**HB3922 three-phase digital driver**

HB3922 is a three-phase hybrid stepping motor driver based on DSP control. It is a new generation of digital stepping motor driver composed of advanced DSP control chip and three-phase inverter drive module. The drive voltage is AC110-220V, the adaptive current is below 9.0A, and the outer diameter is 57-130MM. The internal circuit of the driver is similar to the servo control principle. This circuit can make the motor run smoothly without vibration and noise. At high speed, the torque of the motor is much higher than that of the two-phase and five-phase hybrid stepping motor. The positioning accuracy can reach up to 60000 steps/revolution. This product is widely used in engraving machines, medium-sized CNC machine tools, computer embroidery machines, packaging machinery and other large and medium-sized CNC equipment with high resolution.

Characteristic ：

·With 16-gear equal-angle constant moment subdivision, the maximum resolution is 60000 steps/revolution

·The maximum reaction frequency can reach 200KPPS

·When the step pulse stops for more than 1.5S, the coil current will automatically decrease to half of the set current

·Photoelectric isolation signal input/output

·Drive current 1.5A/phase to 9.0A phase, 16 gears adjustable

·Single power input, voltage range：AC180-240V

·Phase memory function (note: after the input stops for more than 3 seconds, the driver will automatically remember the current motor phase, power on again or the WF signal will change from low level to high level, and the driver will automatically recover the motor phase)

Current setting

The operating current of the driver is set by the SW1-SW4 terminal, and the operating current is the normal operating output current setting switch (see the following table for details)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SW1** | **SW2** | **SW3** | **SW4** | **RMS(A)** |
| OFF | OFF | OFF | OFF | 1.5 |
| OFF | OFF | OFF | ON | 2.0 |
| OFF | OFF | ON | OFF | 2.6 |
| OFF | OFF | ON | ON | 3.0 |
| OFF | ON | OFF | OFF | 3.3 |
| OFF | ON | OFF | ON | 3.9 |
| OFF | ON | ON | OFF | 4.2 |
| OFF | ON | ON | ON | 4.7 |
| ON | OFF | OFF | OFF | 5.2 |
| ON | OFF | OFF | ON | 5.8 |
| ON | OFF | ON | OFF | 6.5 |
| ON | OFF | ON | ON | 6.9 |
| ON | ON | OFF | OFF | 7.5 |
| ON | ON | OFF | ON | 8.0 |
| ON | ON | ON | OFF | 8.5 |
| ON | ON | ON | ON | 9.0 |

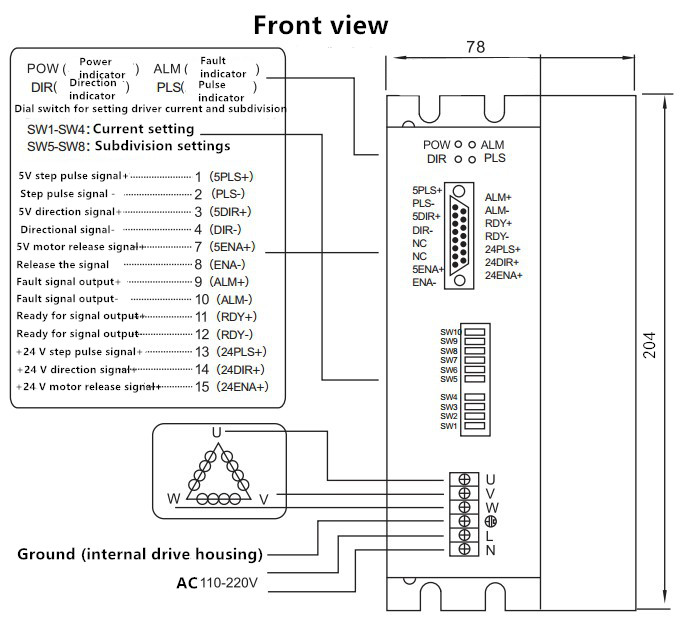
Subdivision settings

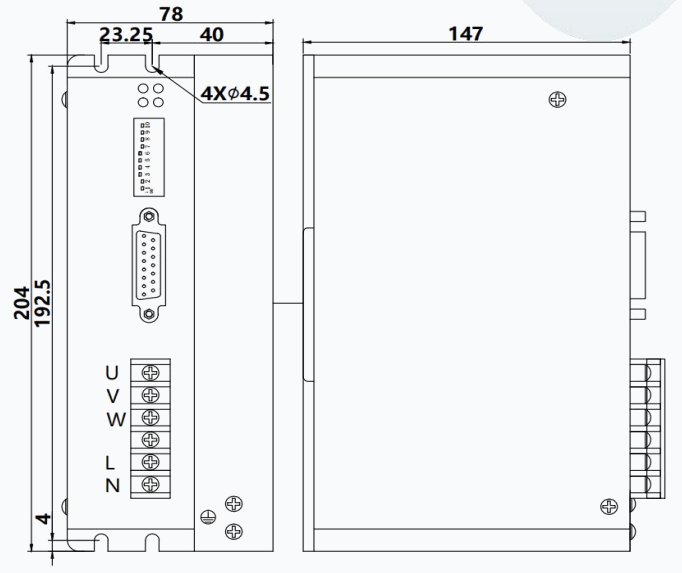
Driver subdivision is set by SW5-SW8 terminal, with 16 gears in total. SW9 and SW10 are function settings. Attached table is as follows: sub-fraction (pulse/revolution)

Note: The sub-score can be customized according to customer requirements!

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SW5 | SW6 | SW7 | SW8 | PULES/REV |
| ON | ON | ON | ON | 400 |
| ON | ON | ON | OFF | 500 |
| ON | ON | OFF | ON | 600 |
| ON | ON | OFF | OFF | 800 |
| ON | OFF | ON | ON | 1000 |
| ON | OFF | ON | OFF | 1200 |
| ON | OFF | OFF | ON | 2000 |
| ON | OFF | OFF | OFF | 3000 |
| OFF | ON | ON | ON | 4000 |
| OFF | ON | ON | OFF | 5000 |
| OFF | ON | OFF | ON | 6000 |
| OFF | ON | OFF | OFF | 10000 |
| OFF | OFF | ON | ON | 8000 |
| OFF | OFF | ON | OFF | 20000 |
| OFF | OFF | OFF | ON | 30000 |
| OFF | OFF | OFF | OFF | 60000 |
| SW9 | ON:Double pulse: PU is forward step pulse signal, DR is reverse step pulse signal | | | |
| OFF：Single pulse: PU is step pulse signal, DR is direction control signal | | | |
| SW10 | Automatic detection switch (when OFF, external pulse is received, and when ON, the internal drive operates at 30 rpm) | | | |

Driver wiring and dimension diagram





Note：

1. Input voltage cannot exceed current 220V；
2. The input control signal level is 5V and 24V. The two terminals are selected separately. Pay attention to the control signal voltage when wiring；
3. Input pulse signal descent delay is valid；
4. When the drive temperature exceeds 80 ℃, the drive stops working and the fault indicator light ALM is on. Until the drive temperature drops to 50 ℃, the drive needs to be powered on again to resume working. In case of overheating protection, please install a radiator；
5. Overcurrent (load short circuit) fault indicator light ALM is on, please check the motor wiring and other short circuit faults, and power on again after troubleshooting；
6. No motor fault indicator light ALM is on, please check the motor wiring, and power on again after troubleshooting.

Pin function description

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Port definition | Joint pin number | Mark symbol | function | Notes |
| DB 15 | 1 | 5PU+ | Input signal photoelectric isolation positive end | +5V power supply can be driven by +5V-24V, and current limiting resistor is higher than +5V. |
| 2 | PU- | DP9=OFF, PU is stepping pulse signal. | The descending edge is valid. Each time the pulse is changed from high to low, the input resistance is 220Ω. Requirements: low level 0-0.5V, high level 4-5V, pulse width > 2. 5μs |
| DP9=ON, PU is a forward step pulse signal. |
| 3 | 5DR+ | Input signal photoelectric isolation positive end | +5V power supply can be driven by +5V-+24V, and current limiting resistor is higher than +5V. |
| 4 | DR- | DP9=OFF and DR are directional control signals. | It is used to change motor steering. Input resistance 220 ohms, low level 0-0.5V, high level 4-5V, pulse width > 2.5μs |
|  | DP9=ON, DR is abackward stepping pulse signal. |
| 7 | 5MF+ | Input signal photoelectric isolation positive end | +5V power supply can be driven by +5V-+24V, and current limiting resistor is higher than +5V. |
| 8 | MF- | Motor release signal | When effective (low level), turn off the motor wiring current, the driver stops working, and the motor is in free state. |
| 9 | ALM+ | Driver failure output signal photoelectric isolation positive end | When overcurrent and overheat failures occur in the driver, the driver outputs a fault signal which is valid (high level) |
| 10 | ALM- | Driver failure output signal photoelectric isolation negative end |  |
| 11 | RDY+ | The driver is ready to output the photoelectric isolator. | The state of the driver is normal, ready to accept the controller signal when the signal is valid (low level). |
| 12 | RDY- | Drive ready for output signal photoelectric isolation negative end |  |
|  | 13 | 24PU+ | Input pulse signal photoelectric isolation positive end | +24V can be driven |
| 14 | 24PU+ | Input pulse signal photoelectric isolation positive end | +24V can be driven |
| 15 | 24PU+ | Input pulse signal photoelectric isolation positive end | +24V can be driven |
| Motor,  Power terminal | 1、2 | L、N | Power Supply | Power Supply :AC110-220V |
| 3 | PE | Baseline | Earth (enclosing drive housing) |
| 4 | U |  | 3722.JPG |
| 5 | V | Electrical wiring |
| 6 | W |  |