

Schneider Series Service Manual

ATV61HC11N4

1. Description

SPEED DRIVE 150 HP 460 V ATV61

3. Product Information

SPEED DRIVE 150 HP 460 V ATV61
ATV61HC11N4
Main
Range of Product
Altivar 61
Product or Component Type
Variable speed drive
Product Specific Application
Pumping and ventilation machine
Component name
ATV61
Motor power kW
110 kW, 3 phase 380...480 V
Maximum Horse Power Rating
150 hp, 3 phase 380...480 V
power supply voltage
380...480 V - 15...10 %
supply number of phases
3 phase
Line current
168 A 480 V 3 phase 110 kW / 150 hp
202 A 380 V 3 phase 110 kW / 150 hp
EMC filter
Level 3 EMC filter
Assembly style
With heat sink
Apparent power
133 kVA 380 V 3 phase 110 kW / 150 hp
maximum prospective line Isc
35 kA 3 phase
Maximum transient current
258 A 60 s, 3 phase
Nominal switching frequency
2.5 kHz
Switching frequency
2...8 kHz adjustable
2.5...8 kHz with derating factor
asynchronous motor control
Voltage/frequency ratio, 5 points
Voltage/frequency ratio - Energy Saving, quadratic U/f
Voltage/frequency ratio, 2 points
Flux vector control without sensor, standard
Synchronous motor control profile
Vector control without sensor, standard
Communication Port Protocol
Modbus
CANopen
Type of polarization
No impedance Modbus
Option card
Communication card APOGEE FLN
Communication card BACnet
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

Communication card LonWorks
 Communication card METASYS N2
 Communication card Modbus Plus
 Communication card Modbus TCP
 Communication card Modbus/Uni-Telway
 Multi-pump card
 Communication card Profibus DP
 Communication card Profibus DP V1
 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
 Continuous output current
 215 A 2.5 kHz, 380 V - 3 phase
 215 A 2.5 kHz, 460 V - 3 phase
 Output frequency
 0.1...500 Hz
 Speed range
 1...100 in open-loop mode, without speed feedback
 Speed accuracy
 +/- 10 % of nominal slip 0.2 Tn to Tn without speed feedback
 Torque accuracy
 +/- 15 % in open-loop mode, without speed feedback
 Transient overtorque
 130 % of nominal motor torque +/- 10 % 60 s
 Braking torque
 <= 125 % with braking resistor
 30 % without braking resistor
 Regulation loop
 Frequency PI regulator
 Motor slip compensation
 Adjustable
 Not available in voltage/frequency ratio (2 or 5 points)
 Automatic whatever the load
 Can be suppressed
 diagnostic
 1 LED (red) for drive voltage
 Output voltage
 <= power supply voltage
 electrical isolation
 Between power and control terminals
 type of cable for mounting in an enclosure
 With an IP21 or an IP31 kit 3 IEC cable 104 °F (40 °C), copper 70 °C / PVC
 With UL Type 1 kit 3 UL 508 cable 104 °F (40 °C), copper 75 °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 / 2 x 250 kcmil L1/R, L2/S, L3/T, U/T1, V/T2, W/T3)
 Terminal 60 mm² / 250 kcmil PA, PB)
 Terminal 2 x 100 mm² / 2 x 250 kcmil 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)

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

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

External supply 24 V DC 19...30 V)

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

sampling time

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

2 ms +/- 0.5 ms AI2) - analog input

2 ms +/- 0.5 ms AO1) - analog output

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

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

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+)

+/- 0.15 % of maximum value AI2)

+/- 0.2 % AO1)

Analogue output number

1

Analogue output type

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

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

AO1 software-configurable logic output 10 V, 20 mA

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

maximum response time

<= 100 ms in STO (Safe Torque Off)

R1A, R1B, R1C <= 7 ms +/- 0.5 ms

R2A, R2B <= 7 ms +/- 0.5 ms

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 7 ms

R1, R2 2 A 30 V DC inductive, cos phi = 0.4 7 ms

R1, R2 5 A 250 V AC resistive, cos phi = 1 0 ms

R1, R2 5 A 30 V DC resistive, cos phi = 1 0 ms

Discrete input number

7

Discrete input type

Programmable LI1...LI5) 24 V DC <= 30 V)level 1 PLC - 3500 Ohm

Switch-configurable LI6) 24 V DC <= 30 V)level 1 PLC - 3500 Ohm

Switch-configurable PTC probe LI6)0...6 - 1500 Ohm

Safety input PWR) 24 V DC <= 30 V) - 1500 Ohm

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

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

Linear adjustable separately from 0.01 to 9000 s

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

Power removal 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

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

Net Weight

185.2 lb(US) (84 kg)

Width

12.6 in (320 mm)

Height

36.2 in (920 mm)

Depth
14.8 in (377 mm)

Environment

Noise level
60.5 dB 86/188/EEC

Dielectric strength
3535 V DC between earth and power terminals
5092 V DC between control and power terminals

Electromagnetic compatibility
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 3C2
EN 61800-3 environments 2 category C3
EN/IEC 61800-5-1
EN 61800-3 environments 1 category C3
EN 55011 class A group 2
UL Type 1
EN/IEC 61800-3

Product Certifications
GOST
CSA
C-tick
NOM 117
DNV
UL

Pollution degree
3 EN/IEC 61800-5-1
3 UL 840

degree of protection
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
IP00 EN/IEC 60529
IP00 EN/IEC 61800-5-1
IP30 on side parts EN/IEC 60529
IP30 on side parts EN/IEC 61800-5-1
IP30 on the front panel EN/IEC 60529
IP30 on the front panel EN/IEC 61800-5-1

Vibration resistance
0.6 gn (f= 10...200 Hz) conforming to EN/IEC 60068-2-6
1.5 mm peak to peak (f= 3...10 Hz) conforming to EN/IEC 60068-2-6

Shock resistance
7 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...113 °F (-10...45 °C) (without derating)
113...140 °F (45...60 °C) (with derating factor)

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

US1CP4C22138

Discount Schedule

CP4C

GTIN

3389118080614

Returnability

No

Packing Units

Unit Type of Package 1

PCE

Nbr. of units in pkg.

1

Package 1 Height

20.866 in (53.000 cm)

Package 1 Width

16.142 in (41.000 cm)

Package 1 Length

48.228 in (122.500 cm)

Package weight(Lbs)

253.532 lb(US) (115.000 kg)