6.3 Motor Control

For controlling the phase of the magnets of the Eddy Current brake, a stepper motor was chosen for it's accuracy and the ability to control it's operation with the Raspberry Pi's GPIO pins.

(a) Nema 23 Stepper Motor with 15:1 Gearbox (Micro Robotics)

(b) TB660 v1.1 Stepper Motor Driver (Communica)

Figure 6.2: Motor Control Components

After testing the resistance level between the wires on the Nema-23 stepper motor, the results were:

Table 6.2: Stepper Motor Wire Resistance Measurement Results

	Black	Green	Red	Yellow	White
Blue	> 1 MΩ	> 1 MΩ	41.2 Ω	> 1 MΩ	20.7 Ω
White	> 1 MΩ	> 1 MΩ	20.8 Ω	> 1 MΩ	
Yellow	20.7 Ω	20.5 Ω	> 1 MΩ		
Red	> 1 MΩ	> 1 MΩ			
Green	40.5 Ω				

From Table 6.2 above, the wires associated with each coil can be identified. A resistance of > 1 MΩ indicates that the wires are not connected to the same coil. For the wires on the same coil, a larger resistance indicates that there is more coiled wire between the connections, and they are thus farther apart. This results in the :