C Maximum switching current Relay output R1A, R1B, R1C on resistive load, cos phi = 1.3 A at 30 V DC Relay output R1A, R1B, R1C on resistive load, cos phi = 1.3 A at 30 V DC Relay output R1A, R1B, R1C on resistive load, cos phi = 1.5 A at 30 V DC Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and LR = 7 mix. 2 At 30 V DC Relay output R1A, R1B, R1C, R2A, R2C on resistive load, cos phi = 1.5 A at 30 V DC Relay output R1A, R1B, R1C, R2A, R2C: 5 mA at 24 V DC Mothod of access Slave CANopen 4 quadrant operation possible True Voltage/frequency ratio, 5 points Flav vector control without sensor Transient overtorque 170200 % of nominal motor loque Moximum output frequency 4 (SS) S CUS		
Relay output type Configurable relay logic R1A 1 NO electrical durability 100000 cycles Configurable relay logic R1A 1 NO electrical durability 100000 cycles Configurable relay logic R1A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relay logic R2A 1 NO electrical durability 100000 cycles Configurable relation control code, comparing the part is 3 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Rela	Analogue output type	bits Software-configurable voltage AQ1: 010 V DC impedance 470 Ohm, resolution 10
Configurable relay logic R18 I NC electrical durability 100000 cycles Configurable relay logic R10 Configurable relay logic R10 Configurable relay logic R20 Conf	<u>-</u>	
Configurable relay logic RTA RTB, RTC on resistive load, cos phi = 1: 3 A at 250 V AC Relay output RTA, RTB, RTC, RTA, RTC, RTC, RZA, RZC on inductive load, cos phi = 0.4 and LTR = 7 miss. 2 At 250 V AC Relay output RTA, RTB, RTC, RZA, RZC on resistive load, cos phi = 1: 5 A at 250 V AC Relay output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC Relay output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC Relay output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC Relay output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC Relay output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC Relay output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC RELAY output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC RELAY output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC RELAY output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC RELAY output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC RELAY output RTA, RTB, RTC, RZA, RZC: 5 mA at 24 V DC RTM, RTM, RTM, RTM, RTM, RTM, RTM, RTM,	Relay output type	
Configurable relay logic RZC		
Relay output R1A, R1B, R1C, A2A, R2C on inductive load, cos phi = 1.3 A at 30 V DC Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and LIR = 7 ms: 2 A at 350 V AC Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and LIR = 7 ms: 2 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1.5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1.5 A at 30 V DC Relay output R1A, R1B, R1C, R2A, R2C; 5 mA at 24 V DC Minimum switching current Relay output R1A, R1B, R1C, R2A, R2C; 5 mA at 24 V DC Method of access Slave CANopen 4 quadrant operation possible True Asynchronous motor control Voltage/frequency ratio, 5 points Flux vector control without sensor, standard Voltage/frequency ratio, 2 points Flux vector control without sensor - Energy Saving, quadratic U/f Flux vector control without sensor - Energy Saving Voltage/frequency ratio, 2 points Synchronous motor control profile Vector control without sensor - Energy Saving Voltage/frequency ratio, 2 points Synchronous motor ocntrol profile Vector control without sensor Transient overtorque 170200 % of nominal motor torque Maximum output frequency 0.599 kHz Acceleration and deceleration Acceleration automatic stop with DC injection Acceleration adverted the load Adjustable 0300 % Not available in voltage/frequency ratio (2 or 5 points) Switching frequency 4 kHz Braking to standstill By DC injection Brake chopper integrated True Line current 6.4 A at 380 V (heavy duty) Maximum input current 6.4 A at 380 V (heavy duty) Maximum input current 6.4 A A at 380 V (heavy duty) Maximum input current 6.4 A Maximum output voltage Sou V Apparent power 4.2 kVA at 500 V (heavy duty) Notwork frequency 5060 Hz Relative symmetric network frequency lolerance Prospective line los 5 kA Base load current at high overload With safety function Safety True		
Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and L/R = 7 ms. 2 A at 25 V AC Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and L/R = 7 ms. 2 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1.5 A at 350 V AC Relay output R2A, R2C on resistive load, cos phi = 1.5 A at 350 V AC Relay output R2A, R2C on resistive load, cos phi = 1.5 A at 30 V DC Minimum switching current Relay output R1A, R1B, R1C, R2A, R2C: 5 mA at 24 V DC Method of access Slave CANopen Voltage/frequency ratio. 5 points Flux vector control profile Voltage/frequency ratio. 5 points Flux vector control without sensor, standard Voltage/frequency ratio. 5 points Flux vector control without sensor - Energy Saving Voltage/frequency ratio. 2 points Synchronous motor control profile Vector control without sensor - Energy Saving Voltage/frequency ratio. 5 points Synchronous motor control profile 170200 % of nominal motor torque Maximum output frequency 0.599 kHz Acceleration and deceleration Relay output R2A, R2C on resistive load Adjustable 0300 % Not available in voltage/frequency ratio (2 or 5 points) Switching frequency 216 kHz adjustable 416 kHz adjustable 416 kHz with derating factor Nominal switching frequency 4 kHz Braking to standatill By DC injection Brake chopper integrated True Line current 6.4 A at 380 V (heavy duty) 4.9 A at 500 V (heavy duty) Maximum input current 6.4 A Maximum output voltage 500 V Apparent power 4.2 kVA at 500 V (heavy duty) Network frequency 5060 Hz Relative symmetric network frequency tolerance 5 kA Base load current at high overload With safety function Safety True With safety function Safety True	Maximum switching current	Relay output R1A, R1B, R1C on resistive load, cos phi = 1: 3 A at 250 V AC
Relay output R1A. R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and L/R = 7 ms; 2 A at 3 0 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Minimum switching current Relay output R1A, R1B, R1C, R2A, R2C: 5 mA at 24 V DC Method of access Slave CANopen 4 quadrant operation possible True Asynchronous motor control profile Voltageffrequency ratio. 5 points Flux vector control without sensor, standard voltagefrequency ratio. Energy Saving, quadratic Uff Flux vector control without sensor Voltageffrequency ratio. 2 points Synchronous motor control profile 7 you without sensor Vector control without sensor Vector sensor V		Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and L/R = 7
Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 30 V DC Minimum switching current Relay output R1A, R1B, R1C, R2A, R2C: 5 mA at 24 V DC Method of access Slave CANopen 4 quadrant operation possible True Asynchronous motor control profile Voltagefrequency ratio, 5 points Flux vector control without sensor, standard Voltagefrequency ratio - Energy Saving, quadratic Urf Flux vector control without sensor - Energy Saving Voltagefrequency ratio, 2 points Synchronous motor control profile Vector control without sensor Transient overtorque 170200 % of nominal motor torque Maximum output frequency 0.599 kHz Acceleration and deceleration ramps Linear U S CUS Ramp switching Acceleration automatic stop with DC injection Motor slip compensation Automatic whatever the load Adjustable of SAVIN Acceleration automatic stop with DC injection Motor slip compensation Automatic whatever the load Adjustable of SAVIN Acceleration automatic stop with DC injection Motor slip compensation Motor slip compensation Automatic whatever the load Adjustable of SAVIN Acceleration automatic stop with DC injection Motor slip compensation Automatic whatever the load Adjustable of SAVIN Acceleration automatic stop with DC injection Motor slip compensation Automatic whatever the load Adjustable of SAVIN Acceleration automatic stop with DC injection Motor slip compensation Automatic whatever the load Adjustable of SHz with derating factor Nominal switching frequency 4 kHz Braking to standstill By DC injection Brake chopper integrated True 6.4 A at 380 V (heavy duty) 4.9 A at 500 V (heavy duty) Maximum input current 6.4 A Maximum output voltage 500 V Apparent power 4.2 kVA at 500 V (heavy duty) Network frequency 5060 Hz Rolative symmetric network frequency loterance Prospective line isc 5 kA Base load current at high overload With safety function Safety True		Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and L/R = 7
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Transient overtorque 170200 % of nominal motor torque Maximum output frequency 0.599 kHz Acceleration and deceleration ramps U U S CUS Ramp switching Acceleration/deceleration automatic stop with DC injection Motor slip compensation Automatic whatever the load Adjustable 0300 % Not available in voltage/frequency ratio (2 or 5 points) Switching frequency 216 kHz adjustable 416 kHz with derating factor Nominal switching frequency 4 kHz Braking to standstill By DC injection Brake chopper integrated True Line current 6.4 A at 380 V (heavy duty) 4.9 A at 500 V (heavy duty) 4.9 A at 500 V (heavy duty) Maximum input current 6.4 A Maximum output voltage 500 V Apparent power 4.2 kVA at 500 V (heavy duty) Network frequency 5060 Hz Relative symmetric network frequency 5 kA Base load current at high overload Power dissipation in W Fan: 56.0 W at 380 V, switching frequency 4 kHz With safety function Safely True		Voltage/frequency ratio, 2 points
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Acceleration and deceleration and second and	Transient overtorque	170200 % of nominal motor torque
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Line current 6.4 A at 380 V (heavy duty) 4.9 A at 500 V (heavy duty) Maximum input current 6.4 A Maximum output voltage 500 V Apparent power 4.2 kVA at 500 V (heavy duty) Network frequency 5060 Hz Relative symmetric network frequency tolerance Prospective line lsc 5 kA Base load current at high overload Power dissipation in W Fan: 56.0 W at 380 V, switching frequency 4 kHz With safety function Safely True	Braking to standstill	By DC injection
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Apparent power 4.2 kVA at 500 V (heavy duty) Network frequency 5060 Hz Relative symmetric network frequency tolerance Prospective line Isc 5 kA Base load current at high overload Power dissipation in W Fan: 56.0 W at 380 V, switching frequency 4 kHz With safety function Safely True	Maximum input current	6.4 A
Network frequency 5060 Hz Relative symmetric network frequency tolerance 5 % Prospective line Isc 5 kA Base load current at high overload 7.0 A Power dissipation in W Fan: 56.0 W at 380 V, switching frequency 4 kHz With safety function Safely True	Maximum output voltage	500 V
Relative symmetric network frequency tolerance Prospective line lsc 5 kA Base load current at high overload Power dissipation in W Fan: 56.0 W at 380 V, switching frequency 4 kHz With safety function Safely True	Apparent power	4.2 kVA at 500 V (heavy duty)
frequency tolerance Prospective line Isc 5 kA Base load current at high overload Power dissipation in W Fan: 56.0 W at 380 V, switching frequency 4 kHz With safety function Safely True	Network frequency	5060 Hz
Base load current at high overload Power dissipation in W Fan: 56.0 W at 380 V, switching frequency 4 kHz With safety function Safely True		5 %
overload Power dissipation in W Fan: 56.0 W at 380 V, switching frequency 4 kHz With safety function Safely True	Prospective line Isc	5 kA
With safety function Safely True		3.0 A
	Power dissipation in W	Fan: 56.0 W at 380 V, switching frequency 4 kHz
		True

With safety function Safe brake management (SBC/SBT)	False
With safety function Safe Operating Stop (SOS)	False
With safety function Safe Position (SP)	False
With safety function Safe programmable logic	False
With safety function Safe Speed Monitor (SSM)	False
With safety function Safe Stop 1 (SS1)	True
With sft fct Safe Stop 2 (SS2)	False
With safety function Safe torque off (STO)	True
With safety function Safely Limited Position (SLP)	False
With safety function Safe Direction (SDI)	False
Protection type	Input phase breaks: drive Overcurrent between output phases and earth: drive Overheating protection: drive Short-circuit between motor phases: drive Thermal protection: drive
Width	105.0 mm
Height	142.0 mm
Depth	158.0 mm
net weight	1.3 kg

Environment

Operating position	Vertical +/- 10 degree
Product certifications	CE ATEX NOM GOST EAC RCM KC
marking	CE ATEX UL CSA EAC RCM
Standards	IEC 61800-5-1
Electromagnetic compatibility	Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2 Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3 Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4 1.2/50 µs - 8/20 µs surge immunity test level 3 conforming to IEC 61000-4-5 Conducted radio-frequency immunity test level 3 conforming to IEC 61000-4-6 Voltage dips and interruptions immunity test conforming to IEC 61000-4-11
Environmental class (during operation)	Class 3C3 according to IEC 60721-3-3 Class 3S2 according to IEC 60721-3-3
Maximum acceleration under shock impact (during operation)	150 m/s² at 11 ms
Maximum acceleration under vibrational stress (during operation)	10 m/s² at 13200 Hz
Maximum deflection under vibratory load (during operation)	1.5 mm at 213 Hz
Permitted relative humidity (during operation)	Class 3K5 according to EN 60721-3

Volume of cooling air	18.0 m3/h
Overvoltage category	III
Regulation loop	Adjustable PID regulator
Speed accuracy	+/- 10 % of nominal slip 0.2 Tn to Tn
Pollution degree	2
Ambient air transport temperature	-2570 °C
Ambient air temperature for operation	-1050 °C without derating 5060 °C with derating factor
Ambient air temperature for storage	-2570 °C

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	18.000 cm
Package 1 Width	18.500 cm
Package 1 Length	18.700 cm
Package 1 Weight	1.710 kg
Unit Type of Package 2	P06
Number of Units in Package 2	30
Package 2 Height	75.000 cm
Package 2 Width	60.000 cm
Package 2 Length	80.000 cm
Package 2 Weight	64.360 kg



Green PremiumTM **label** is Schneider Electric's commitment to delivering products with best-inclass environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO₂ products.

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

Learn more about Green Premium >

Guide to assess a product's sustainability >





Transparency RoHS/REACh

Resource performance



Upgraded Components Available

Well-being performance



Mercury Free



Rohs Exemption Information

Yes

Certifications & Standards

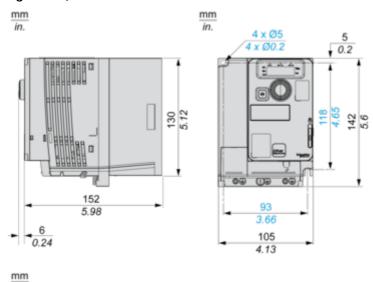
Reach Regulation	REACh Declaration
Eu Rohs Directive	Pro-active compliance (Product out of EU RoHS legal scope)
China Rohs Regulation	China RoHS declaration
Environmental Disclosure	Product Environmental Profile
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins
Circularity Profile	End of Life Information

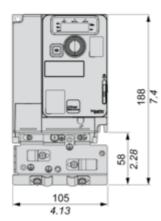
Dimensions Drawings

Dimensions

in.

Right View, Front View and Front View with EMC Plate

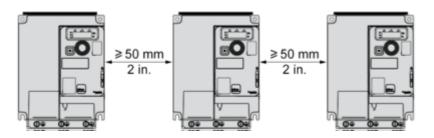




Mounting and Clearance

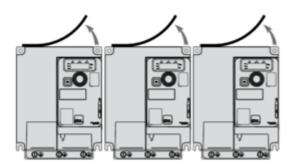
Mounting Types

Mounting Type A: Individual with Ventilation Cover

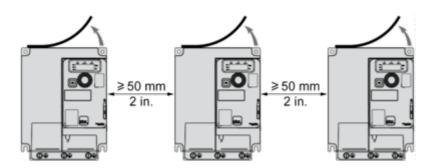


Only Possible at Ambient Temperature Less or Equal to 50 °C (122 °F)

Mounting Type B: Side by Side, Ventilation Cover Removed



Mounting Type C: Individual, Ventilation Cover Removed



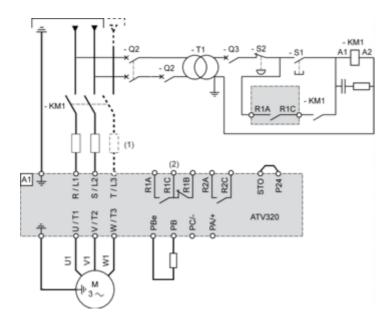
For Operation at Ambient Temperature Above 50 °C (122 °F)

Connections and Schema

Connection Diagrams

Diagram with Line Contactor

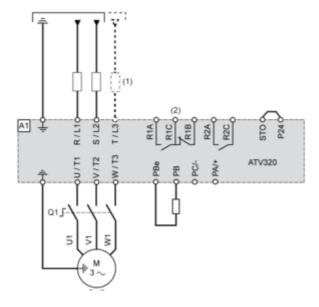
Connection diagrams conforming to standards ISO13849 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1.



- (1) Line choke (if used)
- (2) Fault relay contacts, for remote signaling of drive status

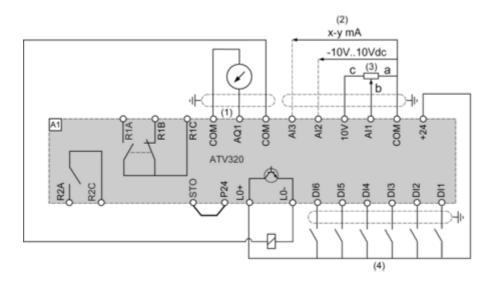
Diagram with Switch Disconnect

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) Fault relay contacts, for remote signaling of drive status

Control Connection Diagram in Source Mode



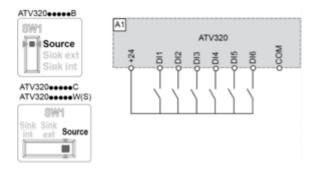
- (1) Analog output
- (2) Analog inputs
- (3) Reference potentiometer (10 kOhm maxi)
- (4) Digital inputs

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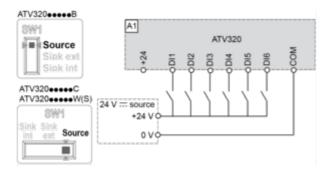
Digital Inputs Wiring

The logic input switch (SW1) is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs.

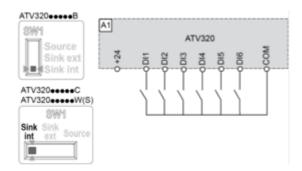
Switch SW1 set to "Source" position and use of the output power supply for the DIs.



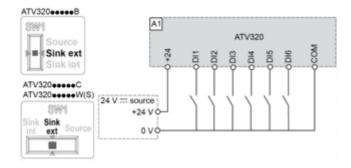
Switch SW1 set to "Source" position and use of an external power supply for the DIs.



Switch SW1 set to "Sink Int" position and use of the output power supply for the DIs.



Switch SW1 set to "Sink Ext" position and use of an external power supply for the Dls.

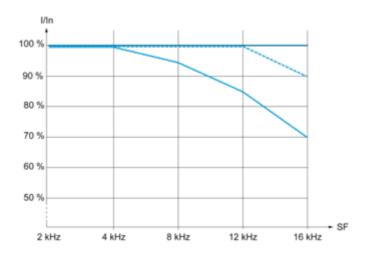


Product datasheet

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Performance Curves

Derating Curves



40 °C (104 °F) - Mounting type A, B and C 50 °C (122 °F) - Mounting type A, B and C 60 °C (140 °F) - Mounting type B and C

In: Nominal Drive Current SF: Switching Frequency