



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	Standard version
Product destination	Synchronous motors Synchronous motors
EMC filter	Integrated with 150 m conforming to EN/IEC 61800-3 category C3
IP degree of protection	IP55 conforming to IEC 60529 IP55 conforming to IEC 61800-5-1
Type of cooling	Forced convection
Supply frequency	50...60 Hz - 5...5 %
[Us] rated supply voltage	380...480 V - 15...10 %
Motor power kW	37 KW (heavy duty) 55 KW (normal duty)
Motor power hp	50 Hp heavy duty 75 Hp normal duty
Line current	69.1 A at 480 V (normal duty) 67.1 A at 380 V (heavy duty) 59 A at 480 V (heavy duty) 97.2 A at 380 V (normal duty)
Prospective line Isc	50 KA
Apparent power	49.1 KVA at 480 V (heavy duty) 70 KVA at 480 V (normal duty)
Continuous output current	72 A at 4 kHz for heavy duty 106 A at 2.5 kHz for normal duty
Maximum transient current	111.8 A during 60 s (heavy duty) 116.6 A during 60 s (normal duty)
Asynchronous motor control profile	Constant torque standard Optimized torque mode Optimized torque mode
Synchronous motor control profile	Synchronous reluctance motor Permanent magnet motor
Output frequency	0.0001...0.5 KHz
Speed drive output frequency	0.1...599 Hz
Nominal switching frequency	2.5 kHz
Switching frequency	4...12 kHz with derating factor 2.5...8 kHz with derating factor
Safety function	STO (safe torque off) SIL 3
Discrete input logic	16 preset speeds

Communication port protocol	Modbus TCP Modbus serial Modbus serial
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
Output voltage	$\leq$ power supply voltage
Permissible temporary current boost	1.5 x I _n during 60 s (heavy duty) 1.1 x I _n during 60 s (normal duty)
Motor slip compensation	Adjustable Not available in permanent magnet motor law Automatic whatever the load Adjustable
Acceleration and deceleration ramps	Linear adjustable separately from 0.01...9999 s
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
Frequency resolution	Analog input: 0.012/50 Hz Display unit: 0.1 Hz
Electrical connection	Line side: screw terminal 35...50 mm ² /AWG 3...AWG 1 Motor: screw terminal 35...50 mm ² /AWG 2...AWG 1 Control: removable screw terminals 0.5...1.5 mm ² /AWG 20...AWG 16
Connector type	RJ45 (on the remote graphic terminal) for Modbus serial RJ45 (on the remote graphic terminal) for Ethernet/Modbus TCP
Exchange mode	Half duplex, full duplex, autonegotiation Ethernet/Modbus TCP
Number of addresses	1...247 for Modbus serial
Method of access	Slave Modbus TCP
Supply	Internal supply for reference potentiometer (1 to 10 kOhm): 10.5 V D-C +/- 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
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
Width	345 Mm
Height	1250 Mm
Depth	375 Mm
Net weight	87 Kg
Analogue input number	3

Analogue input type	AI1, AI2, AI3 software-configurable current: 0...20 mA/4...20 mA, impedance: 250 Ohm, resolution 12 bits AI1, AI2, AI3 software-configurable voltage: 0...10 V DC, impedance: 30 kOhm, resolution 12 bits
Discrete input number	8
Discrete input type	DI5, DI6 programmable as pulse input: 0...30 kHz, 24 V DC (≤ 30 V) STOA, STOB safe torque off, 24 V DC (≤ 30 V), impedance: > 2.2 kOhm DI1...DI6 programmable, 24 V DC (≤ 30 V), impedance: 3.5 kOhm
Input compatibility	DI5, DI6: discrete input level 1 PLC conforming to IEC 65A-68 STOA, STOB: discrete input level 1 PLC conforming to EN/IEC 61131-2 DI1...DI6: discrete input level 1 PLC conforming to EN/IEC 61131-2
Discrete input logic	Negative logic (sink) (DI1...DI6), > 16 V (state 0), < 10 V (state 1) Positive logic (source) (DI5, DI6), < 0.6 V (state 0), > 2.5 V (state 1) Positive logic (source) (STOA, STOB), < 5 V (state 0), > 11 V (state 1) Positive logic (source) (DI1...DI6), < 5 V (state 0), > 11 V (state 1)
Analogue output number	2
Analogue output type	Software-configurable current AO1, AO2: 0...20 mA, resolution 10 bits Software-configurable voltage AO1, AO2: 0...10 V DC impedance 470 Ohm, resolution 10 bits
Sampling duration	5 Ms $\pm$ 1 ms (DI5, DI6) - discrete input 5 Ms $\pm$ 0.1 ms (AI1, AI2, AI3) - analog input 10 Ms $\pm$ 1 ms (AO1) - analog output 2 Ms $\pm$ 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 % for analog output AI1, AI2, AI3: ± 0.15 % of maximum value for analog input
Relay output number	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 m-s: 2 A at 250 V AC Relay output R1, R2, R3 on inductive load, $\cos \phi = 0.4$ and L/R = 7 m-s: 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
Discrete and process manufacturing	Building - HVAC Compressor centrifugal
Power range	55...100 KW at 380...440 V 3 phases

Environment

Insulation resistance	> 1 MOhm 500 V DC for 1 minute to earth
Noise level	69.9 DB conforming to 86/188/EEC
Operating position	Vertical ± 10 degree
Maximum THDI	< 48 % from 80...100 % of 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 μ s - 8/20 μ s 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 EN/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

Standards	EN/IEC 61800-3 Environment 1 category C2 EN/IEC 61800-3 Environment 2 category C3 EN/IEC 61800-3 EN/IEC 61800-5-1 IEC 61000-3-12 IEC 60721-3 IEC 61508 IEC 13849-1 UL 508C
Product certifications	UL CSA DNV-GL ABS Bureau Veritas TÜV ATEX INERIS
Marking	CE

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Weight	79 Kg
Package 1 Height	63 Cm
Package 1 width	43 Cm
Package 1 Length	140 Cm

Offer Sustainability

Sustainable offer status	Green Premium product
REACH Regulation	REACH Declaration
EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS Declaration
Environmental Disclosure	Product Environmental Profile
Circularity Profile	End Of Life Information
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

Product Life Status : **Commercialised**