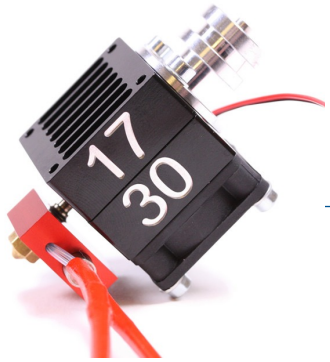

1730-FMH

1730 Full Metal Hotend

9 July 2016 - Product data sheet

1. General description

The 1730 Full Metal Hotend offers many great features that makes it a truly unique Hotend. For the very first time it is possible to print 1.75 mm or 3 mm filament with the same single Hotend. 1730's innovative modular design is leakage proofed and optimized for printing standard filaments, special filaments and high-temperature filaments.

The modular 1730 Full Metal Hotend is specially designed to provide answers to the limitations of current fused filament fabrication (FFF) Hotend technology. The 1730 Full Metal Hotend simplifies, improves and opens up new applications in 3D-Printing.

2. Features and benefits

- Print 1.75 mm and 3 mm Filament with the same Hotend
- Innovative interchangeable Filament Nozzle Units
- Modular Hotend design
- Optimized thermal barrier
- Short heating zone
- Leakage proof - No PEEK or PTFE used
- Multiple Filament Nozzle Diameters available (e.g. 0.25 / 0.30 / 0.40 / 0.60 / 0.80 mm)
- Brass & Stainless steel Filament Nozzle Units
- Fully assembled
- Print the widest range of filaments
- Max. printing temperature of 300 °C
- Print faster - reduced feeding friction
- Heats up to 200 °C in less than 60 seconds
- Multiple mounting options
- Round Mount turns 1730 Full Metal Hotend into bowden setup
- Change Filament Nozzle Units in cold state
- 500 °C ready (future upgrade)

3. Applications

- FFF (fused filament fabrication) 3D-Printing
  - Domestic / Desktop 3D-Printing
  - RepRap 3D-Printing
  - Industrial 3D-Printing
- Additive manufacturing
- Filament prototyping

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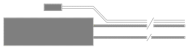
4. Parts of the 1730-FMH

Table 1. 1730-FMH metal parts

Part	Graphic	Material	Finish	Weight (gr)	Dimensions (mm)
Heatsink Block 17		Aluminium	anodized black	17	30 x 30 x 12
Heatsink Block 30		Aluminium	anodized black	14.8	30 x 30 x 12
Heater Block		Aluminium	anodized red	5	21 x 15 x 8
Groove Mount		Aluminium	polished	14.6	68 x 23 x 4
Round Mount Nominal Thread Size: 1/8" BSPT for 1.75 mm & 3 mm bowden coupler		Aluminium	polished	7	20.7 x 16
Fan Holder		Aluminium	anodized red	0.8	30 x 30 x 1
Filament Nozzle Unit 1.75 mm		Brass; Stainless Steel	polished	6	66
Filament Nozzle Unit 3 mm		Brass; Stainless Steel	polished	3.6	66
Bolt (4 pcs)		Steel		7	M3x30
Bolt (2 pcs)		Steel		1.5	M3x10
CSK head (2 pcs)		Steel		1	M3x10
Washer (2 pcs)		Steel			M3 small
Setscrew		Steel			M3
Hex Key		Steel		0.8	1.5

Table 2. 1730-FMH electronic parts

Part	Graphic	Material	Cable length	Weight (gr)	Dimensions (mm)
Cooling Fan 12 V or 24 V		Plastic	Variable	7.6	30 x 30 x 10
Heater Cartridge 40W + Thermistor Unit 12 V or 24 V		Glass; Ceramic; Stainless Steel	1 m	20	20 x 6

5. Limiting values

Table 3. Limiting values

Symbol	Parameter	Condition	Min	Max	Unit
V_{CC}	Supply Voltage	12 V Edition	11	13	V
V_{CC}	Supply Voltage	24 V Edition	22	26	V
$T_{PRINT(FDM)}$	Printing temperature	NTC3950		300	°C

6. Ordering options

Table 4. Ordering options

Name	SKU	HB 17	HB 30	HBL	GM	RM	FH	FNU 1.75	FNU 3.00	B4P	B2P	CSK	W2P	SES	HEX	FAN	HC TER
1730 Full Metal Hotend Standard Edition - Basic Set - 1.75 mm	12 V: 1000000005370 24 V: 1000000005615	•	•	•			•	•		•				•	•	•	•
1730 Full Metal Hotend Standard Edition - Basic Set - 3 mm	12 V: 1000000005592 24 V: 1000000005622	•	•	•			•		•	•				•	•	•	•
1730 Full Metal Hotend Standard Edition - Basic Set - 1.75 mm & 3 mm	12 V: 1000000005608 24 V: 1000000005639	•	•	•			•	•	•	•				•	•	•	•
1730 Full Metal Hotend Standard Edition - Deluxe Set - 1.75 mm & 3 mm	12 V: 1000000005288 24 V: 1000000005486	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Table 5. Ordering options acronym table

Acronym	Description		Acronym	Description		Acronym	Description
HB17	Heatsink Block 17		FNU 1.75	Filament Nozzle Unit 1.75 mm		SES	Set Screw
HB30	Heatsink Block 30		FNU 3.00	Filament Nozzle Unit 3 mm		HEX	Hex Key
HBL	Heater Block		B4P	Bolt (4 pcs)		FAN	Cooling Fan
GM	Groove Mount		B2P	Bolt (2 pcs)		HC TER	Heater Cartridge 40W + Thermistor Unit
RM	Round Mount		CSK	CSK head (2 pcs)			
FH	Fan Holder		W2P	Washer (2 pcs)			

7. Temperature characteristics

Table 6. Temperature performance (heat up)

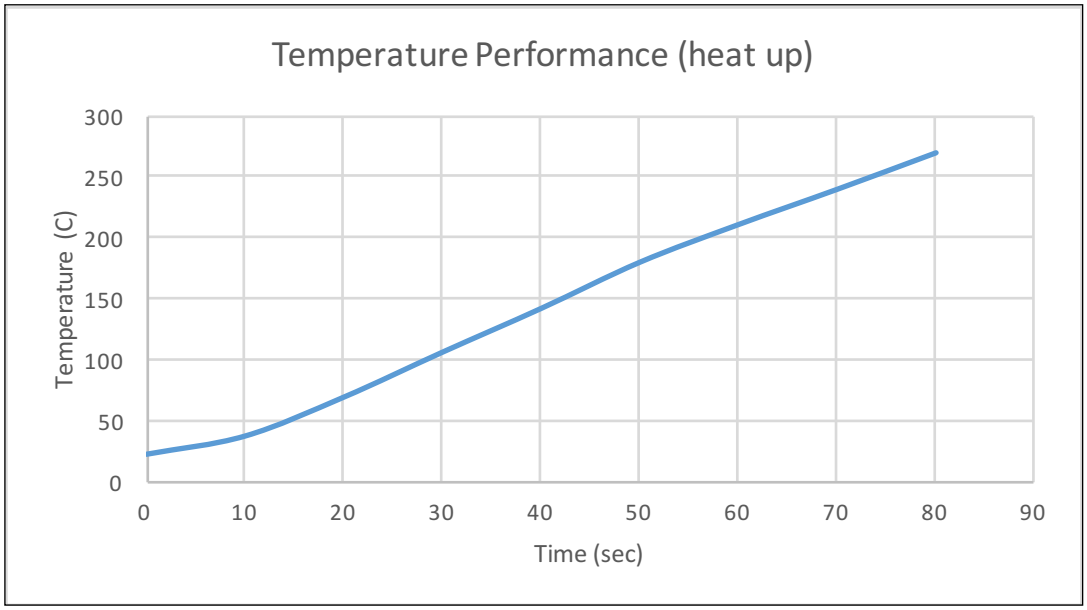
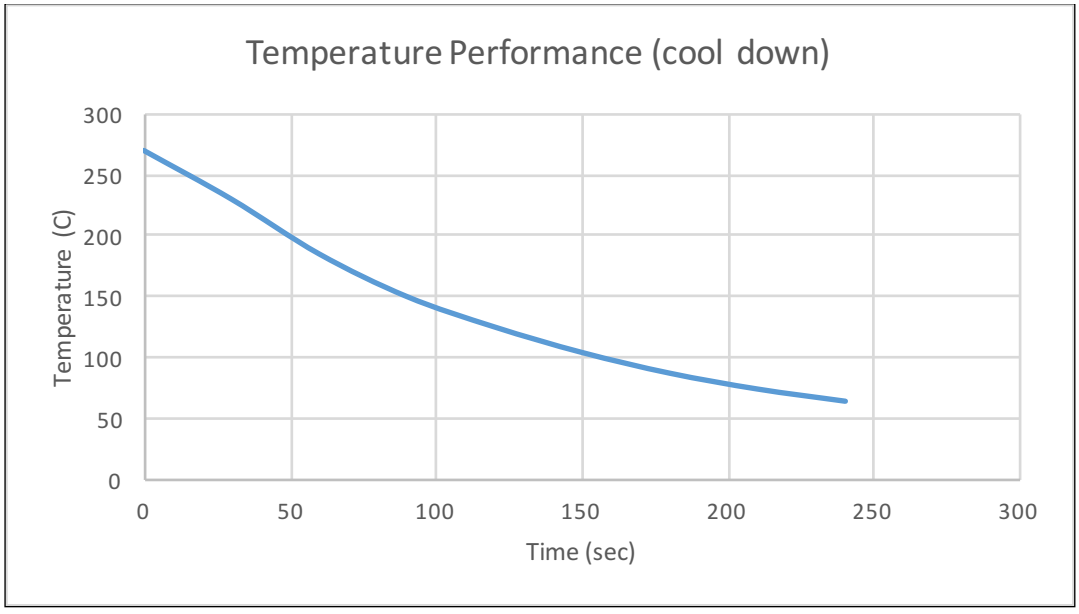


Table 7. Temperature performance (cool down)



8. Recommended printing temperatures

Table 8. Recommended printing temperatures

Symbol	Filament	Min	Max	Unit
$T_{PRINT(FDM)}$	PLA	190	220	°C
$T_{PRINT(FDM)}$	ABS	230	260	°C
$T_{PRINT(FDM)}$	Nylon	250	270	°C
$T_{PRINT(FDM)}$	PC	260	280	°C

9. Static characteristics

Table 9. Static characteristics

Symbol	Parameter	Condition	Type	Unit
$V_{SUP(Fan)}$	Fan Supply Voltage	12 V Edition	12	V
$V_{SUP(Heater)}$	Heater Supply Voltage	12 V Edition	12	V
$I_{SUP(Heater)}$	Heater Current	12 V Edition	3	A
$V_{SUP(Fan)}$	Fan Supply Voltage	24 V Edition	24	V
$V_{SUP(Heater)}$	Heater Supply Voltage	24 V Edition	24	V
$I_{SUP(Heater)}$	Heater Current	24 V Edition	1.5	A
NTC	Thermistor	NTC3950	100	kΩ

10. PID settings

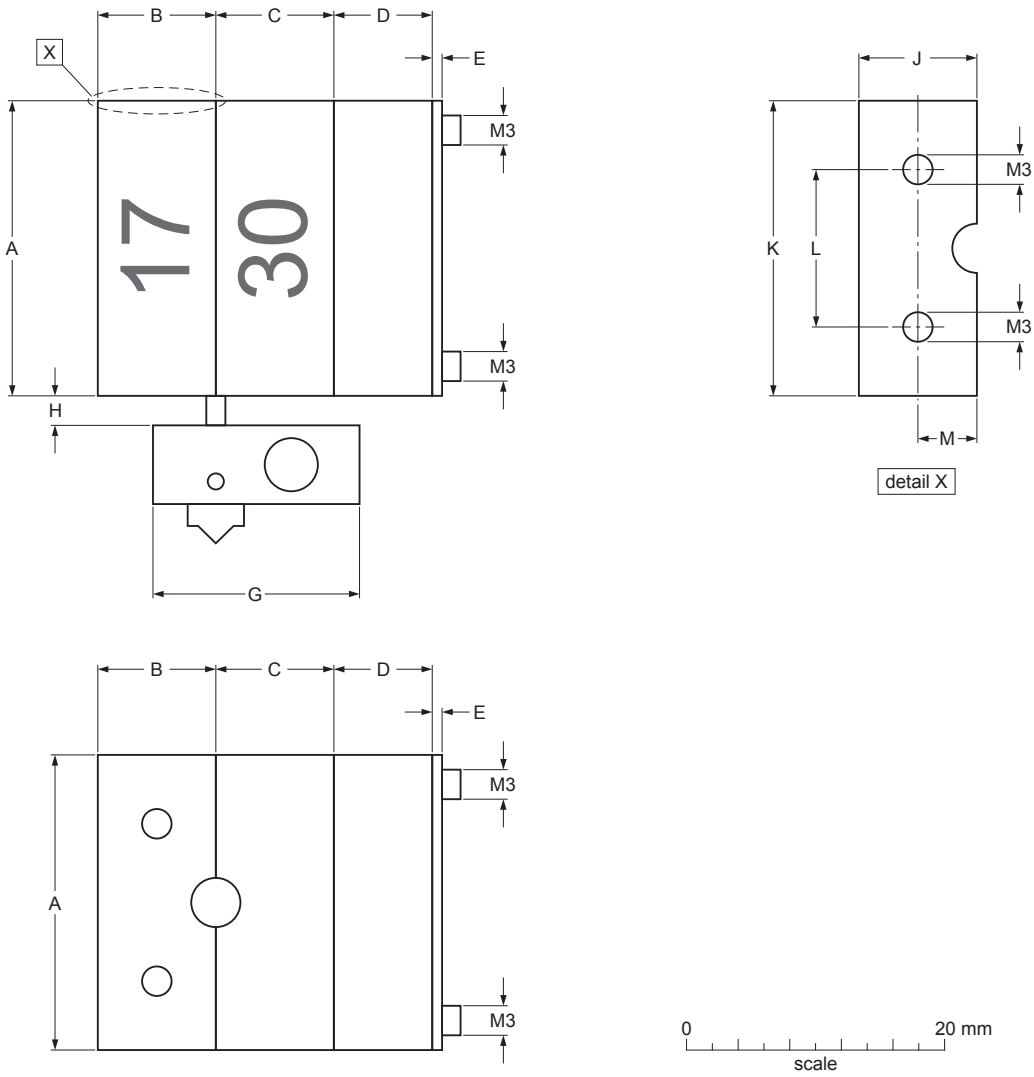
Table 10. PID settings

Symbol	Parameter	Condition	Type	Unit
K_p	Proportional gain	NTC3950	19.95	tuning parameter
K_i	Integral gain	NTC3950	1.97	tuning parameter
K_d	Derivative gain	NTC3950	50.50	tuning parameter

11. 1730-FMH Outline

Table 11. 1730-FMH outline

1730 Full Metal Hotend **Achatz Industries**



Dimensions (mm are the original dimensions)

Unit	A	B	C	D	E	F	G	H	J	K	L	M
mm	30	12	12	10	1	8	21	3	12	30	16	6

Outline version	European projection	Issue date
1730 FMH		~~16-07-02~~ 16-07-08

12. Acronym Table

Table 12. Acronym table

Acronym	Description		Acronym	Description		Acronym	Description
FMH	Full Metal Hotend		RepRap	Replicating rapid prototyper		B4P	Bolt (4 pcs)
FNU	Filament Nozzle Unit		HB17	Heatsink Block 17		B2P	Bolt (2 pcs)
PC	Polycarbonate		HB30	Heatsink Block 30		CSK	CSK head (2 pcs)
FFM	Fused filament method		HBL	Heater Block		W2P	Washer (2 pcs)
FFF	Fused filament fabrication		GM	Groove Mount		SES	Set Screw
NTC	Negative temperature coefficient		RM	Round Mount		FAN	Cooling Fan
PID	Proportional–integral–derivative		FH	Fan Holder		HC TER	Heater Cartridge 40W + Thermistor Unit
PTFE	Polytetrafluoroethylene		FNU 1.75	Filament Nozzle Unit 1.75 mm			
PEEK	Polyether ether ketone		FNU 3.00	Filament Nozzle Unit 3 mm			
PLA	Polylactic acid		ABS	Acrylonitrile butadiene styrene			

13. Revision history

Table 13. Revision history

Document ID	Release Date	Status	Notice
1730-FMH	20160709	released	V1.00
Modifications:			

14. Legal information

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15. Contents

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