

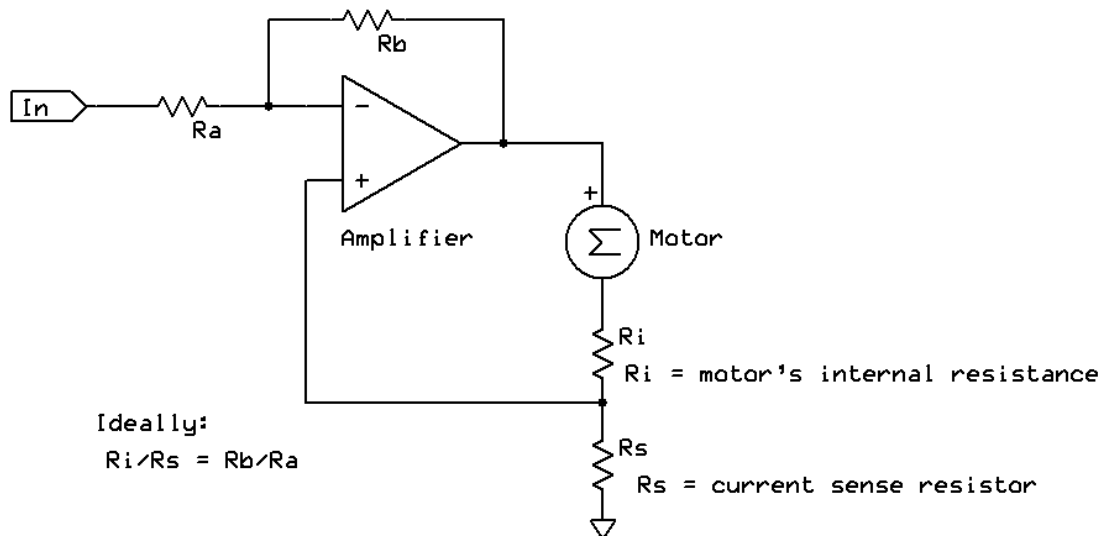
Bi-directional Motor Speed Regulator

This circuit shows the concept I used in the drill motor control I submitted earlier. I came up with it in 1994 when I built the device. My algebra and my patience are a bit too rusty at my age now, to write an equation that describes the relationship between the BEMF of the motor and V_{in} .

I've seen circuits like this that use two opamps that separate the positive and negative feedback portions of the motor control signal. They're easier to analyze mathematically. Still, the concept is the same. The motor gets a voltage applied to it that is proportional to the control voltage, but with a sample of the motor current used as positive feedback to compensate for the motor resistance loss.

Unless you use power opamps, this is only a concept drawing. The ratio of R_b/R_a cannot be greater than the ratio of R_i/R_s , or it will oscillate. It should be slightly less. Perfect speed control would require the ratios to be the same, but that is not realistically possible. For one thing, brush resistance varies with wear and during motor rotation. For precise control, you can't use carbon brushes. Note that cassette recorder motors have wire brushes in them.

If your amplifier supports it, this concept allows for bi-directional rotation.



Bi-directional Motor Regulator

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