

From: "R.O. Rushton" <RORushton@HopewellDesigns.com>
To: Eric Jameson <EJameson@dnr.state.ga.us>
Date: Friday, 24 April, 2009 08:12
Subject: Fwd: Additional information on amendment for DI40 irradiator 1138d103s-01a
Attachments: DI40 Addt'l Info Apr09.pdf

Dear Eric,
I sent this to you 2 days ago, but apparently to the wrong address <Eric.Jameson@dnr.state.ga.us>. Hopefully this will get through to you.

Robert

--

Robert Rushton
Hopewell Designs, Inc.
5940 Gateway Drive, Alpharetta, GA 30004 USA
Phone: 770-667-5770
Email: RORushton@HopewellDesigns.com

----- Forwarded message -----

From: R.O. Rushton <RORushton@hopewelldesigns.com>
Date: Wed, Apr 22, 2009 at 4:18 PM
Subject: Additional information on amendment for DI40 irradiator 1138d103s-01a
To: Eric Jameson <Eric.Jameson@dnr.state.ga.us>

Dear Eric,
You had requested additional information on the electric actuator used in the DI40 irradiator regarding the pending amendment 1138d103s-01a. Please find attached a cover letter and manufacturing data on the electric actuator.

Thanks for all your help. Please let me know if you need anything else.

--

Robert Rushton
Hopewell Designs, Inc.
5940 Gateway Drive, Alpharetta, GA 30004 USA
Phone: 770-667-5770
Email: RORushton@HopewellDesigns.com

HOPEWELL DESIGNS, INC.

5940 Gateway Drive, Alpharetta, GA 30004 770-667-5770

April 22, 2009

Mr. Eric Jameson
Department of Natural Resources
Radioactive Materials Program
P.O. Box 1001161
Atlanta, GA 30392

Ref: Additional Information for Amendment for DI40 Irradiator #1138d103s-01a

Dear Mr. Jameson:

In response to the questions in our telephone conversation today, I have provided the following information.

- 1) The electric actuator that could be used for raising and lowering the EPDs in the irradiator has a life expectancy of 1,000,000,000 inches of travel. See attached chart. Assuming an annual cycle of 10,000 EPD exposure per year, this gives a life cycle for the actuator of 2,500 years. [1,000,000,000 inches of travel / 40 inches per cycle / 10,000 cycles per year]. Also attached are the ISO9001 and CE certificates for the manufacturer of this product.
- 2) This electric actuator consists of a ball screw and a reversible stepper motor. The actuator is moved by instructions from the computer: a forward/reverse signal, and a series of pulses to move the motor. The distance moved is proportional to the number of pulses sent to the motor. When pulses stop, the motor stops. If power is lost the actuator remains where it is. When power is returned, the actuator can then be moved to the bottom of its position where EPDs are loaded/unloaded. There is no change in radiation exposure rates if the system fails and the actuator is extended. The worst case is that the EPD might be damaged from a long exposure. In all cases, the exposure rate on the surface of the irradiator would be the same low rates described in the original application.

Thank you for your support and assistance. Please let me know if you need any additional information.

Sincerely,



R.O. Rushton
President

Encl:

Lead Screw Life Expectancy

Acme Screw Life: As a result of the high friction inherent to acme screws, life expectancy is unpredictable. Load, duty cycle, speed, temp, and lubrication all affect the amount of heat generated and thread wear by the acme nut which ultimately determines the life of the mechanism. Acme screws typically have lower life expectancies than ball screws and should only be used in low duty cycle applications.

Ball Screw Life: Ball screws are high efficiency mechanisms that utilize a rolling friction, ball bearing nut to translate rotary motion and torque to linear motion and thrust. Life expectancy can be predicted by comparing the effective load to the screw's basic dynamic load rating. Basic dynamic load rating is the load at which a screw has a 90% probability of achieving 1,000,000 revs of life before metal fatigue develops – L10 life.

To Use Charts:

- Determine required life in millions of inches of travel. Life is determined by multiplying the total stroke in inches by the total number of strokes required for the designed life of the equipment.
- Calculate the equivalent load L_m .

$$L_m = \sqrt{\frac{\%_1 (L_1)^2 + \%_2 (L_2)^2 + \%_3 (L_3)^2 + \%_n (L_n)^2}{100}}$$

Where: L_m = equivalent load
 L_n = each increment of load
 $\%_n$ = percent of stroke at load L_n

For example:

L1 = 150# %1 = 30%
 L2 = 225# %2 = 45%
 L3 = 725# %3 = 25%

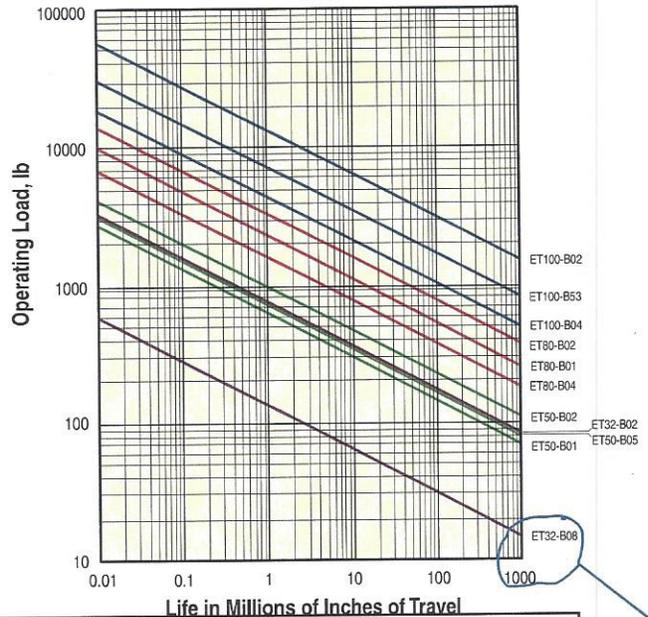
$$L_m = \sqrt{\frac{30 (150)^2 + 45 (225)^2 + 25 (725)^2}{100}}$$

$L_m = 466$ lbs

- Find the point at which load and life intersect.
- Select actuator screw combination to the right of or above the point of intersection.

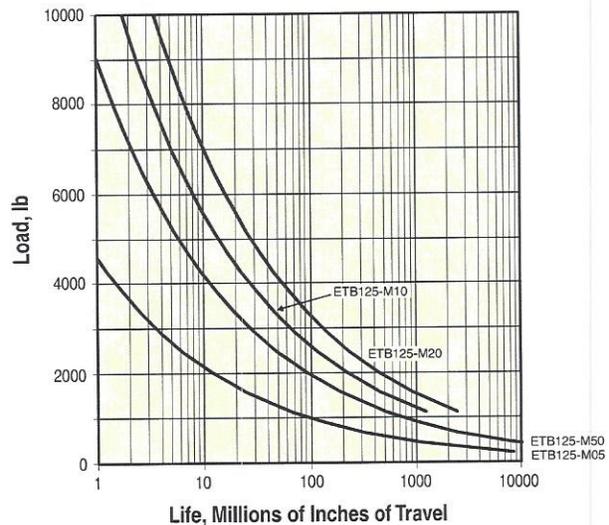
For more detailed information and examples on calculating screw life, reference the ET technical manual.

Life Expectancy (inch) ETB32 - ETB100



Operating Load: 0.5lbs
 Actuator Model ET32-B08 has a life expectancy of more than 1,000,000,000 inches of travel as shown in the curve above

Life Expectancy (inch) ETB125





PERRY JOHNSON REGISTRARS, INC.

Certificate of Registration

Perry Johnson Registrars, Inc., has assessed the Quality Management System of:

Parker Pneumatic Division North America
135 Quardal Drive, Wadsworth, OH 44281 United States
(This location is a participant in a multisite registration. See Appendix.)

*(Hereinafter called the Organization) and hereby declares that
Organization is in conformance with:*

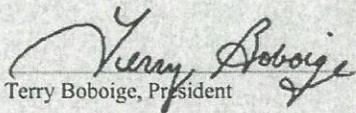
ISO 9001:2000

This Registration is in respect to the following scope of supply:

**Design and Manufacture of Electromechanical, Pneumatic,
and Hydraulic Actuator Components and Systems**

Such products shall be manufactured by the Organization at, or such processes or services shall be offered at or from, only the address given above. This Registration is granted subject to the system rules governing the Registration referred to above, and the Organization hereby covenants with the Assessment body duty to observe and comply with the said rules.

For PJR:


Terry Boboige, President

Perry Johnson Registrars, Inc. (PJR)
26555 Evergreen, Suite 1340
Southfield, Michigan 48076
(248) 358-3388



The validity of this certificate is mandated through ongoing surveillance.

Effective Date:
February 3, 2008

Expiration Date:
February 2, 2011

Certificate No.:
C2008-00384



Declaration of Conformity

Application of Council Directive:

EMC 89/336/EEC

Applicable Standards:

**EN55011:1998, A1:1999, A2:2002
EN61000-6-2:2001
EN61000-3-2:2000
EN61000-3-3:1995, A1:2001**

Manufacturer:

Intelligent Motion Systems, Inc.

Issued by:

**Intelligent Motion Systems, Inc.
370 North Main Street
Marlborough, Connecticut, USA
06447**

Type of Equipment:

Step Motor with Controller

Product:

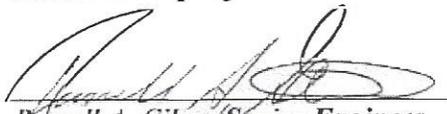
**MDrive23Plus Motion Control
MDrive23Plus² Motion Control
MDrive23Plus²-65 Motion Control
MDrive23Plus Microstepping
MDrive23Plus Speed Control**

**Base model number
MDI1xxx23x7 *
MDI3Cxx23x7 *
MDI4Mxx23x7 *
MDM1xSx23x7 *
MDO1xSx23x7 ***

**Date of issue
October 12, 2006
October 12, 2006
September 14, 2007
October 12, 2006
September 14, 2007**

*Only base model numbers are shown. This declaration applies to all base model variations.

I, the undersigned, hereby declare that the equipment specified above conforms to the directives and standards as specified.


Russell A. Gibas, Senior Engineer

CE testing performed by Global Certification Laboratories, Ltd., East Haddam, CT