Schneider □□□ Series Service Manual

ATV71HD15M3X

1. Description

The ATV71HD15M3X is a variable-speed drive from the Schneider Electric Altivar 71 series. It is rated for 15 kW (20 hp) and operates on a 3-phase, 230 V AC supply.

2. Specifications

Specification	Value
Manufacturer	**Schneider Electric**
Product	**Type Variable Speed Drive**
Product	**Line Altivar 71**
Part	**Number ATV71HD15M3X**
UPC	**785901561484**
Weight	**30.00 lbs (13.61 kg)**
Motor	**Power 15 kW (20 hp)**
Input	**Current 45.8 A**
Operating	**Temperature Typically 0 to 50°C (standard for Altivar 71)**
Phase	**3-phase**
Voltage	**Rating 230 V AC**
Storage	**Temperature -25 to 70°C**
Frequency	**50/60 Hz**
EMC	**Filter Without EMC filter**
Graphic	**Terminal Included**

3. Product Information

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Technical specifications for ATV71HD15M3X

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Product Line Altivar 71

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Phase 3-phase

Voltage Rating 230 V AC

Storage Temperature -25 to 70°C

Frequency 50/60 Hz

EMC Filter Without EMC filter

Graphic Terminal Included

Description

The Schneider Electric ATV71HD15M3X variable-speed drive exemplifies reliable performance in a compact unit. With a power capacity rated at 15 kW (20 horsepower), it is well-suited for demanding motor applications. The drive operates on standard 3-phase 230 V AC power, providing a robust solution for various industrial setups.

Weighing 13.61 kg, the ATV71HD15M3X is designed to handle an input current of 45.8 A, facilitating smooth operation across different load conditions. It operates effectively at ambient temperatures ranging from 0 to 50°C, ensuring stability even in moderately warm environments. For storage needs, it can withstand temperatures as low as -25°C and as high as 70°C, making it versatile for different settings.

Furthermore, this drive operates at frequencies of 50 and 60 Hz. It does not include an EMC filter, which may be relevant for setups where electromagnetic compatibility is critical. A graphic terminal is part of this package, enhancing user interaction and making parameter adjustments straightforward.

Range of Product

Altivar 71

Product or Component Type

Variable speed drive

Product Specific Application

Complex, high-power machines

Component name

ATV71

Motor power kW

15 kW, 3 phase 200...240 V

Maximum Horse Power Rating

20 hp, 3 phase 200...240 V

Maximum motor cable length

164.04 ft (50 m) shielded cable

328.08 ft (100 m) unshielded cable

power supply voltage

200...240 V - 15...10 %

Phase

3 phase

Line current

61.6 A 240 V 3 phase 15 kW / 20 hp

71.7 A 200 V 3 phase 15 kW / 20 hp

EMC filter

Without EMC filter

Assembly style

With heat sink

Apparent power

25.6 kVA 240 V 3 phase 15 kW / 20 hp

Prospective line Isc

22 kA 3 phase

Nominal output current

66 A 4 kHz 230 V 3 phase 15 kW / 20 hp

Maximum transient current

109 A 2 s 3 phase 15 kW / 20 hp

99 A 60 s 3 phase 15 kW / 20 hp

Output frequency

0.1...599 Hz

Nominal switching frequency

4 kHz

Switching frequency

1...16 kHz adjustable

4...16 kHz with derating factor

Asynchronous motor control profile

Sensorless flux vector control (SFVC) (voltage or current vector)

Flux vector control (FVC) with sensor (current vector)

ENA (Energy adaptation) system for unbalanced loads

Voltage/frequency ratio (2 or 5 points)

Type of polarization

No impedance Modbus

Complementary

Product destination

Synchronous motors

Asynchronous motors

power supply voltage limits

170...264 V

power supply frequency

50...60 Hz - 5...5 %

power supply frequency limits

47.5...63 Hz

Speed range

1...100 asynchronous motor in open-loop mode, without speed feedback

1...1000 asynchronous motor in closed-loop mode with encoder feedback

1...50 synchronous motor in open-loop mode, without speed feedback

Speed accuracy

+/- 0.01 % of nominal speed in closed-loop mode with encoder feedback 0.2 Tn to Tn

+/- 10 % of nominal slip without speed feedback 0.2 Tn to Tn

Torque accuracy

+/- 15 % in open-loop mode, without speed feedback

+/- 5 % in closed-loop mode with encoder feedback

Transient overtorque

170 % +/- 10 % 60 s every 10 minutes

220 % +/- 10 % 2 s

Braking torque

<= 150 % with braking or hoist resistor

30 % without braking resistor

Synchronous motor control profile

Vector control without speed feedback

Regulation loop

Adjustable PI regulator

Motor slip compensation

Suppressable

Adjustable

Not available in voltage/frequency ratio (2 or 5 points)

Automatic whatever the load

diagnostic

1 LED (red) for drive voltage

Output voltage

<= power supply voltage

Insulation

Electrical between power and control

type of cable for mounting in an enclosure

With a NEMA Type1 kit 3 UL 508 cable 104 °F (40 °C), copper 75 °C / PVC

With an IP21 or an IP31 kit 3 IEC cable 104 °F (40 °C), copper 70 °C / PVC

Without mounting kit 1 IEC cable 113 °F (45 °C), copper 70 °C / PVC

Without mounting kit 1 IEC cable 113 °F (45 °C), copper 90 °C / XLPE/EPR

Electrical connection

Terminal 2.5 mm², AWG 14 AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR)

Terminal 35 mm², AWG 2 L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB)

Tightening torque

5.3 lbf.in (0.6 N.m) AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR)

47.8 lbf.in (5.4 N.m), 47.7 lb.in L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB)

Supply

Internal supply for reference potentiometer (1 to 10 kOhm) 10.5 V DC +/- 5 %, <10 mA overload and short-circuit protection

Internal supply 24 V DC 21...27 V), <200 mA overload and short-circuit protection

Analogue input number

2

Analogue input type

AI1-/AI1+ bipolar differential voltage +/- 10 V DC 24 V max 11 bits + sign

AI2 software-configurable current 0...20 mA 242 Ohm 11 bits

AI2 software-configurable voltage 0...10 V DC 24 V max 30000 Ohm 11 bits

input sampling time

2 ms +/- 0.5 ms AI1-/AI1+) - analog

2 ms +/- 0.5 ms AI2) - analog

2 ms +/- 0.5 ms LI1...LI5) - discrete

2 ms +/- 0.5 ms LI6)if configured as logic input - discrete

Response time

<= 100 ms in STO (Safe Torque Off)

AO1 2 ms +/- 0.5 ms analog

R1A, R1B, R1C 7 ms +/- 0.5 ms discrete

R2A, R2B 7 ms +/- 0.5 ms discrete

absolute accuracy precision

+/- 0.6 % AI1-/AI1+) for a temperature variation 60 °C

+/- 0.6 % AI2) for a temperature variation 60 °C

+/- 1 % AO1) for a temperature variation 60 °C

Linearity error

+/- 0.15 % of maximum value AI1-/AI1+, AI2)

+/- 0.2 % AO1)

Analogue output number

1

Analogue output type

AO1 software-configurable logic output 10 V 20 mA

AO1 software-configurable current 0...20 mA 500 Ohm 10 bits

AO1 software-configurable voltage 0...10 V DC 470 Ohm 10 bits

Discrete output number

2

Discrete output type

Configurable relay logic R1A, R1B, R1C) NO/NC - 100000 cycles

Configurable relay logic R2A, R2B) NO - 100000 cycles

Minimum switching current

3 mA 24 V DC configurable relay logic

Maximum switching current

R1, R2 2 A 250 V AC inductive, cos phi = 0.4

R1, R2 2 A 30 V DC inductive, cos phi = 0.4

R1, R2 5 A 250 V AC resistive, cos phi = 1

R1, R2 5 A 30 V DC resistive, cos phi = 1

Discrete input number

7

Discrete input type

LI1...LI5 programmable 24 V DC level 1 PLC 3500 Ohm

LI6 switch-configurable 24 V DC level 1 PLC 3500 Ohm

LI6 switch-configurable PTC probe 0...6 1500 Ohm

PWR safety input 24 V DC 1500 Ohm ISO 13849-1 level d

Discrete input logic

Negative logic (sink) LI1...LI5), > 16 V, < 10 V

Positive logic (source) LI1...LI5), < 5 V, > 11 V

Negative logic (sink) LI6)if configured as logic input, > 16 V, < 10 V

Positive logic (source) LI6)if configured as logic input, < 5 V, > 11 V

Acceleration and deceleration ramps

S, U or customized

Linear adjustable separately from 0.01 to 9000 s

Automatic adaptation of ramp if braking capacity exceeded, by using resistor

Braking to standstill

By DC injection

Protection type

Against exceeding limit speed drive

Against input phase loss drive

Break on the control circuit drive

Input phase breaks drive

Line supply overvoltage drive

Line supply undervoltage drive

Overcurrent between output phases and earth drive

Overheating protection drive

Overvoltages on the DC bus drive

Short-circuit between motor phases drive

Thermal protection drive

Motor phase break motor

Power removal motor

Thermal protection motor

Insulation resistance

> 1 mOhm 500 V DC for 1 minute to earth

Frequency resolution

Analog input 0.024/50 Hz

Display unit 0.1 Hz

Communication Port Protocol

Modbus

CANopen

Connector type

1 RJ45 on front face)Modbus

1 RJ45 on terminal)Modbus

Male SUB-D 9 on RJ45CANopen

Physical interface

2-wire RS 485 Modbus

Transmission frame

RTU Modbus

Transmission rate

4800 bps, 9600 bps, 19200 bps, 38.4 Kbps Modbus on terminal

9600 bps, 19200 bps Modbus on front face

20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 1 Mbps CANopen

Data format

8 bits, 1 stop, even parity Modbus on front face

8 bits, odd even or no configurable parity Modbus on terminal

Number of addresses

1...127 CANopen

1...247 Modbus

Method of access

Slave CANopen

Marking

CE

Operating position

Vertical +/- 10 degree

Height

15.7 in (400 mm)

Depth

8.4 in (213 mm)

Width

9.06 in (230 mm)

Net Weight

48.5 lb(US) (22 kg)

Option card

Communication card CC-Link

Controller inside programmable card

Communication card DeviceNet

Communication card EtherNet/IP

Communication card Fipio

I/O extension card

Communication card Interbus-S

Interface card for encoder

Communication card Modbus Plus

Communication card Modbus TCP

Communication card Modbus/Uni-Telway

Overhead crane card

Communication card Profibus DP

Communication card Profibus DP V1

Environment

Noise level

60.2 dB 86/188/EEC

Dielectric strength

2830 V DC between earth and power terminals

4230 V DC between control and power terminals

Electromagnetic compatibility

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

Electrical fast transient/burst immunity test level 4 conforming to IEC 61000-4-4

Electrostatic discharge immunity test level 3 conforming to IEC 61000-4-2

Radiated radio-frequency electromagnetic field immunity test level 3 conforming to IEC 61000-4-3

Voltage dips and interruptions immunity test conforming to IEC 61000-4-11

Standards

IEC 60721-3-3 class 3C1

UL Type 1

IEC 60721-3-3 class 3S2

Product Certifications

GOST

UL

NOM 117

C-tick

CSA

Pollution degree

2 EN/IEC 61800-5-1

IP degree of protection

IP20 on upper part without blanking plate on cover EN/IEC 60529

IP20 on upper part without blanking plate on cover EN/IEC 61800-5-1

IP21 EN/IEC 60529

IP21 EN/IEC 61800-5-1

IP41 on upper part EN/IEC 60529

IP41 on upper part EN/IEC 61800-5-1

IP54 on lower part EN/IEC 60529

IP54 on lower part EN/IEC 61800-5-1

Vibration resistance

1 gn (f= 13...200 Hz) conforming to EN/IEC 60068-2-6

1.5 mm peak to peak (f= 3...13 Hz) conforming to EN/IEC 60068-2-6

Shock resistance

15 gn 11 ms EN/IEC 60068-2-27

Relative humidity

5...95 % without condensation IEC 60068-2-3

5...95 % without dripping water IEC 60068-2-3

Ambient air temperature for operation

14...122 °F (-10...50 °C) (without derating)

Ambient Air Temperature for Storage

-13...158 °F (-25...70 °C)

Operating altitude

<= 3280.84 ft (1000 m) without derating

3280.84...9842.52 ft (1000...3000 m) with current derating 1 % per 100 m

Ordering and shipping details

Category

US1CP4C22131

Discount Schedule

CP4C

GTIN

00785901561484

Returnability

No