Cheatography

Choosing a Gerotor Motor Cheat Sheet

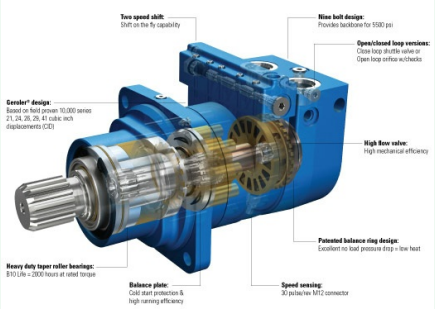
by [deleted] via cheatography.com/2754/cs/9450/

Introduction

There are two motor types using what is termed as the orbit principle, which is what gives the motors their tremendous power density and compact size. A gerotor motor star has six teeth and seven lobes. The spaces among them are pressure chambers. Pumped fluid flows into these pockets, creating high pressure in one chamber and low pressure in another. This creates an imbalance of forces, which causes the gerotor motor star to rotate, or orbit. A gerotor motor star orbits multiple times, Figure 1, typically six to eight times depending on the specific star and ring geometry—for each complete single revolution within the outer ring. Geroler motors use the gerotor principle, but use rollers instead of lobes. This reduces friction and wear—and improves low-speed performance, extending the motor's life.. Gerotor and Geroler motors deliver from 10 to 50,000 in.-lb of torque and can operate at speeds up to 2,000 rpm. Because of their simple design and compact size, they can be used in both mobile and industrial applications. However, they are well-suited for mobile applications—especially agriculture, material handling and construction—because of their incredible power density.

Credit: By Todd Degler, Product Manager, Eaton Hydraulic Motors
http://www.mobilehydraulictips.com/select-gerotor-motor/

Gerotor Motor



The speed and torque requirements of the application will determine the size of motor. This will point users into what displacement (how much fluid is needed to turn one revolution) is needed. Speed and torque can be determined with the following basic motor equations. These are the starting points for finding the properly sized motor.

Theoretical torque (in.-lbs) = in.3/rev x pressure differential/(2Pi)

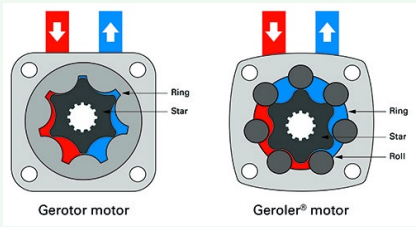
Theoretical speed (rpm) = gpm x 231 / in.3/rev

1. Performance

⬛Ask for mechanical and volumetric efficiency data, and make sure the test data is over an extended period of time. Some manufacturers may tune performance to peak in the first few hours of operation, but then degrade quickly. Performance that degrades quickly will not do your machine justice.

⬛Compare apples to apples; hydraulic motor performance data is not standardized. Be wary of ratings and test data that do not include all of the performance test parameters.

Gerotor & Geroler Motors



2. Quality

⬛Does the manufacturer have a history of consistent quality? Ask for the quality data.

⬛Motor grinding is not all the same. Grinding star profiles outside the capabilities of the form grinding machine will cause inconsistent results.

⬛Look for high-quality materials and ensure that inferior materials (with processes like heat treating and form grinding) are not being used.

⬛Compare the warranty options.

3. Reliability

⬛Reliability is quality over time. Look for a product with a track record—history is the best predictor of the future.

4. Support

⬛Investigate the options for additional support. Would you benefit from CAD modeling support or the creation of a custom solution? Remember that this can differentiate your machine from the competitor.

⬛Do you just want a part or do you want a system of solutions? Some manufacturers can provide a custom system of solutions for your machine, while others specialize in providing a singular part.

5. Cost

■Obviously, cost is very important, but it is really a function of all the previous items. Sacrificing the above items can provide a lower cost, but consider what will happen to your machine (and your customer) when issues arise.

■Some companies try to keep costs low by having a “one size fits all” approach to their motor portfolio. This may work for some, but make sure the solution you choose really works the way it should on your machine.

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