Control Algorithm Discussion and P-I-D Tuning

For Models:

MD / ASP II Series - MD20P / MD30P / MD30E and ASP20

MD / ASP Plus Series - MD40P / MD50P / MD50E / ASP40 (all with or without -420)

Not for Models: *MD10P / MD3P / MD3E*

A true P-I-D speed control algorithm is employed in the **MD *Plus*** and **MD II Series** which allows for precise response to motor loop speed or load changes. The three parameters Proportional, Integral, and Derivative are adjustable software parameters accessed when the drive is in the Programming Mode. Consult your product's instruction manual to understand the steps for accessing the drive's Programming Mode **understanding** that the drive may be locked out of this mode. Your manual will explain how to release this. If you do not have your manual, you may access a copy on the Dart website:

MD II Series - http://www.dartcontrols.com/manuals/ASPIIMDIIRevAManual.pdf

or

MD *Plus* Series - http://www.dartcontrols.com/manuals/MDP_PlusManual.pdf

When adjusting P-I-D, begin by using the factory defaults the control is preset to. If further adjustment of P-I-D is needed, follow the steps below.

To adjust P: (Item 26)
Run the motor from zero speed to the set speed. If the start up response of the motor is too slow, increase "P" in increments of 20 until the desired start up response time is obtained. If the start up response time is too fast, decrease "P" in increments of 10 until the desired response is reached. "P" is used to adjust the start up response time only. The start up response time is approximately 0 to 60% of the set speed. "I" can be used if adjustment of the upper response time (60 to 100% of the set speed) is needed.

To adjust I: (Item 27)
Run the motor from zero speed to the set speed. If the upper response time (60 to 100% of the set speed) has any hesitation or has too slow of a response, then increase "I" in increments of 5 until the hesitation is eliminated and/or the desired upper response time is obtained. If the upper response time is too fast or has too much overshoot, decrease "I" in increments of 3 until the overshoot is eliminated and/or the desired upper response time is reached.

To adjust D: (Item 28)
"D" can be used to dampen the effect of "P". By making "D" too large, the response time of the control can be reduced, so keep "D" as small as possible on non-regenerative controls.

Note: The proportion of P-I-D seems to be more critical than the individual values, i.e. values of 50-50-50 will achieve virtually the same results as 999-999-999.