


Installation instructions

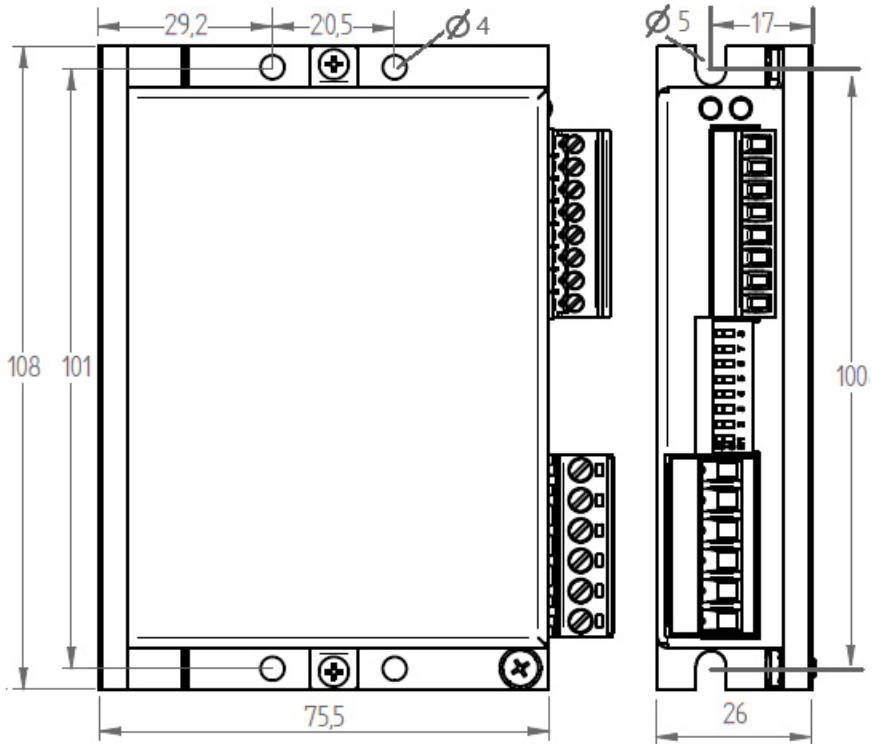
 For more information about drive installation, use and maintenance



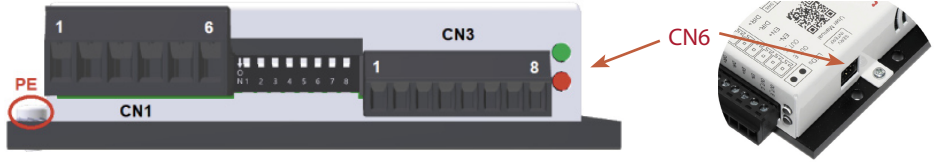
2 phase step motor bipolar chopper drive technical data

- 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

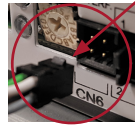
CN1.1	V+	PWR_IN	Power supply Voltage
CN1.2	GND	PWR_IN	Power supply GND
CN1.3	A	PWR_OUT	Motor Output phase A
CN1.4	A/	PWR_OUT	Motor Output phase A/
CN1.5	B	PWR_OUT	Motor Output phase B
CN1.6	B/	PWR_OUT	Motor Output phase B/

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	

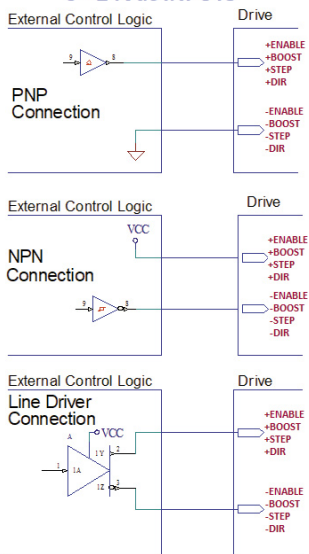
Working status (LEDs)

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 shourtcut
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

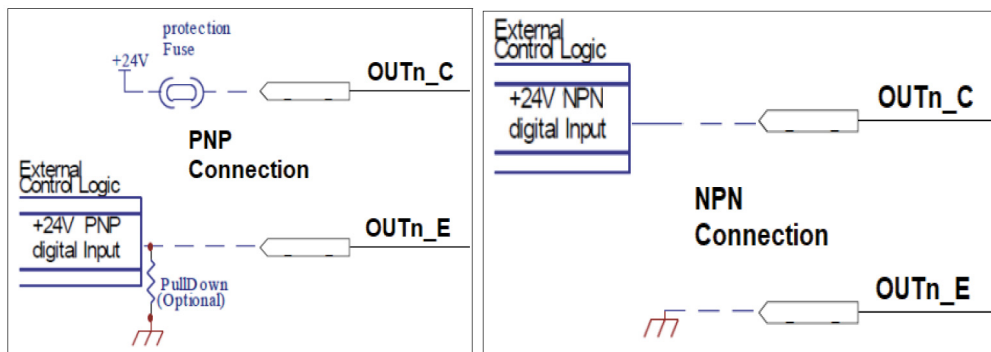


Standard (EN)			
Characteristics	MIN.	MAX.	Unit
Supply Voltage	5	24	Vdc
Inputs Frequency	---	20	kHz
Threshold switching voltage	---	2	Vdc
Current at 5Vdc	---	6	mA
Current at 24 Vdc	---	15	mA

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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