# Product data sheet

**Specifications**

Variable speed drive, Altivar Process ATV600, ATV650, 15 kW, 400...480 V, IP55

ATV650D15N4U

Product availability: Stock - Normally stocked in distribution facility

**Price**: 5,652.00 USD

<table>
<thead>
<tr>
<th><strong>Main</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range of Product</strong></td>
<td>Altivar Process ATV600</td>
</tr>
<tr>
<td><strong>Product or Component Type</strong></td>
<td>Variable speed drive</td>
</tr>
<tr>
<td><strong>Product Specific Application</strong></td>
<td>Process and utilities</td>
</tr>
<tr>
<td><strong>Device short name</strong></td>
<td>ATV650</td>
</tr>
<tr>
<td><strong>Variant</strong></td>
<td>Standard version</td>
</tr>
<tr>
<td><strong>Product destination</strong></td>
<td>Asynchronous motors, Synchronous motors</td>
</tr>
<tr>
<td><strong>EMC filter</strong></td>
<td>Integrated 164.04 ft (50 m) EN/IEC 61800-3 category C2, Integrated 492.13 ft (150 m) EN/IEC 61800-3 category C3</td>
</tr>
<tr>
<td><strong>IP degree of protection</strong></td>
<td>IP55 IEC 60529, IP55 IEC 61800-5-1</td>
</tr>
<tr>
<td><strong>[Us] rated supply voltage</strong></td>
<td>380...480 V</td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td>UL type 12 UL 508C</td>
</tr>
<tr>
<td><strong>Type of cooling</strong></td>
<td>Forced convection</td>
</tr>
<tr>
<td><strong>Supply frequency</strong></td>
<td>50...60 Hz - 5...5 %</td>
</tr>
<tr>
<td></td>
<td>380...480 V - 15...10 %</td>
</tr>
<tr>
<td><strong>Motor power kW</strong></td>
<td>11 kW heavy duty, 15 kW normal duty</td>
</tr>
<tr>
<td><strong>Maximum Horse Power Rating</strong></td>
<td>15 hp heavy duty, 20 hp normal duty</td>
</tr>
<tr>
<td><strong>Line current</strong></td>
<td>23.3 A 480 V normal duty, 20.6 A 380 V heavy duty, 18.1 A 480 V heavy duty, 27 A 380 V normal duty</td>
</tr>
<tr>
<td><strong>Prospective line Isc</strong></td>
<td>50 kA</td>
</tr>
<tr>
<td><strong>Apparent power</strong></td>
<td>15 kVA 480 V heavy duty, 19.4 kVA 480 V normal duty</td>
</tr>
<tr>
<td><strong>Continuous output current</strong></td>
<td>23.5 A 4 kHz heavy duty, 31.7 A 4 kHz normal duty</td>
</tr>
<tr>
<td><strong>Asynchronous motor control profile</strong></td>
<td>Variable torque standard, Constant torque standard</td>
</tr>
<tr>
<td><strong>Synchronous motor control profile</strong></td>
<td>Synchronous reluctance motor, Permanent magnet motor</td>
</tr>
<tr>
<td><strong>Speed drive output frequency</strong></td>
<td>0.1...500 Hz</td>
</tr>
</tbody>
</table>

*Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.
<table>
<thead>
<tr>
<th>Nominal switching frequency</th>
<th>4 kHz</th>
</tr>
</thead>
</table>
| Switching frequency         | 4...12 kHz with derating factor  
                            | 2...12 kHz adjustable |
| Safety function             | STO (safe torque off) SIL 3 |
| Discrete input logic        | 16 preset speeds |
| Communication Port Protocol | Modbus serial  
                            | Ethernet  
                            | 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  
                            | Slot A communication module, BACnet MS/TP  
                            | Slot A communication module, Ethernet Powerlink  
                            | Slot A communication module, Profibus DP V1 |
| Complementary               |                                           |
| Mounting Mode               | Wall mount |
| Maximum transient current   | 35.3 A 60 s heavy duty)  
                            | 34.9 A 60 s normal duty) |
| Phase                       | 3 phase |
| 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 In 60 s heavy duty)  
                            | 1.1 x In 60 s normal duty) |
| Motor slip compensation     | Not available in permanent magnet motor law  
                            | Can be suppressed  
                            | Automatic whatever the load  
                            | Can be suppressed |
| 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 |
| Transmission frame          | RTU |
| Electrical connection       | Line side screw terminal 10...16 mm² |
Motor screw terminal 10...16 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)

### Data format
8 bits, configurable odd, or even or no parity

### Type of polarization
No impedance

### Exchange mode
Half duplex, full duplex, autonegotiation Ethernet/Modbus TCP

### Number of addresses
1...247 Modbus serial

### Method of access
Slave Modbus TCP

### 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
- for embedded communication status 3 LEDs (dual colour)
- for communication module status 4 LEDs (dual colour)
- for presence of voltage 1 LED (red)
- for local diagnostic 3 LEDs

### Width
10.39 in (264 mm)

### Height
26.69 in (678 mm)

### Depth
11.77 in (299 mm)

### Net Weight
43.21 lb(US) (19.6 kg)

### 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

### Discrete input number
8

#### Discrete input type
- DI7, DI8 programmable as pulse input 0...30 kHz, 24 V DC <= 30 V)

### Input compatibility
- DI5, DI6 discrete input level 1 PLC IEC 65A-68
- STOA, STOB discrete input level 1 PLC EN/IEC 61131-2
- DI1...DI6 discrete input level 1 PLC EN/IEC 61131-2
- Positive logic (source) DI1...DI8), < 5 V, > 11 V
- Negative logic (sink) DI1...DI8), > 16 V, < 10 V

### 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

### 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

### 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

### Refresh time
Relay output R1, R2, R3(5 ms +/- 0.5 ms)

### Minimum switching current
Relay output R1, R2, R3 5 mA 24 V DC

### 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

### Isolation
Between power and control terminals

### Maximum output frequency
500 kHz
Maximum Input Current per Phase 27.0 A

Quantity per Set 1

Enclosure mounting Wall mounted

Environment

Insulation resistance > 1 MOhm 500 V DC for 1 minute to earth

Noise level 53.7 dB 86/188/EEC

Operating position Vertical +/- 10 degree

Maximum THDI <48 % from 80…100 % of load IEC 61000-3-12

Electromagnetic compatibility Radiated radio-frequency electromagnetic field immunity test level 3 IEC 61000-4-3
Electrical fast transient/burst immunity test level 4 IEC 61000-4-4
1.2/50 µs - 8/20 µs surge immunity test level 3 IEC 61000-4-5
Conducted radio-frequency immunity test level 3 IEC 61000-4-6
Electrostatic discharge immunity test level 3 IEC 61000-4-2

Pollution degree 2 EN/IEC 61800-5-1

Vibration resistance 1 gn 13…200 Hz|IEC 60068-2-6
1.5 mm peak to peak 2…13 Hz|IEC 60068-2-6

Shock resistance 15 gn 11 ma 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)

Ambient Air Temperature for Storage -40…158 °F (-40…70 °C)

Operating altitude 1000…4800 m with current derating 1 % per 100 m
<= 3280.84 ft (1000 m) without derating

Product Certifications Bureau Veritas
UL
ATEX INERIS
CSA
ABS
DNV-GL
UL

Marking CE

Standards EN/IEC 61800-3 environment 1 category C2
EN/IEC 61800-3 environment 2 category C3
EN/IEC 61800-5-1
IEC 61000-3-12
IEC 60721-3
IEC 61508
IEC 13849-1
UL 508C

Overvoltage category III

Regulation loop Adjustable PID regulator
53.7 dB
3

Ordering and shipping details

Category 22206-ATV630 FRAMES 3 & 4

Discount Schedule CP4E

GTIN 3606480906800

Returnability No

Packing Units

Unit Type of Package 1 PCE

Number of Units in Package 1 1

Nov 30, 2023
Package 1 Height 21.65 in (55.0 cm)
Package 1 Width 15.43 in (39.2 cm)
Package 1 Length 31.50 in (80.0 cm)
Package 1 Weight 55.12 lb (US) (25.0 kg)

Offer Sustainability
Sustainable offer status Green Premium product
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

REACH Regulation REACH Declaration
EU RoHS Directive Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration
Mercury free Yes
China RoHS Regulation China RoHS declaration
RoHS exemption information Yes
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

Recommended replacement(s)