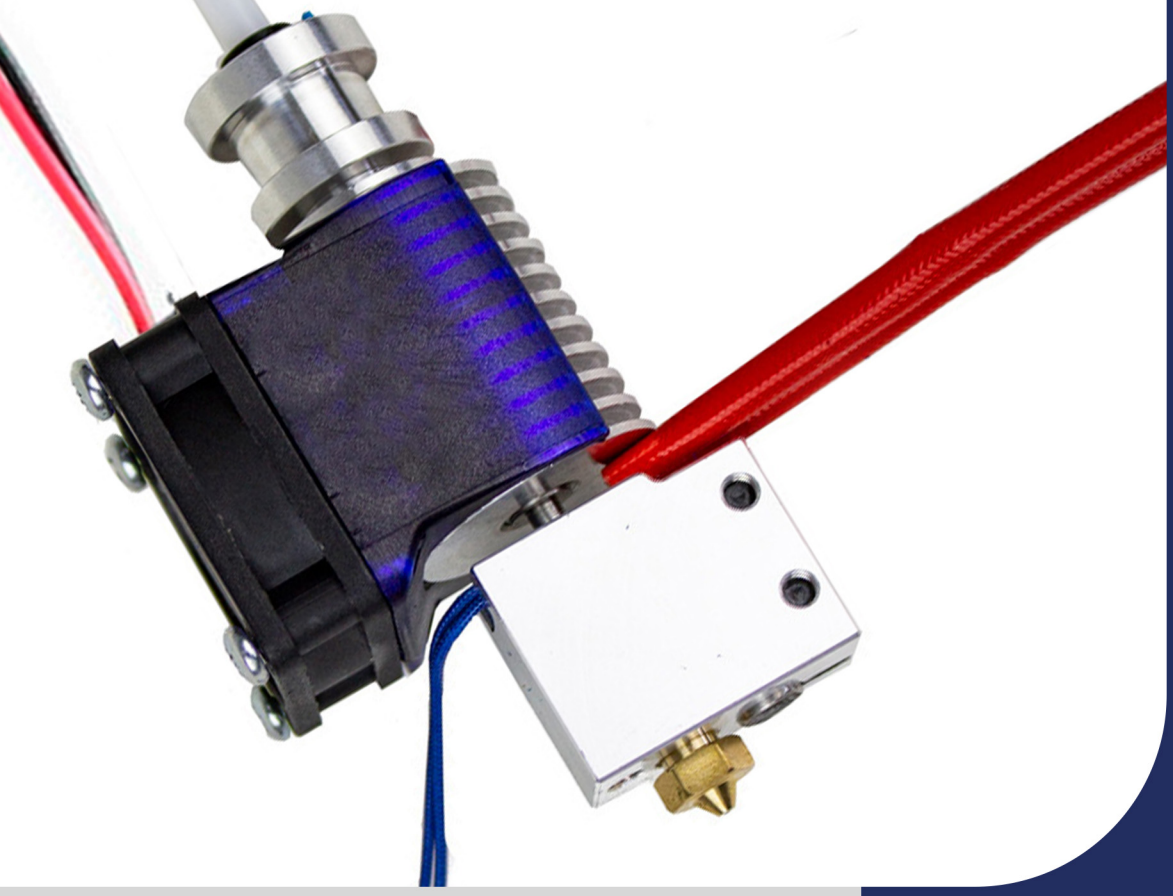


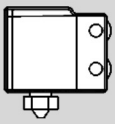
E3D-ONLINE

Volcano HotEnd

"A low price-point for easy printing, with E3D's high-quality engineering and manufacturing."

The popular Volcano Upgrade now in as it's own HotEnd. Prints parts bigger and faster than the V6 with 3x the volumetric flow rate.

Prints Fast



Modular Upgrade

Print Big

Product Specifications

Dimensions	
Overall Length V6 Standard	62.3±0.5mm
Overall Length V6 Bowden 3mm	65.6±0.5mm

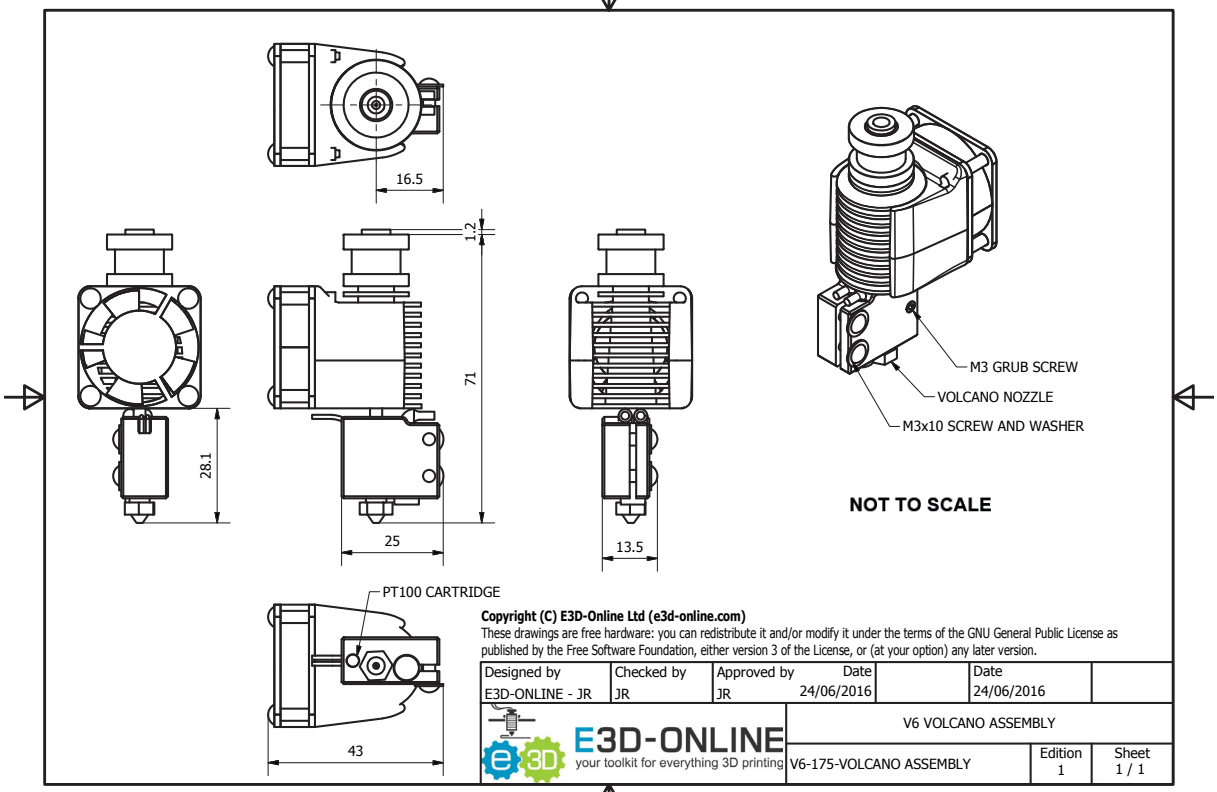
Mechanical Specifications	
Maximum nominal volumetric throughput (PLA print test at 220°C)* *results may vary depending on your set-up	600 mm3/min
Maximum safe operation temperature with the sock fitted	260°C
Maximum safe operation temperature without the sock and a E3D thermistor fitted	285°C
Maximum safe operation temperature without the sock and with a copper block and E3D PT100	485°C (https://e3d-online.dozuki.com/Wiki/Maximum_temperatures_for_the_V6)

Electrical Specifications	
Maximum rated operating temperature of the heater	300°C (please be aware that the heater is capable of reaching higher temperatures if used improperly. We highly recommend that you do not exceed the rated temperature of the heater) (High temperature heaters allow up to 500°C)
Nominal heater power	30W
Maximum current draw with 12V/24V heater variants	2.8A/3.9A
Fan (12V)	30x30x10mm fan

Materials (as standard)	
Block	Aluminium
Nozzle	Brass
Heatsink	Aluminium
Heat Break	Stainless Steel

Options	
Filament size	1.75mm/3.00mm
Nozzle size	0.40mm

TECHNICAL DRAWINGS



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E3D-ONLINE - JR	JR	JR	24/06/2016		24/06/2016	

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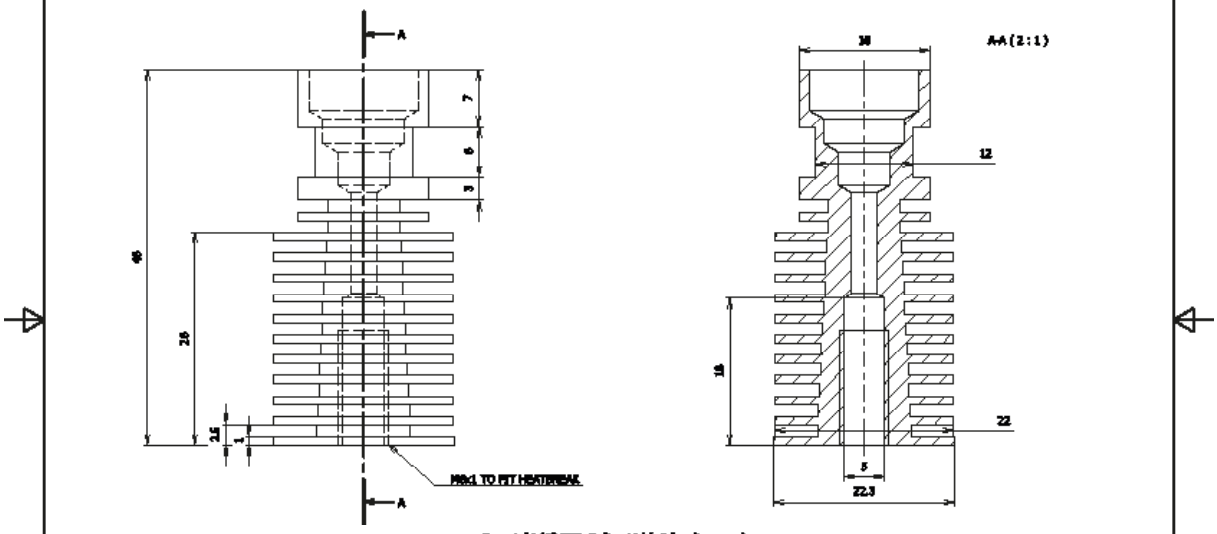
V6 VOLCANO ASSEMBLY		
V6-175-VOLCANO ASSEMBLY	Edition 1	Sheet 1 / 1



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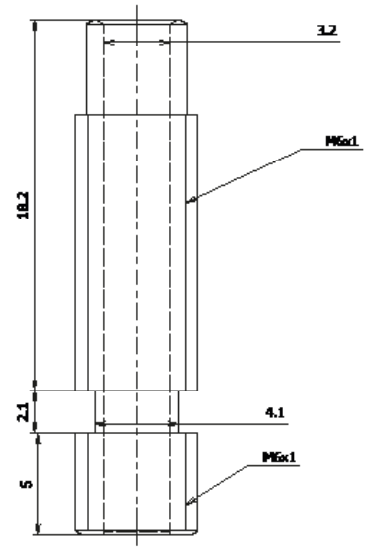
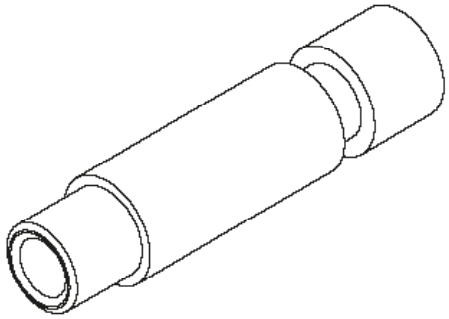
E3D-v6 3mm Bowden Heat Sink		
V6-3MM-SINK-B	Edition 4	Sheet 1 / 1

TECHNICAL DRAWINGS





NOT TO SCALE

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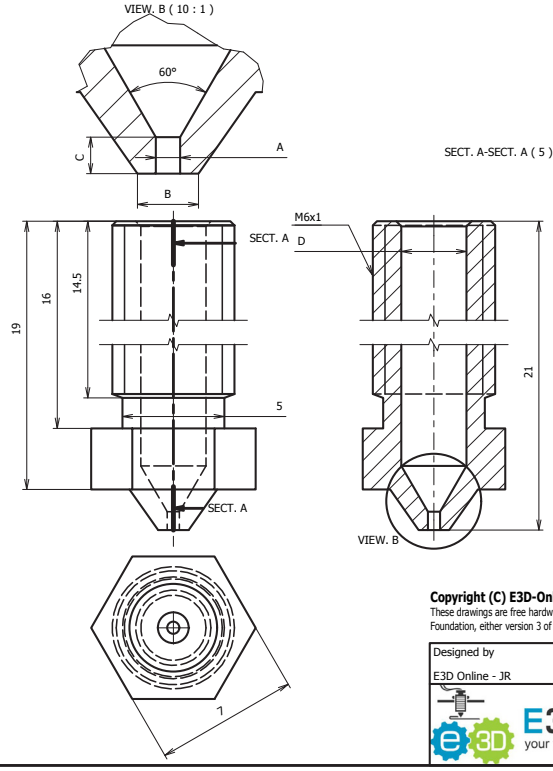
E3D-v6 3mm Heat Break

V6-300-BREAK	Edition 6	Sheet 1 / 1



NOZZLE GEOMETRIES					
A	A	B	C	D	# Dots
VOLCANO-NOZZLE-175-0400	0.40	1.00	0.6	2.00	4
VOLCANO-NOZZLE-175-0600	0.60	1.50	1.2	2.00	0
VOLCANO-NOZZLE-175-0800	0.80	2.00	1.6	2.00	1
VOLCANO-NOZZLE-175-1000	1.00	2.50	2.0	2.00	2
VOLCANO-NOZZLE-175-1200	1.20	3.00	2.4	2.00	3
VOLCANO-NOZZLE-300-0400	0.40	1.00	0.6	3.20	4
VOLCANO-NOZZLE-300-0600	0.60	1.50	1.2	3.20	0
VOLCANO-NOZZLE-300-0800	0.80	2.00	1.6	3.20	1
VOLCANO-NOZZLE-300-1000	1.00	2.50	2.0	3.20	2
VOLCANO-NOZZLE-300-1200	1.20	3.00	2.4	3.20	3

NOT TO SCALE

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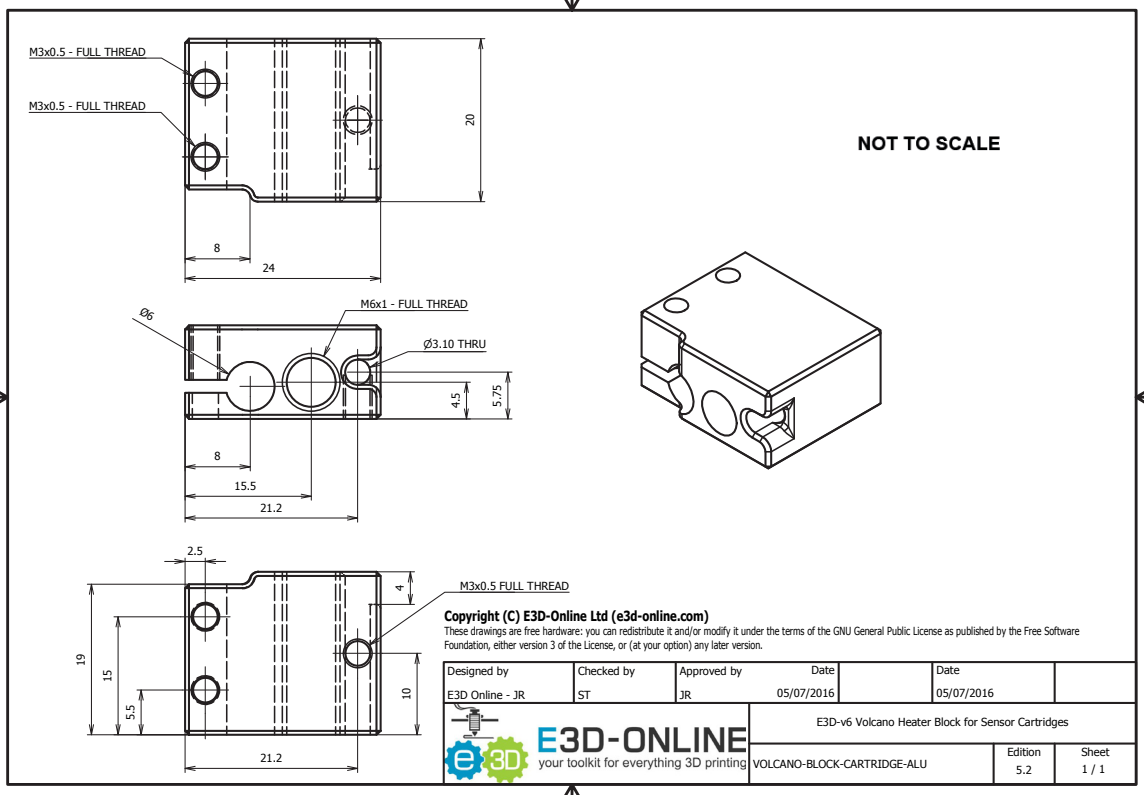
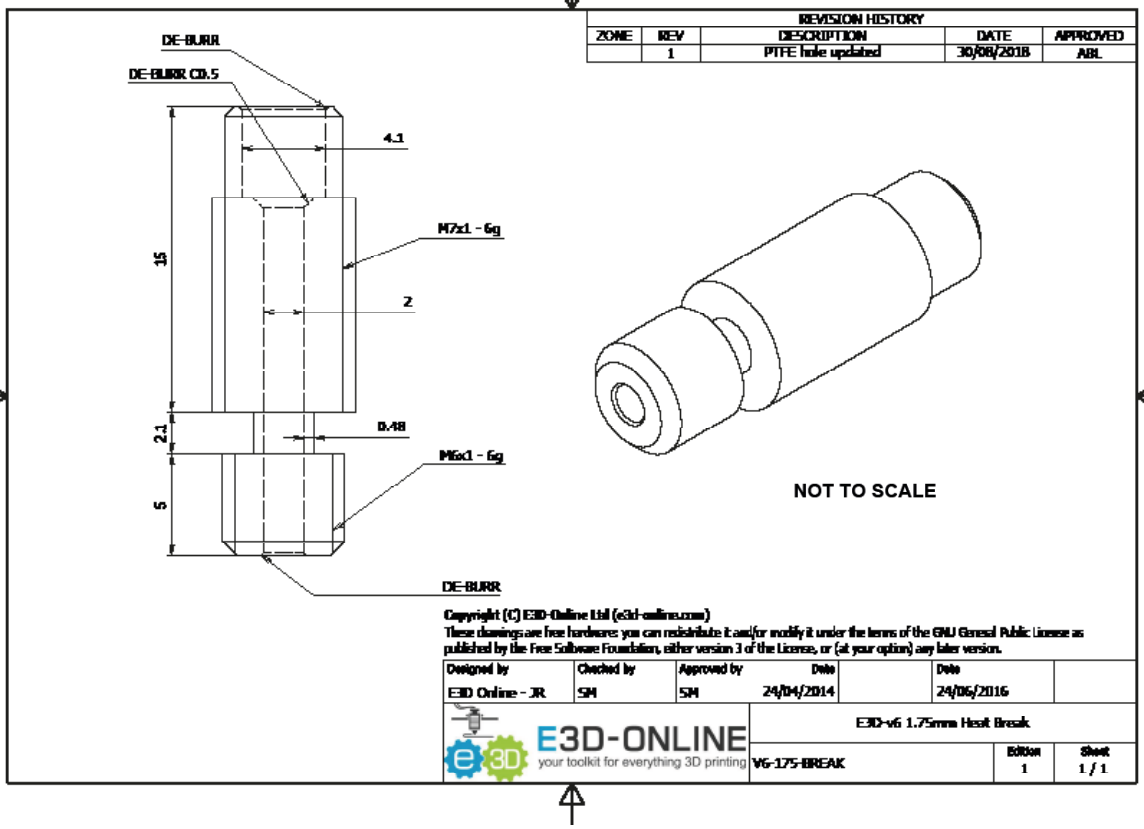
E3D v6 Nozzles ALL - LONG

V6.5.1 NOZZLE-175-LONG	Edition 5.1	Sheet 1 / 1

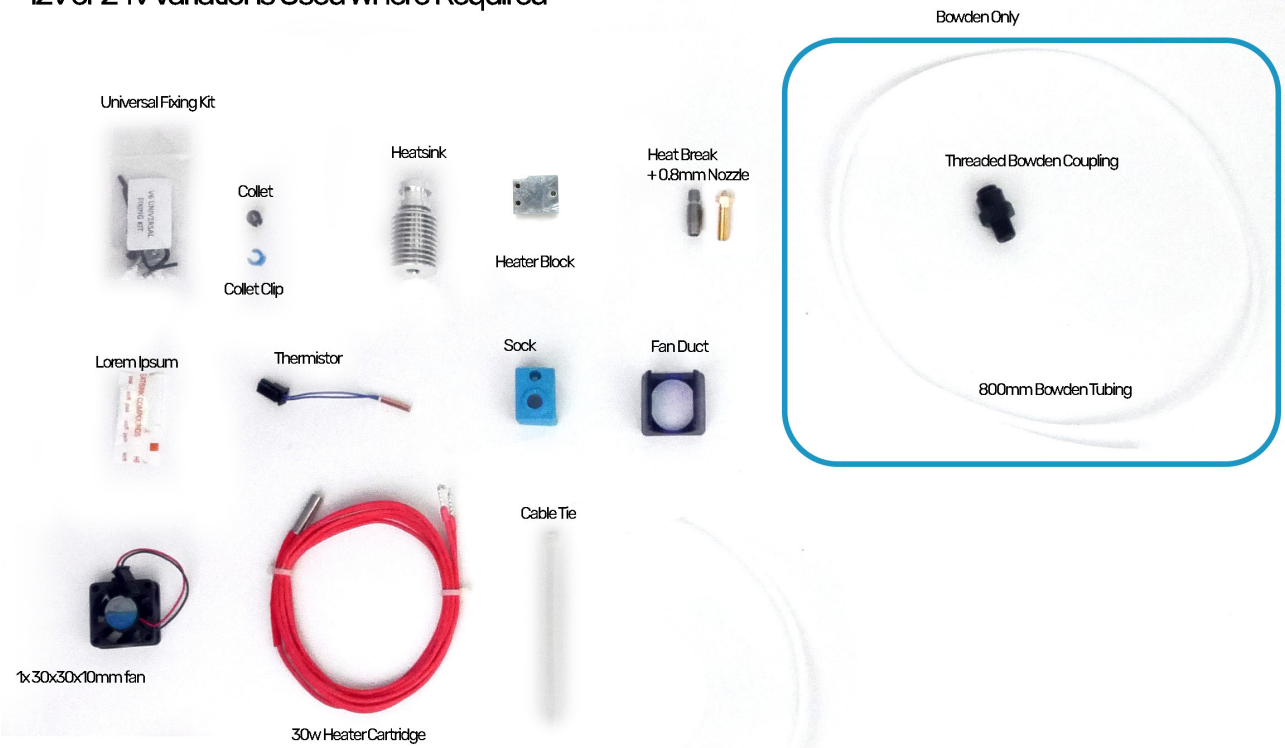
TECHNICAL DRAWINGS



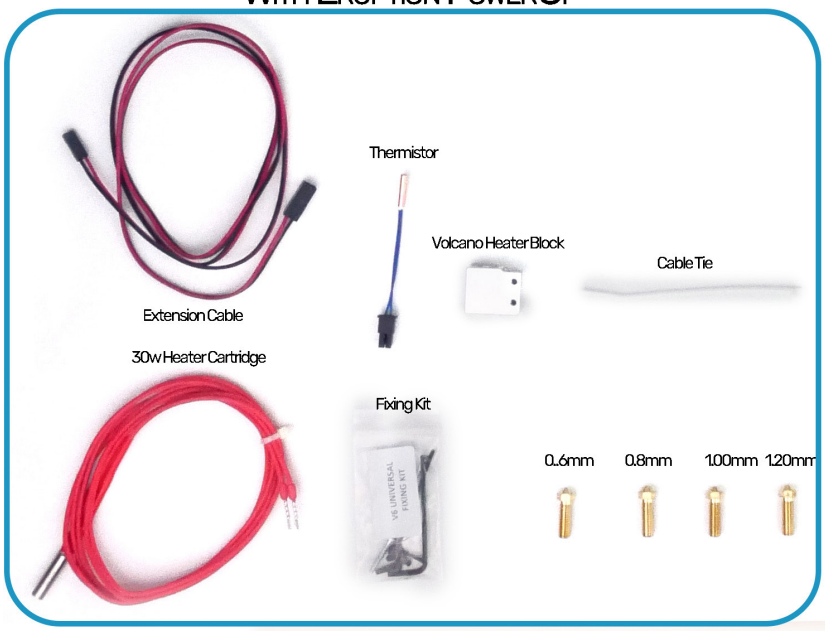


What's in The Box

12v or 24v Variations Used Where Required



With Eruption PowerUp



Solutions to Common Issues

The most common causes of trouble with extrusion on E3D hotends are as follows...

Inadequate cooling and Filament Jamming

Inadequate cooling is the most common cause of problems, accounting for nearly half of all issues reported to us. Consistent performance of the extruder is heavily dependent on having a sharp temperature differential between the nozzle and where the cold filament enters. If the unit is not cooled properly, filament will melt too high in the unit and cause jamming.

The entirety of the heatsink must be kept cool at all times during printing. For this to happen enough airflow must be directed at the heatsink, and that airflow must be distributed over the whole heatsink. The use of the supplied 30mm fan and duct is highly recommended, the supplied fan has adequate airflow (4-5 CFM) and the duct is specifically designed to aim that airflow at the fins of the heatsink.

An easy way to check that your heatsink has sufficient air flow is to simply feel the heatsink with a finger after a print has been running for some time. (Be careful not to touch the heater-block, it will burn you instantly) The entirety of the heatsink should be cool to the touch, including the bottom fins closest to the hot parts.

Like the heatsink and fan cooling your CPU, proper thermal conduction is necessary for the heatsink to work. In the case of your E3D hot end, the threaded heat-break tube should be snugly tightened into the heatsink otherwise the threads will not make sufficient surface contact to conduct heat. If you are printing in hot climates or continue to have issues, a liberal coating of thermal paste on the upper heat-break threads will ensure much better thermal contact with the heatsink. Even with thermal paste the threads can vibrate loose and cause performance issues. To combat this heat up the heatsink with a heat gun and then thread in and tighten the heat break tube with two pairs of pliers. The heatsink should contract around the heatbreak when it cools and ensure a solid connection.

Common issues are:

Not wiring the fan directly to a 12v or 24v power supply.
Connecting the hotend fan to the “Fan” output on an electronics board, which is software controlled and should be used for print cooling, not for a hotend fan.
Using a 3rd party designed printed duct that is improperly designed and impedes flow or does not direct flow properly to all fins. This is not to say all ducts other than the supplied one are bad, but that you should be cautious in your selection or design of a duct.
Having some sort of obstruction in front of the fan or behind the duct which restricts airflow.
Heat break tube is not snugly tightened into the heatsink.
Misconfigured Retraction
Choosing slicer settings is a bit of an art and everyone has their particular preferences as to how they print. The following guidance is to help people avoid common configuration pitfalls.

A common issue is massively excessive retraction distances. In direct configurations retraction of 0.5 to 2mm is all that should be needed for ooze-free prints. We use around 0.6mm for ABS that oozes very little, and 2mm for the very floppy flexible filaments that like to ooze a great deal and need a good tug to pull back the soft filament from the melt zone. For PLA we stick with retraction settings no higher than 0.8mm.

Bowden configurations are more tricky as the amount of retraction needed is dependent on factors such as the length of tubing and the stiffness of the filament has more impact on the needed retraction. A good starting place is around the 2mm mark, which you can increase if required.

Retractions of 5mm or more are troublesome as they pull hot filament up into the cold areas of the hotend where they can freeze, adhere and jam.

You should be able to print at both very high, and very low speeds with your E3D hotend, but you may need to adjust your temperatures. Very high speeds will require higher temperatures in order to melt the filament quickly enough as it passes through the hotend. Very slow prints do not require as high a temperature.

Nozzle Blockages

Debris, dust, scorched carbonised plastic, contaminants in your filament, all of these things can enter and accumulate in the hotend. Debris can then block or partially obstruct the very small hole in the tip of the nozzle. This can be as subtle as high extrusion force, or thin ribbon like extrudate, or it can simply be a complete blockage of the nozzle where no plastic can pass through at all.

There is a fantastic guide to unblocking nozzles present on the Bukobot website which shows a range of techniques and procedures. http://bukobot.com/nozzle-cleaning

Bad Filament

There are a huge number of filament vendors out there, to cater to all needs and budgets. The E3D hotends are designed to cope with and print the vast majority of filaments on the market.

Filament must be of an appropriate dimensional tolerance in order to smoothly pass through the hotend. Filament that is too big will have excessive friction in the hotend. Filament that is too thin will buckle or snake inside the hotend and jam. Be aware that just making a couple of measurements on the start of a spool will not reveal if the filament has bulges where the diameter of the filament is too wide, or hard kinks that will not easily pass down the hotend. Filament can also be out-of-round or oval in cross section, this can lead to deceptive measurements if you do not measure your filament at multiple angles.

1.75mm Filament:

Should be within 1.65mm to 1.85mm in diameter.

Significant increases in friction occur once diameter exceeds 1.90mm.

3mm Filament:

Usually 2.85mm nominal diameter, but the hotend should handle filament that is 3mm nominal as long as it is accurately 3mm.

Significant increases in friction occur once diameter exceeds 3.05mm.

Some particular brands/colours of filament are particularly troublesome despite having good dimensions. This may be due to additives added to bulk-out the filament and reduce costs, particularly in the cheaper filaments. The exact mechanism or cause of why this happens is not clear, but it seems that some of these filament are more “sticky” when partially molten and therefore cause more jams. Ultimately the solution is here is to stick to good quality filament.

Black is often a troublesome colour as unscrupulous manufacturers can easily hide low quality recycled regrind behind lots of black pigment.

You cannot use 1.75mm filament in a 3mm hotend. Please stop asking. If you think you might be able to use 3mm filament in a 1.75mm hotend you shouldn't be modifying or building a 3D Printer. Put the screwdriver down.

Misconfigured thermistor/temperature

The supplied thermistor is a Semitec 104-GT2 and your firmware must be configured to use this thermistor.

For more information about how to update your firmware for your new thermistor, look through the V6 Firmware guides.

Using an incorrect thermistor can result in temperatures being too low and increasing extrusion force, as well as producing prints that are poorly bonded.

You may find that after changing your hotend you may need to use slightly different temperatures, as a guide at E3D we tend to print PLA between 190C and 210C, and ABS at 230C to 240C. Your particular filament may however need different settings.

PTFE tubing not properly inserted (where applicable)

In hotends that use PTFE tubing:

E3D-v6 Bowden 1.75mm
E3D-v6 Bowden 3mm
E3D-v6 Direct 1.75mm
E3D-Lite6
The PTFE must be inserted to the fullest extent possible, the hotend is designed to allow the tubing to pass right down into the heatsink, and in v6 1.75mm hotends the tubing passes right down into the HeatBreak.

On bowden systems it is especially helpful to 'lock in' the PTFE tubing so that it cannot move around during retraction, this increases reliability, and gives much better retraction performance in general. To do this, push the PTFE firmly into the hotend, while pulling upwards on the black collet that retains the tubing. This locks the tubing into place so that it cannot move during retraction. It is important to do this at both ends of the tube.

Without the tubing the filament has room to bend and slightly buckle inside the hotend, which prevents the extruder being able to exert adequate force through the filament as it acts like a spring when buckled.

The PTFE tubing is absolutely necessary in the E3D-v6 1.75mm Direct hotend. Some people on the internet say it is not needed. Those people are wrong.

Poor extruder design

There are a lot of great extruder designs out there, freely available and 3D printable. There are also some absolutely terrible extruders too, an extruder needs to be able to produce enough force to push the filament into the hotend, and also have enough grip at the drive gear to apply that force.

Solutions to Common Issues

Some hobbed bolts and drive gears are better than others. In general most conventional hobbed bolts that are cut with a tap work very well, especially as they are often used in conjunction with a geared extruder. We see quite a few issues arising from poor quality drive gears designed to go right onto a 5mm motor shaft, some of which are simply repurposed spur gears, or worse knurled inserts or similar.

Airtripper has an excellent analysis of a range of drive gears, and we second his experiences and reccomendations: http://airtripper.com/1676/3d-printer-ex...

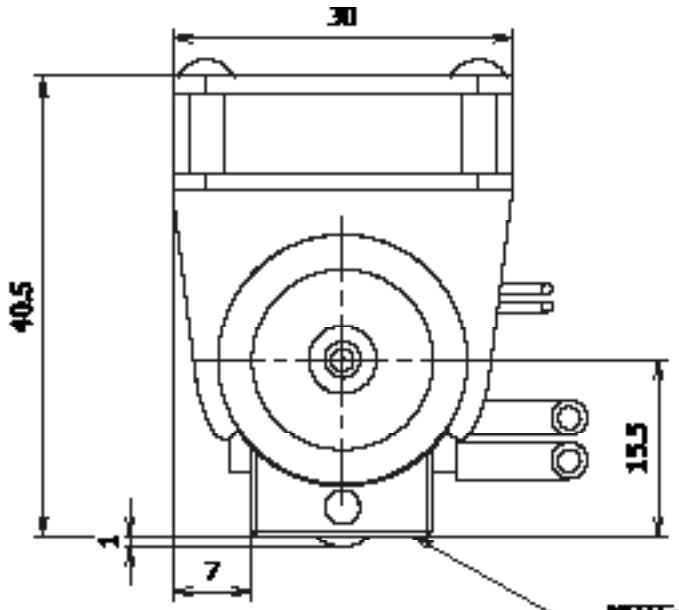
Bad drive gears offer poor grip and can deform the filament so badly that it no longer fits down the hotend without significant friction, if at all. A good drive gear that is designed and manufactured from the ground up for 3D printing is an essential component of your printer, a good one only costs a few pounds, this is not a place to be cheap!

A good extruder should constrain the filament from bending, snaking or buckling once it is past the drive gear or hobbed bolt. Having a wide open space where the filament has room to bend or buckle will have a detrimental effect on reliability and performance, it will also make printing flexible filaments nearly impossible.

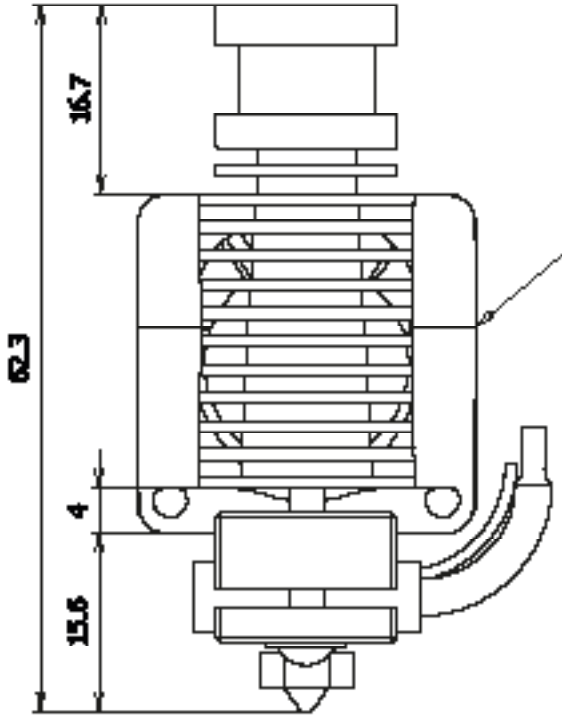
Wherever possible when using E3Dv6 1.75mm hotends, or E3Dv6 3mm Bowden hotends you should have the PTFE tubing run as far up into the extruder as possible. This provides the smoothest possible path for the filament to travel down with the least possibility of buckling. On our machines the PTFE tubing runs up into the extruder literally to the point where it is in contact with the hobbed bolt. This gives exceptional ease of filament loading and the best possible performance with flexible filaments.

Still having trouble?

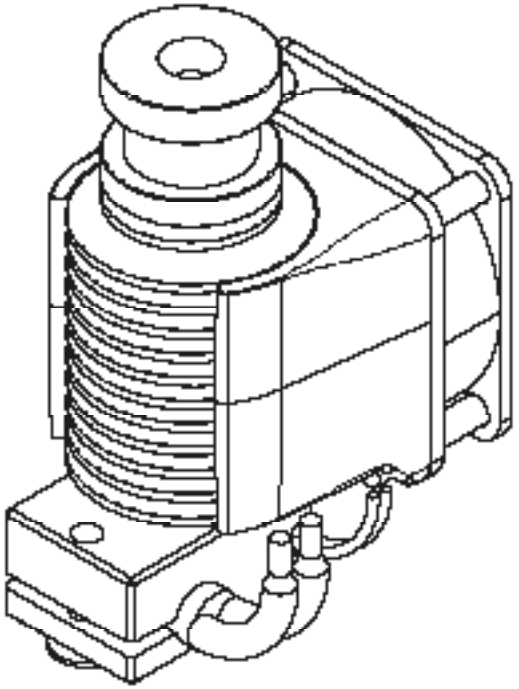
If you are still having trouble, we are here to help. Please fill out our questionnaire and let us know once you have done that via our Contact Us page.



NOTE: THE BLOCK CAN BE MOUNTED EITHER WAY ROUND



NOTE: THE DUCT CAN BE MOUNTED EITHER WAY UP



THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
SCALE: 1.5:1

Designed by	Checked by	Approved by	Date		Date	
E3D Online - JR	ST	JR	24/06/2016		24/06/2016	

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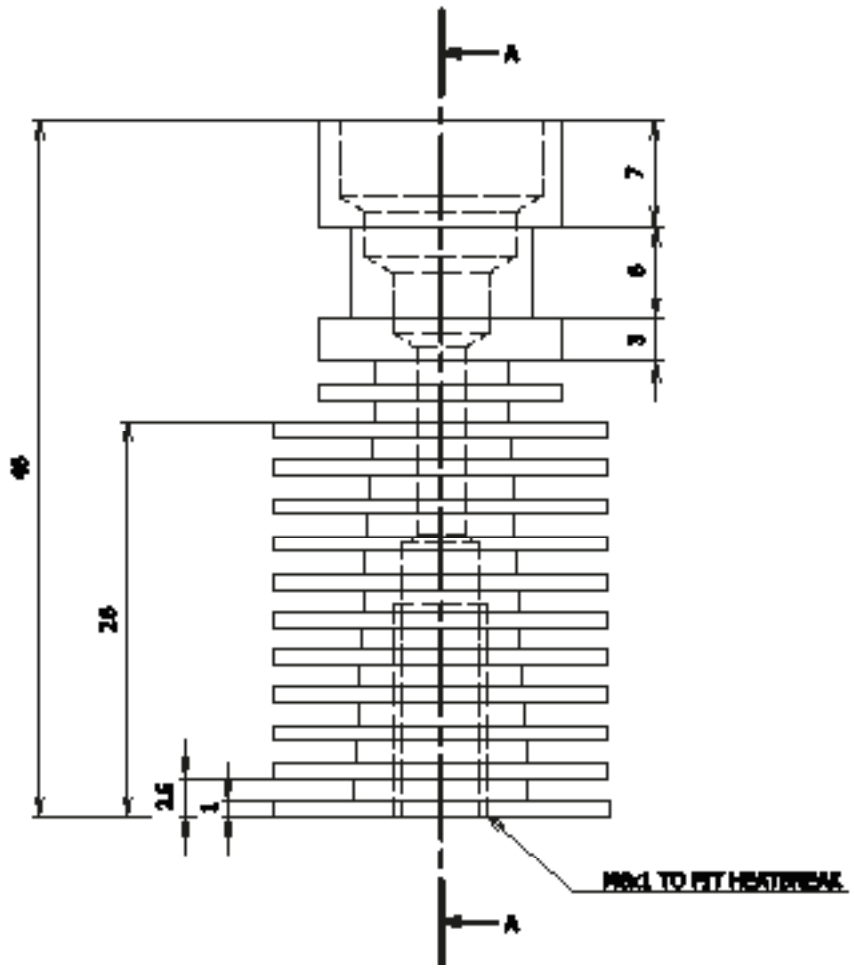
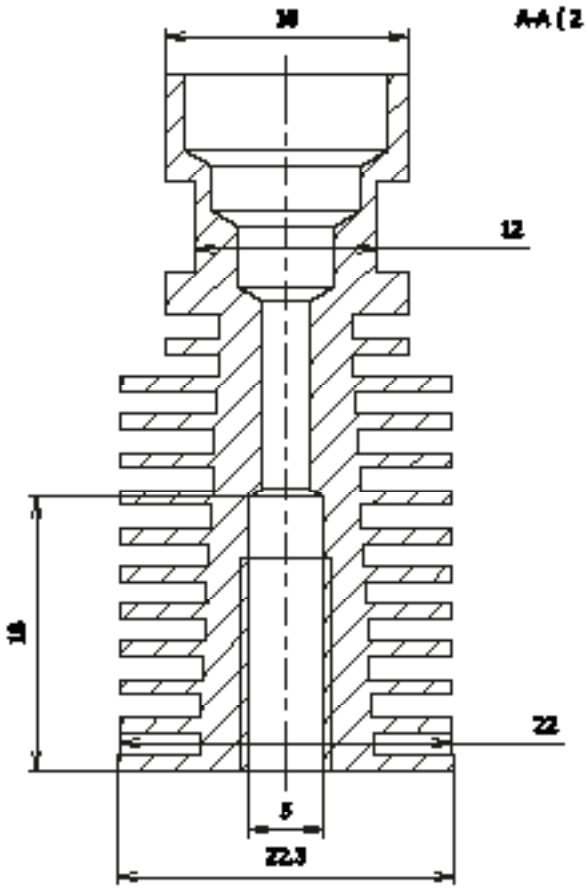
E3D-v6 3mm Direct with Sensor Cartridge

V6-3DD-D-ASSM	Edition 6	Sheet 1 / 1





THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
MATERIAL: ALUMINIUM
SCALE: 2:1
SURFACE FINISH: UNFINISHED

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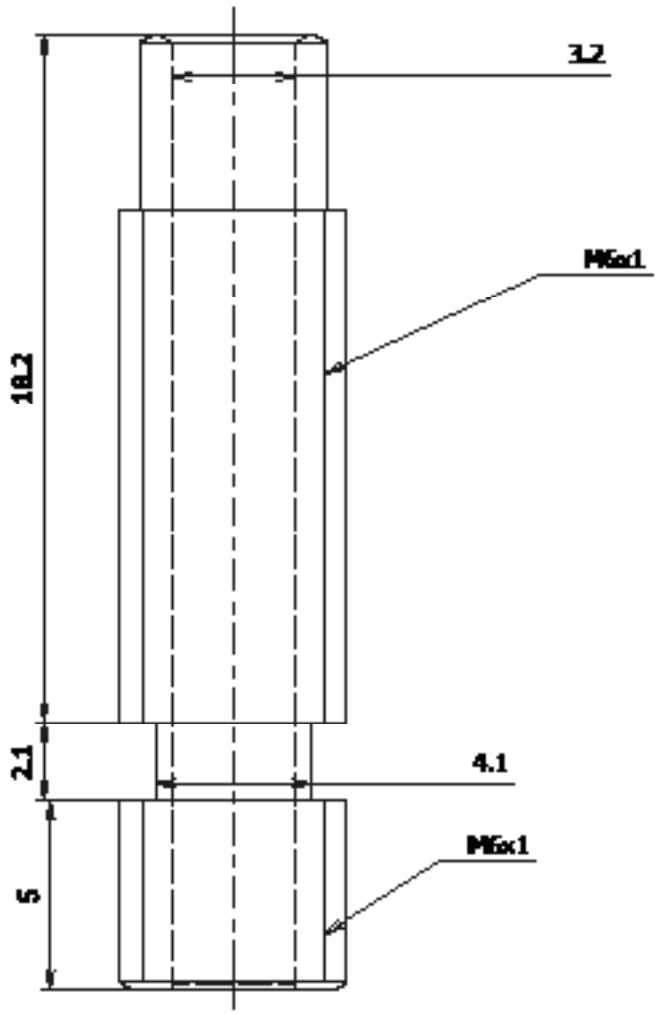
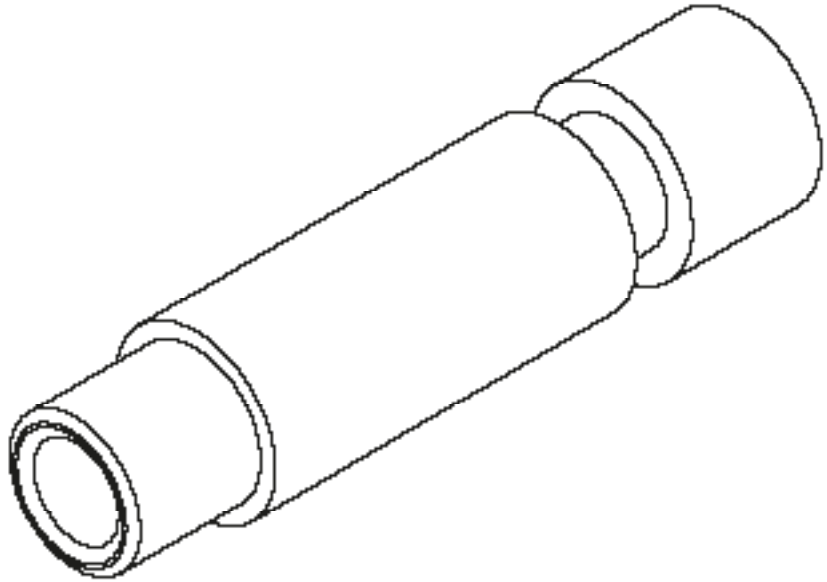
E3D-v6 3mm Bowden Heat Sink

V6-3BD-SINK-B	Edition 4	Sheet 1/1





THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
MATERIAL: S/S 303
SCALE: 5:1
SURFACE FINISH: UNFINISHED UNLESS STATED

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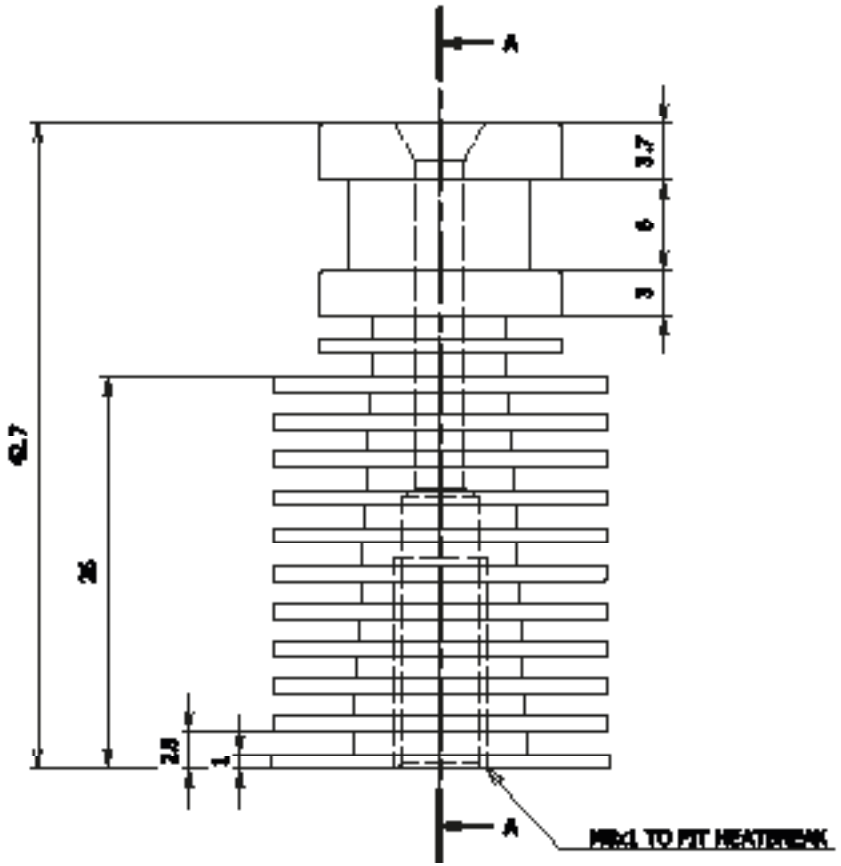
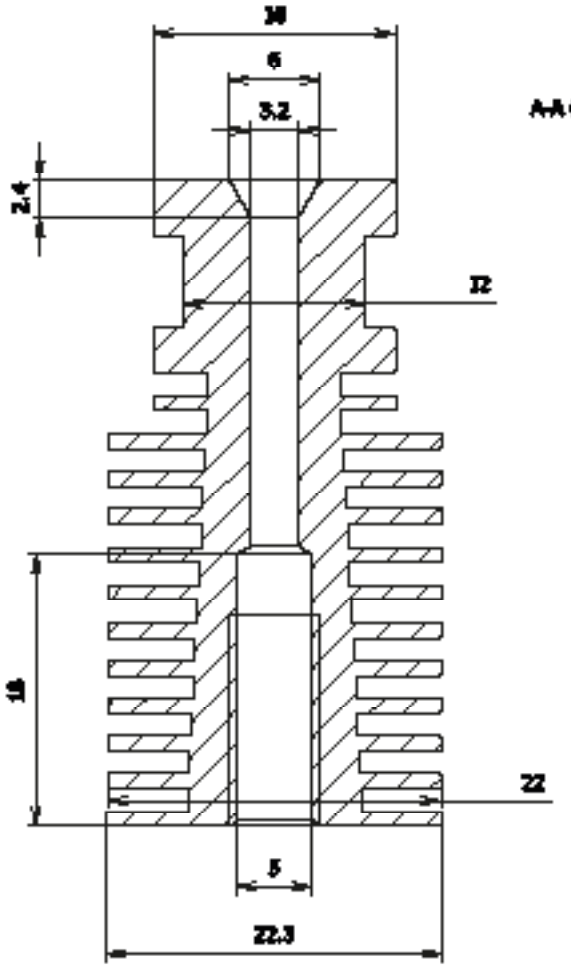
E3D-v6 3mm Heat Break

V6-3DD-BREAK	Edition 6	Sheet 1 / 1





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THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
MATERIAL: ALUMINIUM
SCALE: 2:1
SURFACE FINISH: UNFINISHED

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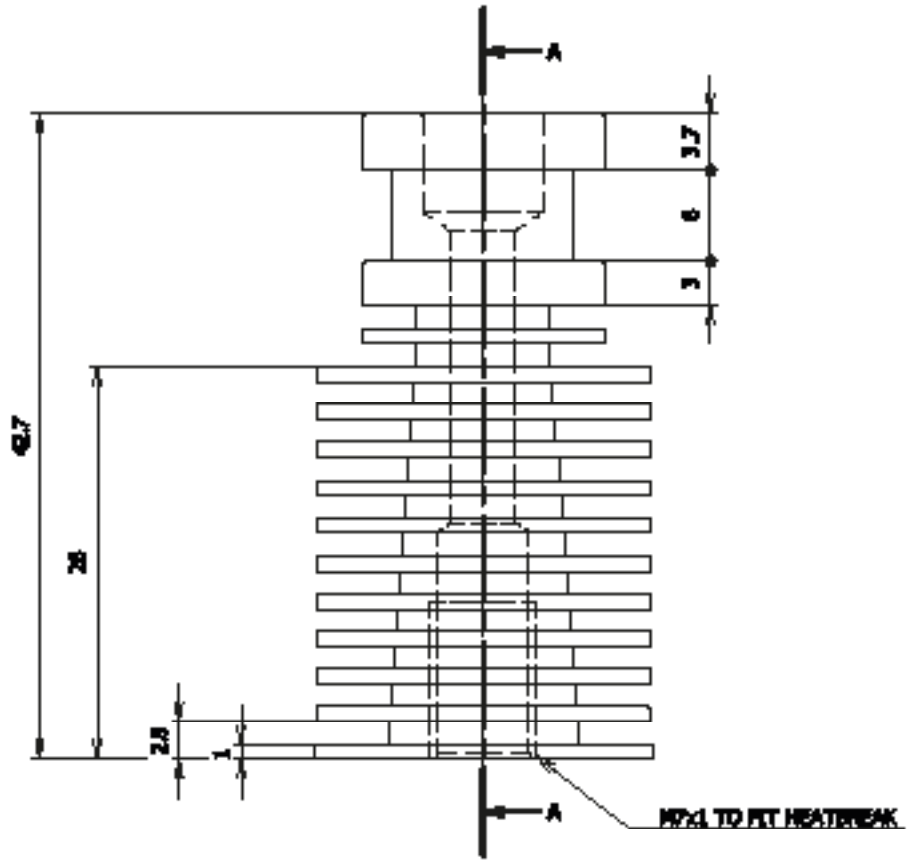
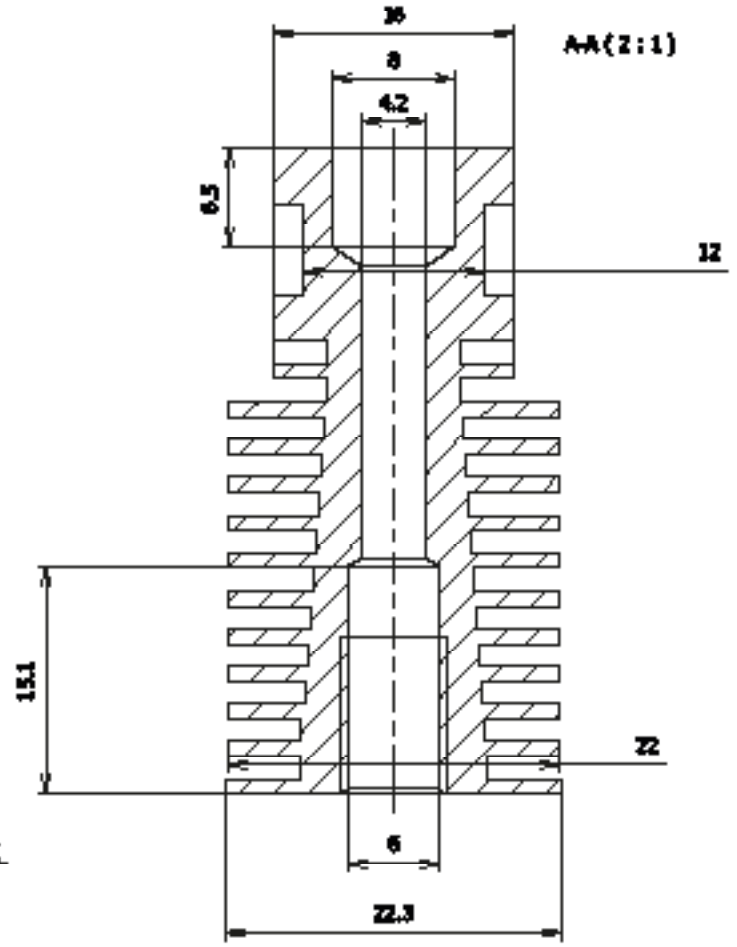
E3D-v6 3mm Direct Heat Sink

V6-3MM-SINK-D	Edition 5	Sheet 1/1





Designed by	Checked by	Approved by	Date		Date	
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THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
MATERIAL: ALUMINIUM
SCALE: 2:1
SURFACE FINISH: UNFINISHED

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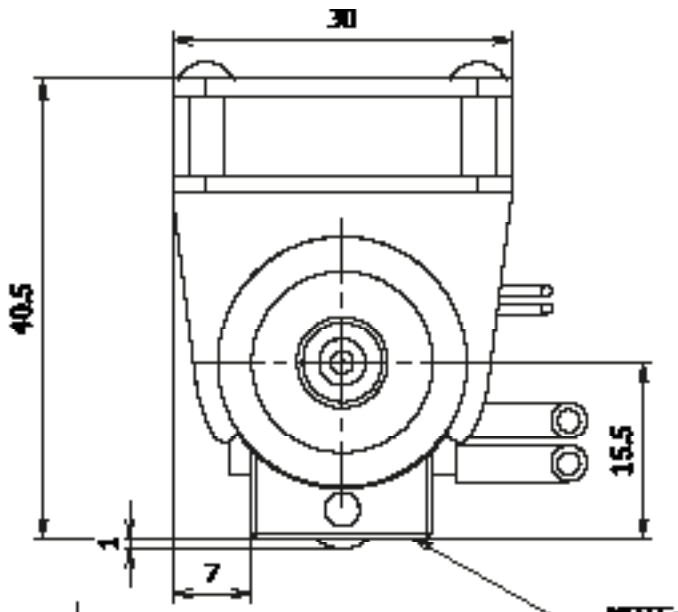
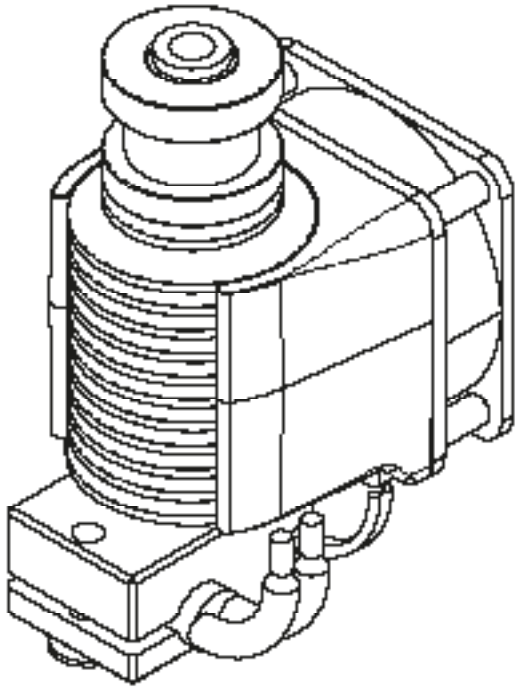
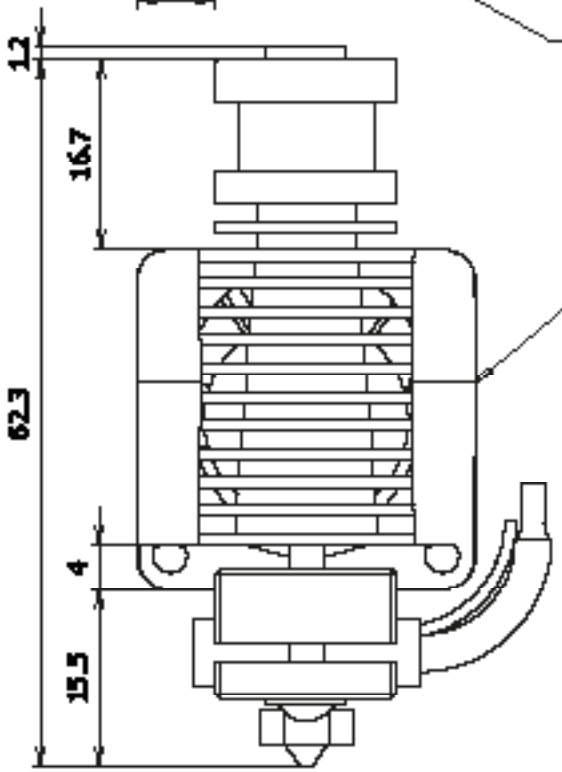
E3D-v6 1.75mm Universal HeatSink

V6-175-SINK	Edition 6	Sheet 1/1





NOTE: THE BLOCK CAN BE MOUNTED EITHER WAY ROUND



NOTE: THE DUCT CAN BE MOUNTED EITHER WAY UP

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
SCALE: 1.5:1

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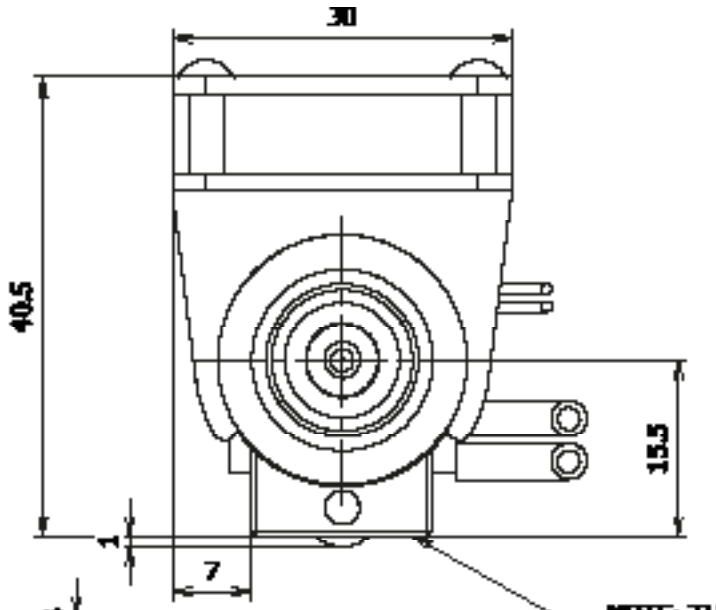
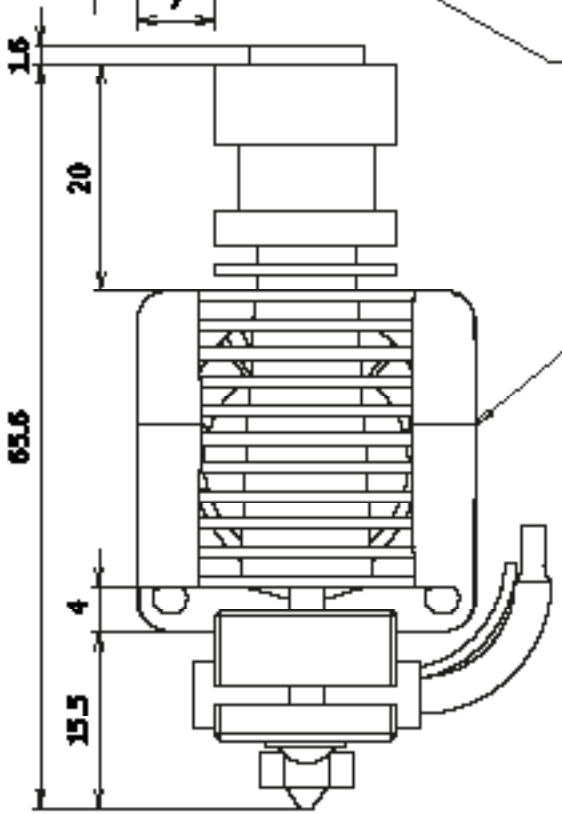
E3D-v6 1.75mm Universal with Sensor Cartridge

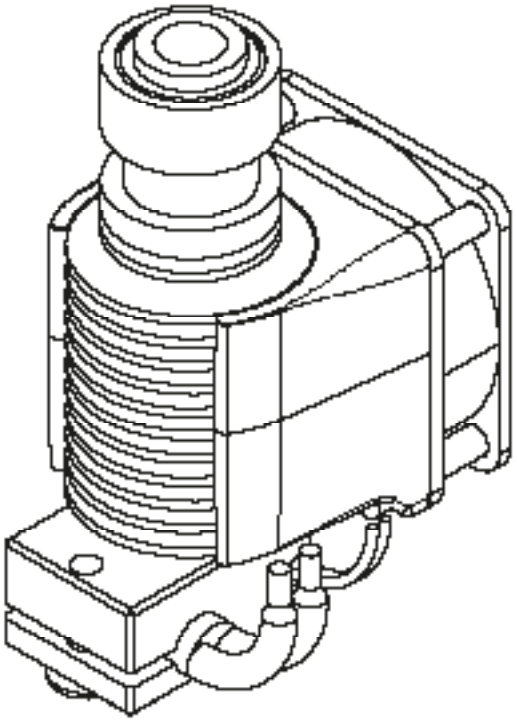
V6-175	Edition 6	Sheet 1 / 1





NOTE: THE BLOCK CAN BE MOUNTED EITHER WAY ROUND

NOTE: THE DUCT CAN BE MOUNTED EITHER WAY UP



THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
SCALE: 1.5:1

Designed by	Checked by	Approved by	Date		Date	
E3D Online - JR	ST	JR	24/06/2016		24/06/2016	

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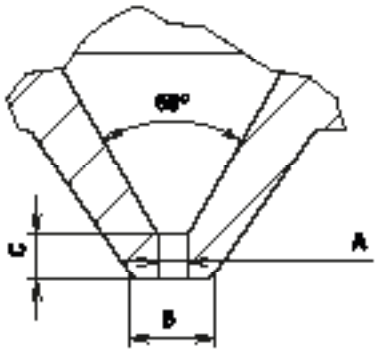
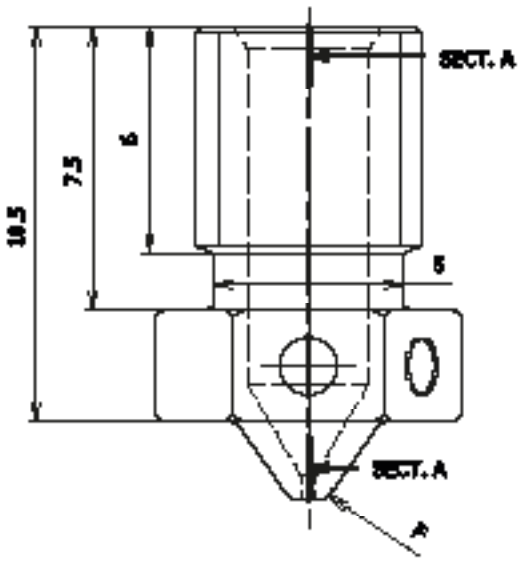
E3D-v6 3mm Bowden with Sensor Cartridge

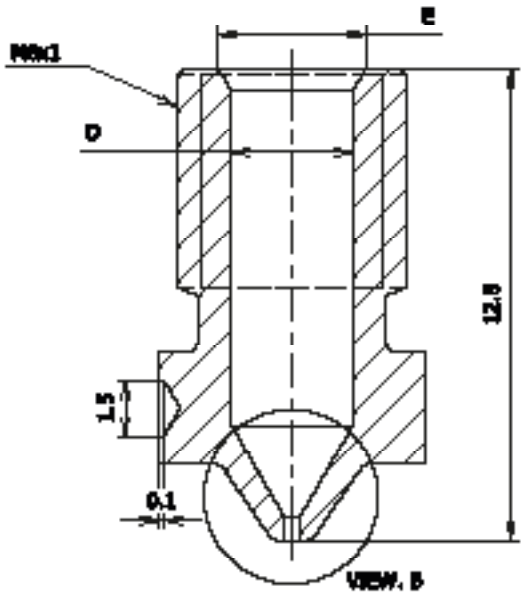
V6-3DD-B-ASSM	Edition 6	Sheet 1 / 1

VIEW. B (10 : 1)



SECT. A-SECT. A (5)





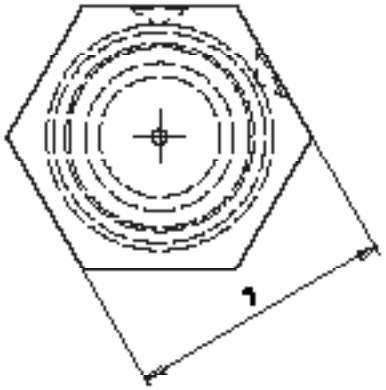


TABLE							
SKU	A	B	C	D	E	F	# Dots
V6-NOZZLE-175-250	0.15	0.30	0.157	2.8	2.6	0.10	7
V6-NOZZLE-175-250	0.25	0.63	0.36	2.8	2.6	0.10	0
V6-NOZZLE-175-300	0.30	0.75	0.45	2.8	2.6	0.10	1
V6-NOZZLE-175-350	0.35	0.88	0.53	2.8	2.6	0.15	2
V6-NOZZLE-175-400	0.40	1.00	0.60	2.8	2.6	0.20	3
V6-NOZZLE-175-500	0.50	1.25	0.90	2.8	2.6	0.20	6
V6-NOZZLE-175-600	0.60	1.50	1.20	2.8	2.6	0.25	4
V6-NOZZLE-175-800	0.80	2.00	1.60	2.8	2.6	0.30	5
V6-NOZZLE-175-000	UNDRILLED	1.00	0.60	2.8	2.6	0.20	0
V6-NOZZLE-308-250	0.15	0.30	0.157	3.2	3.0	0.10	7
V6-NOZZLE-308-250	0.25	0.63	0.36	3.2	3.0	0.10	0
V6-NOZZLE-308-300	0.30	0.75	0.45	3.2	3.0	0.10	1
V6-NOZZLE-308-350	0.35	0.88	0.53	3.2	3.0	0.15	2
V6-NOZZLE-308-400	0.40	1.00	0.60	3.2	3.0	0.20	3
V6-NOZZLE-308-500	0.50	1.25	0.90	3.2	3.0	0.20	6
V6-NOZZLE-308-600	0.60	1.50	1.20	3.2	3.0	0.25	4
V6-NOZZLE-308-800	0.80	2.00	1.60	3.2	3.0	0.30	5
V6-NOZZLE-308-000	UNDRILLED	1.00	0.60	3.2	3.0	0.20	0

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
MATERIAL: Brass (ie V5)
SCALE: 5:1
SURFACE FINISH: UNFINISHED UNLESS STATED

Designed by	Checked by	Approved by	Date		Date	
E3D Online - JR	SM	SM	28/05/2014		24/09/2015	

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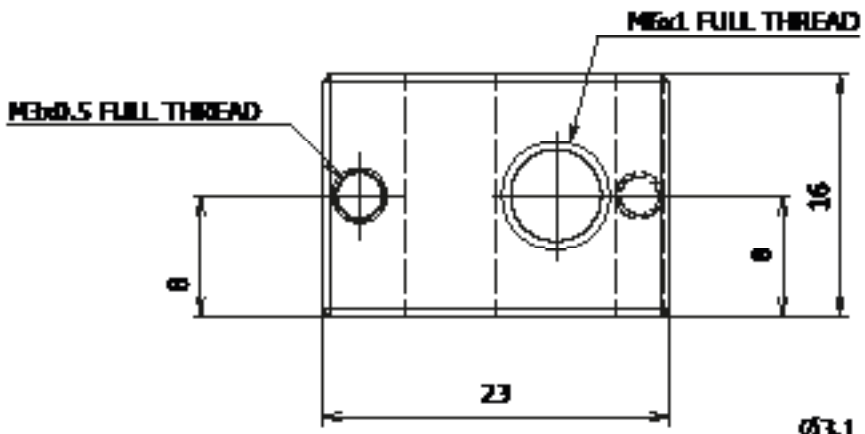
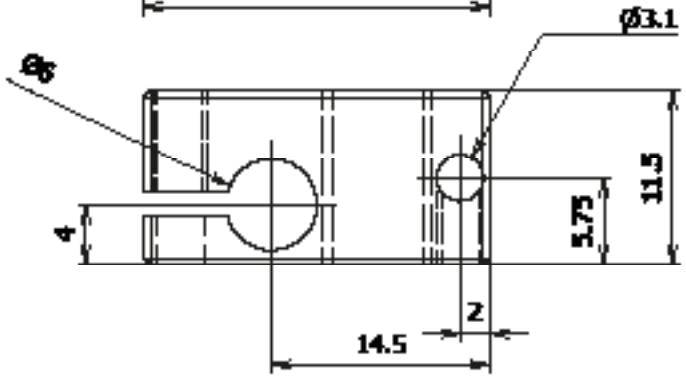
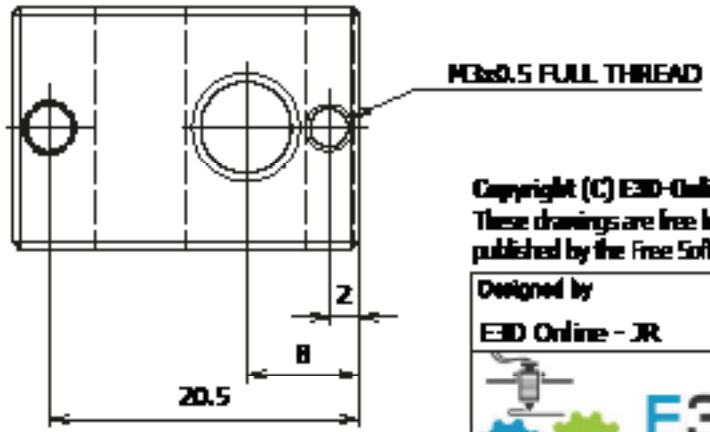
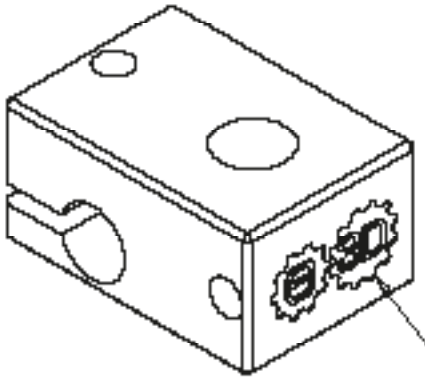
E3D-v6 Nozzle Series

V6-NOZZLE-(175|300)-([0-5]|8|5)(0)	Edition	Sheet
	a	1 / 1









NOTE: NOT ALL E3D BLOCKS ARE ENGRAVED

THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
MATERIAL: ALUMINIUM
SCALE: 2:1
SURFACE FINISH: UNFINISHED UNLESS STATED

Designed by	Checked by	Approved by	Date		Date	
E3D Online - JR	SM	SM	27/03/2015		24/06/2016	

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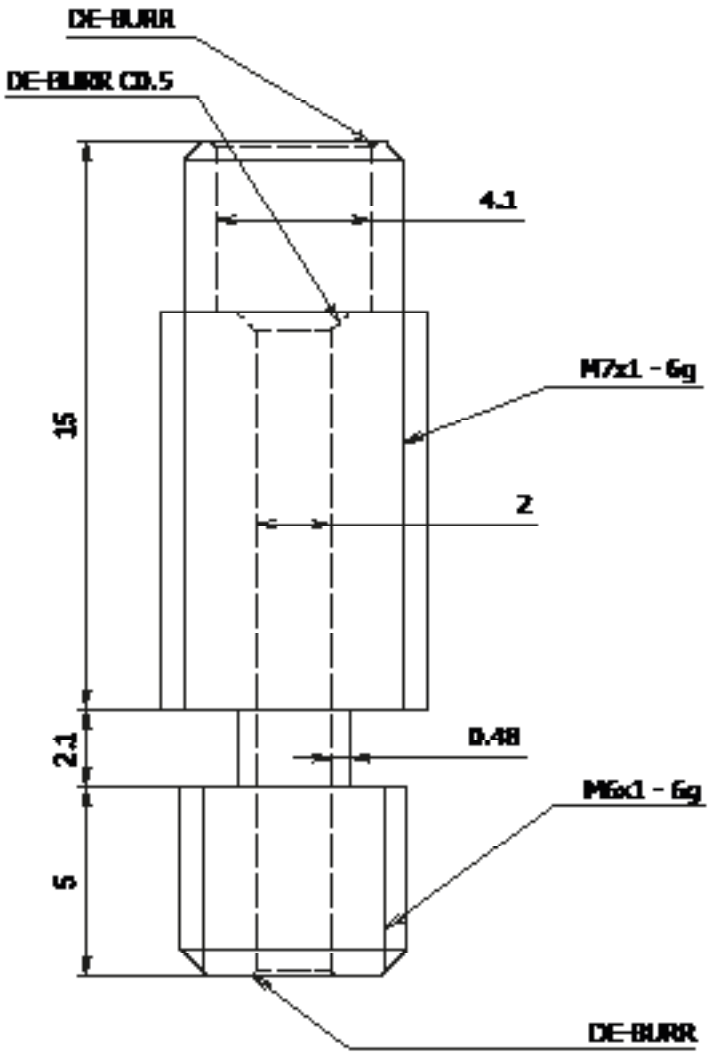
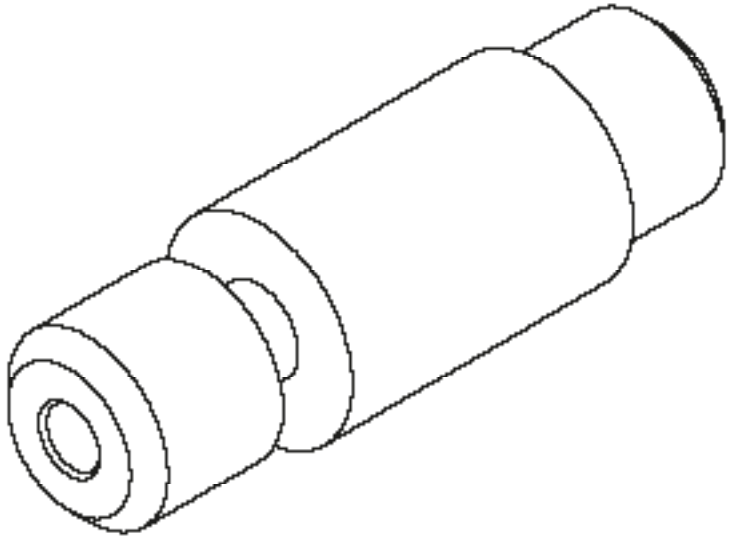
E3D-v6 Heater Block for Sensor Cartridges

V6-BLOCK-CARTRIDGE-ALU	Edition B.1	Sheet 1 / 1

REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	1	PTFE hole updated	30/08/2018	ABL





THIRD ANGLE PROJECTION
ALL DIMENSIONS IN MM
MATERIAL: S/S 303
SCALE: 5:1
SURFACE FINISH: UNFINISHED UNLESS STATED

Designed by	Checked by	Approved by	Date		Date	
E3D Online - JR	SM	SM	24/04/2014		24/06/2016	

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E3D-v6 1.75mm Heat Break

V6-175-BREAK	Edition 1	Sheet 1 / 1