

User Manual



H2 500°C EXTRUDER MANUAL

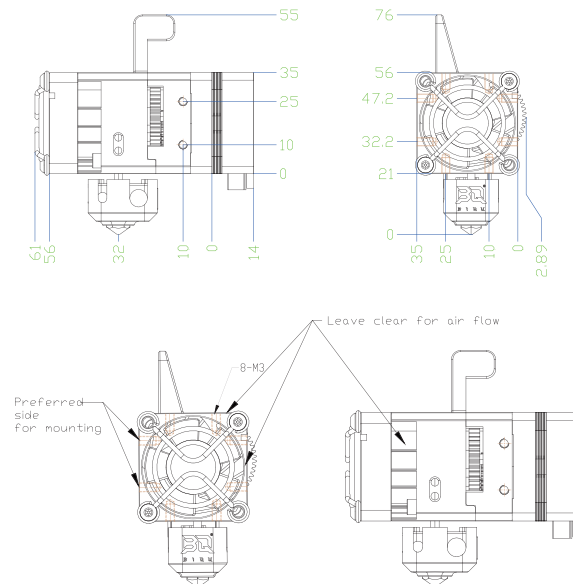
Summary:

- Extrusion : Double gear extrusion
- Maximum printing temperature : 500°C
- Weight : 222g
- Maximum extrusion : 7.5kg (depending on filament)
- Extrusion volume: 600mm³/min (depending on filament)
- Number of pulse:932/mm at 16 microstep (need to be confirmed)
- Current of the motor : 800mA
- Gear ratio : 7:1
- Extrusion wheel circumference:24.5mm
- Diameter and tolerance of filament:1.75±0.05mm
- Maximum temperature of silicon sleeve : 270°C (please take off the sleeve if it exceeds 270°C)
- When the nozzle temperature is up to 500 °C, the color of heat block may change, and it cannot be restored.
- * Incompatible with Nema14, but designed based on it *

Size:

XYZ dimensions (including fan) : 76x37.9x75mm

Diameter of nozzle : 0.4mm



More guidance:

- You are advised to install fans facing left, and pay attention to gears and air exhaust vents when installing fans facing right. 8 M3 screw holes of extruder can be used to fix it
- The m3*8 screws provided are suitable for mounting plates 3~5mm thick

Maximum operating temperature:

- *Note: the maximum temperature is for individual parts, not the whole system.*
- Notice:The temperature of the extruder body will be slightly higher when H2 500°C extruder runs at high temperature in box printer. So to avoid scalding, please wear insulated gloves or contact the extruder after it cools down
- Fan: 110°C
- Motor: 180°C
- Heat break (H2 bi-metal (copper alloy + GRADE5 titanium alloy) high temperature version): 500°C
- Bearing: 120°C
- Silicone motor cable: 150°C

Thermistor Specifications

- Size: 4*30mm
- Type: PT100(2 wires)

Heating Cable specifications:

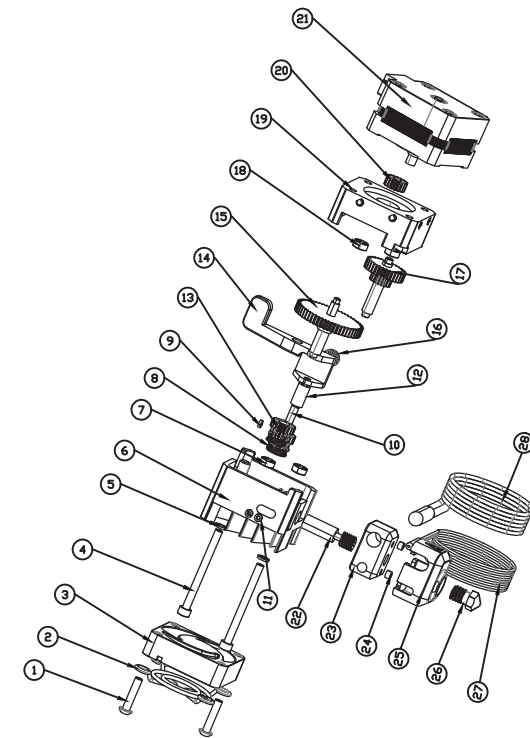
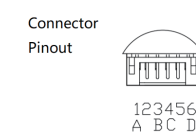
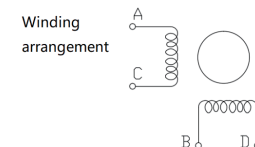
- Head size: 5*20mm
- Power: 70W

Fan specifications:

	12V	24V
Size	35*35*10mm	35*35*10mm
Cable	100mm	100mm
Voltage	12V	24V
Rotating speed	9000±10%	9000±10%

Motor specifications:

Items	Specification
Length rating of motor cable	1000mm
The rated voltage	DC3.45V
Rated current	DC 1.5A/phase
Number of phase	2
Winding DC resistance (25°C)	2.3X (1±10%)Ω
Winding inductance	2.0X (1±20%) mH
Keep the torque	≥110mN·m
Locate the torque	7mN·mREF
Insulation resistance	≥100MΩ (DC 500V)
The insulation level	Class H
The moment of inertia	8g·cm ³



1. Button head cap screw M3*14
2. Fan guard
3. Fan 3510
4. Socket Head Cap Screw M3*35
5. Spring shim
6. Heat sink
7. Bearing 673ZZ
8. Extrusion idler
9. Set screw M3x2
10. Pin Φ3*13
11. Set screw M3x3
12. Needle roller bearing
13. Extruding gear
14. Knob
15. Output gear
16. Spring
17. Driven gear
18. Bearing 682xzz
19. Gear box
20. Driving gear
21. Motor
22. Heat break
23. Heat block
24. Set screw M3x3
25. Silicone sleeve
26. Nozzle
27. PT100
28. Heating cable

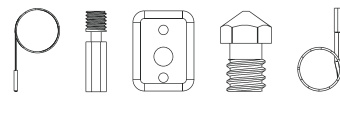
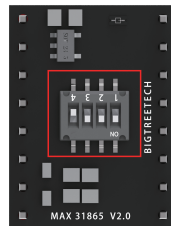
1. Hardware configuration

Driver and wiring

Driver: MAX31865 V2.0

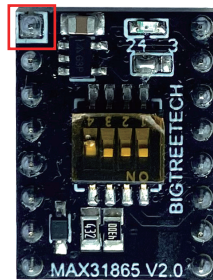
MAX31865 V2.0 can be used when the motherboard driver supports SPI mode

Select 2-wire PT100 mode, choose ON for dipswitch 1, 2, 3 and OFF for 4.

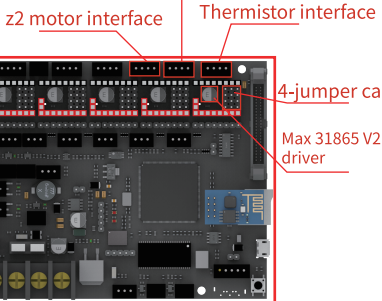


Wiring

Please make sure the direction is correct when the driver is plugged into the motherboard (red-red, black-black)
As shown, when there is no color mark, plug the pin of the red part against "EN" pin on motherboard



Z1 motor interface



Heating cable interface

Z2 motor interface

Thermistor interface

4-jumper cap

Max 31865 V2.0 driver

2. Firmware modification tutorial (Marlin bugfix-2.0.x July 07, 2021 version)

The following is an example of nozzle 0 and the same is true for nozzle 1.

(1) Configuration. h file

```
#define TEMP_SENSOR_0 -5
#define MAX31865_SENSOR_OHMS_0 100 // (Ω)
Typically 100 or 1000 (PT100 or PT1000)
#define MAX31865_CALIBRATION_OHMS_0 430 // (Ω)
Typically 430 for Adafruit PT100; 4300 for Adafruit PT1000
```

```
#define TEMP_SENSOR_0 -5
// resistor values when using MAX31865 sensors
#define MAX31865_SENSOR_OHMS_0 100 // (Ω)
#define MAX31865_CALIBRATION_OHMS_0 430 // (Ω)
// #define MAX31865_SENSOR_OHMS_1 100
M Maxifile
583 #define TEMP_SENSOR_0 -5 // (-5) on TEMP_SENSOR_0
584 #define MAX31865_SENSOR_OHMS_0 100 // (Ω) typically 100 or 1000
585 #define MAX31865_CALIBRATION_OHMS_0 430 // (Ω) typically 430 for
586 #define MAX31865_SENSOR_OHMS_1 100
589 // #define MAX31865_CALIBRATION_OHMS_1 430
590
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618 #define MAX31865_SENSOR_OHMS_1 100
619 // #define MAX31865_CALIBRATION_OHMS_1 430
620
621 #define TEMP_SENSOR_0 -5 // (-5) on TEMP_SENSOR_0
622 #define MAX31865_SENSOR_OHMS_0 100 // (Ω) typically 100 or 1000
623 #define MAX31865_CALIBRATION_OHMS_0 430 // (Ω) typically 430 for
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630 #define MAX31865_SENSOR_OHMS_1 100
631 // #define MAX31865_CALIBRATION_OHMS_1 430
632
```

(2) The configuration_adv. h file Configure the following options

```
#define THERMOCOUPLE_MAX_ERRORS 20
#define MAX_CONSECUTIVE_LOW_TEMPERATURE_ERROR_ALLOWED 10
#define SHOW_TEMP_ADC_VALUES
#define M115_GEOMETRY_REPORT
```

(3) PIN file configuration

```
// #define E1_STEP_PIN PA8
// #define E1_DIR_PIN PC9
// #define E1_ENABLE_PIN PD2
// #define E1_CS_PIN PC8

#define TEMP_0_MISO_PIN PG3 //SD0
#define TEMP_0_SCK_PIN PC7 //CLK
#define TEMP_0_MOSI_PIN PC6 //SDI
#define TEMP_0_CS_PIN PC8

// #define TMC2209_SENSOR_0 PA8
// #define TMC2209_SENSOR_1 PC9
// #define TMC2209_SENSOR_2 PD2
// #define TMC2209_SENSOR_3 PC8

// #define TMC2209_SENSOR_4 PA8
// #define TMC2209_SENSOR_5 PC9
// #define TMC2209_SENSOR_6 PD2
// #define TMC2209_SENSOR_7 PC8
```

1) Select the driver interface, and comment out the original driver definition to avoid interference.
The above picture takes the BIQU BX motherboard as an example, select the E1 driver interface to connect to the max31865V2.0 module.

2) Define the SPI pin of the module
//Thermocouple sensor
//if the TEMP_SENSOR value of -5 is enabled in the configuration file, it will work
#define TEMP_0_MISO_PIN PG3 //SD0
#define TEMP_0_SCK_PIN PC7 //CLK
#define TEMP_0_MOSI_PIN PC6 //SDI
#define TEMP_0_CS_PIN PC8

3) Please note that the SPI pin needs to be consistent with the SPI pin used by the TMC driver.
4) Modify the maximum temperature

```
// This can protect components from o
// (Use MINTEMP for thermistor short/
#define HEATER_0_MAXTEMP 520
```

#define HEATER_0_MAXTEMP 520
The maximum temperature exceeds 500°C