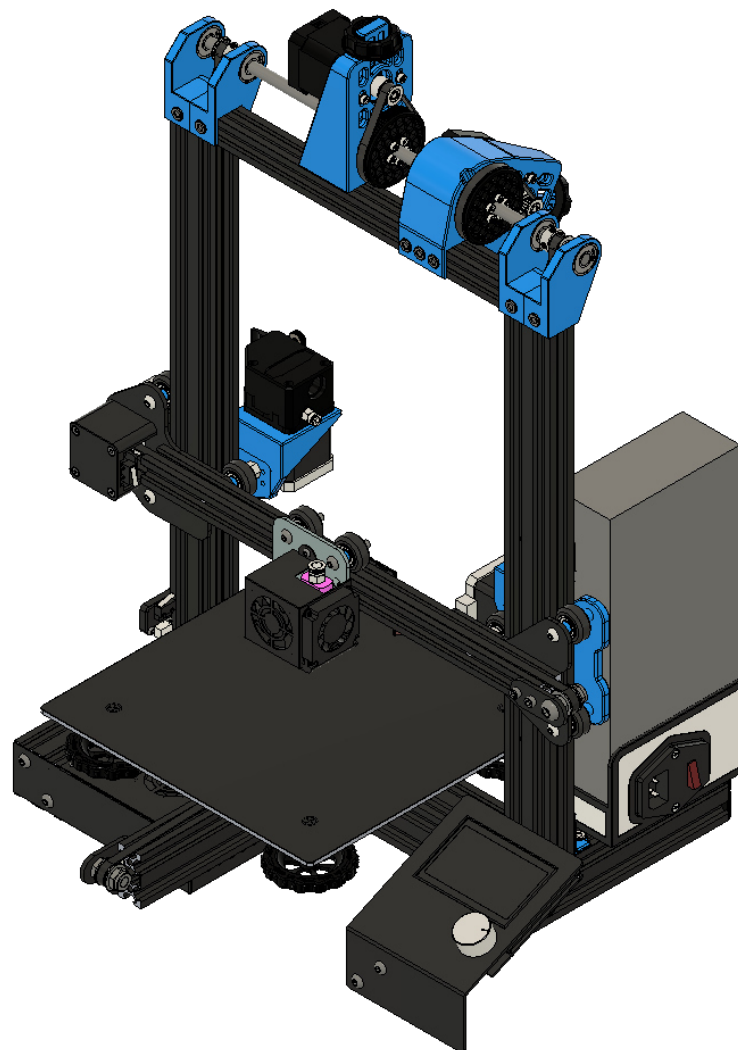


# Single Z and V-Rollers

Rotated

or

Unrotated



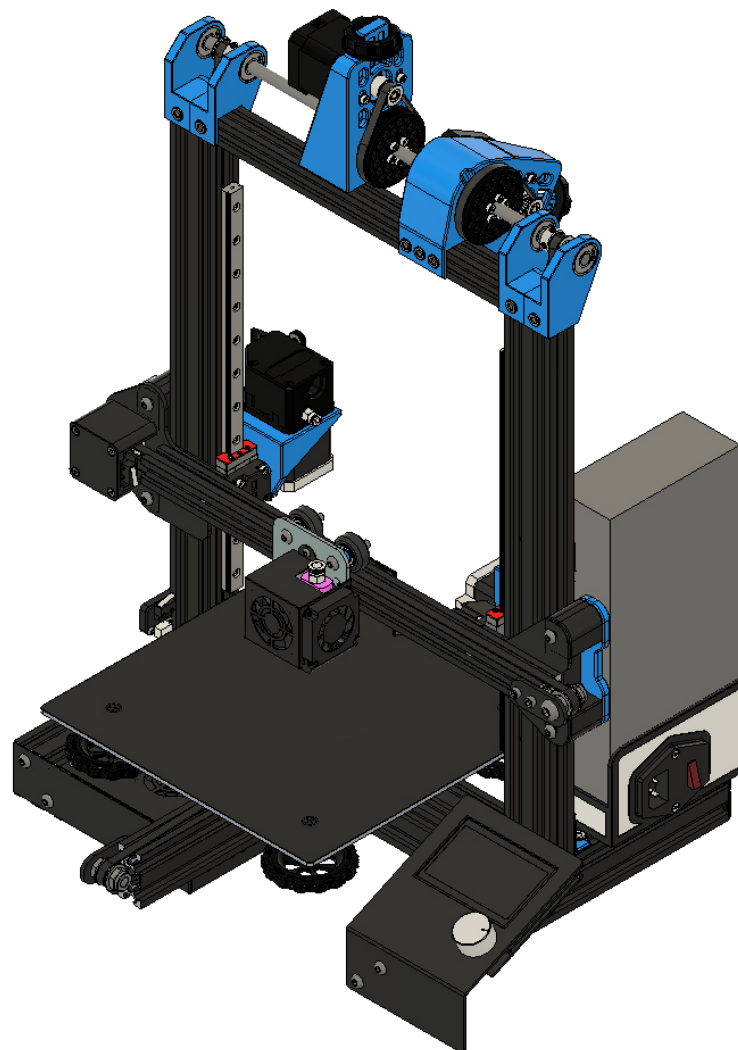
Single Z + V-Rollers						
Category	Component	Quantity	Reuse from Printer?	Notes	My Source	Alternative Source
Motion	20T Pulley - 8mm Bore	3	no	One for each side on the Rod, one for the printed 80T Gear.	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	16T Pulley - 5mm Bore	1	no	Motorshaft	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	Gt2 Belt	2 Meter	no	Don't buy the cheapest. You should go for belts with glassfiber. Width: 6mm	<a href="#">Amazon Germany</a>	<a href="#">Aliexpress</a>
	188mm Looped Belt	1	no	Width: 6mm	<a href="#">Aliexpress</a>	<a href="#">Aliexpress Affiliate Link Voron Guys</a>
	F623ZZ 3*10*4 bearing	4	no	2 Pieces per side or 2x 20T toothed Idlers (18mm in diameter, 8.5mm width, 3mm ID)	<a href="#">Aliexpress</a>	
	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)	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	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.	<a href="#">Aliexpress</a>	
	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.	<a href="#">Aliexpress</a>	<a href="#">Aliexpress (cheaper)</a>
	M5 T-nuts	27 (28)	no	(28 for rotated) + 6 for PowerSupply holder if needed.	<a href="#">Aliexpress</a>	
	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.	<a href="#">Aliexpress</a>	
	M3x10mm	2	no			
	M3x8mm	4	no			
	M3x6mm	5	no			
	M3 nuts	8	no			
	M3 washer	2	no			
	Motor extension cable	1	no	The original Cable is obviously too short^^ Check if the middle cables are crossed!!!	<a href="#">Aliexpress</a>	
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	/	<a href="#">Thingiverse (If you want toothed idlers see here: How to use toothed idlers)</a>		
	Spacer	3	/	Thingiverse		
	Tensioner Block	2	/	Thingiverse		
	TensionerClamp	2	/	Thingiverse		
	Power_Supply_Holder	1	/	Thingiverse		
	Transmission	1	/	<a href="#">Github</a>		
	MotorMountTensionerArm	1	/	<a href="#">Github</a>		
	ZDriveTensioningRing	1	/	<a href="#">Github</a>		
	80TRingGear	1	/	<a href="#">Github</a>		
Filament	Petg or ABS (+)	??kg	no	Yes you can use PLA, but you shouldn't ;)		

# Single Z and MGN 12H

Rotated

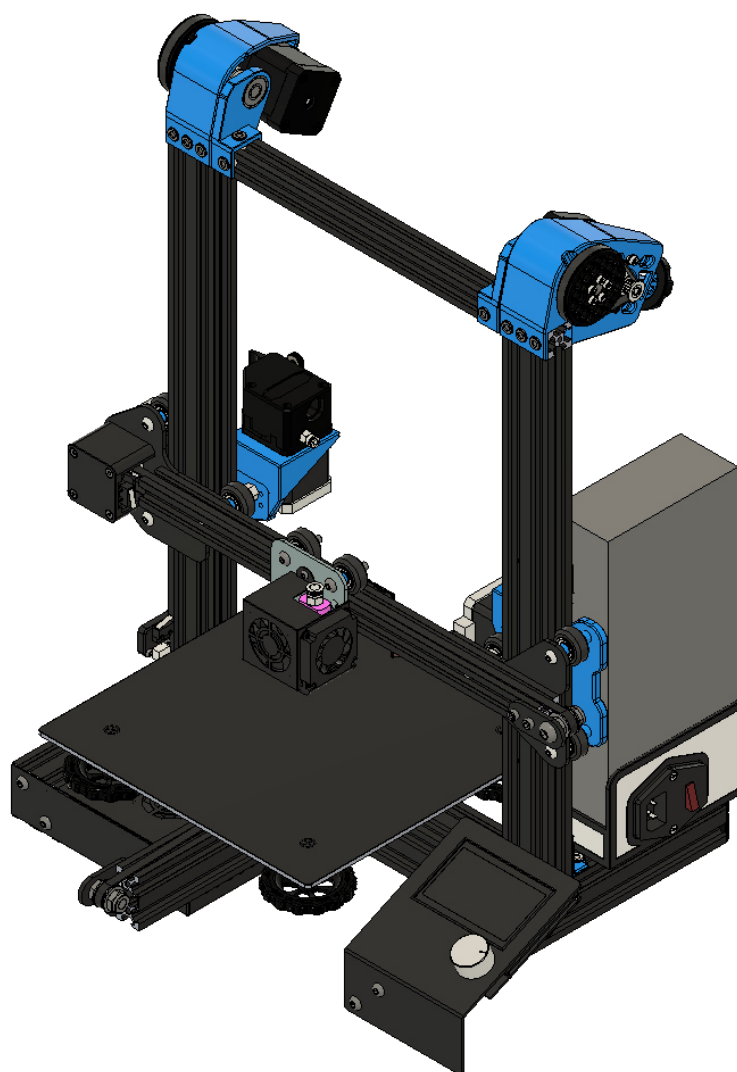
or

Unrotated



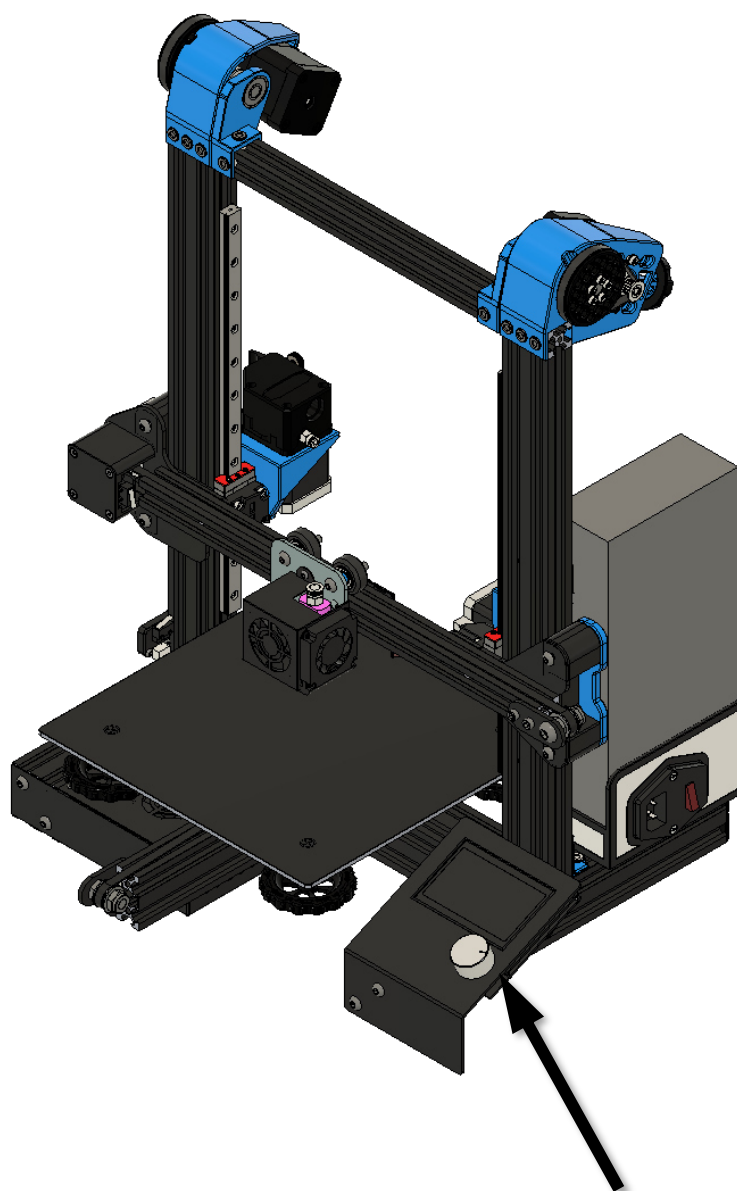
Single Z + MGN						
Category	Component	Quantity	Reuse from Print v3	Notes	My Source	Alternative Source
Motion	20T Pulley - 8mm Bore	3	no	One for each side on the Rod, one for the printed 80T Gear.	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	16T Pulley - 5mm Bore	1	no	Motorshaft	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	Gt2 Belt	2 Meter	no	Don't buy the cheapest. You should go for belts with glassfiber. Width: 6mm	<a href="#">Amazon Germany</a>	<a href="#">Aliexpress</a>
	188mm Looped Belt	1	no	Width: 6mm	<a href="#">Aliexpress</a>	<a href="#">Aliexpress Affiliate Link Voron Guys</a>
	F623ZZ 3*10*4 bearing	4	no	2 Pieces per side or 2x 20T toothed Idlers (18mm in diameter, 8.5mm width, 3mm ID)	<a href="#">Aliexpress</a>	
	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)	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	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.		
Fasteners	M5x8mm	27 (28)	no	(28 for rotated) + 6 for PowerSupply holder if needed. Any type of M5x8mm screw can be used.	<a href="#">Aliexpress</a>	
	M5x40mm	4	yes (3x)		<a href="#">Aliexpress</a>	<a href="#">Aliexpress (cheaper)</a>
	M5 T-nuts	27 (28)	no	(28 for rotated) + 6 for PowerSupply holder if needed.	<a href="#">Aliexpress</a>	
	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.	<a href="#">Aliexpress</a>	
	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			
	M3 nuts	12	no			
	M3 washer	2	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!!!	<a href="#">Aliexpress</a>	
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	/	<a href="#">Thingiverse (If you want toothed idlers see here: How to use toothed idlers)</a>		
	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	1	/	<a href="#">Github</a>		
	MotorMountTensionerArm	1	/	<a href="#">Github</a>		
	ZDriveTensioningRing	1	/	<a href="#">Github</a>		
	80TRingGear	1	/	<a href="#">Github</a>		
Filament	Petg or ABS (+)	??kg	no	Yes you can use PLA, but you shouldn't ;)		

## Dual Z and V\_Rollers



Dual Z + V-Rollers						
Category	Component	Quantity	Reuse from Printer?	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.	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	16T Pulley - 5mm Bore	2	no	Motorshaft	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	Gt2 Belt	2 Meter	no	Don't buy the cheapest. You should go for belts with glassfiber. Width: 6mm	<a href="#">Amazon Germany</a>	<a href="#">Aliexpress</a>
	188mm Looped Belt	2	no	Width: 6mm	<a href="#">Aliexpress</a>	<a href="#">Aliexpress Affiliate Link Voron Guys</a>
	F623ZZ 3*10*4 bearing	4	no	2 Pieces per side or 2x 20T toothed Idlers (18mm in diameter, 8.5mm width, 3mm ID)	<a href="#">Aliexpress</a>	
	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)	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	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.	<a href="#">Aliexpress</a>	
	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.	<a href="#">Aliexpress</a>	<a href="#">Aliexpress (cheaper)</a>
	M5 T-nuts	37	no	(37 for rotated) + 6 for PowerSupply holder if needed.	<a href="#">Aliexpress</a>	
	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.	<a href="#">Aliexpress</a>	
	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!!!	<a href="#">Aliexpress</a>	
Printed Parts	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	/	<a href="#">Thingiverse (If you want toothed idlers see here: How to use toothed idlers)</a>		
	Spacer	3	/	Thingiverse		
	Tensioner Block	2	/	Thingiverse		
	TensionerClamp	2	/	Thingiverse		
	Power_Supply_Holder	1	/	Thingiverse		
	Transmission_Left	1	/	<a href="#">Github</a>		
	Transmission_Right	1	/	<a href="#">Github</a>		
	MotorMountTensionerArm	2	/	<a href="#">Github</a>		
	ZDriveTensioningRing	2	/	<a href="#">Github</a>		
	80TRingGear	2	/	<a href="#">Github</a>		
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	Reuse from	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.	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	16T Pulley - 5mm Bore	2	no	Motorshaft	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	Gt2 Belt	2 Meter	no	Don't buy the cheapest. You should go for belts with glassfiber. Width: 6mm	<a href="#">Amazon Germany</a>	<a href="#">Aliexpress</a>
	188mm Looped Belt	2	no	Width: 6mm	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a> <a href="#">Affiliate Link</a> <a href="#">Voron Guys</a>
	F623ZZ 3*10*4 bearing	4	no	2 Pieces per side or 2x 20T toothed Idlers (18mm in diameter, 8.5mm width, 3mm ID)	<a href="#">Aliexpress</a>	
	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)	<a href="#">Aliexpress</a>	<a href="#">Aliexpress</a>
	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.	<a href="#">Aliexpress</a>	
	M5x40mm	4	yes (3x)		<a href="#">Aliexpress</a>	<a href="#">Aliexpress (cheaper)</a>
	M5 T-nuts	27 (28)	no	(28 for rotated) + 6 for PowerSupply holder if needed.	<a href="#">Aliexpress</a>	
	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.	<a href="#">Aliexpress</a>	
	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.		
	Motor extension cable	1	no	The original Cable is obviously too short^^ Check if the middle cables are crossed!!!	<a href="#">Aliexpress</a>	
Printed Parts	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	/	<a href="#">Thingiverse (If you want toothed idlers see here: How to use toothed idlers)</a>		
	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	/	<a href="#">Github</a>		
	Transmission_Right	1	/	<a href="#">Github</a>		
	MotorMountTensionerArm	2	/	<a href="#">Github</a>		
	ZDriveTensioningRing	2	/	<a href="#">Github</a>		
	80TRingGear	2	/	<a href="#">Github</a>		
	Petg or ABS (+)	??kg	no	Yes you can use PLA, but you shouldn't ;)		

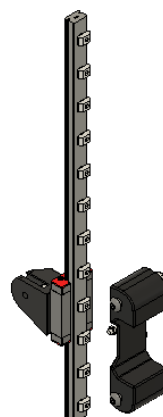
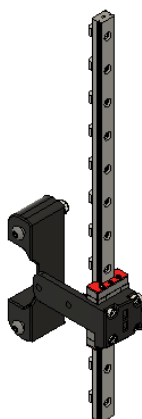


# Upgrade V-Rollers to MGN 12H

Single Z and Dual Z

+

Rotated and Unrotated



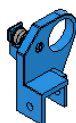
Version: Upgrade from V-Rollers to MGN						
Category	Component	Quantity	Reuse from Printer?	Notes	My Source	Alternative Source
	300mm MGN Rail	2	no	Don't buy the cheapest.		
Fasteners	M3x20mm	4	no			
	M3x10mm	8	no			
	M3x8mm	24	no	You will need these to mount the rails. All holes: 12 per rail. You can 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.		
Printed Parts	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

+

Rotated and Unrotated



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