

Zimbra

bjones@mbari.org

RE: Help with motor/gearbox selection**From :** Sio, Eugene <Eugene.Sio@maxongroup.com>

Tue, Mar 05, 2024 04:07 PM

Subject : RE: Help with motor/gearbox selection

📎 3 attachments

To : Brent Jones <bjones@mbari.org>

Hi Brent,

Thanks for the clarification. So the motor can rotate between 57rpm (60sec) to 171rpm (20 sec).

If 15V needs to be generated at those speeds, I'd suggest adding a gearhead ratio to bump up the low speed input of 57rpm. See below for my recommendation.

B815A27EFE28 (DCX22L, EB 48V + GPX22UP, 35:1)

The DCX22L, 48V has a speed constant of 109rpm/V = 9V generated per 1000rpm.

To generate 15V, the motor will need to run at a speed of 1667rpm minimum

Since your input speed from the ball screw is 57rpm, this will need to be geared up by ~29:1 to achieve a motor speed of 1667rpm.

I selected the 35:1 reduction ratio to give you more headroom to generate more voltage if needed.

This combination uses the Ultra Performance gearhead which has high efficiencies with the use of needle bearings between the planet gears, and is great for backdrivability. This reduces friction in the gearhead and reduces losses in the system.

Please review the specification sheet attached for the motor + gear assembly, and let me know if you have any questions about my thought process.

Best regards,

Eugene Sio
Senior Sales Engineer

Phone 650-524-8822, Direct 650-445-4733

eugene.sio@maxongroup.commaxon precision motors, inc.
2860 Zanker Road, Suite 107
San Jose, California 95134
www.maxongroup.us

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From: Brent Jones <bjones@mbari.org>
Sent: Monday, March 4, 2024 3:53 PM
To: Sio, Eugene <Eugene.Sio@maxongroup.com>
Subject: Re: Help with motor/gearbox selection

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57 total rotations at the ball screw shaft. So that will either be at the output of the gearbox or if no gearbox at the motor. And yes, ideally would like this in about a minute. Can vary down to about 20sec though if needed. So 57 rotations between 20-60s.

From: "Eugene Sio" <Eugene.Sio@maxongroup.com>
To: "Brent Jones" <bjones@mbari.org>
Sent: Monday, March 4, 2024 3:49:18 PM
Subject: RE: Help with motor/gearbox selection

Hi Brent,

Is the 57 total revolutions on the motor side? If so, can we assume this is 57 total revolutions of the motor shaft in 1 minute?

Best regards,

Eugene Sio
Senior Sales Engineer

Phone 650-524-8822, Direct 650-445-4733
eugene.sio@maxongroup.com

maxon precision motors, inc.
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parvalux
by maxon

From: Brent Jones <bjones@mbari.org>
Sent: Monday, March 4, 2024 3:47 PM
To: Sio, Eugene <Eugene.Sio@maxongroup.com>
Subject: Re: Help with motor/gearbox selection

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Somewhere around 15V would be nice.

From: "Eugene Sio" <Eugene.Sio@maxongroup.com>

To: "Brent Jones" <bjones@mbari.org>

Sent: Monday, March 4, 2024 1:26:37 PM

Subject: RE: Help with motor/gearbox selection

Hi Brent,

It sounds like you're looking to use the motor as a generator. If so, do you know how much voltage you are looking to generate and at what speed? This will help me determine what motor winding works best.

Do you also need this motor to be capable of driving the piston at 1.5Nm? If so what is the output speed (rpm)?

See link to a great article our academy team wrote on guidelines to selecting motors for generator applications:
[maxon Motors as Generators – maxon Support \(maxongroup.com\)](https://www.maxongroup.com/maxon-Motors-as-Generators)

Best regards,

Eugene Sio
Senior Sales Engineer

Phone 650-524-8822, Direct 650-445-4733
eugene.sio@maxongroup.com

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San Jose, California 95134
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From: Brent Jones <bjones@mbari.org>

Sent: Monday, March 4, 2024 9:24 AM

To: Sio, Eugene <Eugene.Sio@maxongroup.com>

Subject: Help with motor/gearbox selection

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Hi Eugene, can I get some help with motor/gearbox selection? Im running a piston backwards that turns a DC motor into a generator. I have the following calcs for the ball screw output:

Torque = 1.5 N-m

57 total revolutions (determined from stroke length of piston)

Just looking at the sales literature it seems something like a RE30 (448595) coupled to a 15:1 gearbox would work? I calculate 2.43A generated at about 850rpm but Im not sure if that is correct?

Thanks,
Brent

Brent Jones
Engineer
Monterey Bay Aquarium Research Institute
7700 Sandholdt Road
Moss Landing, CA 95039
+1 (831) 775-2064



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