

# Product data sheet

Specifications



variable speed drive, Altivar Process  
ATV600, ATV650, 5.5kW,  
400...480V, IP55

ATV650U55N4EU

## Main

Range Of Product	Altivar Process ATV600
Product Or Component Type	Variable speed drive
Product Specific Application	Process and utilities
Device Short Name	ATV650
Variant	With disconnect switch
Product Destination	Asynchronous motors Synchronous motors
Emc Filter	Integrated with 50 m conforming to IEC 61800-3 category C2 Integrated with 150 m conforming to IEC 61800-3 category C3
Ip Degree Of Protection	IP55 conforming to IEC 60529 IP55 conforming to IEC 61800-5-1
[Us] Rated Supply Voltage	380...480 V
Degree Of Protection	UL type 12 conforming to UL 508C
Type Of Cooling	Forced convection
Supply Frequency	50...60 Hz - 5...5 %
[Us] Rated Supply Voltage	380...480 V - 15...10 %
Motor Power Kw	4 kW (heavy duty) 5.5 kW (normal duty)
Motor Power Hp	5 hp heavy duty 7.5 hp normal duty
Line Current	9.1 A at 480 V (normal duty) 8 A at 380 V (heavy duty) 7.2 A at 480 V (heavy duty) 10.4 A at 380 V (normal duty)
Prospective Line Isc	50 kA
Apparent Power	6 kVA at 480 V (heavy duty) 7.6 kVA at 480 V (normal duty)
Continuous Output Current	9.3 A at 4 kHz for heavy duty 12.7 A at 4 kHz for normal duty
Asynchronous Motor Control Profile	Variable torque standard Constant torque standard Variable torque standard
Synchronous Motor Control Profile	Synchronous reluctance motor Permanent magnet motor
Speed Drive Output Frequency	0.1...500 Hz
Nominal Switching Frequency	4 kHz
Switching Frequency	4...12 kHz with derating factor 2...12 kHz adjustable

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Safety Function	STO (safe torque off) SIL 3
Discrete Input Logic	16 preset speeds
Communication Port Protocol	Ethernet Modbus TCP Ethernet
Option Card	Slot A: communication module, PROFINET Slot A: communication module, DeviceNet Slot A: communication module, Modbus TCP/EtherNet/IP Slot A: communication module, CANopen daisy chain RJ45 Slot A: communication module, CANopen SUB-D 9 Slot A: communication module, CANopen screw terminals Slot A/slot B: digital and analog I/O extension module Slot A/slot B: output relay extension module Slot A: communication module, Ethernet IP/Modbus TCP/MD-Link Communication module, BACnet MS/TP Communication module, Ethernet Powerlink Slot A: communication module, Profibus DP V1

## Complementary

Mounting Mode	Wall mount
Maximum Transient Current	14 A during 60 s (heavy duty) 14 A during 60 s (normal duty)
Network Number Of Phases	3 phases
Discrete Output Number	0
Discrete Output Type	Relay outputs R1A, R1B, R1C 250 V AC 3000 mA Relay outputs R1A, R1B, R1C 30 V DC 3000 mA Relay outputs R2A, R2C 250 V AC 5000 mA Relay outputs R2A, R2C 30 V DC 5000 mA Relay outputs R3A, R3C 250 V AC 5000 mA Relay outputs R3A, R3C 30 V DC 5000 mA
Output Voltage	<= power supply voltage
Permissible Temporary Current Boost	1.5 x I <sub>n</sub> during 60 s (heavy duty) 1.1 x I <sub>n</sub> during 60 s (normal duty)
Motor Slip Compensation	Can be suppressed Adjustable Not available in permanent magnet motor law Automatic whatever the load
Acceleration And Deceleration Ramps	Linear adjustable separately from 0.01...9999 s
Physical Interface	Ethernet 2-wire RS 485
Braking To Standstill	By DC injection
Protection Type	Safe torque off: motor Motor phase break: motor Thermal protection: drive Safe torque off: drive Overheating: drive Overcurrent between output phases and earth: drive Overload of output voltage: drive Short-circuit protection: drive Motor phase break: drive Overvoltages on the DC bus: drive Line supply overvoltage: drive Line supply undervoltage: drive Line supply phase loss: drive Overspeed: drive Break on the control circuit: drive Thermal protection: motor
Transmission Rate	10, 100 Mbits 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps
Frequency Resolution	Analog input: 0.012/50 Hz Display unit: 0.1 Hz

<b>Transmission Frame</b>	RTU
<b>Electrical Connection</b>	Line side: screw terminal 4...6 mm <sup>2</sup> Motor: screw terminal 4...6 mm <sup>2</sup> Control: removable screw terminals 0.5...1.5 mm <sup>2</sup>
<b>Connector Type</b>	RJ45 (on the remote graphic terminal) for Modbus serial RJ45 (on the remote graphic terminal) for Ethernet/Modbus TCP
<b>Data Format</b>	8 bits, configurable odd, even or no parity
<b>Type Of Polarization</b>	No impedance
<b>Exchange Mode</b>	Half duplex, full duplex, autonegotiation Ethernet/Modbus TCP
<b>Number Of Addresses</b>	1...247 for Modbus serial
<b>Method Of Access</b>	Slave Modbus TCP
<b>Supply</b>	Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V DC +/- 5 %, <10 mA, protection type: overload and short-circuit protection Internal supply for digital inputs and STO: 24 V DC (21...27 V), <200 mA, protection type: overload and short-circuit protection External supply for digital inputs: 24 V DC (19...30 V), <1.25 mA, protection type: overload and short-circuit protection
<b>Local Signalling</b>	3 LEDs (dual colour) for embedded communication status 4 LEDs (dual colour) for communication module status 1 LED (red) for presence of voltage 3 LEDs for local diagnostic
<b>Width</b>	264 mm
<b>Height</b>	678 mm
<b>Depth</b>	300 mm
<b>Net Weight</b>	10.7 kg
<b>Analogue Input Number</b>	3
<b>Analogue Input Type</b>	AI1, AI2, AI3 software-configurable voltage: 0...10 V DC, impedance: 31.5 kOhm, resolution 12 bits AI1, AI2, AI3 software-configurable current: 0...20 mA, impedance: 250 Ohm, resolution 12 bits AI2 voltage analog input: - 10...10 V DC, impedance: 31.5 kOhm, resolution 12 bits
<b>Discrete Input Number</b>	8
<b>Discrete Input Type</b>	DI7, DI8 programmable as pulse input: 0...30 kHz, 24 V DC (<= 30 V)
<b>Input Compatibility</b>	DI5, DI6: discrete input level 1 PLC conforming to IEC 65A-68 STOA, STOB: discrete input level 1 PLC conforming to IEC 61131-2 DI1...DI6: discrete input level 1 PLC conforming to IEC 61131-2
<b>Discrete Input Logic</b>	Positive logic (source) (DI1...DI8), < 5 V (state 0), > 11 V (state 1) Negative logic (sink) (DI1...DI8), > 16 V (state 0), < 10 V (state 1)
<b>Analogue Output Number</b>	2
<b>Analogue Output Type</b>	Software-configurable voltage AQ1, AQ2: 0...10 V DC impedance 470 Ohm, resolution 10 bits Software-configurable current AQ1, AQ2: 0...20 mA, resolution 10 bits Software-configurable current DQ-, DQ+: 30 V DC Software-configurable current DQ-, DQ+: 100 mA
<b>Sampling Duration</b>	5 ms +/- 1 ms (DI5, DI6) - discrete input 5 ms +/- 0.1 ms (AI1, AI2, AI3) - analog input 10 ms +/- 1 ms (AO1) - analog output 2 ms +/- 0.5 ms (DI1...DI4) - discrete input
<b>Accuracy</b>	+/- 1 % AO1, AO2 for a temperature variation 60 °C analog output +/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input
<b>Linearity Error</b>	AO1, AO2: +/- 0.2 % for analog output AI1, AI2, AI3: +/- 0.15 % of maximum value for analog input
<b>Relay Output Number</b>	3

Relay Output Type	Configurable relay logic R2: sequence relay NO electrical durability 100000 cycles Configurable relay logic R3: sequence relay NO electrical durability 100000 cycles Configurable relay logic R1: fault relay NO/NC 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 30 V DC Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 250 V AC Relay output R1, R2, R3 on inductive load, cos phi = 0.4 and L/R = 7 ms: 2 A at 30 V DC Relay output R1, R2, R3 on resistive load, cos phi = 1: 3 A at 250 V AC
Isolation	Between power and control terminals
Maximum Output Frequency	500 kHz
Maximum Input Current	10.4 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 conforming to 86/188/EEC
Operating Position	Vertical +/- 10 degree
Maximum Thdi	<48 % full load conforming to IEC 61000-3-12
Electromagnetic 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 Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2
Pollution Degree	2 conforming to IEC 61800-5-1
Vibration Resistance	1 gn (f= 13...200 Hz) conforming to IEC 60068-2-6 1.5 mm peak to peak (f= 2...13 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	40...50 °C (with derating factor) -15...40 °C (without derating)
Ambient Air Temperature For Storage	-40...70 °C
Operating Altitude	1000...4800 m with current derating 1 % per 100 m <= 1000 m without derating
Product Certifications	ATEX INERIS ATEX zone 2/22 UL DNV-GL CSA TÜV ABS
Marking	CE
Standards	IEC 61800-3 environment 1 category C2 EN/IEC 61800-3 environment 2 category C3 IEC 61800-5-1 IEC 61000-3-12 IEC 60721-3 IEC 61508 IEC 13849-1 IEC 61800-3

Overvoltage Category	III
Regulation Loop	Adjustable PID regulator
Noise Level	52 dB
Pollution Degree	3

## Packing Units

Unit Type Of Package 1	PCE
Number Of Units In Package 1	1
Package 1 Height	54.0 cm
Package 1 Width	39.2 cm
Package 1 Length	80.0 cm
Package 1 Weight	21.0 kg

## Sustainability

**Green Premium™ label** is Schneider Electric’s commitment to delivering products with best-in-class environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO<sub>2</sub> 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	<a href="#">REACH Declaration</a>
Eu Rohs Directive	Pro-active compliance (Product out of EU RoHS legal scope)
China Rohs Regulation	<a href="#">China RoHS declaration</a>
Environmental Disclosure	<a href="#">Product Environmental Profile</a>
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins
Circularity Profile	<a href="#">End of Life Information</a>
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>