

Turntable motor control PCB design

Overview

Design and prototype a PCB that will accurately control the rotation speed a turntable via pulley. The board will be connected to a motor with self-encoding and will monitor and adjust the speed of the motor to ensure target speed is maintained.

Features:

- DC power management
- Onboard microchip for firmware
- Target speed switch (33.33rpm or 45 rpm)
- Display of current & target speed (via OLED or 8 segment display)
- Fine adjustment of target speed +/- 10% via pot
- USB C for power & firmware upgrade
- Motor control and sensing
- Auto adjustment to ensure target speed is achieved
- Motor overload cutout and warning

Notes

An example of a motor BL4235I

PCB may need to be in two parts - one for Switches/buttons and display and one for power and motor control.

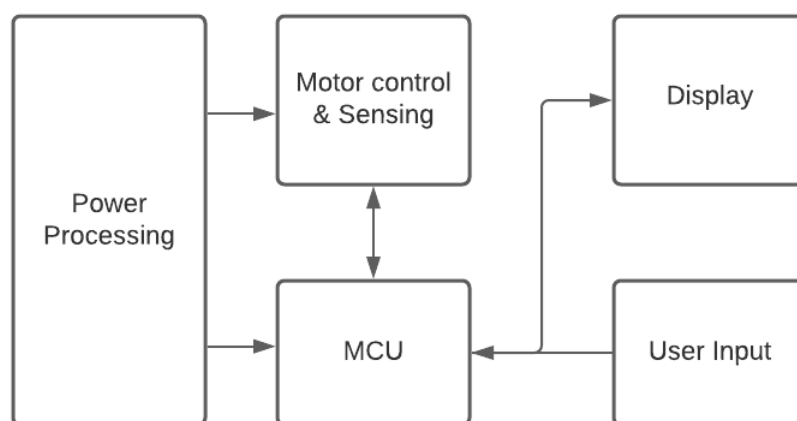
PCB/s to be designed to fit in cylindrical machined metal machined housing (See example pictures)

Potentiometers and switches are to be high quality and have a good “feel”

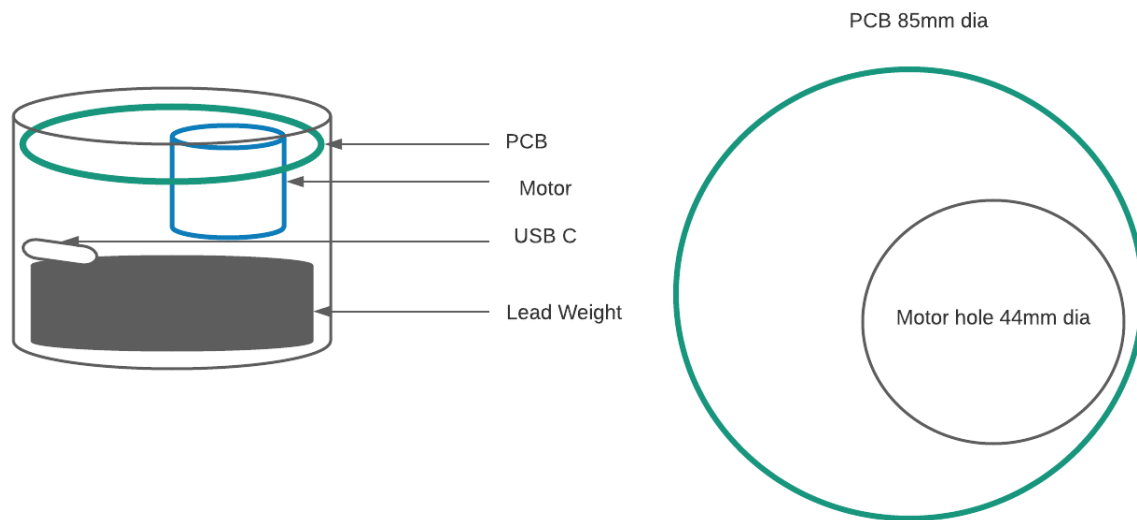
300mm Pulley > 40mm Pulley

PCB to be round with max 85mm diameter

Block Diagram



PCB Details



Images





BL4235I

OUTPUT: APPROX 5W~35W

INNER ROTOR

WEIGHT : 160g (APPROX)

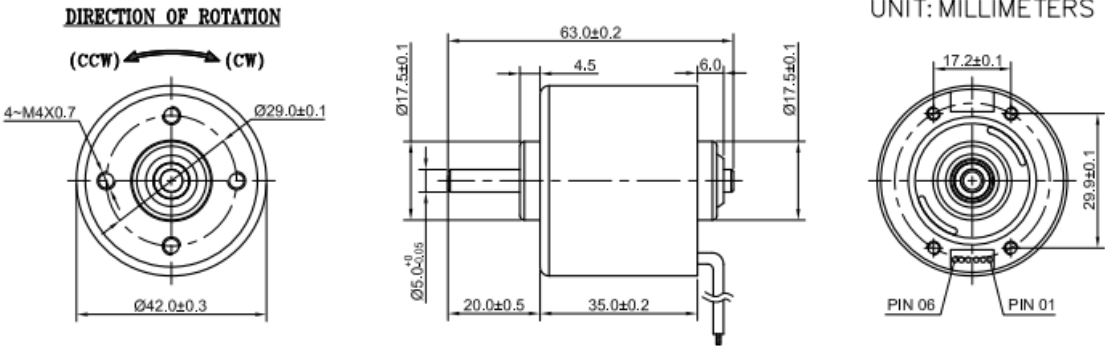
● Typical Application 典型应用

个人护理(Personal Care)
家用电器(Home Application)
电动工具(Industry Apparatus)
商业设备(Business Equipment)
医疗器械(Medical Apparatus)

● Connector Interface 连接端口

NO.	PIN ARRANGEMENT
1	VCC
2	FG
3	CW/CCW
4	GND
5	PWM
6	BRAKE

◆ External Dimensions 外形图



◆ Major Characteristic Parameters 主要特性参数

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY				STALL	
	OPERATING RANGE	RATED	SPEED	CURRENT	SPEED	CURRENT	TOGQUE	OUTPUT	TOGQUE	CURRENT
			r/min	A	r/min	A	g.cm	W	g.cm	A
BL4235I-V1	8V~16V	12 V	2860	0.21	2288	0.874	282.5	6.629	1412.3	3.529
BL4235I-V2	8V~26V	18 V	4290	0.25	3518	1.127	381.3	13.76	2118.5	5.123
BL4235I-V3	8V~26V	24 V	5200	0.30	4160	1.214	457.1	19.51	2285.7	4.871