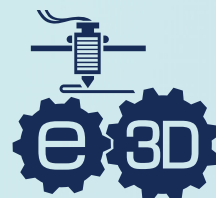
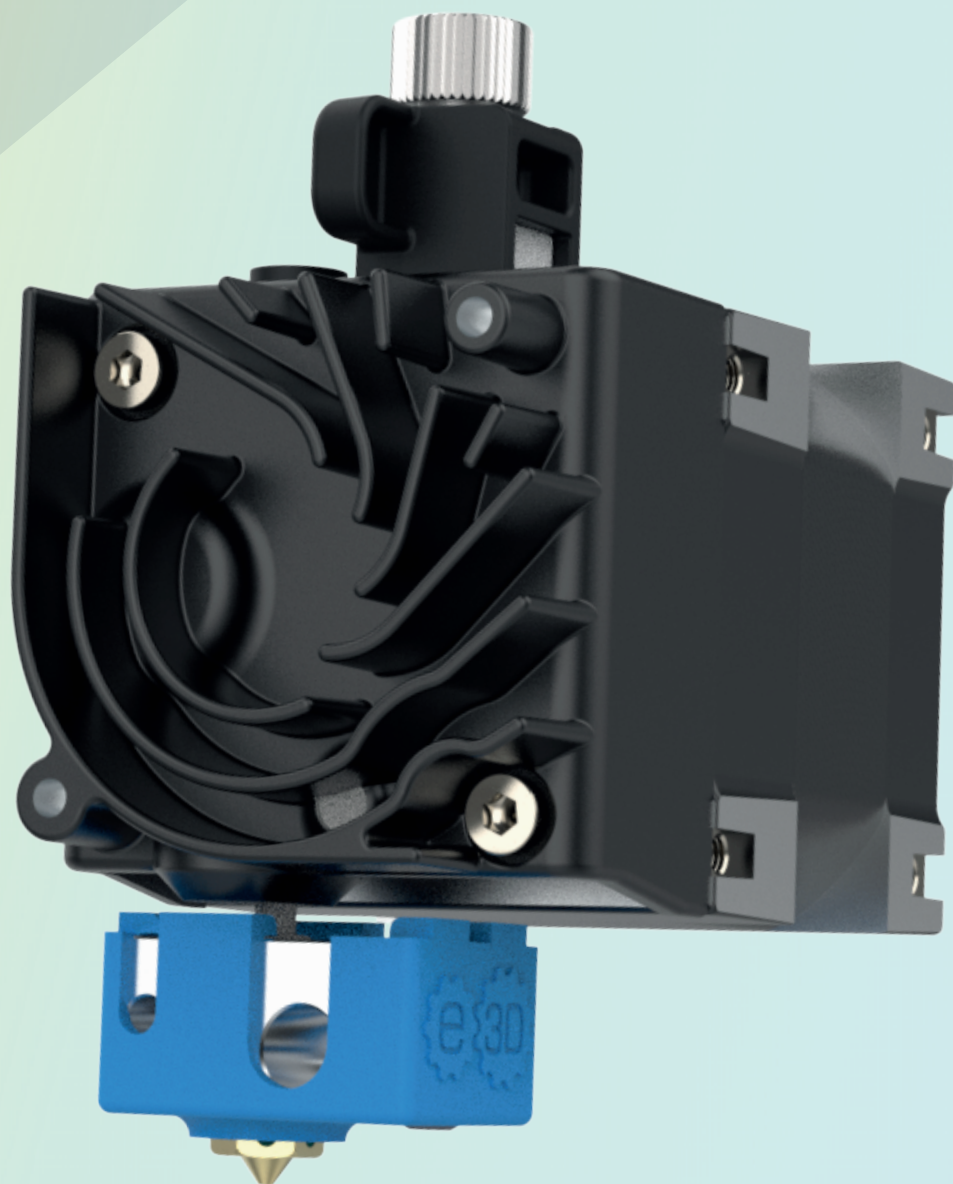


Hemera Datasheet



E3D-ONLINE



E3D-ONLINE

Hemera Specification

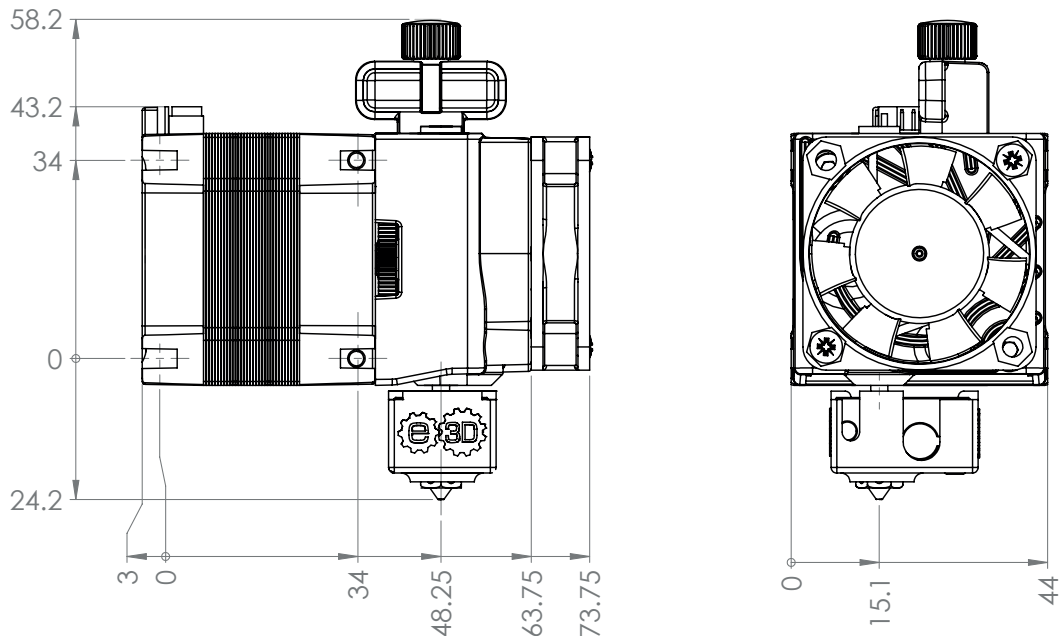
Summary

- Drive type: dual drive with adjustable tension idler
- Max printing temperature: 285°C (upgradable to 500°C)
- Mass: 388g (including V6 hotside)
- Max pushing force: ~10kg*
 - Dependent on filament
- Flow rate (based on V6): 600mm³/min*
 - Dependent on filament
- Nominal steps per mm (16x): 409 steps per mm
- Motor current: 1.33A
- Filament diameter and tolerances: 1.75±0.05mm
- *Not compatible with Nema17 but based upon its design*

Volume & Dimensions

- XYZ dimensions
 - 77 × 44 × 83mm (Direct)
 - 67 × 44 × 76mm (Bowden)

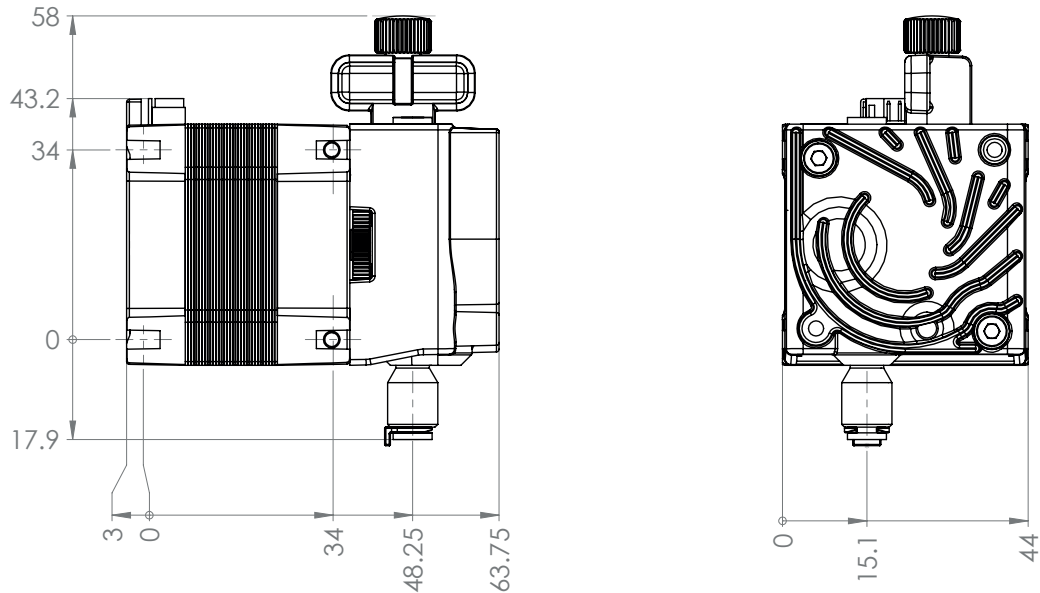
Direct





E3D-ONLINE

Bowden



Mass

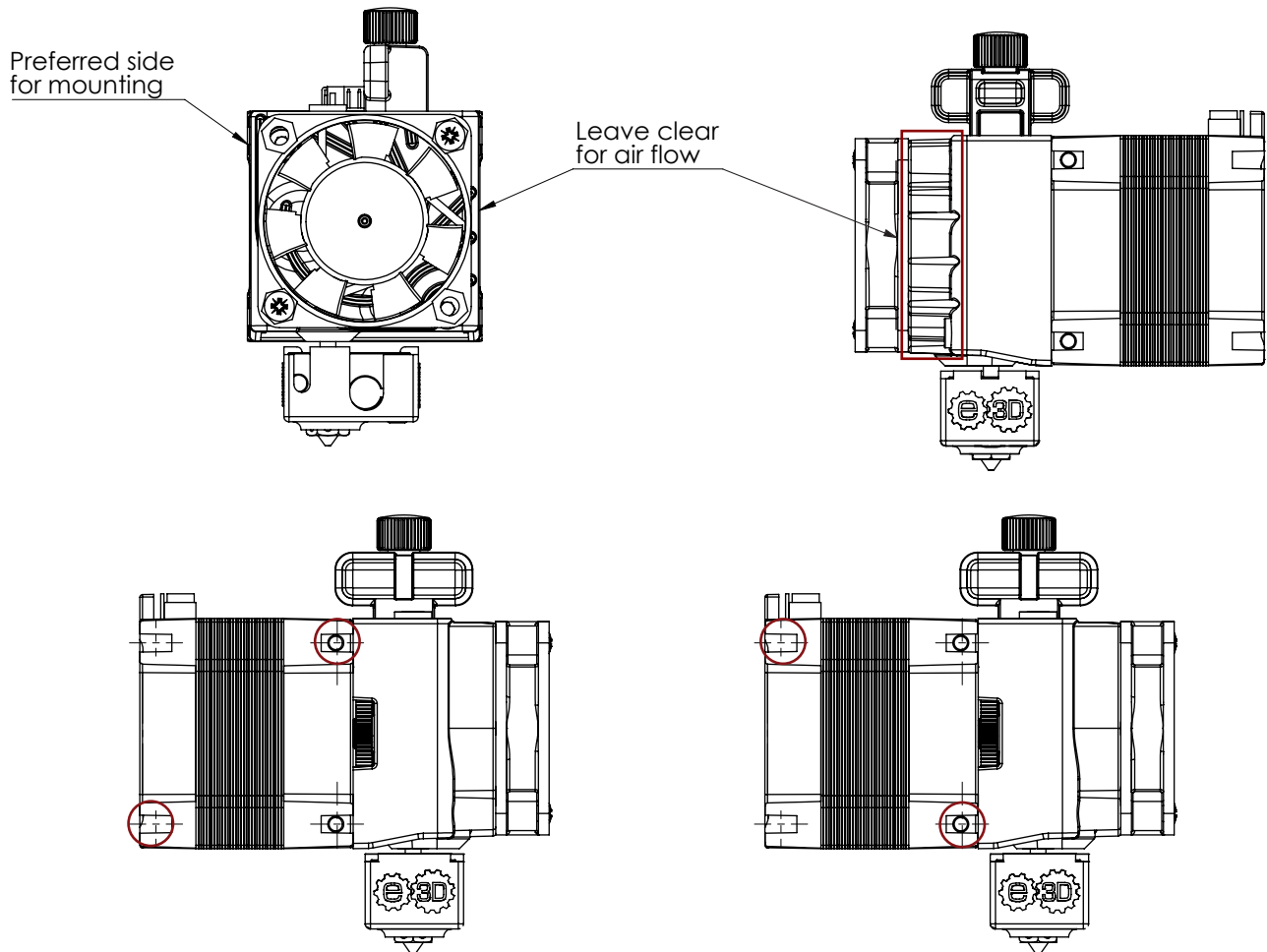
- 388g Direct (including hotside)
- 327g Bowden

Performance Characteristics

- Max pushing force: ~10kg*
 - Dependent on filament
- Maximum nominal volumetric throughput (PLA print test at 220°C)
 - 600mm³/min*
 - *Results may vary depending on your set-up, higher volumetric throughputs are achievable with Volcano and SuperVolcano
<https://e3d-online.com/blog/2019/02/28/supervolcano/>
- Maximum printing temperature:
 - 285°C
 - Upgradable to 500°C (with copper block, copper nozzle, PT100)



E3D-ONLINE



Mounting Guidance

- Hemera is mounted to a flat surface via the T-slots in the left or right sides of the motor
- Typically Hemera is mounted on to the left side, as the air from the heatsink cooling fan exits on the right, if mounting on the right ensure that sufficient space is left for airflow
- The screws must protrude $3\text{mm} \pm 0.25\text{mm}$ from the mounting surface to go into the T-slots
 - The supplied M3x8 mounting screws are suitable for a nominal 5mm mounting plate thickness
- Hemera must be mounted on a minimum of 2 mounting points, if using 2 mounting points, diagonally opposing points should be used, in order to ensure rigidity

Service Temperatures

- Note, these are max ambient service temperatures of the components used, and not a guaranteed operating temperature of the system
 - Fan: 50°C
 - Motor: 85°C
 - Polymer bushing: 90°C
 - Bearings: 100°C
 - Acetal idler components: 120°C



E3D-ONLINE

Gearing Train Specification

- Single stage spur reduction: 3.32:1
 - Motor pinion: 22T MOD 0.25
 - Large gear: 73T MOD 0.25
 - Hobb gears: 20T MOD 0.5
 - Hobb effective diameter: 8.27mm* (Effective diameter will vary with filament type and tension).

Electrical Specification

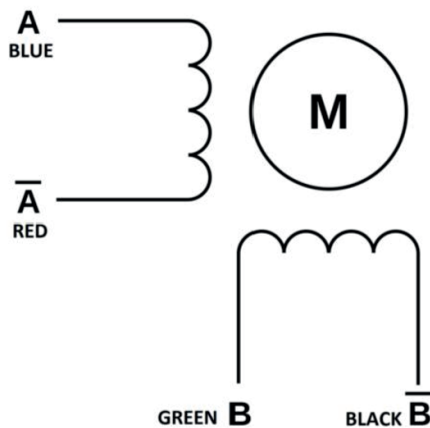
- Nominal heater power: 30W (can be upgraded)

Fan Specification

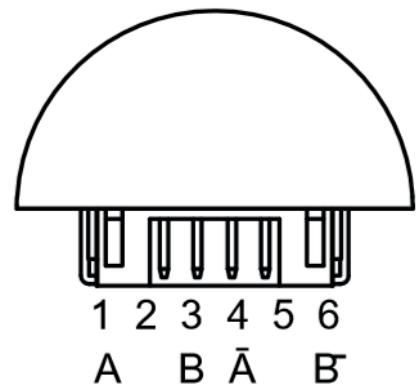
	12v	24v
Width	40mm	40mm
Depth	10mm	10mm
Cable	1000mm	1000mm
Voltage	12 VDC	24 VDC
Current	0.08 A	0.04 A
RPMS	7500±10%	6900±10%
Connector*	Dupont 0.1"	Dupont 0.1"
Startup voltage	6 VDC	12 VDC
Speed	7000 RPM	7000 RPM
Airflow	6.8 CFM	6.8 CFM
Static pressure	4.55 mmH2O	4.55 mmH2O
Noise level	33.6 dBA	33.6 dBA
Weight	14 g	14 g

*Typical connector used on most microcontroller headers

Motor Diagram



Winding Arrangement



Connector Pinout

Motor Specification

Items	Specs
Motor cable length	1000mm
Phase no	2 phases
Rated voltage	2.8V
Current	1.33A
Resistance	2.10Ω per phase
Inductance	2.5 mH
Holding torque	3.2 kgcm
Detent torque	0.12 kgcm
Rotate direction	ABAB CW
Max starting PPS	2800 PPS
Max slewing PPS	3500 PPS
Insulation	≥100MΩ (DC 500V)
HI POT	AC 600V/1mA/1S
Insulation class	Class B
Rotor inertia	35gcm ²
Connector	JST - 56B - PH
Step angle	1.8°

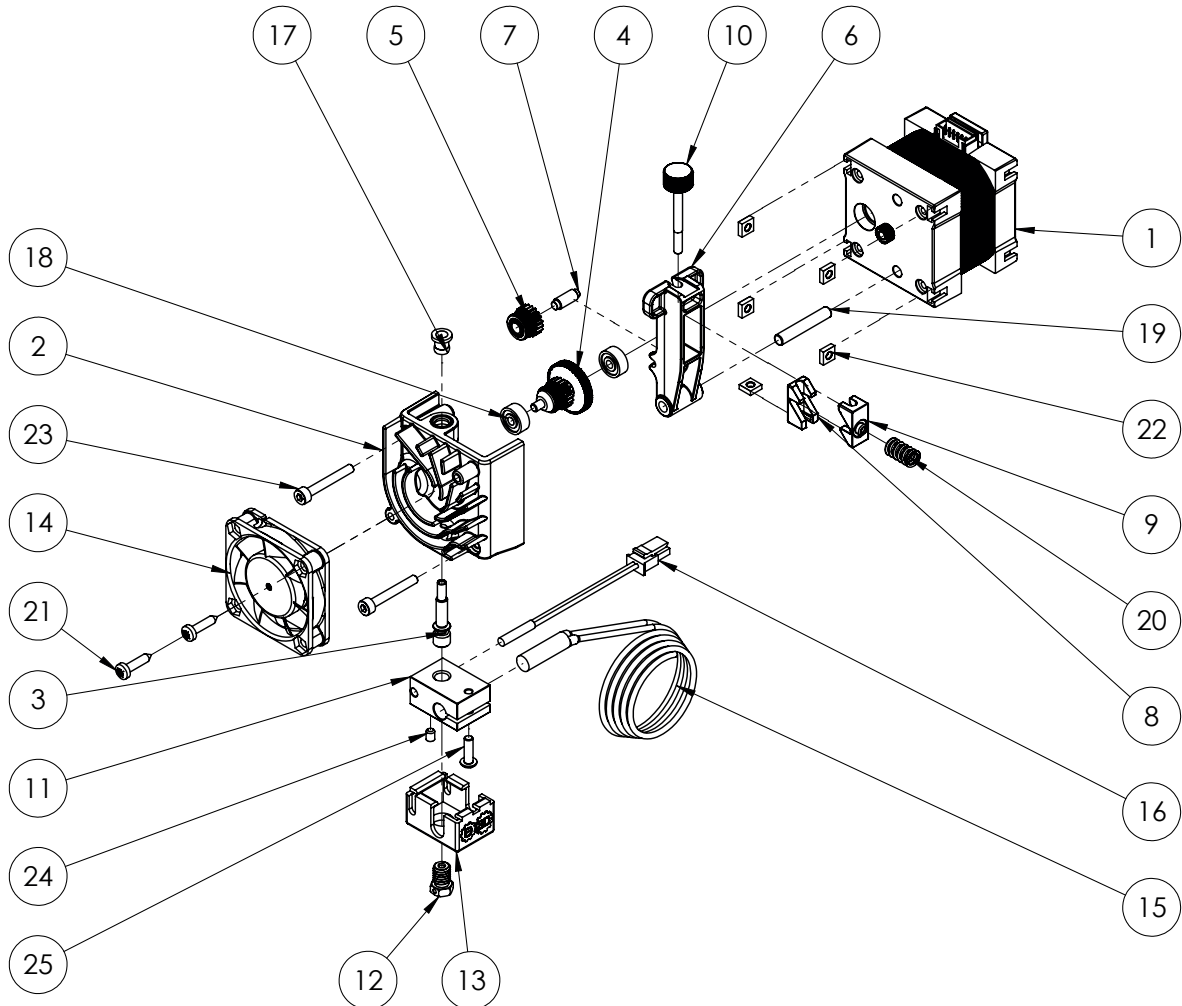
Maintenance

- Do not remove the grease from the drive gears.
- Compressed air is a recommended method of dislodging filament debris from hobb teeth.
- Avoid using wire brushes on the hobb teeth or gears.

Materials

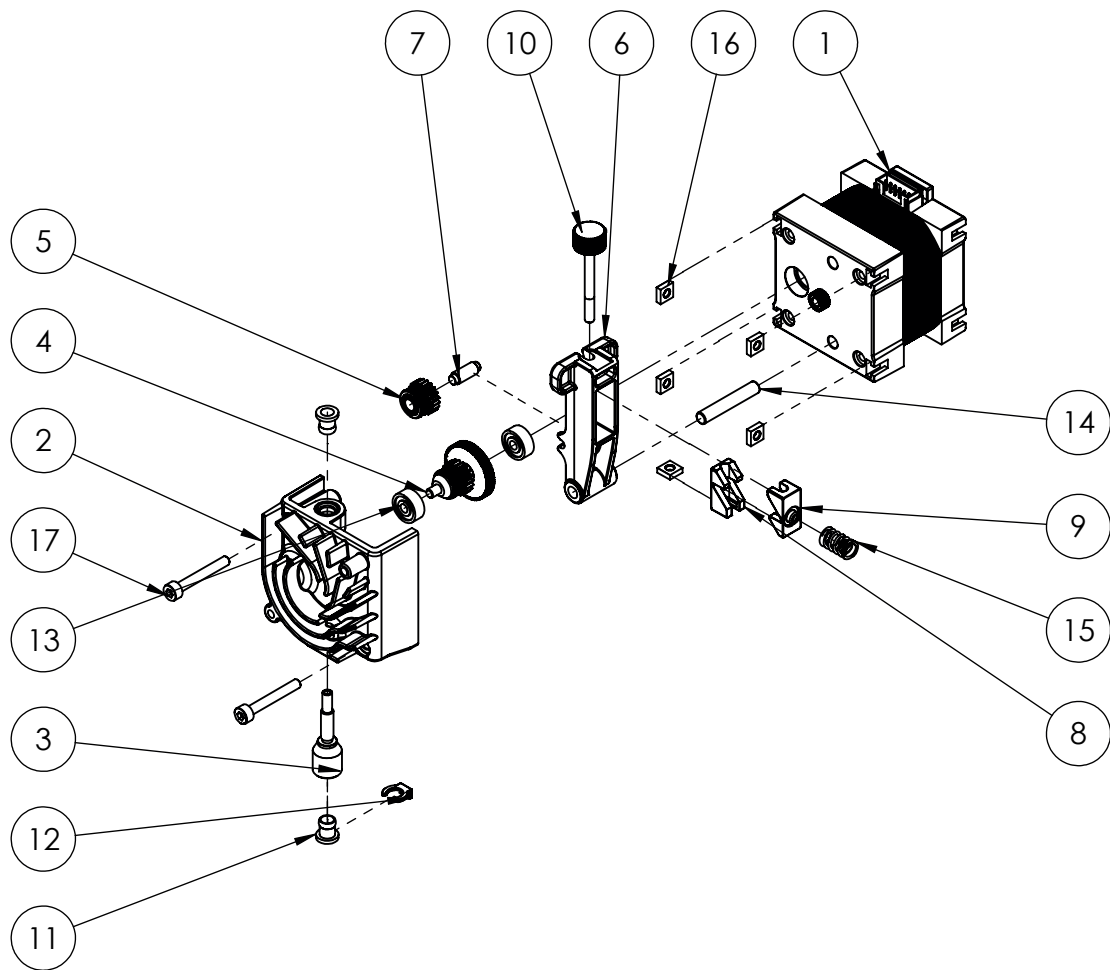
- Block: aluminium (can be upgraded)
- Nozzle: brass (can be upgraded)
- Heatsink: die cast aluminium
- Heatbreak: stainless steel
- Gear/Hobb materials: stainless steel
- Fixings: steel
- Idler materials: acetal
- Bearing elements:
 - 2x shielded 623 bearings (drive shaft)
 - Igus bushing

Direct Setup

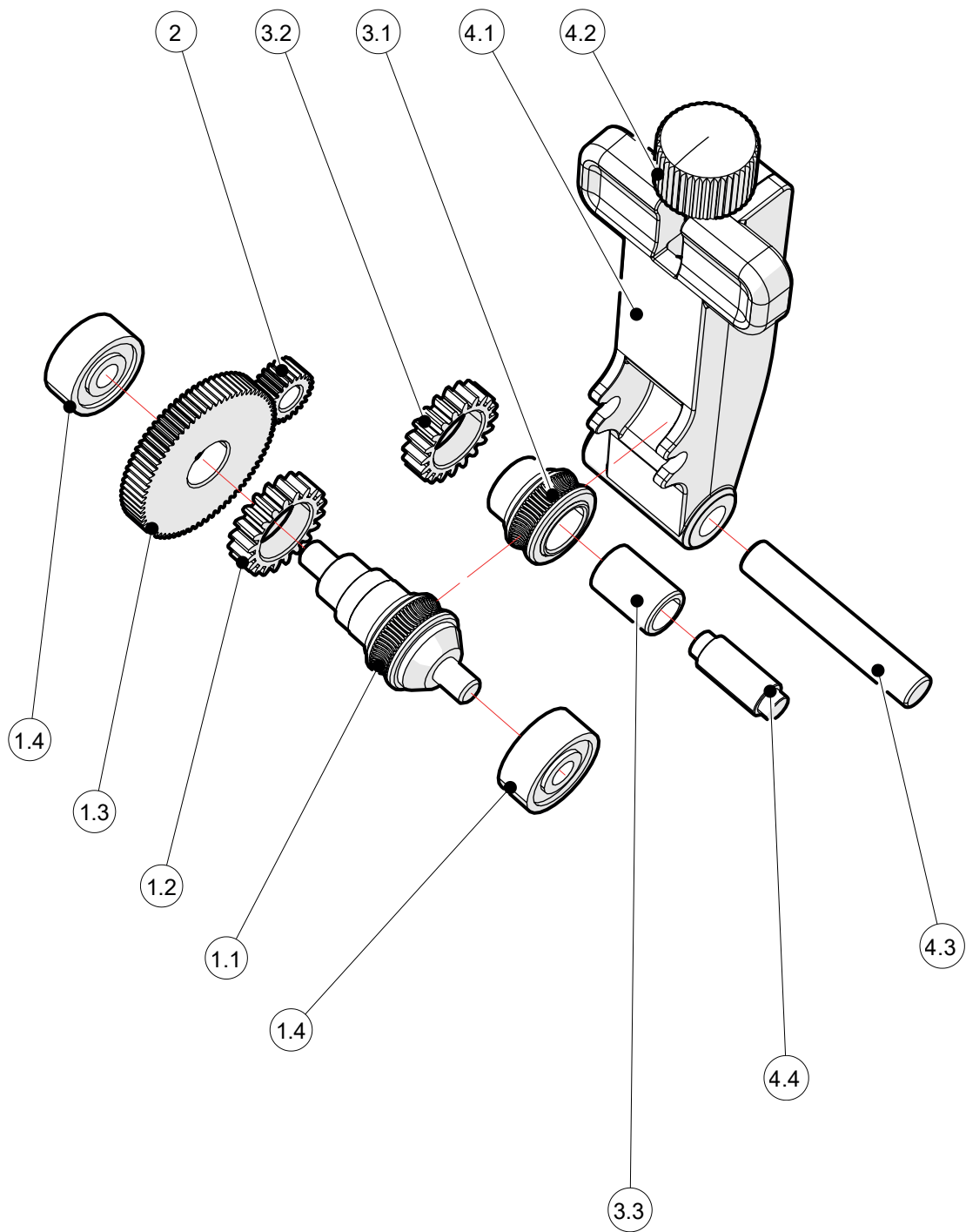


- | | |
|------------------------------------|--|
| 1. Hemera Motor | 14. 40 × 40 × 10 Fan |
| 2. Hemera 1.75 Sink Assembly | 15. Heater Cartridge |
| 3. Hemera 1.75 Break | 16. Thermistor Cartridge |
| 4. Hemera Drive Hobb assembly | 17. 1.75mm Bowden Collet |
| 5. Hemera Idler Hobb Assembly | 18. 623 Bearing (x2) |
| 6. Hemera 1.75 Idler | 19. 4mm x 24mm Dowel |
| 7. Hemera 1.75 Idler Shaft | 20. Spring |
| 8. Hemera Idler Slide block | 21. 2.9 × 13 Self-tapping Screw (x2) |
| 9. Hemera Idler Spring block | 22. M3 Square Nut (x5) |
| 10. Hemera Thumbwheel | 23. M3 × 22 Socket Head Cap Screw (x2) |
| 11. V6 Heater Block | 24. M3 × 4 Grubscrew |
| 12. V6 Brass Nozzle 1.75mm x 0.4mm | 25. M3 X 10 Button Head Cap Screw |
| 13. V6 Sock | |

Bowden Setup



- | | |
|-------------------------------|--------------------------------------|
| 1. Hemera Motor | 13. 623 Bearing (x2) |
| 2. Hemera 1.75 Sink Assembly | 14. 4mm x 24mm Dowel |
| 3. Hemera 1.75 Bowdaptor | 15. Spring |
| 4. Hemera Drive Hobb Assembly | 16. M3 Square Nut (x5) |
| 5. Hemera Idler Hobb Assembly | 17. M3x22 Socket Head Cap Screw (x2) |
| 6. Hemera 1.75 Idler | |
| 7. Hemera 1.75 Idler Shaft | |
| 8. Hemera Idler Slide Block | |
| 9. Hemera Idler Spring Block | |
| 10. Hemera Thumbwheel | |
| 11. 1.75mm Bowden Collet (x2) | |
| 12. 1.75mm Bowden Clip | |



- 1.1 Hemera Hobb Drive
- 1.2 Hemera 0.5 20T gear
- 1.3 Hemera 0.25 73T gear
- 1.4 Hemera Bearing
- 2. Hemera 0.25 22T gear
- 3.1 Hemera 1.75 Idler Hobb
- 3.2 Hemera 0.5 20T gear
- 3.3 Hemera Bushing
- 4.1 Hemera Idler Spring Block
- 4.2 Hemera Thumbwheel
- 4.3 Hemera Dowel
- 4.4 Hemera Idler Shaft



Changelog

Edition 1

- Publication date: 29/11/2019
- Author: DR
- Approved: RY

Edition 2

- Publication date: 09/07/2020
- Author: DR
- Approved: RY
- Changes:
 - Lubrication specification added

Edition 3

- Publication date: 05/01/21
- Author: DR
- Approved: ST
- Changes:
 - Maintenance section added.
 - Step angle added to motor specification
 - Additional fan specification added