Product data sheet

Specifications



variable speed drive, Altivar Process ATV600, ATV650, 45kW, 400...480V, IP55

ATV650D45N4U

Product availability: Non-Stock - Not normally stocked in distribution facility

Main

Range of Product	Altivar Process ATV600
Product Specific Application	Process and utilities
Product or Component Type	Variable speed drive
Variant	Standard version
Device short name	ATV650
Mounting Mode	Wall mount
Communication Port Protocol	Modbus TCP Modbus serial Ethernet
[Us] rated supply voltage	380...480 V - 15...10 %
[Us] rated supply voltage	380...480 V
Relative symmetric mains voltage tolerance	10 %
Relative symmetric network frequency tolerance	5 %
Nominal output current	88.0 A
IP degree of protection	IP55
Product destination	Asynchronous motors Synchronous motors
EMC filter	Integrated 164.04 ft (50 m) IEC 61800-3 category C2 Integrated 492.1 ft (150 m) IEC 61800-3 category C3
IP degree of protection	IP55IEC 60529 IP55IEC 61800-5-1
Degree of protection	UL type 12 UL 508C
Type of cooling	Forced convection
Supply frequency	50...60 Hz - 5...5 %
Motor power kW	37 kW heavy duty) 45 kW normal duty)
Maximum Horse Power Rating	50 hp heavy duty 60 hp normal duty
Line current	69.1 A 480 V normal duty) 67.1 A 380 V heavy duty) 59 A 480 V heavy duty) 79.8 A 380 V normal duty)
Continuous output current	72 A 4 kHz heavy duty 87 A 4 kHz normal duty
Speed drive output frequency	0.1…500 Hz
Safety function	STO (safe torque off) SIL 3

Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.

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

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

Discrete input number	8
Discrete input type	DI7, DI8 programmable as pulse input 0…30 kHz, 24 V DC <= 30 V)
Discrete input logic	16 preset speeds
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
Analogue input number	3
Analogue input type	AI1, AI2, AI3 software-configurable voltage 0...10 V DC 31.5 kOhm 12 bits AI1, AI2, AI3 software-configurable current 0...20 mA 250 Ohm 12 bits AI2 voltage analog input - 10...10 V DC 31.5 kOhm 12 bits
Analogue output number	2
Analogue output type	Software-configurable voltage AQ1, AQ2 0...10 V DC 470 Ohm 10 bits Software-configurable current AQ1, AQ2 0...20 mA 10 bits Software-configurable current DQ-, DQ+ 30 V DC Software-configurable current DQ-, DQ+ 100 mA
Relay output number	3
Relay output type	Configurable relay logic R2 sequence relay NO 100000 cycles Configurable relay logic R3 sequence relay NO 100000 cycles Configurable relay logic R1 fault relay NO/NC 100000 cycles
Maximum switching current	Relay output R1, R2, R3 resistive, cos phi = 1 3 A 30 V DC Relay output R1, R2, R3 inductive, cos phi = 0.4 7 ms 2 A 250 V AC Relay output R1, R2, R3 inductive, cos phi = 0.4 7 ms 2 A 30 V DC Relay output R1, R2, R3 resistive, cos phi = 1 3 A 250 V AC
Minimum switching current	Relay output R1, R2, R3 5 mA 24 V DC
Phase	3 phase
Physical interface	Ethernet 2-wire RS 485
Method of access	Slave Modbus TCP
Transmission Rate	10, 100 Mbits 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps
Transmission frame	RTU
Output voltage	<= power supply voltage
Permissible temporary current boost	1.5 x In 60 s heavy duty) 1.1 x In 60 s normal duty)
Data format	8 bits, configurable odd, even or no parity
Type of polarization	No impedance
Frequency resolution	Analog input 0.012/50 Hz Display unit 0.1 Hz

Electrical connection	Line side screw terminal 35...50 mm² Motor screw terminal 35...50 mm² Control removable screw terminals 0.5...1.5 mm² AWG 20...AWG 16
Connector type	RJ45 on the remote graphic terminal)Modbus serial RJ45 on the remote graphic terminal)Ethernet/Modbus TCP
Exchange mode	Half duplex, full duplex, autonegotiation Ethernet/Modbus TCP
Number of addresses	1…247 Modbus serial
Supply	Internal supply for reference potentiometer (1 to 10 kOhm) 10.5 V DC +/- 5 %, <10 mA overload and short-circuit protection Internal supply for digital inputs and STO 24 V DC 21…27 V), <200 mA overload and short-circuit protection External supply for digital inputs 24 V DC 19…30 V), <1.25 mA overload and short-circuit protection
Local signalling	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
Input compatibility	DI5, DI6 discrete input level 1 PLC IEC 65A-68 STOA, STOB discrete input level 1 PLC IEC 61131-2 DI1...DI6 discrete input level 1 PLC IEC 61131-2
Discrete input logic	Positive logic (source) DI1...DI8), < 5 V, > 11 V Negative logic (sink) DI1...DI8), > 16 V, < 10 V
Sampling duration	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
Accuracy	+/- 1 % AO1, AO2 for a temperature variation 60 °C analog output +/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input
Linearity error	AO1, AO2 +/- 0.2 % analog output AI1, AI2, AI3 +/- 0.15 % of maximum value analog input
Refresh time	Relay output R1, R2, R3)5 ms +/- 0.5 ms)
Isolation	Between power and control terminals
Enclosure mounting	Wall mounted
4 quadrant operation possible	False
Asynchronous motor control profile	Constant torque standard Optimized torque mode Variable torque standard
Synchronous motor control profile	Synchronous reluctance motor Permanent magnet motor
Maximum output frequency	500 kHz
Acceleration and deceleration ramps	Linear adjustable separately from 0.01...9999 s
Motor slip compensation	Adjustable Can be suppressed Not available in permanent magnet motor law Automatic whatever the load
Switching frequency	4...12 kHz with derating factor 2...12 kHz adjustable
Nominal switching frequency	4 kHz
Braking to standstill	By DC injection
Brake chopper integrated	False
Maximum Input Current per Phase	79.8 A
Maximum output voltage	480.0 V
Apparent power	49.1 kVA 480 V heavy duty) 57.4 kVA 480 V normal duty)

Maximum transient current	111.8 A 60 s heavy duty) 96.8 A 60 s normal duty)
Network Frequency	50-60 Hz
Prospective line Isc	50 kA
Base load current at high overload	74.5 A
Base load current at low overload	88.0 A
With safety function Safely Limited Speed (SLS)	False
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)	False
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	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
Quantity per Set	1
Width	11.4 in (290 mm)
Height	35.8 in (910 mm)
Depth	13.4 in (340 mm)
Product Weight	110.2 lb(US) (50 kg)

Environment

Insulation resistance	> 1 MOhm 500 V DC for 1 minute to earth
Noise level	69.7 dB 86/188/EEC
Pollution degree	2 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 11 ms IEC 60068-2-27
Relative humidity	5…95 % without condensation IEC 60068-2-3

Ambient air temperature for operation	104…122 °F (40…50 °C) (with derating factor) 5…104 °F (-15…40 °C) (without derating)
Operating altitude	1000...4800 m with current derating 1 % per 100 m <= 3280.84 ft (1000 m) without derating
Operating position	Vertical +/- 10 degree
Product Certifications	ATEX INERIS Bureau Veritas ABS DNV-GL UL TÜV
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 UL 508C
Maximum THDI	<48 % from 80...100 % of load 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
Environmental class (during operation)	Class 3C3 according to IEC 60721-3-3 Class 3S3 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 13...200 Hz
Maximum deflection under vibratory load (during operation)	1.5 mm at 2...13 Hz
Permitted relative humidity (during operation)	Class 3K5 according to EN 60721-3
Overvoltage category	III
Regulation loop	Adjustable PID regulator
Noise level	69.7 dB
Pollution degree	3
Ambient air transport temperature	-40…158 °F (-40…70 °C)
Ambient Air Temperature for Storage	-40…158 °F (-40…70 °C)

Ordering and shipping details

Category	US1CP4E22207
Discount Schedule	CP4E
GTIN	3606480906909
Returnability	Yes
Country of origin	CN

Packing Units

Unit Type of Package 1	PCE
Nbr. of units in pkg.	1

Package 1 Height	25.2 in (64.0 cm)
Package 1 Width	17.008 in (43.2 cm)
Package 1 Length	43.4 in (110.2 cm)
Package weight(Lbs)	145.5 lb(US) (66.0 kg)

Contractual warranty

Warranty (in months)	18

Environmental Data

Schneider Electric aims to achieve Net Zero status by 2050 through supply chain partnerships, lower impact materials, and circularity via our ongoing “Use Better, Use Longer, Use Again” campaign to extend product lifetimes and recyclability.

Environmental Data explained >

How we assess product sustainability >

Environmental footprint

Total lifecycle Carbon footprint	**36 373 kg CO2 eq.**
Carbon footprint of the manufacturing phase [A1 to A3]	**566 kg CO2 eq.**
Carbon footprint of the distribution phase [A4]	**9 kg CO2 eq.**
Carbon footprint of the installation phase [A5]	**11 kg CO2 eq.**
Carbon footprint of the use phase [B2, B3, B4, B6]	**35 776 kg CO2 eq.**
Carbon footprint of the end-of-life phase [C1 to C4]	**11 kg CO2 eq.**
Environmental Disclosure	**Product Environmental Profile**

Use Better

Materials and Substances

Packaging made with recycled cardboard	**Yes**
Packaging without single use plastic	**No**
SCIP Number	**5fb596ba-e321-43d4-bd6d-9f75a221228c**
EU RoHS Directive	**Compliant By Exemption**
REACh Regulation	**Reference contains Substances of Very High Concern above the threshold**
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 www.P65Warnings.ca.gov**

Energy efficiency

Product contributes to saved and avoided emissions	**Yes**

Use Longer

Lifetime extension

Repair	**No**

Use Again

Repack and remanufacture

Circularity Profile	**End of Life Information**
Removable battery	**Yes**
Take-back	**No**

WEEE Label	**The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.**