

Schneider Series Service Manual

ATV312H018M2

1. Description

ATV312H018M2

3. Product Information

ATV312H018M2

variable speed drive ATV312 - 0.18kW - 0.6kVA -

24W - 200..240 V- 1-phase supply

Main

Range of product Altivar 312

Product or component type Variable speed drive

Product destination Asynchronous motors

Product specific application Simple machine

Assembly style With heat sink

Component name ATV312

Motor power kW 0.18 kW

Motor power hp 0.25 hp

[Us] rated supply voltage 200...240 V (- 15...10 %)

Supply frequency 50...60 Hz (- 5...5 %)

Network number of phases Single phase

Line current 3 A for 200 V, 5 kA

2.5 A for 240 V

EMC filter Integrated

Apparent power 0.6 kVA

Maximum transient current 2.3 A for 60 s

Power dissipation in W 24 W at nominal load

Speed range 1...50

Asynchronous motor control profile Sensorless flux vector control with PWM type motor control signal

Factory set : constant torque

Electrical connection AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6 terminal 2.5 mm² AWG 14

L1, L2, L3, U, V, W, PA, PB, PA/+, PC/- terminal 2.5 mm² AWG 14

Supply Internal supply for logic inputs at 19...30 V, ≤ 100 mA for overload and short-circuit protection

Internal supply for reference potentiometer (2.2 to 10 kOhm) at 10...10.8 V, ≤ 10 mA for overload

and short-circuit protection

Communication port protocol Modbus

CANopen

IP degree of protection IP20 on upper part without cover plate

IP21 on connection terminals

IP31 on upper part

Option card CANopen daisy chain communication card

DeviceNet communication card

Fipio communication card

Modbus TCP communication card

Profibus DP communication card

Complementary

Supply voltage limits 170...264 V

Network frequency 47.5...63 Hz

Prospective line Isc 5 kA

Continuous output current 1.5 A at 4 kHz

Output frequency 0...500 kHz

Nominal switching frequency 4 kHz

Switching frequency 2...16 kHz adjustable

Transient overtorque 170...200 % of nominal motor torque

Braking torque 100 % with braking resistor continuously

150 % without braking resistor

150 % with braking resistor for 60 s

Regulation loop Frequency PI regulator

Motor slip compensation Automatic whatever the load

Suppressable

Adjustable

Output voltage ≤ power supply voltage

Tightening torque 0.6 N.m AI1, AI2, AI3, AOV, AOC, R1A, R1B, R1C, R2A, R2B, LI1...LI6

0.8 N.m L1, L2, L3, U, V, W, PA, PB, PA/+, PC/-

Insulation Electrical between power and control

Analogue input number 3

Analogue input type AI1 configurable voltage 0...10 V, input voltage 30 V max, impedance 30000 Ohm

AI2 configurable voltage +/- 10 V, input voltage 30 V max, impedance 30000 Ohm

AI3 configurable current 0...20 mA, impedance 250 Ohm

Sampling duration AI1, AI2, AI3 8 ms for analog

LI1...LI6 4 ms for discrete

Response time AOV, AOC 8 ms for analog

R1A, R1B, R1C, R2A, R2B 8 ms for discrete

Linearity error +/- 0.2 % for output

Analogue output number 1

Analogue output type AOC configurable current 0...20 mA, impedance 800 Ohm, resolution 8 bits

AOV configurable voltage 0...10 V, impedance 470 Ohm, resolution 8 bits

Discrete input logic (LI1...LI4) logic input not wired, < 13 V (state 1)

(LI1...LI6) negative logic (source), > 19 V (state 0)

(LI1...LI6) positive logic (source), < 5 V (state 0), > 11 V (state 1)

Discrete output number 2

Discrete output type (R1A, R1B, R1C) configurable relay logic 1 NO + 1 NC, electrical durability 100000 cycles

(R2A, R2B) configurable relay logic NC, electrical durability 100000 cycles

Minimum switching current R1-R2 10 mA at 5 V DC

Maximum switching current R1-R2 on inductive load, 2 A at 250 V AC, (cos phi = 0.4, and L/R = 7 ms)

R1-R2 on inductive load, 2 A at 30 V DC, (cos phi = 0.4, and L/R = 7 ms)

R1-R2 on resistive load, 5 A at 250 V AC, (cos phi = 1, and L/R = 0 ms)

R1-R2 on resistive load, 5 A at 30 V DC, (cos phi = 1, and L/R = 0 ms)

Discrete input number 6

Discrete input type (LI1...LI6) programmable, 24 V 0...100 mA with PLC, impedance 3500 Ohm

Acceleration and deceleration ramps S, U or customized

Linear adjustable separately from 0.1 to 999.9 s

Braking to standstill By DC injection

Protection type Input phase breaks drive

Line supply overvoltage and undervoltage safety circuits drive

Line supply phase loss safety function, for three phases supply drive

Motor phase breaks drive

Overcurrent between output phases and earth (on power up only) drive

Overheating protection drive

Short-circuit between motor phases drive

Thermal protection motor

Insulation resistance >= 500 mOhm at 500 V DC for 1 minute

Local signalling 1 LED red for drive voltage

Four 7-segment display units for CANopen bus status

Time constant 5 ms for reference change

Frequency resolution Analog input 0.1...100 Hz

Display unit 0.1 Hz

Type of connector 1 RJ45 Modbus/CANopen

Physical interface RS485 multidrop serial link

Transmission frame RTU

Transmission rate 10, 20, 50, 125, 250, 500 kbps or 1 Mbps CANopen

4800, 9600 or 19200 bps Modbus

Number of addresses 1...247 Modbus

1...127 CANopen

Number of drive 127 CANopen

31 Modbus

Marking CE

Operating position Vertical +/- 10 degree

Height 145 mm

Width 72 mm

Depth 132 mm

Product weight 1.5 kg

Environment

Dielectric strength 2040 V DC between earth and power terminals

2880 V AC between control and power terminals

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

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

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

1.2/50 μ s - 8/20 μ s surge immunity test conforming to IEC 61000-4-5 level 3

Standards IEC 61800-3

IEC 61800-5-1

Product certifications NOM

CSA

UL

GOST

DNV

C-Tick

Pollution degree 2

Protective treatment TC

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

1 gn ($f = 13 \dots 150$ 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 condensation conforming to IEC 60068-2-3

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

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

Ambient air temperature for operation -10...50 °C without derating with protective cover on top of the drive

-10...60 °C with derating factor without protective cover on top of the drive

Operating altitude ≤ 1000 m without derating

1000...2000 m with current derating 1 % per 100 m