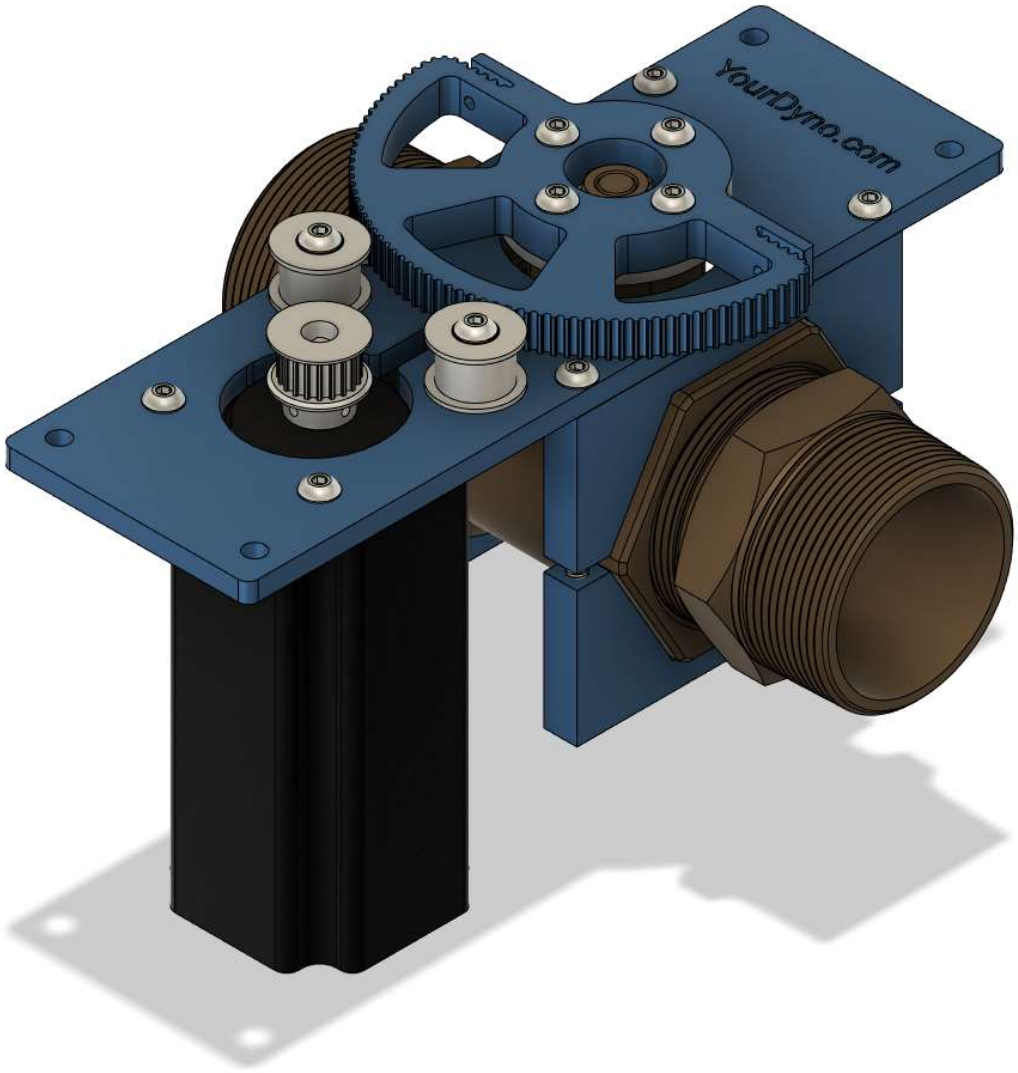
1 Introduction

This document describes the installation and maintenance of the YourDyno water brake valve.



2 Dimensions

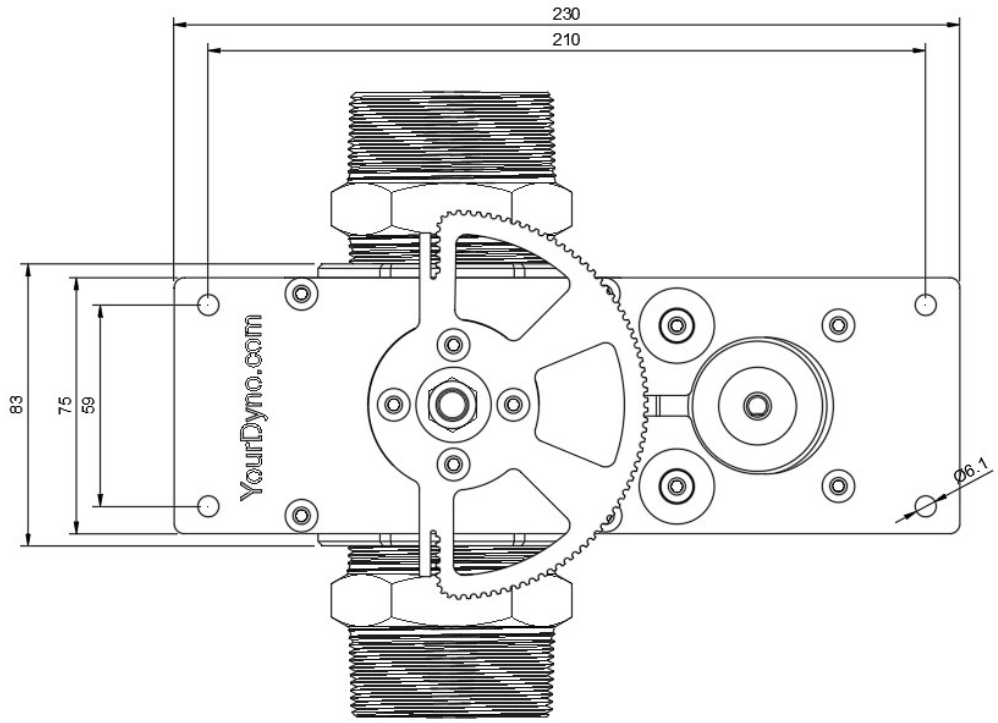


Figure 1 2" valve dimensions (mm)

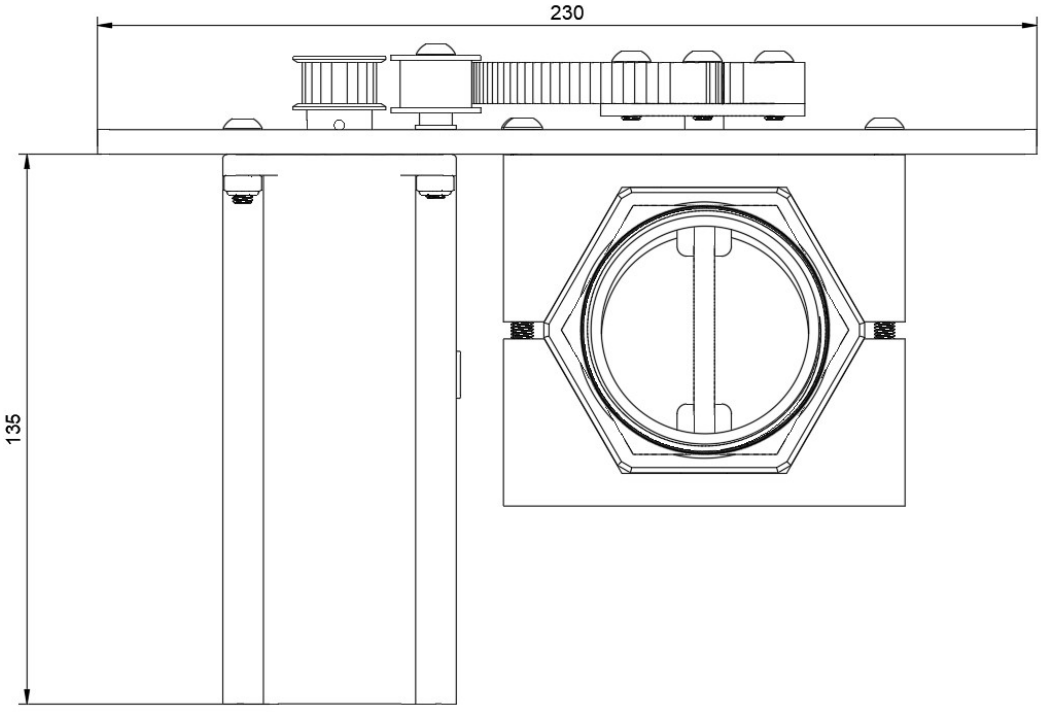


Figure 2 2" valve dimensions cont. (mm)

3 Mechanical installation

1) Make sure the valve is installed with support on all 4 mounting holes in the top plate. The valve is heavy, and the plate may bend if it is not properly supported.
2) Notice the fully open and fully closed positions
3) The valve includes a 1-1/4" or 2" male pipe thread coupler on each side of the valve. Connect it to the piping.
    a. **NEVER TORQUE THE PIPE CONNECTIONS THROUGH THE VALVE, THE VALVE BODY MAY TWIST/DEFORM. You must torque each side separately.**
    b. **If you need to remove the male-to-male couplers, the valve must be disassembled so you can hold each side of the valve while unscrewing the coupler. If the valve is held in a wise, do not hold it harder than needed, as it may deform**
4) The servo motor can get warm, ensure to install it away from other parts
5) The servo tolerates water spray, but not heavy jets. Install the valve in a way that minimizes the motor's exposure to water

4 Electrical installation

1) Install a suitable power cord to the power supply
2) Install the servo controller and power supply in a place free from water spray and excessive vibration. The controller can get a warm, so put it in a place with some ventilation or enough air volume
3) The following picture shows the color coding of the connections to the servo controller.

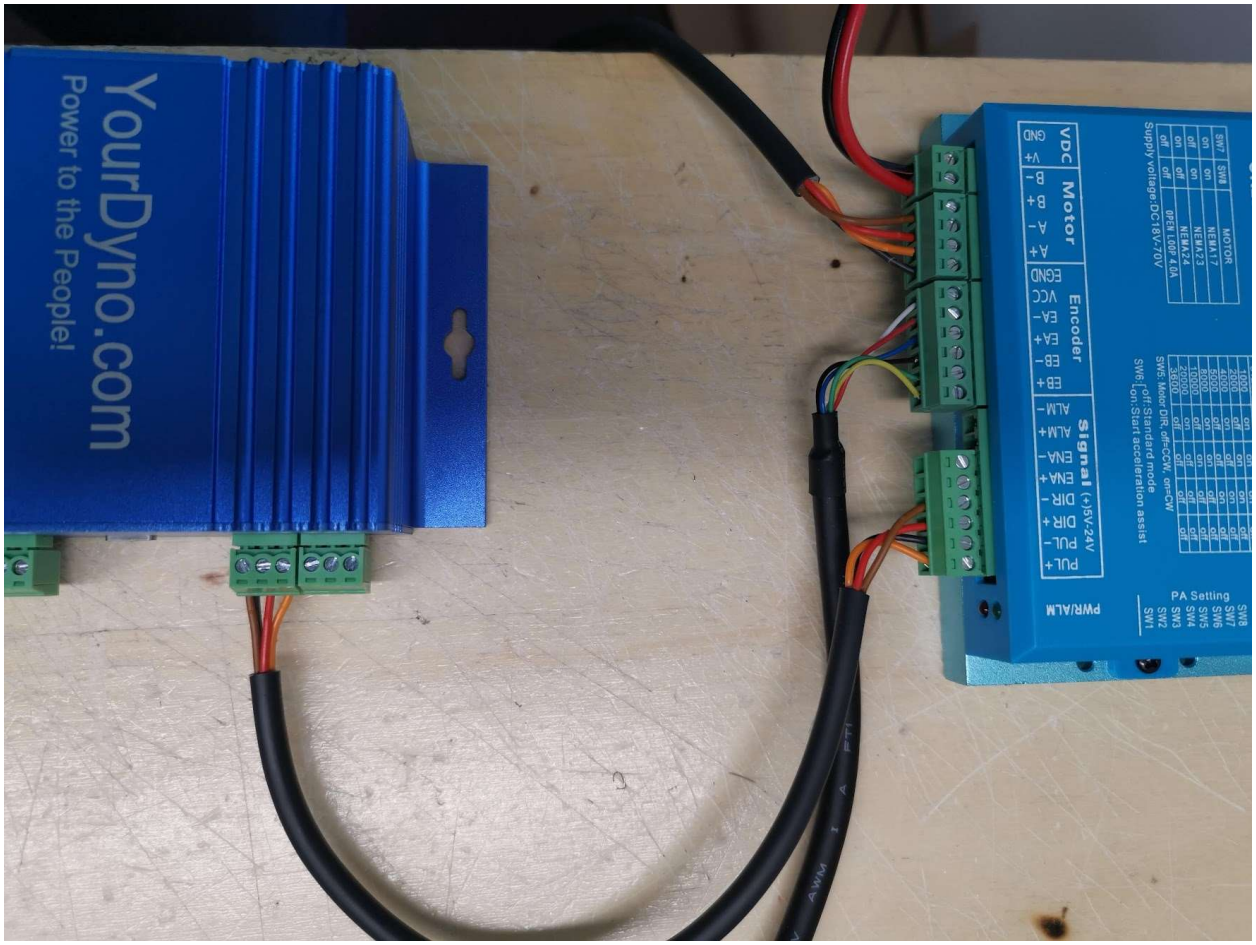


Figure 3 Color coding of the connections to the servo controller (all wires are pre-made and included in the kit)

5 Software settings

The following settings are needed to configure the water brake valve.

Go to Options->Brake controller setup.

Scroll to the bottom where the Stepper motor options are. Set it like this:

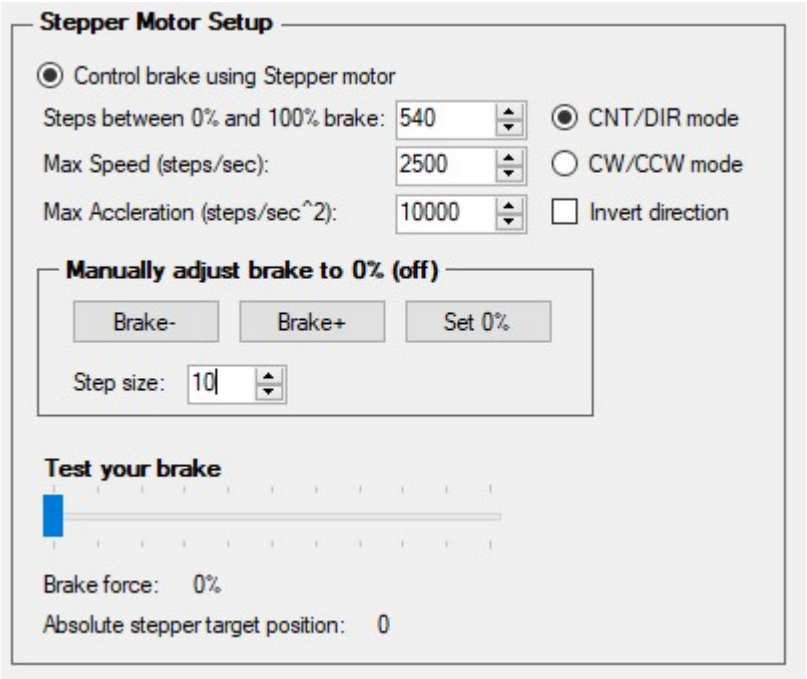


Figure 4 Brake settings in the software

6 Initial testing

1) Manually move the valve to 0% brake position before connecting the power supply. Depending on your application, you may want to define 0% as completely closed or with a small opening
2) Use the "Test your brake" functionality to test that everything works after it is connected electrically
    a. Click the Brake+. The brake valve should open a small amount
    b. If it moves the wrong way, click the "Invert direction" in the software
    c. If necessary click the "Set 0%" when the valve is physically at the 0% brake position
    d. Drag the slider quickly back and forth and see that the valve moves fast and freely

7 Engine testing

Here are a few recommended settings for water brakes.

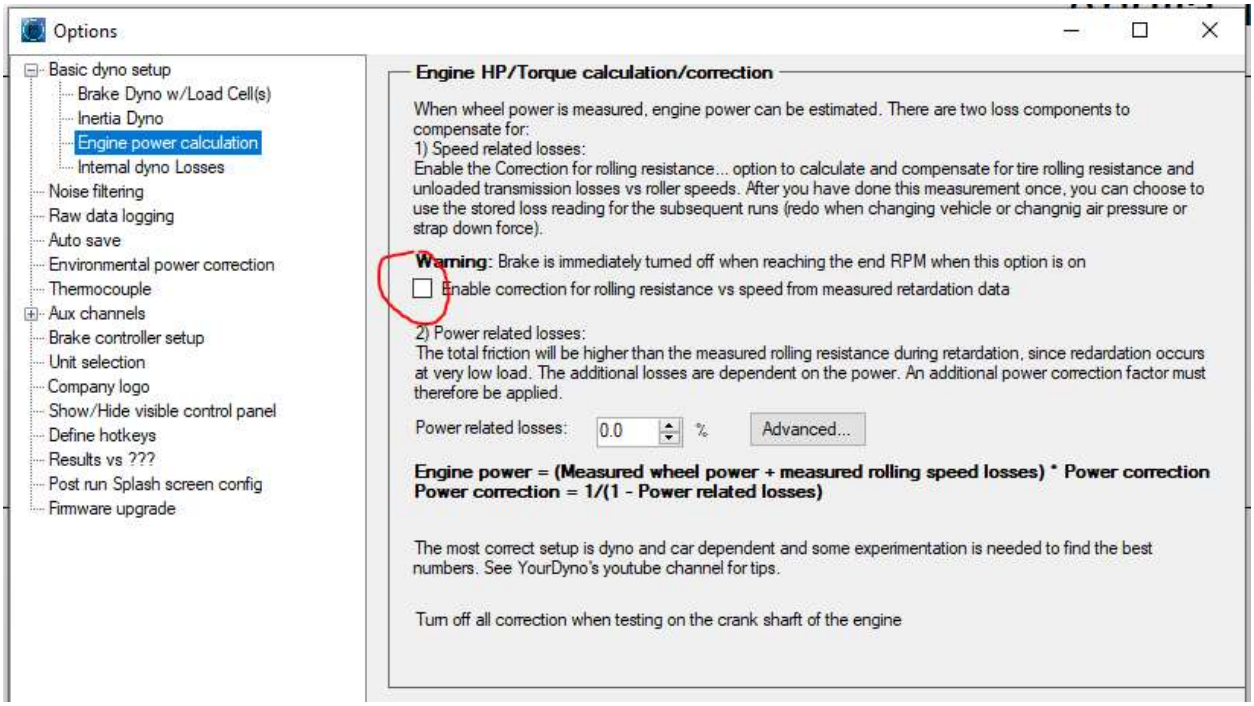


Figure 5 Ensure rolling resistance correction is off (or the brake will turn off at max RPM)

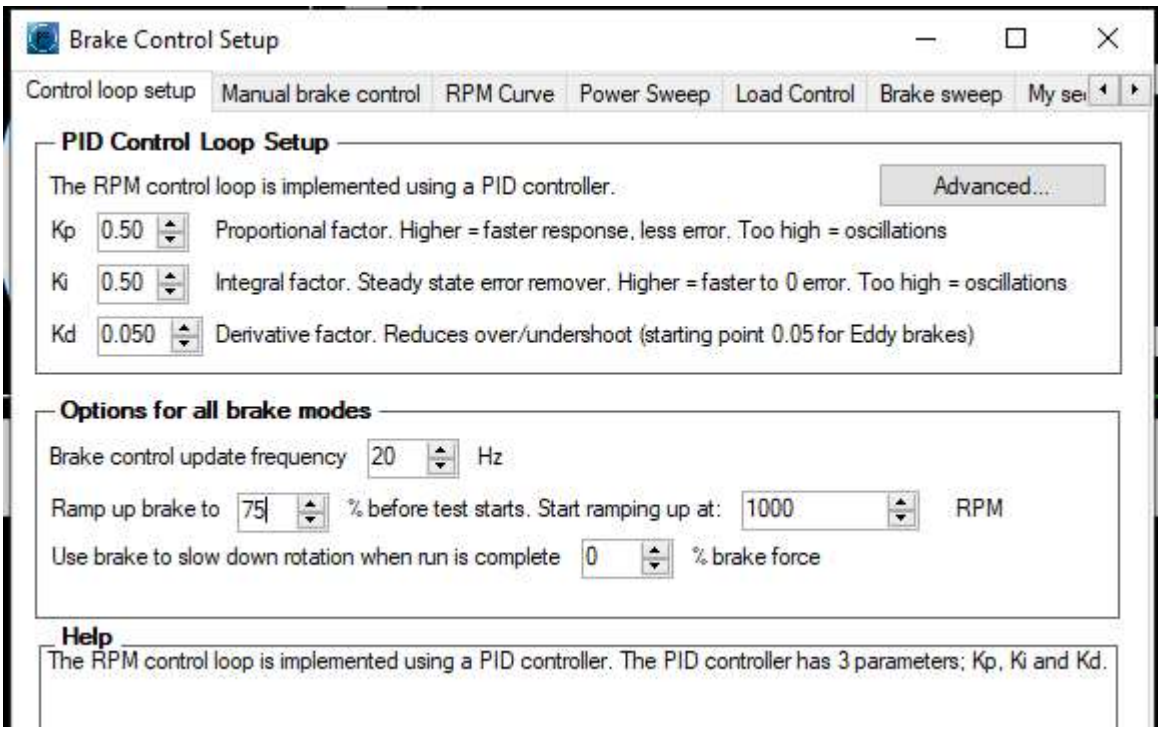


Figure 6 Ensure Ramp up brake is on. This will gradually increase the brake as RPM nears the start RPM. Many water brakes need high start %

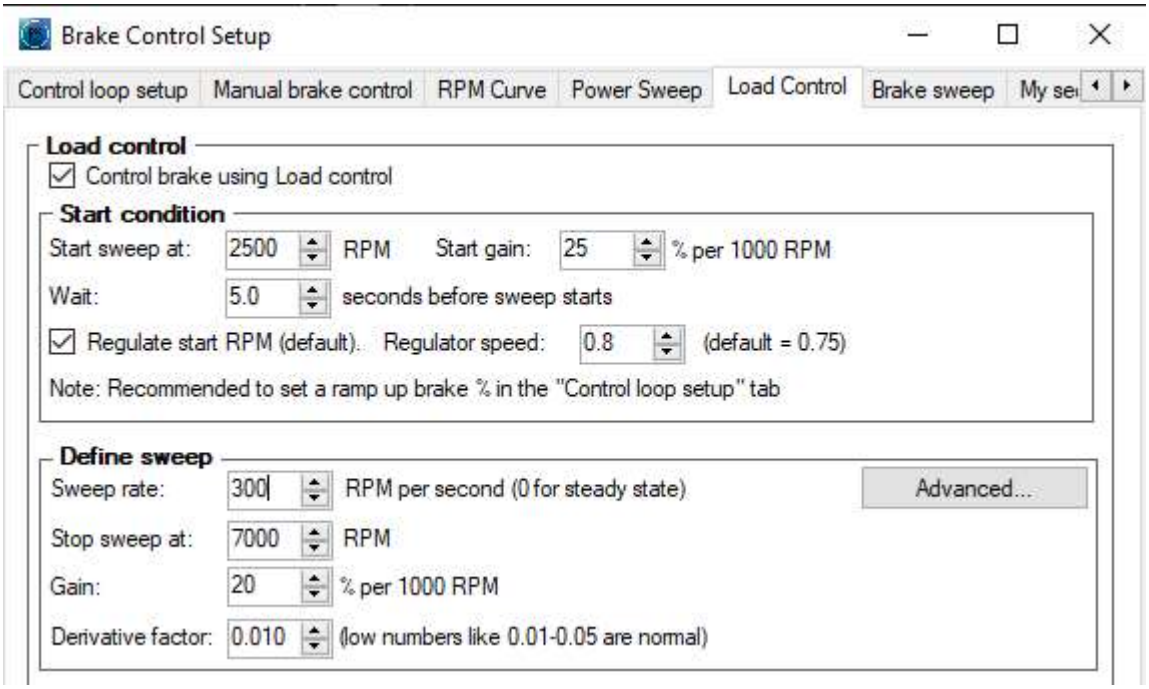


Figure 7 Load Control is the best brake mode for water brakes. Here is a starting point for the settings

7.1 Understanding Load control

Load Control is different from regular PID control. PID tries to make the RPM follow a straight line from start RPM to end RPM. This makes it prone to oscillations. Load Control is different, as it allows for a more natural sweep. Where the engine is strong, the RPM will increase a bit faster than the set sweep rate and vice versa. Following a straight RPM line is not important, it is much more important to get a nice smooth sweep, which Load Control more naturally creates.

7.1.1 The parameters

By far the most important parameter is Gain. Gain sets how much the brake responds to RPM changes. Too high = oscillations and too low = slow/sluggish regulation. Typical numbers are 10-20, but it may be higher or lower depending on your setup.

If you prefer, you can typically have a somewhat higher gain at the starting condition to make it lock faster. You can also play with the Regulator speed to make it lock to the start RPM faster (too fast = oscillations).

Derivative factor reduces fast brake responses. Low numbers like 0.01-0.05 are normal.

Advanced options make it possible to have different gains at different RPMs. This is typically not needed but could be if the engine has a very abrupt power band.

8 Valve maintenance

The valve is straight forward to disassemble and assemble.

No regular maintenance is necessary, other than occasionally checking the belt tension.

Belt tension is adjusted by moving the motor. Ensure the belt is tight but not overly tight. You should easily be able to turn the plastic free wheels after assembly.

9 Startup and shutdown

It is recommended to disconnect the power supply from the mains when the system is not in use, as the servo and the servo controller can get hot.

NOTE: The servo has an encoder position sensor. This is a relative position sensor. Ensure the valve position is at 0% before turning off power, otherwise the reference position is lost next time the system is started. It is recommended to mark the 0% position with a marker or similar on the small belt wheel, so you can quickly set the valve manually to 0% if necessary.