

Schneider Series Service Manual

ATV61HD37N4Z

1. Description

ATV61HD37N4Z

3. Product Information

ATV61HD37N4Z

variable speed drive ATV61 - 37kW 50HP -

380...480V - IP20

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 37 kW 3 phases at 380...480 V

Motor power hp 50 hp 3 phases at 380...480 V

Power supply voltage 380...480 V (- 15...10 %)

Supply number of

phases

3 phases

Line current 84 A for 380 V 3 phases 37 kW / 50 hp

69 A for 480 V 3 phases 37 kW / 50 hp

EMC filter Level 3 EMC filter

Variant Without remote graphic terminal

Assembly style With heat sink

Apparent power 55.3 kVA for 380 V 3 phases 37 kW / 50 hp

Maximum prospective

line Isc

22 kA 3 phases

Maximum transient current

94.8 A for 60 s 3 phases

Nominal switching frequency

12 kHz

Switching frequency 12...16 kHz with derating factor

1...16 kHz adjustable

Asynchronous motor

control

Voltage/Frequency ratio, 2 points

Voltage/Frequency ratio, 5 points

Flux vector control without sensor, standard

Voltage/Frequency ratio - Energy Saving, quadratic

U/f

Synchronous motor

control profile

Vector control without sensor, standard

Communication port

protocol

CANopen

Modbus

Type of polarization No impedance for Modbus

Option card Profibus DP V1 communication card

Profibus DP communication card

Multi-pump card

Modbus/Uni-Telway communication card

Modbus TCP communication card

Modbus Plus communication card

METASYS N2 communication card

LonWorks communication card

Interbus-S communication card

I/O extension card

Fipio communication card

Ethernet/IP communication card

DeviceNet communication card
 Controller inside programmable card
 CC-Link communication card
 BACnet communication card
 APOGEE FLN communication card
 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 79 A at 12 kHz, 380 V 3 phases
 65 A at 12 kHz, 460 V 3 phases
 Speed drive output frequency 0.1...1000 Hz
 Speed range 1...100 in open-loop mode, without speed feedback
 Speed accuracy +/- 10 % of nominal slip for 0.2 Tn to Tn torque variation without speed feedback
 Torque accuracy +/- 15 % in open-loop mode, without speed feedback
 Transient overtorque 130 % of nominal motor torque, +/- 10 % for 60 s
 Braking torque 30 % without braking resistor
 <= 125 % with braking resistor
 Regulation loop Frequency PI regulator
 Motor slip compensation Adjustable
 Automatic whatever the load
 Can be suppressed
 Not available in voltage/frequency ratio (2 or 5 points)
 Diagnostic 1 LED red presence of drive voltage
 Output voltage <= power supply voltage
 Electrical isolation Between power and control terminals
 Type of cable for mounting in an enclosure Without mounting kit: 1-strand IEC cable at 45 °C, copper 90 °C XLPE/EPR
 Without mounting kit: 1-strand IEC cable at 45 °C, copper 70 °C PVC
 With UL Type 1 kit: 3-strand UL 508 cable at 40 °C, copper 75 °C PVC
 With an IP21 or an IP31 kit: 3-strand IEC cable at 40 °C, copper 70 °C PVC
 Electrical connection L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB terminal 50 mm² / AWG 1/0
 AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR terminal 2.5 mm² / AWG 14
 Tightening torque L1/R, L2/S, L3/T, U/T1, V/T2, W/T3, PC/-, PO, PA/+, PA, PB 12 N.m / 106.2 lb.in
 AI1-/AI1+, AI2, AO1, R1A, R1B, R1C, R2A, R2B, LI1...LI6, PWR 0.6 N.m
 Supply Internal supply 24 V DC (21...27 V), <= 200 mA for overload and short-circuit protection
 Internal supply for reference potentiometer (1 to 10 kOhm) 10.5 V DC +/- 5 %, <= 10 mA for overload and short-circuit protection
 External supply 24 V DC (19...30 V), 30 W
 Analogue input number 2
 Analogue input type AI2 software-configurable voltage 0...10 V DC, input voltage 24 V max, impedance 30000 Ohm, resolution 11 bits
 AI2 software-configurable current 0...20 mA, impedance 242 Ohm, resolution 11 bits
 AI1-/AI1+ bipolar differential voltage +/- 10 V DC, input voltage 24 V max, resolution 11 bits + sign
 Sampling time Discrete input LI6 (if configured as logic input) 2 ms, +/- 0.5 ms
 Discrete input LI1...LI5 2 ms, +/- 0.5 ms
 Analog output AO1 2 ms, +/- 0.5 ms
 Analog input AI2 2 ms, +/- 0.5 ms
 Analog input AI1-/AI1+ 2 ms, +/- 0.5 ms
 Absolute accuracy precision AO1 +/- 1 % for a temperature variation 60 °C
 AI2 +/- 0.6 % for a temperature variation 60 °C
 AI1-/AI1+ +/- 0.6 % for a temperature variation 60 °C
 Linearity error AO1 +/- 0.2 %
 AI2 +/- 0.15 % of maximum value
 AI1-/AI1+ +/- 0.15 % of maximum value

Analogue output number 1

Analogue output type AO1 software-configurable logic output 10 V, ≤ 20 mA

AO1 software-configurable voltage, analogue output range 0...10 V DC,

impedance 470 Ohm, resolution 10 bits

AO1 software-configurable current, analogue output range 0...20 mA, impedance

500 Ohm, resolution 10 bits

Discrete output number 2

Discrete output type R2A, R2B configurable relay logic NO, electrical durability 100000 cycles

R1A, R1B, R1C configurable relay logic NO/NC, electrical durability 100000 cycles

Maximum response time R2A, R2B ≤ 7 ms, tolerance ± 0.5 ms

R1A, R1B, R1C ≤ 7 ms, tolerance ± 0.5 ms

≤ 100 ms in STO (Safe Torque Off)

Minimum switching current Configurable relay logic 3 mA at 24 V DC

Maximum switching current R1, R2 on resistive load, 5 A at 30 V DC, $\cos \phi = 1$, L/R = 0 ms

R1, R2 on resistive load, 5 A at 250 V AC, $\cos \phi = 1$, L/R = 0 ms

R1, R2 on inductive load, 2 A at 30 V DC, $\cos \phi = 0.4$, L/R = 7 ms

R1, R2 on inductive load, 2 A at 250 V AC, $\cos \phi = 0.4$, L/R = 7 ms

Discrete input number 7

Discrete input type PWR safety input 24 V DC, voltage limits ≤ 30 V, impedance 1500 Ohm

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

LI6 switch-configurable 24 V DC, voltage limits ≤ 30 V, with level 1 PLC,

impedance 3500 Ohm

LI1...LI5 programmable 24 V DC, voltage limits ≤ 30 V, with level 1 PLC,

impedance 3500 Ohm

Discrete input logic LI6 (if configured as logic input)positive logic (source), < 5 V (state 0), > 11 V (state 1)

LI6 (if configured as logic input)negative logic (sink), > 16 V (state 0), < 10 V (state 1)

LI1...LI5 positive logic (source), < 5 V (state 0), > 11 V (state 1)

LI1...LI5 negative logic (sink), > 16 V (state 0), < 10 V (state 1)

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 Motor thermal protection

Motor power removal

Motor motor phase break

Drive thermal protection

Drive short-circuit between motor phases

Drive power removal

Drive overvoltages on the DC bus

Drive overheating protection

Drive overcurrent between output phases and earth

Drive line supply undervoltage

Drive line supply overvoltage

Drive input phase breaks

Drive break on the control circuit

Drive against input phase loss

Drive against exceeding limit speed

Insulation resistance > 1 mOhm at 500 V DC for 1 minute to earth

Frequency resolution Display unit 0.1 Hz

Analog input 0.024/50 Hz

Type of connector Male SUB-D 9 on RJ45 for CANopen

1 RJ45 for Modbus on terminal

1 RJ45 for Modbus on front face

Physical interface 2-wire RS 485 for Modbus

Transmission frame RTU for Modbus

Transmission rate 9600 bps, 19200 bps for Modbus on front face

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

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

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

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

Number of addresses 1...247 for Modbus

1...127 for CANopen

Method of access Slave for CANopen

Marking CE

Operating position Vertical +/- 10 degree

Product weight 37 kg

Width 240 mm

Height 550 mm

Depth 266 mm

Environment

Noise level 64 dB conforming to 86/188/EEC

Dielectric strength 5092 V DC between control and power terminals

3535 V DC between earth and power terminals

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

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

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

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

Conducted radio-frequency immunity test conforming to IEC 61000-4-6 level 3

Standards EN 55011 class A group 2

EN 61800-3 environments 1 category C3

EN 61800-3 environments 2 category C3

EN/IEC 61800-3

EN/IEC 61800-5-1

IEC 60721-3-3 class 3C1

IEC 60721-3-3 class 3S2

UL Type 1

Product certifications CSA

C-Tick

DNV

GOST

NOM 117

UL

Pollution degree 3 conforming to UL 840

3 conforming to EN/IEC 61800-5-1

Degree of protection IP54 on lower part conforming to EN/IEC 61800-5-1

IP54 on lower part conforming to EN/IEC 60529

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

IP41 on upper part conforming to EN/IEC 60529

IP21 conforming to EN/IEC 61800-5-1

IP21 conforming to EN/IEC 60529

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

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

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

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

Shock resistance 15 gn for 11 ms conforming to EN/IEC 60068-2-27

Relative humidity 5...95 % without dripping water conforming to IEC 60068-2-3

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

Ambient air temperature for operation 50...60 °C with derating factor

-10...50 °C without derating

Ambient air temperature for storage -25...70 °C

Operating altitude 1000...3000 m with current derating 1 % per 100 m

<= 1000 m without derating