

Schneider Series Service Manual

ATV71HC11N4

1. Description

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3. Product Information

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Technical specifications for ATV71HC11N4

Manufacturer Schneider Electric

Product Type Variable Frequency Drive

Product Line Altivar 71

Part Number ATV71HC11N4

EAN 3389119201049

Weight 164.00 lbs (74.39 kg)

Motor Power 110 kW (150 hp)

Communication Ports Modbus and others (standard for this series)

Voltage Rating 480 V AC

Operating Temperature Typically 0 to 50°C (standard for Altivar 71)

Phase 3-phase

Storage Temperature -25 to 70°C

Frequency 50/60 Hz

Graphic Terminal Included

EMC Filter Integrated

Description

Schneider Electric's ATV71HC11N4 is a variable frequency drive for efficient motor control. This device supports a maximum motor power output of 110 kW, translating to 150 horsepower. It functions at a voltage level of 480 V AC. The ATV71HC11N4 drive's design accommodates 3-phase systems, ensuring compatibility with various industrial applications. Operating temperature conditions for this drive model range from 0 to 50°C, reflecting its suitability for both typical and challenging environments. The unit is also equipped with an integrated EMC filter, which minimizes electromagnetic interference, ensuring smooth operation in diverse settings.

A graphic terminal is included to facilitate user control and configuration. Storage capabilities extend from -25 to 70°C, enabling the drive to withstand various environmental conditions when not in operation. This variable frequency drive can work efficiently at 50 or 60 Hz frequencies. The ATV71HC11N4 drive weighs approximately 98.88 kg, making it a considerable yet manageable installation component.

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

110 kW, 3 phase 380...480 V

Maximum Horse Power Rating

150 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

163 A 480 V 3 phase 110 kW / 150 hp

202 A 380 V 3 phase 110 kW / 150 hp

EMC filter

Integrated

Assembly style

With heat sink

Variant

Reinforced version

Apparent power

133 kVA 380 V 3 phase 110 kW / 150 hp

Prospective line Isc

35 kA 3 phase

Nominal output current

215 A 2.5 kHz 380 V 3 phase 110 kW / 150 hp
 215 A 2.5 kHz 460 V 3 phase 110 kW / 150 hp
 Maximum transient current
 323 A 60 s 3 phase 110 kW / 150 hp
 355 A 2 s 3 phase 110 kW / 150 hp
 Output frequency
 0.1...500 Hz
 Nominal switching frequency
 2.5 kHz
 Switching frequency
 2.5...8 kHz adjustable
 2.5...8 kHz with derating factor
 Asynchronous motor control profile
 Voltage/frequency ratio (2 or 5 points)
 ENA (Energy adaptation) system for unbalanced loads
 Sensorless flux vector control (SFVC) (voltage or current vector)
 Flux vector control (FVC) with sensor (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
 Adjustable
 Not available in voltage/frequency ratio (2 or 5 points)
 Automatic whatever the load
 Suppressable
 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 2 x 100 mm² L1/R, L2/S, L3/T, U/T1, V/T2, W/T3)

Terminal 60 mm² PA, PB)

Terminal 2 x 150 mm² PC/-, PO, PA/+)

Tightening torque

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

212.4 lbf.in (24 N.m), 212 lb.in L1/R, L2/S, L3/T, U/T1, V/T2, W/T3)

106.2 lbf.in (12 N.m), 106 lb.in PA, PB)

362.9 lbf.in (41 N.m), 360 lb.in PC/-, PO, PA/+)

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), $> 16 \text{ V}$, $< 10 \text{ V}$

Positive logic (source) LI1...LI5), $< 5 \text{ V}$, $> 11 \text{ V}$

Negative logic (sink) LI6)if configured as logic input, $> 16 \text{ V}$, $< 10 \text{ V}$

Positive logic (source) LI6)if configured as logic input, $< 5 \text{ V}$, $> 11 \text{ V}$

Acceleration and deceleration ramps

Linear adjustable separately from 0.01 to 9000 s

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

S, U or customized

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

$> 1 \text{ mOhm}$ 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

40.2 in (1022 mm)

Depth

14.8 in (377 mm)

Width

14.2 in (360 mm)

Net Weight

233.7 lb(US) (106 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

69.5 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 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

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 61800-5-1

IEC 61800-3 environments 1 category C3

IEC 60721-3-3 class 3C2

IEC 61800-3

EN 55011 class A group 2

IEC 61800-3 environments 2 category C3

UL Type 1

Product Certifications

NOM 117

CSA

UL

C-tick

GOST

Pollution degree

2 IEC 61800-5-1

3 UL 840

IP degree of protection

IP20

Vibration resistance

0.6 gn (f= 10...200 Hz) conforming to IEC 60068-2-6

1.5 mm peak to peak (f= 3...10 Hz) conforming to IEC 60068-2-6

Shock resistance

7 gn 11 ms 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

3389119201049

Returnability

No

Packing Units

Unit Type of Package 1

PCE

Nbr. of units in pkg.

1

Package 1 Height

16.1 in (41.0 cm)

Package 1 Width

16.9 in (43.0 cm)

Package 1 Length

48.2 in (122.5 cm)

Package weight(Lbs)

202.8 lb(US) (92.0 kg)