Understanding the Data Sheet

Products: **All**

This note is supplied to provide further information about the data presented in Firgelli Data sheets. The intent is to provide clarification on ratings, units, and graphs.

Terms:

Peak Power Point – Power is calculated by multiplying speed by force. The Peak Power point is the specific speed and force point that will result in the largest power output.

Peak Efficiency Point – This indicates the motor speed where the actuator most efficiently converts electricity to mechanical power.

Max Speed (no load) – This is the maximum speed that the actuator can achieve. This occurs when nothing is attached to the actuators piston.

Max Force (lifted) – The maximum force that can be reliably lifted by the actuator without causing damage.

Max Side Load – This is the maximum external force that can be applied perpendicular to the actuators shaft. If this is exceeded, the actuator may not operate correctly and life may be reduced.

Back Drive Force – This is the amount of force that it takes to overcome friction in an actuator with the power removed, causing the shaft to move.

Stroke – This is the distance that the actuator shaft can travel.

Input Voltage – This is the maximum recommended supply voltage for the actuator. Using a voltage lower than this will result in reduced speed and force.

Stall Current – This is the maximum current that the actuator will draw when it is allowed to stall against a hard limit.

Mass – Weight of the actuator.

Firgelli Technologies Inc.
4585 Seawood Tce.
Victoria, BC V8N 3W1
Canada
1 (206) 347-9684 *phone*
1 (888) 225-9198 *toll-free*
1 (206) 347-9684 *fax*
sales@firgelli.com
www.firgelli.com

Operating Temperature – This is the ambient temperature range where the actuator will operate within its performance specs. Outside this range the actuator will continue to operate, but at different speeds, forces and currents, and with reduced life expectancy.

Positional Accuracy – For models with potentiometer feedback this is the level of accuracy that is attainable based on the linearity of the feedback.

Lifetime – Cycle life is based on testing of unloaded actuators with one stall condition at either end of stroke. This tests potentiometer life and mechanical life. The stall condition is the worst case load for an actuator. This applies a load well in excess of the Peak Power Point.

Audible Noise – Maximum noise levels during normal operation measured at 45cm from the actuator.

Ingress Protection – This rating indicates the amount of environmental protection the case provides. IP54 indicates "Protected against dust limited ingress (no harmful deposit)." And "Protection against water sprayed from all directions - limited ingress permitted."

Units:

g – Grams, SI Units used to indicate the weight of the actuator. Convert to ounces by multiplying by 0.035273.

N – Newtons, SI Units used to define forces which the actuator can push or pull. Newtons can be converted to an equivalent hung Weight in pounds by dividing by 9.8 and multiplying by 2.2.

mm/s – Millimeters per Second, SI Unit used to define actuator speed. Convert to inches per second by multiplying by 0.039370078

V,VDC - Volts Direct Current, These are used interchangeably. No Firgelli actuators accept AC voltages. An example of AC would be the power in our houses. To get DC an AC/DC transformer can be used. An example of DC is a battery.

°C – Degrees Celsius Convert to degrees Fahrenheit by multiplying by 1.8 and then adding 32.

dB – Decibel, A measurement of sound level. A reading of 60-75 is comparable to a normal conversation at 3-5 feet.

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Graphs:

Load Curves

This graph shows a plot of speed versus load. As the load is increased the speed of the actuator will be reduced. The multiple lines indicate different gear options that can be specified when ordering.

Current curves

This graph shows a plot of current versus load. As the load is increased the amount of current drawn is increased. The multiple lines show different motor voltage and gear options.

Speed curves

A graph of speed versus voltage is not shown however this is also linear. Actuator speed for a fixed load can be varied by varying the motor voltage. For integrated controllers or the CIB the minimum allowed voltage is ~4V.

Schematics:

Dimensions - All dimensions are given in mm. To convert to inches multiply by 0.039370078.

Ø – Indicates a diameter.

Pitch – This is the center to center distance between two adjacent pins or pads on a connector.

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