

1 Introduction

1.1 Bill of Materials

Designator	Manufacturer (Distributor)	Part #	Number	Cost/each	Total cost
Mechanical					
Coupler	Uxcell (Harfington)	1008917	1 (pack of 4) (need 4)	\$10.22	\$10.22
Lead screw	McMaster-Carr	99030A100	1 (3' length)	\$46.42	\$46.42
Tapped shaft	McMaster-Carr	6649K396	2	\$50.58	\$101.16
Ceramic-coated shaft	McMaster-Carr	1031K72	2	\$16.52	\$33.04
3/8" linear bearing	AMPEC (Bearings Direct)	SW06UU	4	\$9.51	\$38.04
3/8" ball bearing	AMPEC (Bearings Direct)	R6-ZZ	2	\$3.10	\$6.20
1/4" shaft	McMaster-Carr	1031K61	4	\$10.28	\$41.12
1/4" linear bearing	PBC Linear	IP04G	4	\$17.04	\$68.16
M3 screw	McMaster-Carr	92005A124	1 (pack of 100) (need 16)	\$5.79	\$5.79
8-32 screw	McMaster-Carr	91500A197	1(pack of 50) (need 4)	\$7.18	\$7.18
Filament	**	**	**kgs	≈ \$20	**
1/4" acrylic	AZM Displays (Amazon)	B07H9NQP8G	1 (24"x12")	\$22.99	\$22.99
1/8" acrylic	McMaster-Carr	8560K275	1	\$6.95	\$6.95
Electronics					
Motor driver	Pololu (Digikey)	2981	4	\$6.15	\$24.60
Permaproto boards*	Adafruit (Microcenter)	591	1 pack	\$34.95	\$34.95
NEMA-17 Motor with encoder	Stepper Online	17HS15-1504-ME1K	4	\$18.18	\$72.72
ESP32-s2	Espressif (Amazon)	DevKitM-1-N4R2	1	\$8.00	\$8.00
Barrel jack adapter	Philmore (Microcenter)	48-1297	1	\$3.82	\$3.82
Power supply	Alitove (Amazon)	**	1	\$37.99	\$37.99
Solder	**	**	**	1	**
Pressure and Interface					
Aluminum holder	ProtoLabs	N/A	N/A	≈ \$250	≈ \$250
Headless Nut	IDEX	P-283	24	\$4.10	\$98.40
Ferrule	IDEX	P-200X	1 *(pack of 10)* (Need 6)	\$17.11	\$17.11
Luer Adapter	IDEX	P-625	8	\$5.21	\$41.68
Needle (Low Dead Space)	TSK (Air-Tite Products)	LDS-30009I (TSK3009LDS)	1 (pack of 100) (need 6)	\$89.95	\$89.95
Union	IDEX	*P-603 (white Delrin)*	6	\$3.94	\$23.64
2-Port Kit	Elveflow (Darwin Microfluidics)	LVF-KPT-S-2	6	\$156.80	\$940.80
Pressure Regulator	Alicat Scientific (eBay)	PCD-30PSIG-D-PCV30	6	≈\$500 (Used)	≈\$3,000
DIN Jack	L-com	MD88FJF	6	\$20.99	\$125.94