Specifications





Variable speed drive, Altivar Solar, 2.2kW, 200 to 240V, 1 phase, compact

ATV320U22M2C412

Main

Range of product	Altivar Solar
Product or component type	Variable speed drive
Product specific application	Pumping applications
Variant	Standard version
Format of the drive	Compact
mounting mode	Wall mount
Communication port protocol	Modbus serial CANopen
Option card	Communication module, Ethernet IP/Modbus TCP
[Us] rated supply voltage	200240 V - 1510 %
Nominal output current	11.0 A
Motor power kW	2.2 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
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
Relay output number	2

15-Sept-2024 Life Is On Schneider

Relay output type Configurable relay logic R14 1 No electrical durability 100000 cycles Configurable relay logic R16 Configurable relay logic R16 Configurable relay logic R16 Configurable relay logic R16 Configurable relay logic R20 Configurable relay logic R20 Configurable relay logic R20 Configurable relay logic R20 Relay output R1A, R18, R10 or electrical durability 100000 cycles Configurable relay logic R20 Relay output R1A, R18, R10, Cn or resistive load, cos phi = 1: 3 A at 250 V AC Relay output R1A, R18, R10, R16, R2A, R20 on inductive load, cos phi = 1: 3 A at 250 V AC Relay output R1A, R18, R10, R16, R2A, R20 on inductive load, cos phi = 1: 3 A at 250 V AC Relay output R1A, R18, R10, R16, R2A, R20 on inductive load, cos phi = 1: 5 A at 250 V AC Relay output R1A, R18, R16, R16, R16, R2A, R20 on inductive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 30 V DC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V Relay output R2A, R20 on resistive load, cos phi = 1: 5 A at 250 V Relay outpu		
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 con 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 mis: 2 A at 250 V AC Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and L/R = 7 mis: 2 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC R2A on relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC R2A on R2A o	Relay output type	Configurable relay logic R1B 1 NC electrical durability 100000 cycles Configurable relay logic R1C Configurable relay logic R2A 1 NO electrical durability 100000 cycles
Relay output R1A R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and LIR = 7 mis: 2 A at 250 V AC Relay output R1A, R1B, R1C, R2A, R2C on inductive load, cos phi = 0.4 and LIR = 7 mis: 2 A at 30 V DC Relay output R1A, R1B, R1C, R2A, R2C on resistive load, cos phi = 1.5 A at 250 V AC 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 Monthly and relative rela	Maximum switching current	Relay output R1A, R1B, R1C on resistive load, cos phi = 1: 3 A at 250 V AC
ms: 2 A at 30 V DC Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 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 Number of addresses 1247 1127 Data format 8 bits, configurable odd, even or no parity Type of polarization No impedance 1 rue Asynchronous motor control Voltage/frequency ratio, 5 points Fix vector control without sensor, standard Voltage/frequency ratio, 2 points Fix vector control without sensor - Energy Saving Voltage/frequency ratio, 2 points Fix 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 control profile Vector control without sensor Transient overtorque 170200 % of nominal motor torque Maximum output frequency 0,599 kHz Acceleration and deceleration Linear Uses CUS Ramp switching Acceleration automatic stop with DC injection Acceleration/deceleration automatic stop with DC injection Acceleration		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 250 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 Slave CANopen 1247 1127 Data format 8 bits, configurable odd, even or no parity Type of polarization No impedance 4 quadrant operation possible True Asynchronous motor control rordie 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, 12 points Synchronous motor control profile Vector control without sensor - Energy Saving Voltage/frequency ratio, 5 points Flux vector control without sensor Fransient overtorque 170200 % of nominal motor torque Maximum output frequency 0.599 kHz Acceleration and deceleration Ramps witching Acceleration automatic stop with DC injection Automatic adaptation of ramp if braking capacity exceeded, by using resistor Linear adjustable separately from 0.01 to 6000 s Motor slip compensation Automatic whatever the load Adjustable in voltage/frequency ratio (2 or 5 points) Switching frequency 4 kHz Braking to standstill By DC injection Brake chopper integrated True Line current 24.0 A at 200 V (heavy duty) 20.2 A at 240 V (heavy duty) 4 Apparent power 4.8 kVA at 240 V (heavy duty) Maximum input current 4.8 kVA at 240 V (heavy duty) Maximum transient current 4.8 kVA at 240 V (heavy duty) Maximum transient current 4.8 kVA at 240 V (heavy duty) Maximum transient current 5. Short-circuit protection		
Method of access Slave CANopen 1247 1127 Data format 8 bits, configurable odd, even or no parity Type of polarization No impedance 4 quadrant operation possible True Asynchronous motor control profile Synchronous motor control profile Transient overtorque 170200 % of nominal motor torque Maximum output frequency Linear U S S CUS Ramp switching Acceleration and deceleration Acceleration Adaptation of ramp adaptation Acceleration/deceleration adaptation of ramp adaptation Acceleration/deceleration adaptation of ramp if braking capacity exceeded, by using resistor Linear adjustable separately from 0.01 to 6000 s Motor slip compensation Automatic valatever 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 True Linear current 24.0 A at 200 V (heavy duty) 20.2 A at 240 V (heavy duty) Maximum output voltage 4.8 kVA at 240 V (heavy duty) Maximum input current 4.8 kVA at 240 V (heavy duty) Maximum transient current 16.5 A during 60 s Hermal protection		Relay output R2A, R2C on resistive load, cos phi = 1: 5 A at 250 V AC
Number of addresses 1247 1127 Data format 8 bits, configurable odd, even or no parity Type of polarization No impedance 4 quadrant operation possible True Asynchronous motor control profile Asynchronous motor control profile Synchronous motor control profile True Voltage/frequency ratio, 5 points Flux vector control without sensor, standard Voltage/frequency ratio, 6 points Flux vector control without sensor - Energy Saving, quadratic U/f Flux vector control without sensor Vector control without sensor Transient overtorque 170200 % of nominal motor torque Maximum output frequency 0.599 kHz Acceleration and deceleration Acceleration and deceleration Acceleration and poly the part of the	Minimum switching current	Relay output R1A, R1B, R1C, R2A, R2C: 5 mA at 24 V DC
Data format 8 bits, configurable odd, even or no parity Type of polarization No impedance 4 quadrant operation possible True Asynchronous motor control profile Asynchronous motor control profile Synchronous motor control profile Voltage/frequency ratio, 5 points Flux vector control without sensor, standard Voltage/frequency ratio, 2 points Flux vector control without sensor standard Voltage/frequency 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 Linear U S CUS Ramp switching Acceleration automatic stop with DC injection Automatic adaptation of ramp if braking capacity exceeded, by using resistor Linear adjustable separately from 0.01 to 6000 s Motor slip compensation Automatic whatever the load Adjustable in voltage/frequency ratio (2 or 5 points) Switching frequency 216 kHz adjustable 416 kHz adjustable 416 kHz adjustable 416 kHz adjustable By DC injection Brake chopper integrated True 24.0 A at 200 V (heavy duty) Maximum input current 24.0 A Apparent power 4.8 kVA at 240 V (heavy duty) Maximum transient current 16.5 A during 60 s Short-circuit protection thermal protection	Method of access	Slave CANopen
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Acceleration and deceleration Tramps Linear U S CUS Ramp switching Acceleration/deceleration ramp adaptation Acceleration/deceleration automatic stop with DC injection Automatic adaptation of ramp if braking capacity exceeded, by using resistor Linear adjustable separately from 0.01 to 6000 s 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 24.0 A at 200 V (heavy duty) 20.2 A at 240 V (heavy duty) 20.2 A at 240 V (heavy duty) Maximum input current 24.0 A Maximum output voltage 4.8 kVA at 240 V (heavy duty) Maximum transient current 16.5 A during 60 s Short-circuit protection	Transient overtorque	170200 % of nominal motor torque
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Maximum output voltage 240 V Apparent power 4.8 kVA at 240 V (heavy duty) Maximum transient current 16.5 A during 60 s Short-circuit protection thermal protection	Line current	
Apparent power 4.8 kVA at 240 V (heavy duty) Maximum transient current 16.5 A during 60 s Short-circuit protection thermal protection	Maximum input current	24.0 A
Maximum transient current 16.5 A during 60 s Short-circuit protection thermal protection	Maximum output voltage	240 V
Short-circuit protection thermal protection	Apparent power	4.8 kVA at 240 V (heavy duty)
<u>'</u>	Maximum transient current	16.5 A during 60 s
Network frequency 5060 Hz	Short-circuit protection	thermal protection
	Network frequency	5060 Hz
Relative symmetric network 5 % frequency tolerance		5 %

Prospective line Isc	1 kA
Base load current at high overload	17.0 A
Power dissipation in W	Fan: 99.0 W at 200 V, switching frequency 4 kHz
Electrical connection	Screw terminal, clamping capacity: 0.51.5 mm² for analog input Screw terminal for analog output Screw terminal
With safety function Safely Limited Speed (SLS)	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	1.6 kg
Power factor	0.616 at 230 V
Braking torque	170 % with braking resistor
Local signalling	1 LED (red) for drive fault 1 LED (red) for CANopen error 1 LED (green) for CANopen run

Environment

Operating altitude	10002000 m with current derating 1 % per 100 m <= 1000 m without derating	
Operating position	Vertical +/- 10 degree	
product certifications	CE UR UKCA RCM	
marking	CE UR UKCA RCM	
Standards	IEC 61800-5-1	
Assembly style	With heat sink	

Electromagnetic compatibility	Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2
Liectromagnetic compatibility	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	Class 3C3 according to IEC 60721-3-3
operation)	Class 3S2 according to IEC 60721-3-3
Maximum acceleration under	150 m/s² at 11 ms
shock impact (during operation)	
Maximum acceleration under vibrational stress (during	10 m/s² at 13200 Hz
operation)	
Maximum deflection under	1.5 mm at 213 Hz
vibratory load (during operation)	
Permitted relative humidity	Class 3K5 according to EN 60721-3
(during operation)	
Volume of cooling air	16.0 m3/h
Overvoltage category	II
Regulation loop	Adjustable PID regulator
Speed accuracy	+/- 10 % of nominal slip 0.2 Tn to Tn
Noise level	48 dB
Pollution degree	2
Ambient air transport temperature	-2570 °C
Ambient air temperature for	40 F0 90 William Advantion
operation	-1050 °C without derating 5060 °C with derating factor
	3000 G with detailing factor
Ambient air temperature for storage	-2570 °C
Packing Units	
Unit Type of Package 1	PCE

•	
Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	18 cm
Package 1 Width	18.5 cm
Package 1 Length	18.5 cm
Package 1 Weight	1.899 kg
Unit Type of Package 2	S06
Number of Units in Package 2	30
Package 2 Height	75 cm
Package 2 Width	60 cm
Package 2 Length	80 cm
Package 2 Weight	69.97 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



Rohs Exemption Information

Yes

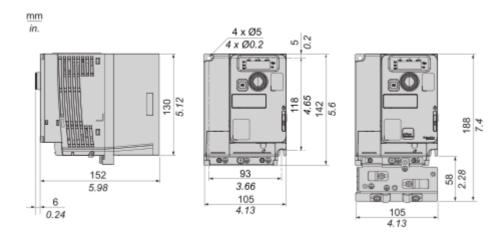
Certifications & Standards

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

ATV320U22M2C412

Dimensions Drawings

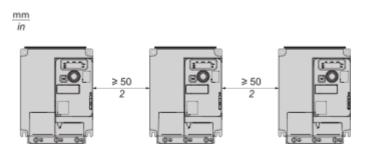
Dimensions



Mounting and Clearance

Mounting Types

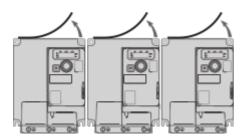
Individual with Ventilation Cover



Free space ≥ 50 mm (2 in.) on each side, with vent cover fitted.

Mounting type A is suitable for drive operation at surrounding air temperature less or equal to 50 °C (122 °F)

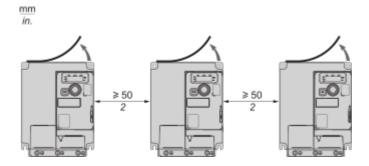
Side by Side, Ventilation Cover Removed



Drives mounted side-by-side, vent cover should be removed. The degree of protection becomes IP20.

Individual, Ventilation Cover Removed

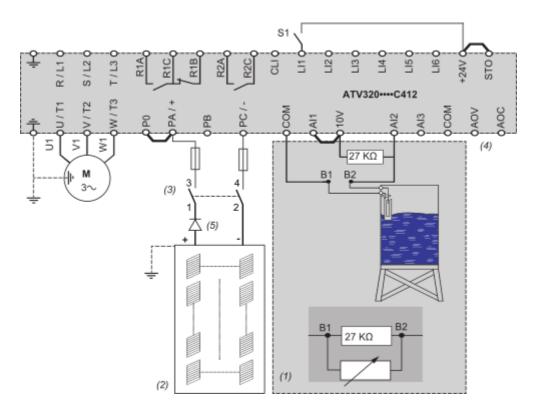
15-Sept-2024



Free space ≥ 50 mm (2 in.) on each side. Vent cover should be removed for operation at surrounding air temperature above 50 °C (122 °F). The degree of protection becomes IP20.

Connections and Schema

Wiring



- (1) Tank water / liquid probe is optional.
- (2) The photovoltaic modules used shall comply with UL 1703. The solar panels and the drive input shall be in compliance with NEC article 690. For the photovoltaic installation ground connection, safety instructions and orientation, refer to the photovoltaic panel user manual.
- (3) Protection according to the concerned voltage, current and according to the photovoltaic arrays manual.
- (4) For AOC or AOV diagnostic values on ATV320 Solar drive.
- (5) On some applications, a blocking diode is mandatory.

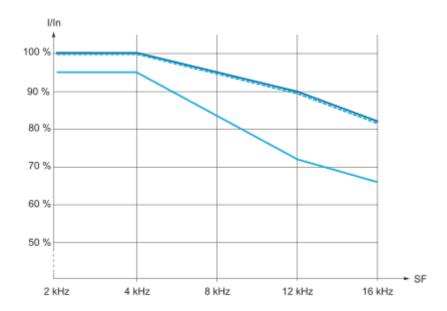
NOTE: Check that the Logic Input switch is on Source position:



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Performance Curves

Derating Curves



40 °C (104 °F) - Mounting type A, B and C

60 °C (140 °F) - Mounting type C

In: Nominal Drive Current SF: Switching Frequency

Image of product / Alternate images

Alternative

