

Autonics Controller Integrated 2-Phase Closed-Loop Stepper Motor Driver [AC type, Frame size 60/86, RS485 Comm.] AiCA-D SERIES

INSTRUCTION MANUAL

Thank you for choosing our Autonics product. Please read the following safety considerations before use.

Safety Considerations

Please observe all safety considerations for safe and proper product operation to avoid hazards. Failure to follow these instructions may result in personal injury, economic loss or fire.

- Warning Failure to follow these instructions may result in serious injury or death.
Caution Failure to follow these instructions may result in personal injury or product damage.

Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.
Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.
Check 'Connections' before wiring.
For installing the unit, ground it exclusively and use over AWG 18 (0.75 mm²) ground cable.
Do not disassemble or modify the unit.
Insulate the connector not to be exposed.
Do not touch the unit during or after operation for a while.
Do not remove the connector during or after operation for a while.
Emergency stop directly when error occurs.

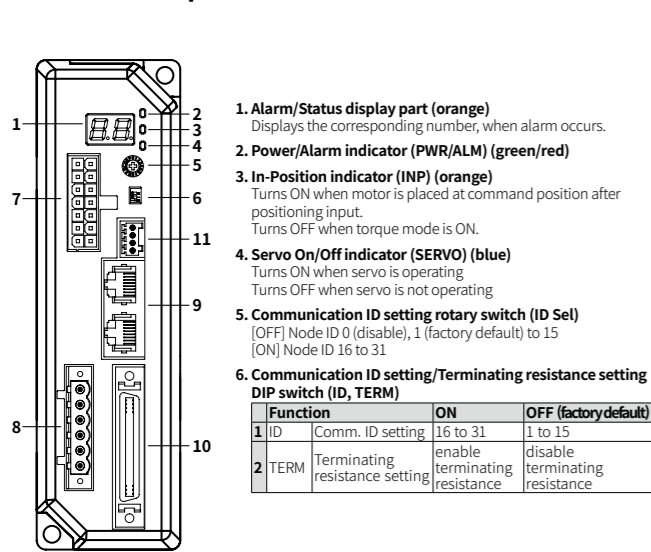
Caution

- When connecting the power input, use AWG 18 (0.75 mm²) cable or over.
Brake is non-polar. When connecting the brake, use AWG 22 (0.3 mm²) cable or over.
Install overcurrent prevention device (e.g. the current breaker, etc) to connect the driver with power.
Check the control input signal before supplying power to the driver.
Install a safety device to maintain the vertical position after turn off the power of this driver.
Use the unit within the rated specifications.
Use a dry cloth to clean the unit and do not use water or organic solvent.
The driver may overheat depending on the environment.
Keep metal chip, dust and wire residue from flowing into the unit.
Use the designated motor only.

Product Components

- Before use the product, check all components are contained. The components are contained each one.
Motor driver, Instruction manual, Power connector, Communication protect connector, I/O connector, Brake connector.
The brake connector is only included in built-in brake model.

Unit Descriptions



The above specifications, dimensions, etc. are subject to change and some models may be discontinued without notice. Be sure to follow cautions written in the instruction manual, user manual and the technical descriptions (catalog, website).

Specifications

Table with columns: Model, Power supply, Main power, Auxiliary power, STOP current, Rotation speed, Resolution, Applied motor, Speed filter, Motor GAIN, Positioning range, In-Position, Motor rotation direction, Status indicator, I/O, External power supply, Operation mode, Index step, Program function, RS485 Comm., Multi-axial control, ID setting switch, Alarm, Warning, Input resistance, Insulation resistance, Dielectric strength, Vibration, Shock, Environ-ment, Protection structure, Sold separately, Approval, Weight.

- Specifications notes: Model name indicates driver type, based on ambient temperature, RUN current varies depending on input frequency, auxiliary power is only available in built-in brake type, settable with dedicated program, brake ON/OFF function can be changed, cable length, EMC standard, cable length should be below 2m, moving type motor+encoder cable, weight includes packaging, environment resistance.

7. Motor+Encoder connector (CN1)

Table with columns: Pin, Function, Pin, Function. Includes GND, Encoder A, Encoder B, Encoder Z, PE, Motor A, Motor B.

8. Power connector (CN2)

Table with columns: Pin, Function, Pin, Function. Includes Regenerative resistance, N-C, AC power input, PE.

9. Communication connector (CN3)

Table with columns: Pin, Function, Pin, Function. Includes N-C, RS485 DATA+, N-C, N-C, RS485 DATA-, N-C, N-C.

10. I/O connector (CN4)

Table with columns: Pin, Function, Pin, Function, Pin, Function, Pin, Function. Includes N-C, MD1/HMD1, IN1, Compare2, N-C, Pause, IN2, OUT0, Reset, Servo On/Off, N-C, OUT1, Start, Home, IN3, OUT2, Stop, Alarm Reset, IN4, OUT3, EMG, +Limit, IN5, OUT4, Step0/+Run/+Jog, -Limit, IN6, OUT5, Step1/-Run/-Jog, ORG, IN7, OUT6, Step2/SSP0, SD, IN8/Brake ON/OFF, Step3/SSP1, In-Position, VEX, OUT7, Step4/MSP0, VEX, GEX, OUT8, Step5/MSP1, GEX, Alarm, OUT9, MD0/HMD0, IN0, Compare1.

11. Brake connector (CN5)

Table with columns: Pin, Function, Pin, Function. Includes 24VDC, GND, Brake+, Brake-.

Connector specifications

Table with columns: Type, Recommended specifications, Manufacture. Lists Motor+Encoder, Power, Communication, I/O connector, Brake connector with their respective specifications and manufacturers.

Configuration Diagram & Cautions for Wiring

In case of unwanted noise generating from peripherals and power, use ferrite core in the wiring. The thickness of cable should be same or thicker than the below specifications when connecting the cable for connector.

- When connecting wires, please purchase separately. Noise filter for signal line, Noise filter for power, Surge protector, Circuit breaker.

Table with columns: Type, Model, Manufacture. Lists Motor line, I/O signal line, Power line, Comm. line with models like 28A5776-0A2 and manufacturer Lairdtech.

When connecting power, please purchase separately. Regenerative resistance. Connect Pin no. 1, 2 on power connector (CN2). Use in condition of the high inertial load or the short deceleration time.

Table with columns: Model, Specification, Manufacture. Lists IRC100 with specifications for resistance, rated power, and max. leakage current.

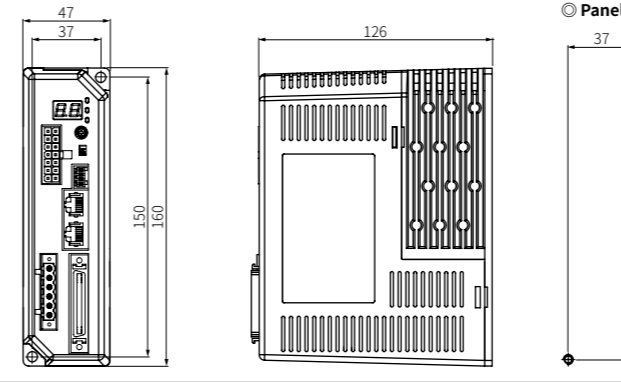
Table with columns: Model, Specification, Manufacture. Lists RNS-2006 with specifications for rated voltage, rated current, and max. leakage current.

Surge protector. Protect the product from external noise and surge by connecting power. Be sure to disconnect the surge protector when testing internal pressure.

Table with columns: Model, Specification, Manufacture. Lists LT-C12G801W with specifications for nominal and max. discharge current and voltage protection level.

Circuit breaker

Dimensions



Installation

- Install on the metal plate with high thermal conductivity for heat dissipation of the driver.
Install in the well-ventilated area and install the cooling fan in the unventilated environment.
Failure to heat dissipation may result in damage or malfunction due to the stress on the product.
Check the environment of use within the rated specifications and install on the well-heat dissipated area.
In case of installing the drivers more than two, keep distance at least 20mm in the horizontal direction and at least 25mm in the vertical direction.

Alarm/Warning Display

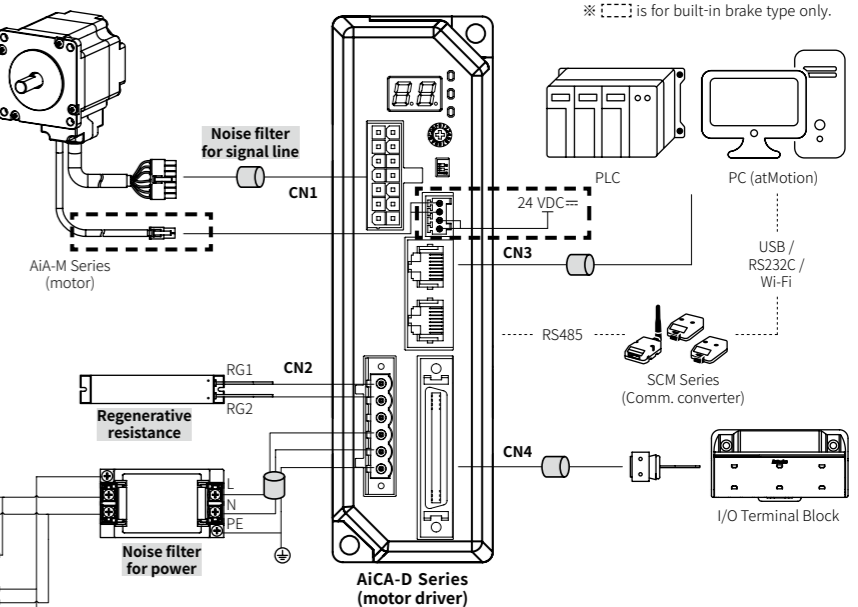
Depending on the alarm/warning type, it displays as a segment on the Alarm/Status display part. Depending on the alarm type, it flashes for 0.4 sec interval and it turns OFF for 0.8 sec repeatedly.

Table with columns: Alarm/Status, ALM (flashing), Alarm type, Alarm/Status, ALM (flashing), Alarm type. Lists various error types like Overcurrent error, Overspeed error, Position tracking error, etc.

Corresponding alarm is built-in brake type only.

When warning occurs, it may result in damage of the product. (maintain operation) Take appropriate troubleshoot for each warning.

Table with columns: Alarm/Status, Warning type. Lists +Software limit, -Software limit, +Hardware limit, -Hardware limit, Overload warning, Position override warning.



Manual

For the detail information and instructions, please refer to user manual, communication manual, library manual and quick manual, and be sure to follow cautions written in the technical descriptions (catalog, website). Visit our website (www.autonics.com) to download manuals.

Motion Device Management Program [atMotion]

atMotion provides GUI control for easy and convenient parameter setting and monitoring data management of multiple devices. Visit our website (www.autonics.com) to download the user manual and software.

Table with columns: Item, Minimum requirements. Lists System (IBM PC compatible), Operations (Microsoft Windows), Memory (256 MB+), Hard disk (1 GB+), VGA (Resolution: 1024 x 768 or higher), Others (RS232C serial port, USB port).

Troubleshooting

Table with columns: Malfunction, Causes, Troubleshooting. Lists issues like communication not connected, servo not on, alarm occurs, motor direction not correct, motor drive unstable.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
It is recommended to use 485 converter with the separate power.
Use designated cable to extend motor+encoder wire.
Install vertically so that the Alarm/Status display part located on top.
Keep the distance between power cable and signal cable more than 10cm.
Do not input external signal until the driver is initialized (In-Position LED ON) after power is applied.
Motor vibration and noise can occur in specific frequency period.
Change motor installation method or attach the damper.
Use and set the gain value.
For using motor, it is recommended to maintenance and inspection regularly.
Unwinding bolts and connection parts for the unit installation and load connection.
Strange sound from ball bearing of the unit.
Damage and stress of lead cable of the unit.
Connection error with motor.
Inconsistency between the axis of motor output and the center, concentric (eccentric, declination) of the load, etc.
This product does not prepare protection function for a motor.
This unit may be used in the following environments.
Indoors (in the environment condition rated in 'Specifications')
Altitude max. 2,000 m
Pollution degree 2
Installation Category II

