

No	Name	Description	Amount
01	Centrifuge Box - lv01 (Bottom) v.1	Motor & Arduino Holder (Vibration damping pad inside motor holder is recommended)	1
02	Centrifuge Box - lv01 (Bottom) v.2	Motor & Arduino Holder [MIRRORED] (Only Use if v.1 is not used)	0-1
03	Centrifuge Box - lv02	Frame Wall to hold Buttons and Display	1
04	Centrifuge Box - lv03	Frame Wall (Plain Simple)	1
05	Centrifuge Box - lv04 (top)	Frame Wall (Plain Simple)	1
06	Centrifuge Box - lv03 Ball Bearing House Cross	To hold the One Way Clutch Ball Bearing	1
07	Centrifuge Box - lv04 Ball Bearing House Cross	To hold the lower Ball Bearing stabilizer	1
08	Centrifuge Box - Top Ball Bearing House Cross v.1	To hold the Upper Ball Bearing stabilizer (No hall sensor support) (Only Used if v.2 is not used)	0-1
09	Centrifuge Box - Top Ball Bearing House Cross v.2	To hold the Upper Ball Bearing stabilizer (KS0020 hall sensor support)	1
10	Centrifuge Test Tube Holder - No Holes	Template to use if custom tube sizes are needed	0
11	Centrifuge Test Tube Holder - With Holes	4 Tube Holes for d:29mm, l: 116mm tubes	1
12	Centrifuge Box - Lid	Top Cover to protect user if something goes wrong	1
13	Support Piece for Digit Display and Button Board	Helper parts to hold and support the button and display parts ((needs to be glued))	1
14	Box Corner Stand	To be attached to metal frame and fit the Centrifuge box between	4
15	TPU Rubber Feet	Controls the natural shaking and movement of the centrifuge	4
16	Feet Extension	Gives more stability to the centrifuge (Adding Anti-slip tape is recommended)	4

No	Name	Description	Amount
01	4-Digit 7-Segment Display	Displays 4 digit numbers (0000-9999) or text for Speed state and current RPM	1
02	Breadboard (Normal Size)	Shared VCC and GND Central Board	1
03	Breadboard (Small Size)	Button Holder	1
04	BTS7960 motor driver	Motor Driver Circuit Board to control Power distribution to the DC-Motor	1
05	Buttons (ON/OFF) and (RPM STEP)	Classic 4-Pin Buttons for controlling Speed state and On/Off	2
06	DC Motor 775 10000RPM 12V/24V 5-10A	A powerful High Speed DC-Motor (15000-20000 RPM at No-Load)	1
07	Hall Sensor (KS0020)	Sensor that reacts to passing magnetic pulses in order to count RPM	1
08	Low Pass Filter Capacitor	Used to make the Hall sensor less sensitive to DC-Motor magnetic field (Sensor Pin to GND)	1
09	Arduino UNO R3 PCB	The main controller of all electronic parts, running the firmware	1
10	Arduino UNO power adapter	To feed power to the Arduino from the socket	1
11	Wires	Any electric wires that solves the connects properly (Various lengths)	23

No	Name	Description	Amount
01	2020 Extrusion (300mm)	To use as Centrifuge frame for stabilizing centrifuge when running	4
02	Corner Gusset Plate	To connect the 4 2020 extrusion bars	4
03	Bolts M3 x 8	To fasten the 4 Corner Gusset Plate to the 2020 extrusions	20
04	20-Series Square Nut M3	To fasten the 4 Corner Gusset Plate to the 2020 extrusions	20
05	Bolts M4 x 8	To fasten the 4 Box Corner Stands to the 2020 extrusions	8
06	20-Series Square Nut M3	To fasten the 4 Box Corner Stands to the 2020 extrusions	8
07	Bolts M4 x 8	To secure the Flange Hub to the Centrifuge Test Tube Holder	4
08	Nut M4	To secure the Flange Hub to the Centrifuge Test Tube Holder	4
09	Flange Shaft Fitting Metal Hub	To secure the Centrifuge Test Tube Holder to the Shaft	1
10	Flange Secure Bolt	To secure the Centrifuge Test Tube Holder to the Shaft	2
11	Bolts M2.5 x 6	To fasten the Hull Sensor in place below (1.5mm) the spinning magnet	1
12	Nut M2.5	To fasten the Hull Sensor in place below (1.5mm) the spinning magnet	1
13	Magnet (Tiny)	Fastened under the Test Tube Holder to allow the Hall sensor count the RPM	2
14	Nut M2	To counter weight the magnets on the Test Tube Holder	~2
15	Shaft M8 (Steel) 160mm	The spinning shaft connected to the motor and the Test tube Holder	1
16	Coupling M5 to M8	To connect the motor to the shaft	1
17	One Way Bearing Clutch (id:8mm;od:22mm;w:7mm)	Connected closest to the motor to allow for free spinning when motor stops	1
18	Ball Bearing (id:8mm;od:22mm;w:7mm)	Lower and Upper Ball bearing for stabilization of the shaft	2
19	Bolts M2 x 5	To fasten the boards to the bottom of the Centrifuge box	8

No	Name	Description*	Amount
01	Wire – Motor Supply +	External Power Supply + → IBT-2 B+	1
02	Wire – Motor Supply –	External Power Supply – → IBT-2 B–	1
03	Wire – Common GND Bus	Arduino GND → Common Ground Distribution	1
04	Wire – IBT-2 Logic VCC	Arduino 5V → IBT-2 VCC	1
05	Wire – IBT-2 Logic GND	Arduino GND → IBT-2 GND	1
06	Wire – IBT-2 RPWM	Arduino D5 → IBT-2 RPWM	1
07	Wire – IBT-2 LPWM	Arduino D6 → IBT-2 LPWM	1
08	Wire – IBT-2 R-EN	Arduino D7 → IBT-2 R-EN	1
9	Wire – IBT-2 L-EN	Arduino D8 → IBT-2 L-EN	1
10	Wire – Motor +	IBT-2 M+ → Motor +	1
11	Wire – Motor –	IBT-2 M– → Motor –	1
12	Wire – Hall VCC	Arduino 5V → Hall Sensor VCC	1
13	Wire – Hall GND	Arduino GND → Hall Sensor GND	1
14	Wire – Hall Signal	Hall Sensor Signal → Arduino D2	1
15	Capacitor – 100nF Ceramic	Hall Signal → GND (Noise suppression capacitor)	1
16	Wire – Display VCC	Arduino 5V → TM1637 VCC	1
17	Wire – Display GND	Arduino GND → TM1637 GND	1
18	Wire – Display CLK	Arduino D3 → TM1637 CLK	1
19	Wire – Display DIO	Arduino D4 → TM1637 DIO	1
20	Wire – BTN1 Signal	BTN1 → Arduino Digital Input	1
21	Wire – BTN1 GND	BTN1 → Arduino GND	1
22	Wire – BTN2 Signal	BTN2 → Arduino Digital Input	1
23	Wire – BTN2 GND	BTN2 → Arduino GND	1

** If firmware pin assignments are modified, this wiring list must be updated accordingly.*