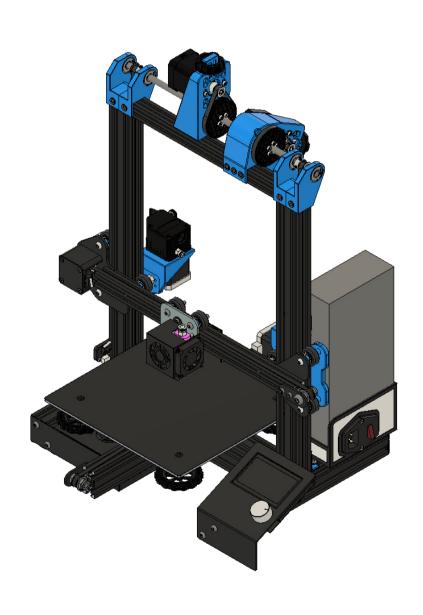
## Single Z and V-Rollers

Rotated

or

Unrotated



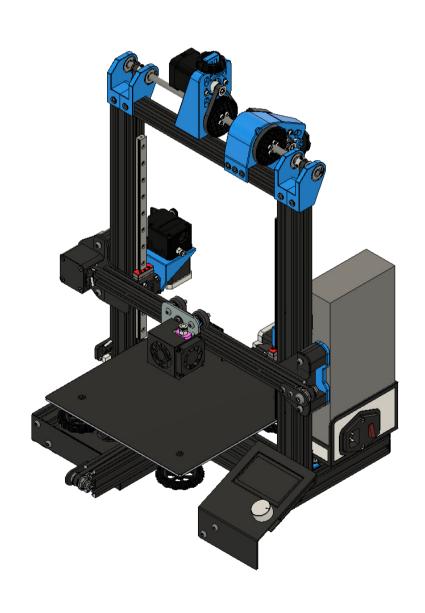
Motion 20T Pulley - 8mm Bore 3 no One for each side on the Rod, one for the printed 80T Gear.  16T Pulley - 5mm Bore 1 no Motorshaft  Gt2 Belt 2 Meter no Don't buy the cheapest. You should go for belts with glassfiber. Width: 6mm  188mm Looped Belt 1 no Width: 6mm  F623ZZ 3*10*4 bearing 4 no 2 Pieces per side or 2x 20T toothed Idlers (18mm in diameter, 8.5mm width, 3mm ID)  608ZZ Bearing 4 (5) no Doy ou have an old skateboard? You can steal the bearings from the wheels;) (5 for extra bearing in transmission body)  8mm Rod 335 mm yes/no Theres no link, just go to your local hardware store and take a cheap 8mm (aluminium) rod. You don't have to buy a hardened steel one. (to expensive and hard to cut). You also could use your leadscrew.  Fasteners M5x8mm 27 (28) no (28 for rotated) + 6 for PowerSupply holder if needed. Any type of M5x8mm screw can be used.  M5x40mm 6 yes (3 x) use a stock 40mm screw from the left side of the printer and place this on the inside of the right side. This	ernative Source express express express express express express
Step   Selet	express express express
G12 Belt   2 Meter   no   Don't buy the cheapest. You should go for belts with glassfiber. Width: 6mm   recommended   Alliest	express express
188mm Looped Belt	express
F623ZZ 3*10*4 bearing	
Boyou have an old skateboard? You can steal the bearings from the wheels;) (5 for extra bearing in transmission body)	express
Sobset   S	
to buy a hardened steel one. (to expensive and hard to cut). You also could use your leadscrew.    Settlemens	<u>express</u>
M5x40mm 6 yes (3 x) use a stock 40mm screw from the left side of the printer and place this on the inside of the right side. This way you can use any type of screwhead for the remaining holes.  M5 T-nuts 27 (28) no (28 for rotated) + 6 for PowerSupply hodier if needed.  M3x25mm 2 no  M3x20mm 2 no  M3x12mm 4 no if you have no screws, you should buy a kit. Especially for the tensioner a longer screw can be good.  M3x12mm 4 no  M3x10mm 2 no  M3x8mm 4 no  M3x8mm 5 no  M3 nuts 8 no  M3 washer 2 no  Electronics Motor extension cable 1 no The original Cable is obviously too short^^ Check if the middle cables are crossed!!! Aliexpress  Printed Parts RightV3.x 1 / Thingiverse (Bowden-Version available)  RightTop_A 1 / Thingiverse  Bottom_F623 or_toothed 2 / Thingiverse  Bottom_F623 or_toothed 2 / Thingiverse  I Thingiverse	
M5x40mm 6 yes (3 x) use a stock 40mm screw from the left side of the printer and place this on the inside of the right side. This way you can use any type of screwhead for the remaining holes.  M5T-nuts 27 (28) no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x25mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  M3x20mm 2 no (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (28 for rotated) + 6 for PowerSupply holder if needed.  Aliexpress (	
M3x25mm 2 no lf you have no screws, you should buy a kit. Especially for the tensioner a longer screw can be good. Aliexpress  M3x12mm 4 no lf you have no screws, you should buy a kit. Especially for the tensioner a longer screw can be good. Aliexpress  M3x10mm 2 no	express (cheaper)
M3x20mm 2 no If you have no screws, you should buy a kit. Especially for the tensioner a longer screw can be good.  M3x10mm 2 no	
M3x12mm 4 no If you have no screws, you should buy a kit. Especially for the tensioner a longer screw can be good.  M3x8mm 2 no	
M3x10mm 2 no M3x8mm 4 no M3x6mm 5 no M3 nuts 8 no M3 washer 2 no The original Cable is obviously too short^^ Check if the middle cables are crossed!!! Aliexpress Printed Parts RightV3.x 1 / Thingiverse (Bowden-Version available)	
M3x8mm 2 no M3x8mm 5 no M3 washer 5 no M3 washer 2 no Electronics Motor extension cable 1 no The original Cable is obviously too short^^ Check if the middle cables are crossed!!! Aliexpress Printed Parts RightV3.x 1 / Thingiverse (Bowden-Version available)	
M3x6mm 5 no	
M3 nuts 8 no	
M3 washer 2 no Electronics Motor extension cable 1 no The original Cable is obviously too short^^ Check if the middle cables are crossed!!! Aliexpress  Printed Parts RightV3.x 1 / Thingiverse (Bowden-Version available)  LeftV3.x 1 / Thingiverse (Bowden-Version available)  RightTop_A 1 / Thingiverse  RightTop_B 1 / Thingiverse  LeftTop_A 1 / Thingiverse  LeftTop_B 1 / Thingiverse  Bottom_F623 or_toothed 2 / Thingiverse (If you want toothed idlers see here: How to use toothed idlers)  Spacer 3 / Thingiverse	
Electronics       Motor extension cable       1       no       The original Cable is obviously too short^^ Check if the middle cables are crossed!!!       Aliexpress         Printed Parts       RightV3.x       1       / Thingiverse (Bowden-Version available)          LeftV3.x       1       / Thingiverse (Bowden-Version available)          RightTop_A       1       / Thingiverse          RightTop_B       1       / Thingiverse          LeftTop_B       1       / Thingiverse          LeftTop_B       1       / Thingiverse          Bottom_F623 or_toothed       2       / Thingiverse (If you want toothed idlers see here: How to use toothed idlers)          Spacer       3       / Thingiverse	
Printed Parts RightV3.x 1 / Thingiverse (Bowden-Version available)  LeftV3.x 1 / Thingiverse (Bowden-Version available)  RightTop_A 1 / Thingiverse  RightTop_B 1 / Thingiverse  LeftTop_A 1 / Thingiverse  LeftTop_B 1 / Thingiverse  Bottom_F623 or_toothed 2 / Thingiverse (If you want toothed idlers see here: How to use toothed idlers)  Spacer 3 / Thingiverse	
LeftV3.x 1 / Thingiverse (Bowden-Version available)  RightTop_A 1 / Thingiverse  RightTop_B 1 / Thingiverse  LeftTop_A 1 / Thingiverse  LeftTop_B 1 / Thingiverse  Bottom_F623 or_toothed 2 / Thingiverse (If you want toothed idlers see here: How to use toothed idlers)  Spacer 3 / Thingiverse	
RightTop_A 1 / Thingiverse	
RightTop_B 1 / Thingiverse	
LeftTop_A     1     /     Thingiverse       LeftTop_B     1     /     Thingiverse       Bottom_F623 or_toothed     2     /     Thingiverse (If you want toothed idlers see here: How to use toothed idlers)       Spacer     3     /     Thingiverse	
LeftTop_B     1     / Thingiverse       Bottom_F623 or_toothed     2     / Thingiverse (If you want toothed idlers see here: How to use toothed idlers)       Spacer     3     / Thingiverse	
Bottom_F623 or _toothed 2 / <u>Thingiverse (If you want toothed idlers see here: How to use toothed idlers)</u> Spacer 3 / Thingiverse	
Spacer 3 / Thingiverse	
Spacer 3 / Thingiverse	
Tansianer Block 2 / Thingiverse	
Tensioner block 2 / Thingiverse	
TensionerClamp 2 / Thingiverse	
Power_Supply_Holder 1 / Thingiverse	
Transmission 1 / Github	
MotorMountTensionerArm 1 / Github	
ZDriveTensioningRing 1 / Github	
80TRingGear 1 / Github	
Filament Petg or ABS (+) ??kg no Yes you can use PLA, but you shouldn't ;)	

## Single Z and MGN 12H

Rotated

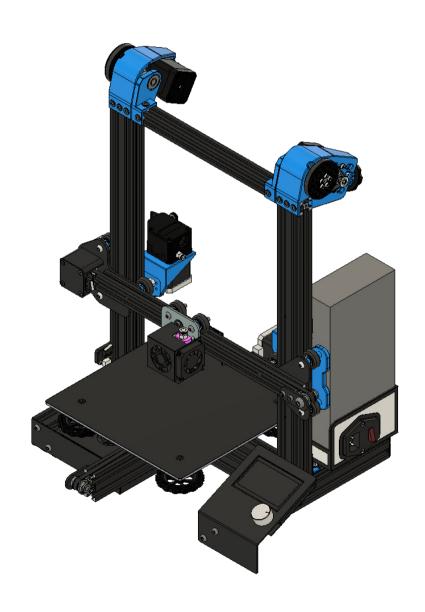
or

Unrotated



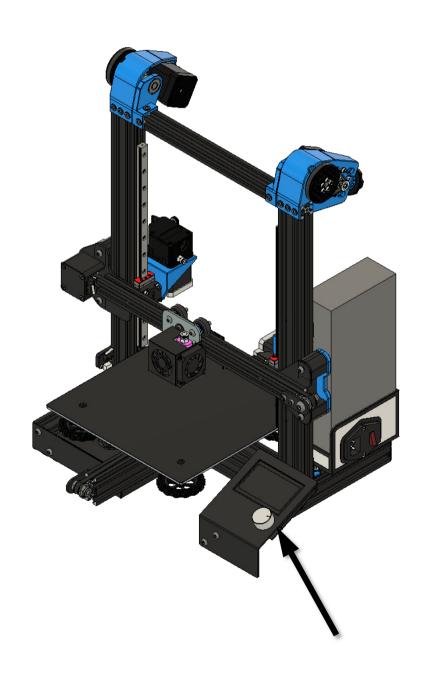
			Single Z + MGN		
Component	Quantity	Neuse II UIII	Notes	My Source	Alternative Source
20T Pulley - 8mm Bore	3	no	One for each side on the Rod, one for the printed 80T Gear.	Motion Kit	<u>Aliexpress</u>
16T Pulley - 5mm Bore	1	no	Motorshaft	Kit is highly	<u>Aliexpress</u>
Gt2 Belt	2 Meter	no	Don't buy the cheapest. You should go for belts with glassfiber. Width: 6mm	recommended	<u>Aliexpress</u>
188mm Looped Belt	1	no	Width: 6mm		<u>Aliexpress</u>
F623ZZ 3*10*4 bearing	4	no	2 Pieces per side or 2x 20T toothed Idlers (18mm in diameter, 8.5mm width, 3mm ID)		<u>Aliexpress</u>
608ZZ Bearing	4 (5)	no	Do you have an old skateboard? You can steal the bearings from the wheels;) (5 for extra bearing in transmission body)		Aliexpress
8mm Rod	335 mm	yes/no	Theres no link, just go to your local hardware store and take a cheap 8mm (aluminium) rod. You don't have to buy a hardened steel one. (to expensive and hard to cut). You also could use your leadscrew.		
300mm MGN Rail	2	no	Don't buy the cheapest.		
M5x8mm	27 (28)	no	(28 for rotated) + 6 for PowerSupply holder if needed. Any type of M5x8mm screw can be used.	<u>Aliexpress</u>	
M5x40mm	4	yes (3x)		<u>Aliexpress</u>	Aliexpress (cheaper)
M5 T-nuts	27 (28)	no	(28 for rotated) + 6 for PowerSupply holder if needed.	<u>Aliexpress</u>	
M3x25mm	2	no			
M3x20mm	6	no			
M3x12mm	4	no	If you have no screws, you should buy a kit. Especially for the tensioner a longer screw can be good.	Aliexpress	
M3x10mm	10	no			
M3x8mm	28	no	You will need 24 of them to mount the rails. All holes: 12 per rail. You can use less, minimum 4 per rail.		
M3x6mm	5	no			
	12				
	2				
	24		You will need these to mount the rails. All holes: 12 per rail. You can use less, minimum 4 per rail.		
			·	Aliexpress	
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hera or AR2 (+)	rrKg	no	res you can use PLA, but you snouldn't ;)		
	20T Pulley - 8mm Bore 16T Pulley - 5mm Bore Gt2 Belt 188mm Looped Belt F623ZZ 3*10*4 bearing 608ZZ Bearing 8mm Rod 300mm MGN Rail M5x8mm M5x40mm M5 T-nuts M3x25mm M3x20mm M3x12mm	20T Pulley - 8mm Bore         3           16T Pulley - 5mm Bore         1           Gt2 Belt         2 Meter           188mm Looped Belt         1           F623ZZ 3*10*4 bearing         4           608ZZ Bearing         4 (5)           8mm Rod         335 mm           300mm MGN Rail         2           M5x8mm         27 (28)           M5x40mm         4           M5 T-nuts         27 (28)           M3x25mm         2           M3x20mm         6           M3x12mm         4           M3x10mm         10           M3x8mm         28           M3x6mm         5           M3 nuts         12           M3 washer         2           M3 T-nuts         24           Motor extension cable         1           RightV3.x         1           LeftV3.x         1           RightTop_B         1           LeftTop_B         1           Bottom_F623 or _toothed         2           Spacer_Right (MGN folder)         1           Right (MGN folder)         1           Spacer_Left (MGN folder)         1           Left (MGN fo	20T Pulley - 8mm Bore         3         no           16T Pulley - 5mm Bore         1         no           Gt2 Belt         2 Meter         no           188mm Looped Belt         1         no           608ZZ Bearing         4 (5)         no           8mm Rod         335 mm         yes/no           300mm MGN Rail         2         no           M5x8mm         27 (28)         no           M5x40mm         4         yes (3x)           M5 T-nuts         27 (28)         no           M3x25mm         2         no           M3x20mm         6         no           M3x12mm         4         no           M3x10mm         10         no           M3x8mm         28         no           M3x6mm         5         no           M3 nuts         12         no           M3 T-nuts         24         no           M3 T-nuts         24         no           M3 T-nuts         24         no           Motor extension cable         1         no           RightV3.x         1         /           LeftTop_A         1         / <t< td=""><td>  20T Pulley - Smm Bore   3</td><td>201F Juliey - Sams Bore 3</td></t<>	20T Pulley - Smm Bore   3	201F Juliey - Sams Bore 3

## Dual Z and V\_Rollers



	Dual Z + V-Rollers						
Category	Component	Quantity	Neuse Iroini	Notes	My Source	Alternative Source	
Motion	20T Pulley - 8mm Bore	4	no	One for each side on the Rod, one for the printed 80T Gear.	Motion Kit	<u>Aliexpress</u>	
	16T Pulley - 5mm Bore	2	no	Motorshaft	Kit is highly	Aliexpress	
	Gt2 Belt	2 Meter	no	Don't buy the cheapest. You should go for belts with glassfiber. Width: 6mm	recommended	<u>Aliexpress</u>	
	188mm Looped Belt	2	no	Width: 6mm		<u>Aliexpress</u>	
	F623ZZ 3*10*4 bearing	4	no	2 Pieces per side or 2x 20T toothed Idlers (18mm in diameter, 8.5mm width, 3mm ID)		<u>Aliexpress</u>	
	608ZZ Bearing	4	no	Do you have an old skateboard? You can steal the bearings from the wheels;) (5 for extra bearing in transmission body)		Aliexpress	
	8mm Rod	2x65mm	yes/no	Theres no link, just go to your local hardware store and take a cheap 8mm (aluminium) rod. You don't have to buy a hardened steel one. (to expensive and hard to cut). You also could use your leadscrew.			
Fasteners	M5x8mm	37	no	(37 for rotated) + 6 for PowerSupply holder if needed. Any type of M5x8mm screw can be used.	<u>Aliexpress</u>		
	M5x40mm	6	yes (3 x)	Screwhead must fit under the extrusion from the X-Axis. (Take a look at 5:20 of my video) You also could use a stock 40mm screw from the left side of the printer and place this on the inside of the right side. This way you can use any type of screwhead for the remaining holes.	<u>Aliexpress</u>	Aliexpress (cheaper)	
	M5 T-nuts	37	no	(37 for rotated) + 6 for PowerSupply hodler if needed.	<u>Aliexpress</u>		
	M3x25mm	2	no				
	M3x20mm	2	no				
	M3x12mm	4	no	If you have no screws, you should buy a kit. Especially for the tensioner a longer screw can be good.	<u>Aliexpress</u>		
	M3x10mm	4	no				
	M3x8mm	8	no				
	M3x6mm	10	no				
	M3 nuts	10	no				
	M3 washer	4	no				
Electronics	Motor extension cable	1	no	The original Cable is obviously too short^^ Check if the middle cables are crossed!!!	<u>Aliexpress</u>		
<b>Printed Parts</b>	RightV3.x	1	/	Thingiverse (Bowden-Version available)			
	LeftV3.x	1	/	Thingiverse (Bowden-Version available)			
	RightTop	1	/	Thingiverse DUAL Z Folder			
	LeftTop	1	/	Thingiverse DUAL Z Folder			
	Bottom_F623 or _toothed	2	/	Thingiverse (If you want toothed idlers see here: How to use toothed idlers)			
	Spacer	3	/	Thingiverse			
	Tensioner Block	2	/	Thingiverse			
	TensionerClamp	2	/	Thingiverse			
	Power_Supply_Holder	1	/	Thingiverse			
	Transmission_Left	1	/	<u>Github</u>			
	Transmission_Right	1	/	<u>Github</u>			
	MotorMountTensionerArm	2	/	<u>Github</u>			
	ZDriveTensioningRing	2	1	<u>Github</u>			
	80TRingGear	2	/	<u>Github</u>			
Filament	Petg or ABS (+)	??kg	no	Yes you can use PLA, but you shouldn't ;)			

## Dual Z and MGN 12H



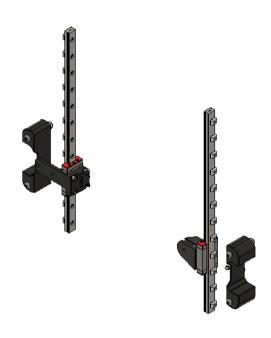
	Dual Z + MGN						
Category	Component	Quantity	Neuse Iroini	Notes	My Source	Alternative Source	
Motion	20T Pulley - 8mm Bore	4	no	One for each side on the Rod, one for the printed 80T Gear.	Motion Kit	<u>Aliexpress</u>	
	16T Pulley - 5mm Bore	2	no	Motorshaft	Kit is highly	<u>Aliexpress</u>	
	Gt2 Belt	2 Meter	no	Don't buy the cheapest. You should go for belts with glassfiber. Width: 6mm	recommended	<u>Aliexpress</u>	
	188mm Looped Belt	2	no	Width: 6mm		<u>Aliexpress</u>	
	F623ZZ 3*10*4 bearing	4	no	2 Pieces per side or 2x 20T toothed Idlers (18mm in diameter, 8.5mm width, 3mm ID)		<u>Aliexpress</u>	
	608ZZ Bearing	4	no	Do you have an old skateboard? You can steal the bearings from the wheels;) (5 for extra bearing in transmission body)		Aliexpress	
	8mm Rod	2x 65mm	yes/no	Theres no link, just go to your local hardware store and take a cheap 8mm (aluminium) rod. You don't have to buy a hardened steel one. (to expensive and hard to cut). You also could use your leadscrew.			
	300mm MGN Rail	2	no	Don't buy the cheapest.			
Fasteners	M5x8mm	27 (28)	no	(28 for rotated) + 6 for PowerSupply holder if needed. Any type of M5x8mm screw can be used.	<u>Aliexpress</u>		
	M5x40mm	4	yes (3x)		Aliexpress	Aliexpress (cheaper)	
	M5 T-nuts	27 (28)	no	(28 for rotated) + 6 for PowerSupply holder if needed.	<u>Aliexpress</u>		
	M3x25mm	2	no				
	M3x20mm	6	no				
	M3x12mm	4	no	If you have no screws, you should buy a kit. Especially for the tensioner a longer screw can be good.	Aliexpress		
	M3x10mm	12	no				
	M3x8mm	32	no	You will need 24 of them to mount the rails. All holes: 12 per rail. You can use less, minimum 4 per rail.			
	M3x6mm	10	no				
	M3 nuts	14	no				
	M3 washer	4	no				
	M3 T-nuts	24	no	You will need these to mount the rails. All holes: 12 per rail. You can use less, minimum 4 per rail.			
Electronics	Motor extension cable	1	no	The original Cable is obviously too short^^ Check if the middle cables are crossed!!!	Aliexpress		
<b>Printed Parts</b>	RightV3.x	1	/	Thingiverse (Bowden-Version available)			
	LeftV3.x	1	/	Thingiverse (Bowden-Version available)			
	RightTop	1	/	Thingiverse			
	LeftTop	1	/	Thingiverse			
	Bottom F623 or toothed	2	/	Thingiverse (If you want toothed idlers see here: How to use toothed idlers)			
	Spacer Right (MGN folder)	1	/	Thingiverse			
	Spacer_Left (MGN folder)	1	/	Thingiverse			
	Right (MGN folder)	1	/	Thingiverse			
	Left (MGN folder)	1	/	Thingiverse			
	DistanceBracket	2	/	Thingiverse - you will need this to align the rails. Just take a look at my video.			
	Tensioner Block	2	/	Thingiverse			
	TensionerClamp	2	/	Thingiverse			
	Power_Supply_Holder	1	/	Thingiverse			
	Transmission_Left	1	/	Github			
	Transmission_Right	1	/	Github			
	MotorMountTensionerArm	2	/	Github			
	ZDriveTensioningRing	2	/	<u>Github</u>			
	80TRingGear	2	/	Github			
Filament	Petg or ABS (+)	??kg	no	Yes you can use PLA, but you shouldn't ;)			
				· , · · · ·			

## Upgrade V-Rollers to MGN 12H

Single Z and  $Dual\ Z$ 

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Rotated and Unrotated



	Version: Upgrade from V-Rollers to MGN							
Category	Component	Quantity	Duintou2	Notes	My Source	Alternative Source		
	300mm MGN Rail	2		Don't buy the cheapest.				
Fasteners	M3x20mm	4	no					
	M3x10mm	8	no					
	M3x8mm	24	no	You will need these to mount the rails. All holes: 12 per rail. You can use less, minimum 4 per rail.				
	M3 nuts	4	no					
	M3 T-nuts	24	no	You will need these to mount the rails. All holes: 12 per rail. You can use less, minimum 4 per rail.				
<b>Printed Parts</b>	Spacer_Right (MGN folder)	1	/	Thingiverse				
	Spacer_Left (MGN folder)	1	/	Thingiverse				
	Right (MGN folder)	1	/	Thingiverse				
	Left (MGN folder)	1	/	Thingiverse				
	DistanceBracket	2	/	Thingiverse - you will need this to align the rails. Just take a look at my video.				
Filament	Petg or ABS (+)	??kg	no	Yes you can use PLA, but you shouldn't ;)				

# Upgrade with Keybak Single Z and Dual Z

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Rotated and Unrotated





	Version: Upgrade with Keybak						
Category	Component	Quantity	Reuse from Printer?	Notos	My Source	Alternative Source	
	Key-bak Super48 13oz	1	no		<u>Amazon</u>		
	F623ZZ 3*10*4 bearing	2	no		<u>Aliexpress</u>		
Fasteners	M3x25mm	1	no				
	M3x12mm	2	no				
	M3 nuts	2	no				
	M5x8mm	2	no				
	M5 T-nuts	2	no				
<b>Printed Parts</b>	Bearing_Holder	1	/	<u>GitHub</u>			
	Keyback_mount	1	/	<u>GitHub</u>			
	Keybak_mount_plate	1	/	<u>GitHub</u>			
	Keybak_Spacer	1	/	<u>GitHub</u>			
	Left_Top_A_Keybak	2	/	<u>GitHub</u>			
Filament	Petg or ABS (+)	??kg	no	Yes you can use PLA, but you shouldn't ;)			
		_					