

Installation instructions

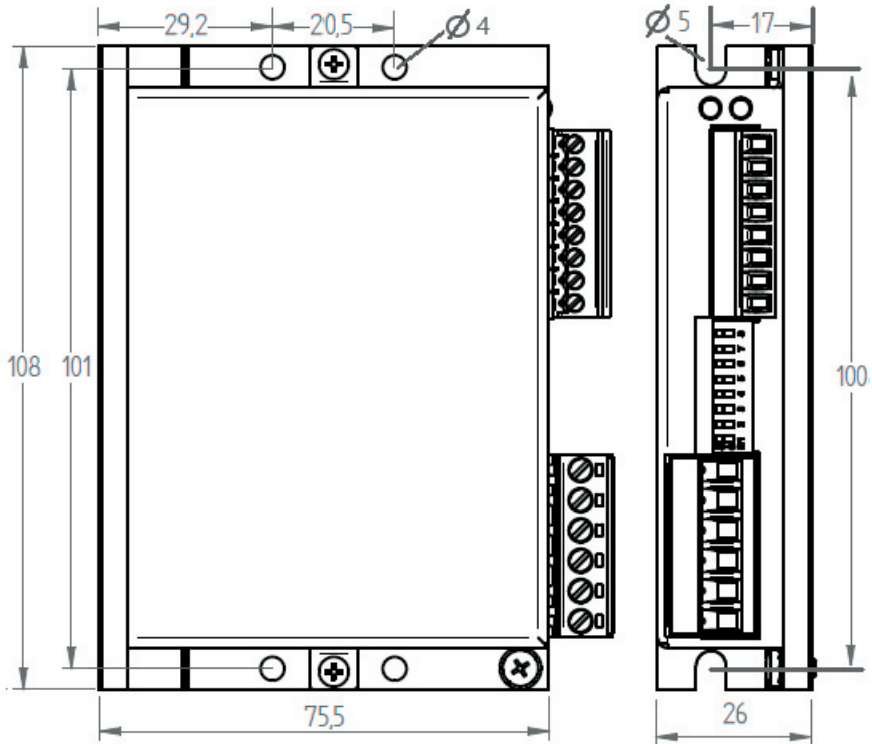
i For more information about drive installation, use and maintenance refer to user manual available at <http://www.everelettronica.it/manhw.html>



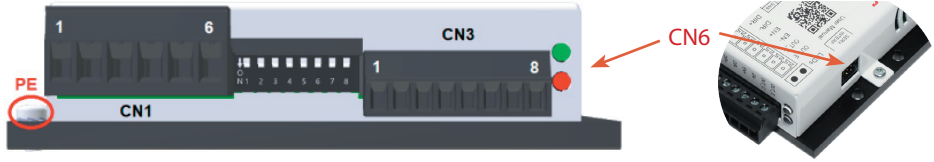
2 phase step motor bipolar chopper drive technical data

- DC power supply : 24 ± 48 Vdc (EPDO-04) or 24 ± 75 Vdc (EPDO-08)
- Phase current: 1.0 ± 4.5 Apeak (EPDO-04) or 2.4 ± 7.8 Apeak (EPDO-08)
- Chopper frequency: ultrasonic 40 kHz
- Emulated Step angle: Full Step, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{64}$, $\frac{1}{128}$, $\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{20}$, $\frac{1}{25}$, $\frac{1}{30}$, $\frac{1}{36}$, $\frac{1}{50}$, $\frac{1}{100}$ configurable by means of Dip-Switches and other step angle could be defined by software
- Protections against: over current, over/under voltage, overheating, short circuit between motor phase-to-phase and phase-to-ground
- Service SCL interface for programming and real time debugging
- Dimensions: $108 \times 75.5 \times 26$ mm (without connectors)
- Protection degree: IP20
- Pollution degree: 2
- Working temperature $5^{\circ}\text{C} + 40^{\circ}\text{C}$; Storage temperature $-25^{\circ}\text{C} + 55^{\circ}\text{C}$
- Humidity: $5\% + 85\%$ not condensing

Mechanical drawing



Connections



CN1: Power supply and Motor

6 position, pitch 5.08mm, PCB header connector

| | | | |
|-------|-----|---------|-----------------------|
| CN1.1 | V+ | PWR_IN | Power supply Voltage |
| CN1.2 | GND | PWR_IN | Power supply GND |
| CN1.3 | A | PWR_OUT | Motor Output phase A |
| CN1.4 | A/ | PWR_OUT | Motor Output phase A/ |
| CN1.5 | B | PWR_OUT | Motor Output phase B |
| CN1.6 | B/ | PWR_OUT | Motor Output phase B/ |

CN3: Digital inputs and output

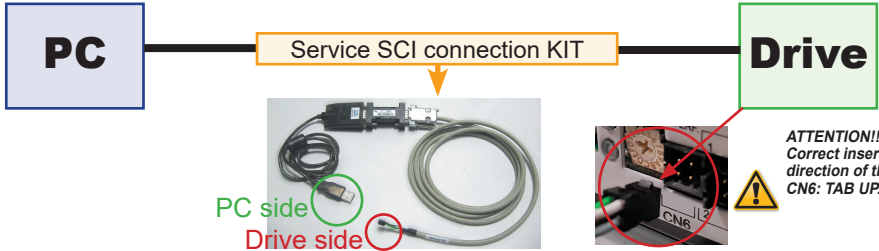
8 position, pitch 3.81mm, PCB header connector

| | | | |
|-------|-------|---------|---------------------------------------|
| CN3.1 | Step+ | DIG_IN | Clock frequency + input (Clock_up +) |
| CN3.2 | Step- | DIG_IN | Clock frequency - input (Clock_up -) |
| CN3.3 | Dir+ | DIG_IN | Motor direction + input (Clock_down+) |
| CN3.4 | Dir- | DIG_IN | Motor direction - input (Clock_down-) |
| CN3.5 | En+ | DIG_IN | Enable + input |
| CN3.6 | En- | DIG_IN | Enable - input |
| CN3.7 | OUT_C | DIG_OUT | Fault output collector side |
| CN3.8 | OUT_E | DIG_OUT | Fault output emitter side |

Service SCI connection



This connection is **only** possible with hardware and software provided by Ever.
Kit code: LW3_SERV00-SL



ATTENTION!!!
Correct insertion
direction of the
CN6: TAB UP.

Dip-Switches settings

| Motor phase current (Apeak) | | DIPs | | | Default |
|-----------------------------|-------|------|-----|-----|---------|
| | | SW1 | SW2 | SW3 | |
| 4.5 A | 7.8 A | OFF | OFF | OFF | |
| 4.0 A | 7.0 A | ON | OFF | OFF | |
| 3.5 A | 6.4 A | OFF | ON | OFF | |
| 3.0 A | 5.6 A | ON | ON | OFF | |
| 2.5 A | 4.8 A | OFF | OFF | ON | |
| 2.0 A | 4.0 A | ON | OFF | ON | |
| 1.5 A | 3.2 A | OFF | ON | ON | |
| 1.0 A | 2.4 A | ON | ON | ON | X |

| SW4 | Current reduction range | Default |
|-----|-------------------------------|---------|
| OFF | Idle current reduction to 90% | |
| ON | Idle current reduction to 50% | X |



NOTE: the device reads the Dip-Switches only during Power up. If it's necessary a setting change, shut down the system, change the settings and start the up the system again to make the changes operating.

| Microstep value | DIPs | | | | Default |
|-----------------|------|-----|-----|-----|---------|
| | SW5 | SW6 | SW7 | SW8 | |
| 20.000 | OFF | OFF | OFF | OFF | X |
| 10.000 | ON | OFF | OFF | OFF | |
| 7200 | OFF | ON | OFF | OFF | |
| 6000 | ON | ON | OFF | OFF | |
| 5000 | OFF | OFF | ON | OFF | |
| 4000 | ON | OFF | ON | OFF | |
| 2000 | OFF | ON | ON | OFF | |
| 1000 | ON | ON | ON | OFF | |
| 25600 | OFF | OFF | OFF | ON | |
| 12800 | ON | OFF | OFF | ON | |
| 6400 | OFF | ON | OFF | ON | |
| 3200 | ON | ON | OFF | ON | |
| 1600 | OFF | OFF | ON | ON | |
| 800 | ON | OFF | ON | ON | |
| 400 | OFF | ON | ON | ON | |
| 200 | ON | ON | ON | ON | |

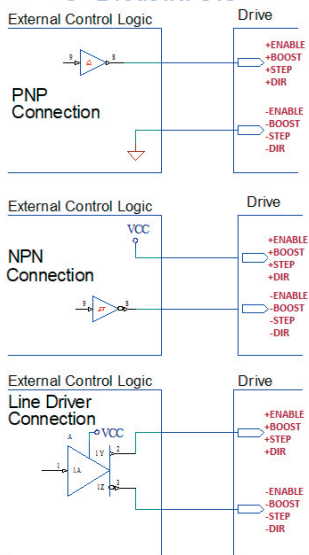
Working status (LEDs)

| Visualization status | | Description |
|----------------------|---|----------------------------------|
| 1 | ● Green ON | Driver enabled |
| 2 | ○ Green Blinking (1sec) | Driver disabled |
| 3 | ● Red ON | Motor is in open phase condition |
| 4 | ○ Red Blinking (100ms) | Motor phase shortcut |
| 5 | ● Green ON (1sec) + ● Red ON (1sec) | Over voltage |
| 6 | ● Green ON (1sec) + ● Red ON (1sec) + ● Red ON (1sec) + ● Red ON (1sec) | Under voltage |
| 7 | ● Green ON (1sec) + ● Red ON (1sec) + ● Red ON (1sec) + ● Red ON (1sec) | Over temperature |

Connection to the digital inputs

i Differential PNP, NPN and Line Driver type.

5 - 24Vdc INPUTS

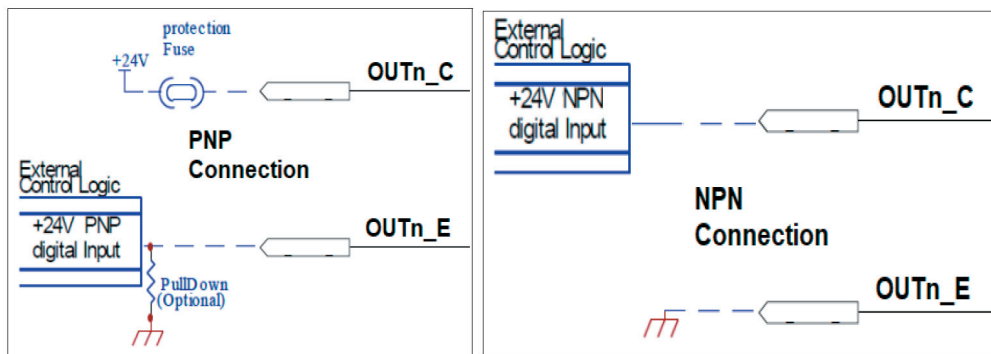


| Standard (EN) | | | |
|-----------------------------|------|------|------|
| Characteristics | MIN. | MAX. | Unit |
| Supply Voltage | 5 | 24 | Vdc |
| Inputs Frequency | --- | 20 | kHz |
| Threshold switching voltage | --- | 2 | Vdc |
| Current at 5Vdc | --- | 6 | mA |
| Current at 24 Vdc | --- | 15 | mA |

| High speed (STEP & DIR) | | | |
|-----------------------------|------|------|------|
| Characteristics | MIN. | MAX. | Unit |
| Supply Voltage | 5 | 24 | Vdc |
| Inputs Frequency | --- | 200 | kHz |
| Threshold switching voltage | --- | 2.5 | Vdc |
| Current at 5Vdc | --- | 6 | mA |
| Current at 24 Vdc | --- | 15 | mA |

Digital outputs connection

i Digital outputs are 5-24 Vdc PNP/NPN, $I_{outmax} = 100\text{ mA}$
 $F_{max} = 2\text{ kHz}$



Mating connectors

| Connector | Description |
|-----------|-----------------|
| CN1 | Phoenix 1758830 |
| CN3 | Phoenix 1839694 |

Cables section

| Function | Cable | |
|-------------------|------------------------------|-----------------------------|
| | Minimum | Maximum |
| Power supply & PE | 0.5 mm ² (AWG20) | 2.5 mm ² (AWG12) |
| Motor output | 0.5 mm ² (AWG20) | 2.5 mm ² (AWG12) |
| Digital inputs | 0.08 mm ² (AWG28) | 0.5 mm ² (AWG20) |
| Digital output | 0.08 mm ² (AWG28) | 0.5 mm ² (AWG20) |

Verify the installation

- Check all connections: Power supply, Stepper motor and control logics.
- Make sure that all settings are correct for the application.
- Make sure that the characteristics of the DC power supply are appropriate for the drive.
- If possible, remove the load from the rotor of the motor to avoid wrong movements and eventual damages.
- Supply power and make sure that the green led is on or blinking. If the led is OFF, shut down immediately and check if all connections are correct.
- Enable the current in the motor (without STEP Clock) and, if possible, verify the presence of the Holding Torque.
- Execute a movement of some steps and verify if the rotation direction is the desired one.

i If the motion direction is not the desired one, it is possible to change it leaving the DIR input unchanged and reversing the connection of a single phase of the motor to CN1, for example A with A1.

- Disconnect the power supply, fix the motor to the load and check the full functionality.

Analysis of malfunctions

When any of the following situations occur, the drive is placed in a error condition.



| DEFECT | CAUSE | ACTION |
|--|--|---|
| Intervention of the thermal protection. | Can be caused due to a heavy working cycle or a high current in the motor. | Improve the drive cooling by a decent air flow or a fan. Consider to use a motor with a higher torque vs. current rating. |
| Intervention of the current protection. | Short circuit to the motor output stage(s) of the drive. | Check motor windings and cables and remove the short circuits replacing the faulty cables or the motor if necessary. |
| Intervention of the over/under voltage protection. | Supply voltage out of range. | Check the value of the supply voltage. |
| Open phase motor protection. | Open circuit from motor windings and drive. | Check motor cables and connections to the drive. |

At any of the following situations occur, the drive doesn't work and isn't placed in an error condition.



| DEFECT | CAUSE | ACTION |
|--|---|--|
| Noisy motor movement with vibrations. | Can be caused due to a lack of power supply to a phase of the motor, a poor regulation of the winding currents. | Check the cables and connections of the motor and/or change the motor speed to exit a resonance region. |
| The external fuse on the power supply of the drive is burned | Can be caused by a wrong connection of the power supply. | Connect the power supply correctly and replace the fuse. |
| At high speed, the motor torque is not enough. | It can be due to a motor current self-limitation. | Increase the motor current (always within the limits), increase the supply voltage, change motor connection from series to parallel. |

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