

Schneider Series Service Manual

ATV71HD75N4

1. Description

The ATV71HD75N4 from Schneider Electric is a versatile variable speed drive designed for three-phase operations. This unit operates within a voltage range of 380 to 480 VAC and provides motor power up to 75 kW (100 HP).

2. Specifications

Specification	Value
Manufacturer	Schneider Electric
Product	Type Variable Speed Drive
Product	Line Altivar 71
Part	Number ATV71HD75N4
EAN	3389118069602
Weight	100.00 lbs (45.36 kg)
Input	Voltage 380-480 VAC
Operating	Altitude Up to 1000 m without derating
Motor	Power 75 kW (100 HP)
Input	Frequency 50/60 Hz
Nominal	Switching Frequency 2.5 kHz (standard)
Phase	3-phase
Assembly	Style With heat sink
EMC	Filter Integrated EMC Filter
Operating	Temperature -10 to 50 °C
IP	Rating IP20

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Description

The ATV71HD75N4 variable speed drive by Schneider Electric is engineered to handle a wide input voltage of 380 to 480 VAC. This unit offers robust motor power capabilities, reaching up to 75 kW (100 HP), suitable for demanding applications. It operates on a three-phase system, ensuring efficient power management.

With an input frequency capability of 50 or 60 Hz, the variable speed drive features a nominal switching frequency of 2.5 kHz, designed to ensure smooth motor operation. This drive can function effectively at altitudes of 1000 meters without experiencing derating, making it a reliable choice for various environments.

Weighing 44.00 kg, the ATV71HD75N4 incorporates a heat sink assembly style for enhanced thermal management. It is equipped with an integrated EMC filter to minimize electrical interference, helping to maintain system performance. This drive operates well within a temperature range of -10 to 50 °C, providing versatility across different operational conditions.

The IP20 rating denotes protection against solid objects larger than 12 mm, although it lacks protection against water ingress.

Main

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

75 kW, 3 phase 380...480 V

Maximum Horse Power Rating

100 hp, 3 phase 380...480 V

Maximum motor cable length

328.08 ft (100 m) shielded cable

656.2 ft (200 m) unshielded cable

power supply voltage

380...480 V - 15...10 %

Phase

3 phase

Line current

137 A 480 V 3 phase 75 kW / 100 hp

167 A 380 V 3 phase 75 kW / 100 hp

EMC filter

Integrated

Assembly style

With heat sink

Apparent power

109.9 kVA 380 V 3 phase 75 kW / 100 hp

Prospective line Isc

22 kA 3 phase

Nominal output current

124 A 2.5 kHz 460 V 3 phase 75 kW / 100 hp

160 A 2.5 kHz 380 V 3 phase 75 kW / 100 hp

Maximum transient current

240 A 60 s 3 phase 75 kW / 100 hp

264 A 2 s 3 phase 75 kW / 100 hp

Output frequency

0.1...500 Hz

Nominal switching frequency

2.5 kHz

Switching frequency

1...16 kHz adjustable

2.5...16 kHz with derating factor

Asynchronous motor control profile

ENA (Energy adaptation) system for unbalanced loads

Voltage/frequency ratio (2 or 5 points)

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

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

Type of polarization

No impedance Modbus

Complementary

Product destination

Asynchronous motors

Synchronous motors

power supply voltage limits

323...528 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

Automatic whatever the load

Adjustable

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

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 150 mm² 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)

362.9 lbf.in (41 N.m), 360 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
 Linear adjustable separately from 0.01 to 9000 s
 S, U or customized
 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
 CANopen
 Modbus
 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

24.8 in (630 mm)

Depth

11.4 in (290 mm)

Width

12.6 in (320 mm)

Net Weight

97.003 lb(US) (44 kg)

Functionality

Full

Specific application

Other applications

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

63.7 dB 86/188/EEC

Dielectric strength

3535 V DC between earth and power terminals

5092 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

EN 61800-3 environments 2 category C3

IEC 60721-3-3 class 3S2

EN/IEC 61800-3

EN/IEC 61800-5-1

UL Type 1

EN 61800-3 environments 1 category C3

EN 55011 class A group 2

Product Certifications

NOM 117

UL

CSA

C-tick

GOST

Pollution degree

2 EN/IEC 61800-5-1

3 UL 840

IP degree of protection

IP20

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

US1CP4C22132

Discount Schedule

CP4C

GTIN

3389118069602

Returnability

No