## Product datasheet <br> Characteristics <br> ATV212HD15M3X

Green
Premium"


| Main |  |
| :--- | :--- |
| Range of product | Altivar 212 |
| Product or component type | Variable speed drive |
| Device short name | ATV212 |
| Product destination | Asynchronous motors |
| Product specific application | Pumps and fans in HVAC |
| Assembly style | With heat sink |
| Phase | 3 phases |
| Motor power kW | 15 kW |
| Motor power hp | 20 hp |
| [Us] rated supply voltage | $200 \ldots 240 \mathrm{~V} \mathrm{-15} \mathrm{\ldots ..10} \mathrm{\%}$ |
| Supply voltage limits | $170 \ldots .264 \mathrm{~V}$ |
| Supply frequency | $50 \ldots 60 \mathrm{~Hz} \mathrm{-} \mathrm{5...5} \mathrm{\%}$ |
| Network frequency | $47.5 \ldots 63 \mathrm{~Hz}$ |
| EMC filter | Without EMC filter |
| Line current | 45.5 A 240 V |

Complementary

| Apparent power | 23.2 kVA 240 V |
| :---: | :---: |
| Prospective line Isc | 22 kA |
| Continuous output current | 61 A 230 V |
| Maximum transient current | 67.1 A 60 s |
| Speed drive output frequency | 0.5... 200 Hz |
| Nominal switching frequency | 12 kHz |
| Switching frequency | $12 . .16 \mathrm{kHz}$ with derating factor <br> $6 . . .16 \mathrm{kHz}$ adjustable |
| Speed range | 1... 10 |
| Speed accuracy | +/-10\% of nominal slip 0.2 Tn to Tn |
| Torque accuracy | +/-15\% |
| Transient overtorque | $120 \%$ of nominal motor torque +/-10\% 60 s |
| Asynchronous motor control profile | Voltage/frequency ratio, 2 points <br> Voltage/frequency ratio, 5 points <br> Flux vector control without sensor, standard <br> Voltage/frequency ratio - Energy Saving, quadratic U/f <br> Voltage/frequency ratio, automatic IR compensation (U/f + automatic Uo) |
| Regulation loop | Adjustable PI regulator |
| Motor slip compensation | Adjustable <br> Automatic whatever the load <br> Not available in voltage/frequency ratio motor control |
| Local signalling | 1 LED red DC bus energized |
| Output voltage | <= power supply voltage |
| Isolation | Electrical between power and control |
| Type of cable | IEC cable without mounting kit $1113^{\circ} \mathrm{F}\left(45^{\circ} \mathrm{C}\right)$ copper $90^{\circ} \mathrm{C}$ XLPE/EPR IEC cable without mounting kit $145^{\circ} \mathrm{C}$ copper $70^{\circ} \mathrm{C}$ PVC UL 508 cable with UL Type 1 kit $340^{\circ} \mathrm{C}$ copper $75^{\circ} \mathrm{C}$ PVC |
| Electrical connection |  Terminal $25 \mathrm{~mm}^{2}$ AWG $3 \mathrm{~L} 1 / \mathrm{R}, \mathrm{L} 2 / \mathrm{S}, \mathrm{L} 3 / \mathrm{T}$ |
| Tightening torque | $39.82 \mathrm{lbf} . \mathrm{in}(4.5 \mathrm{~N} . \mathrm{m}) 40 \mathrm{lb} . \mathrm{in} \mathrm{L1/R}, \mathrm{L2/S}, \mathrm{L3/T}$ 0.6 N.m VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES |

Supply
Internal supply for reference potentiometer ( 1 to 10 kOhm ) $10.5 \mathrm{VDC}+/-5 \%<=10 \mathrm{~A}$
overload and short-circuit protection
Internal supply 24 V DC $21 . . .27$ V <= 200 A overload and short-circuit protection

| Analogue input number | 2 |
| :---: | :---: |
| Analogue input type | Switch-configurable voltage VIA $0 . .10$ V DC 24 V max 30000 Ohm 10 bits Configurable voltage VIB 0... 10 V DC 24 V max 30000 Ohm 10 bits Configurable PTC probe VIB 0... 6 probes 1500 Ohm Switch-configurable current VIA $0 . .20 \mathrm{~mA} 250$ Ohm 10 bits |
| Sampling duration | $2 \mathrm{~ms}+/-0.5 \mathrm{~ms}$ F discrete <br> $2 \mathrm{~ms}+/-0.5 \mathrm{~ms}$ R discrete <br> $2 \mathrm{~ms}+/-0.5 \mathrm{~ms}$ RES discrete <br> $3.5 \mathrm{~ms}+/-0.5 \mathrm{~ms}$ VIA analog <br> $22 \mathrm{~ms}+/-0.5 \mathrm{~ms}$ VIB analog |
| Response time | $\begin{aligned} & 2 \mathrm{~ms}+/-0.5 \mathrm{~ms} \text { FM analog } \\ & 7 \mathrm{~ms}+/-0.5 \mathrm{~ms} \text { FLA, FLC discrete } \\ & 7 \mathrm{~ms}+/-0.5 \mathrm{~ms} \mathrm{FLB}, \text { FLC discrete } \\ & 7 \mathrm{~ms}+/-0.5 \mathrm{~ms} \text { RY, RC discrete } \end{aligned}$ |
| Accuracy | $+/-0.6 \%$ VIA for a temperature variation $60^{\circ} \mathrm{C}$ <br> $+/-0.6 \%$ VIB for a temperature variation $60^{\circ} \mathrm{C}$ <br> +/- $1 \%$ FM for a temperature variation $60^{\circ} \mathrm{C}$ |
| Linearity error | $+/-0.15 \%$ of maximum value input VIA <br> $+/-0.15 \%$ of maximum value input VIB <br> +/- 0.2 \% output FM |
| Analogue output number | 1 |
| Analogue output type | Switch-configurable voltage FM 0... 10 V DC 7620 Ohm 10 bits Switch-configurable current FM 0... 20 mA 970 Ohm 10 bits |
| Discrete output number | 2 |
| Discrete output type | Configurable relay logic FLA, FLC NO 100000 cycles Configurable relay logic FLB, FLC NC 100000 cycles Configurable relay logic RY, RC NO 100000 cycles |
| Minimum switching current | 3 mA 24 V DC configurable relay logic |
| Maximum switching current | 5 A 250 V AC resistive cos phi $=1 \mathrm{~L} / \mathrm{R}=0 \mathrm{~ms}$ FL, R 5 A 30 V DC resistive $\cos \mathrm{phi}=1 \mathrm{~L} / \mathrm{R}=0 \mathrm{~ms}$ FL, R <br> 2 A 250 V AC inductive $\cos \mathrm{phi}=0.4 \mathrm{~L} / \mathrm{R}=7 \mathrm{~ms} F \mathrm{FL}, \mathrm{R}$ 2 A 30 V DC inductive cos phi $=0.4 \mathrm{~L} / \mathrm{R}=7 \mathrm{~ms}$ FL, R |
| Discrete input type | Programmable F 24 V DC level 1 PLC 4700 Ohm Programmable R 24 V DC level 1 PLC 4700 Ohm Programmable RES 24 V DC level 1 PLC 4700 Ohm |
| Discrete input logic | Positive logic (source) F, R, RES $<=5 \mathrm{~V}>=11 \mathrm{~V}$ Negative logic (sink) F, R, RES >= $16 \mathrm{~V}<=10 \mathrm{~V}$ |
| Acceleration and deceleration ramps | Automatic based on the load <br> Linear adjustable separately from 0.01 to 3200 s |
| Braking to standstill | By DC injection |
| Protection type | Input phase breaks drive <br> Line supply overvoltage and undervoltage drive <br> Line supply undervoltage drive <br> Overcurrent between output phases and earth drive <br> Overheating protection drive <br> Short-circuit between motor phases drive <br> Thermal protection motor <br> Motor phase break motor <br> Break on the control circuit drive <br> Thermal power stage drive <br> Overvoltages on the DC bus drive <br> Against exceeding limit speed drive <br> Against input phase loss drive <br> With PTC probes motor |
| Dielectric strength | 2830 V DC between earth and power terminals 4230 V DC between control and power terminals |
| Insulation resistance | >= 1 MOhm 500 V DC for 1 minute |
| Frequency resolution | 0.1 Hz display unit $0.024 / 50 \mathrm{~Hz}$ analog input |
| Communication port protocol | APOGEE FLN BACnet LonWorks METASYS N2 Modbus |
| Connector type | 1 RJ45 <br> 1 open style |
| Physical interface | 2-wire RS 485 |


| Transmission frame | RTU |
| :---: | :---: |
| Transmission rate | 9600 bps or 19200 bps |
| Data format | 8 bits, 1 stop, odd even or no configurable parity |
| Type of polarization | No impedance |
| Number of addresses | 1... 247 |
| Communication service | Monitoring inhibitable <br> Read device identification (43) <br> Read holding registers (03) 2 words maximum <br> Time out setting from 0.1 to 100 s <br> Write multiple registers (16) 2 words maximum <br> Write single register (06) |
| Option card | Communication card LonWorks |
| Operating position | Vertical +/-10 degree |
| Width | 9.65 in (245 mm) |
| Height | 12.99 in (330 mm) |
| Depth | 7.48 in (190 mm) |
| Product weight | $25.46 \mathrm{lb}(\mathrm{US})(11.55 \mathrm{~kg})$ |
| Power dissipation in W | 629 W |
| Air flow | 56798.01 Gal/hr(US) (215 m3/h) |
| Specific application | HVAC |
| IP degree of protection | IP21 |
| Discrete and process manufacturing | Building - HVAC : compressor for scroll <br> Building - HVAC : fan <br> Building - HVAC : pump |
| Power range | 15... 25 kW at 200... 240 V 3 phases |
| Motor starter type | Variable speed drive |

## Environment

| electromagnetic compatibility | $1.2 / 50 \mu \mathrm{~s}-8 / 20$ s surge immunity test level 3 IEC 61000-4-5 |
| :--- | :--- |
|  | Electrical fast transient/burst immunity test level 4 IEC 61000-4-4 |
|  | Electrostatic discharge immunity test level 3 IEC 61000-4-2 |
|  | Radiated radio-frequency electromagnetic field immunity test level 3 IEC $61000-4-3$ |
|  | Conducted radio-frequency immunity test level 3 IEC 61000-4-6 |
|  | Voltage dips and interruptions immunity test IEC 61000-4-11 |

IEC 61800-3 environments 1 category C2
IEC 61800-3 environments 1 category C3
IEC 61800-3 environments 2 category C1
IEC 61800-3 environments 2 category C2
IEC 61800-3 environments 2 category C3
IEC 61800-5-1
UL Type 1

|  | UL Type 1 |
| :--- | :--- |
| product certifications | CSA |
|  | C-Tick |
|  | NOM 117 |
| marking | UL |

Offer Sustainability
Green Premium product Green Premium product
Compliant - since 1101-Schneider Electric declaration Compliant - since 1101-Schneider Electric declaration of conformity of conformity

| Reference not containing SVHC above the threshold | Reference not containing SVHC above the threshold |
| :--- | :--- |
| Available | Available |
| Available | Available |

Contractual warranty
Warranty period 18 months

Dimensions


Plate for EMC mounting (supplied with the drive)
$\frac{\mathrm{mm}}{\mathrm{m}}$

(1) $2 \times \mathrm{M} 5$ screws

## Mounting Recommendations

## Clearance

Depending on the conditions in which the drive is to be used, its installation will require certain precautions and the use of appropriate accessories.

Install the unit vertically:

Do not place it close to heating elements.
। Leave sufficient free space to ensure that the air required for cooling purposes can circulate from bottom to the top of the unit. $\frac{m m}{m}$


Mounting Types
Type A mounting
mm


Type C mounting
$\frac{\mathrm{mm}}{\mathrm{in} \text {. }}$


By removing the protective blanking cover from the top of the drive, the degree of protection for the drive becomes IP21. The protective blanking cover may vary according to the drive model, see opposite.

## Specific Recommendations for Mounting in an Enclosure

To help ensure proper air circulation in the drive:
। Fit ventilation grilles.
। Check that there is sufficient ventilation. If there is not, install a forced ventilation unit with a filter. The openings and/or fans must provide a flow rate at least equal to that of the drive fans (refer to the product characteristics).


। Use special filters with UL Type 12/IP54 protection.
। Remove the blanking cover from the top of the drive.

## Sealed Metal Enclosure (IP54 Degree of Protection)

The drive must be mounted in a dust and damp proof enclosure in certain environmental conditions, such as dust, corrosive gases, high humidity with risk of condensation and dripping water, splashing liquid, etc. This enables the drive to be used in an enclosure where the maximum internal temperature reaches $50^{\circ} \mathrm{C}$.

Recommended Wiring Diagram
3-Phase Power Supply


A1: ATV 212 drive
KM1:Contactor
Q1: Circuit breaker
Q2: GV2 L rated at twice the nominal primary current of T1
Q3: GB2CB05
S1, XB4 B or XB5 A pushbuttons
S2:
T1: 100 VA transformer 220 V secondary
(1) Fault relay contacts for remote signalling of the drive status
(2) Connection of the common for the logic inputs depends on the positioning of the switch (Source, PLC, Sink)
(3) Reference potentiometer SZ1RV1202

All terminals are located at the bottom of the drive. Install interference suppressors on all inductive circuits near the drive or connected on the same circuit, such as relays, contactors, solenoid valves, fluorescent lighting, etc.

Switches (Factory Settings)
Voltage/current selection for analog I/O (VIA and VIB)
 I
PTC

Voltage/current selection for analog I/O (FM)


Selection of logic type

(1) negative logic
(2) positive logic

## Other Possible Wiring Diagrams

Logic Inputs According to the Position of the Logic Type Switch
"Source" position

"Sink" position


[^0]

2-wire contro


F: Forward
R: Preset speed
(2) ATV 212 control terminals


F: Forward
R: Stop
RES:Reverse
(2) ATV 212 control terminals

PTC probe

(2) ATV 212 control terminals
(3) Motor

## Analog Inputs

Voltage analog inputs


Analog input configured for current: 0-20 mA, 4-20 mA, X-Y mA

(2) ATV 212 control terminals
(5) Source 0-20 mA, 4-20 mA, X-Y mA

Analog input VIA configured as positive logic input ("Source" position)

(2) ATV 212 control terminals

Analog input VIA configured as negative logic input ("Sink" position)

(2) ATV 212 control terminals

## Derating Curves

The derating curves for the drive nominal current (In) depend on the temperature, the switching frequency and the mounting type (A, B or C).

For intermediate temperatures $\left(45^{\circ} \mathrm{C}\right.$ for example), interpolate between 2 curves.
${ }^{1 / \mathrm{In}}{ }_{\%}$


X Switching frequency

Our Proposal: Circuit Breaker + Contactor + Drive for Motor Power 15 kW and 200 VAC

| Motor Power (kW) | Icu <br> (kA) | Breaker | Contactor (*) | Motor Starter |
| :---: | :---: | :---: | :---: | :---: |
| 15 | 50 |  |  | ATV212HD15M3X |

Non contractual pictures.
$\left.{ }^{*}\right)$ You can select the contactor proposed or variants. Please consider examples hereafter or follow the link to the complete offer.

| Motor Power <br> kW | Coil voltage <br> VAC -50/60 Hz | 24 | 48 | 110 | 115 | 220 | 230 | 400 | Other |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 15 | LC1D40A .. | B7 | E7 | F7 | FE7 | M7 | P7 | V7 | Complete Offer |


| Motor Power <br> kW | Coil voltage <br> VDC - U 0.75...1.25 Uc | 24 | 48 | Other |
| :--- | :--- | :---: | :---: | :---: |
| 15 | LC1D40A .. | BD | ED | Complete Offer |


[^0]:    "PLC" position with PLC transistor outputs

