Common Types of Hydraulic Flow Meters Cheat Sheet

by [deleted] via cheatography.com/2754/cs/16628/

Introduction: What is flow?

Flow is the measurement of the volume of a liquid that passes a fixed point in a unit of time. For most hydraulic applications, flow is measured in liters per minute (lpm), U.S. gallons per minute (US gpm), or, occasionally, U.K. gallons per minutes (UK gpm).

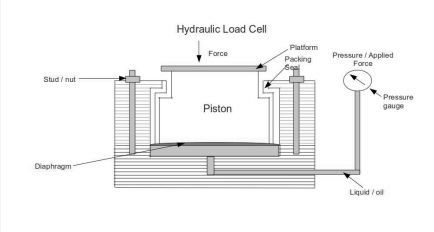
Multiply By To obtain

US gpm 3.785 lpm

UK gpm 4.546 lpm

Source: https://www.fluidpowerworld.com/need-know-hydraulic-flow-meters/

Flow Meter



What to consider when selecting a flow meter?

When searching for a flow meter for use in a particular hydraulic application, these five questions can help:

1. What are the fluid properties?
2. What are the hydraulic system operating conditions?
3. Why is flow being measured; how accurate does the flow measurement need to be?
4. What effect might the flow meter have on the fluid and vice-versa?
5. How important is it to measure flow; what is your budget?

Variable orifice flow meters



The idea of flow displacing an object, usually a piston or a ring, forms the basis of simple ‘variable orifice’ flow meters. The momentum of the fluid exerts a force on a piston that is held in place by a spring. Such meters typically have an accuracy of between 2 – 5% of full scale

Gear type flow meters



These are positive displacement flow meters. On the inside, they look similar to a gear-type motor. Fluid passes around the outside of a pair of intermeshed gears, rotating the gears on their shafts. A transducer mounted above one of the gears generates a pulse each time a gear tooth passes under it. The rotation of the gears is proportional to the flow rate. Sometimes, two transducers are used to measure direction and improve resolution

Turbine-type flow meters



In a turbine-type flow meter, a turbine rotor is mounted on a shaft between two sets of flow straighteners. The fluid passes through the flow meter and rotates the turbine blade. As for a gear-type flow meter, a transducer is mounted above the turbine and generates a pulse each time a blade passes under it. The frequency from the transducer is proportional to the flow over a limited range.

Other Meter Types

Oval gear meters are similar to conventional gear meters, but use two elliptical gears that rotate together at 90º to one another inside a housing. The fluid is swept around the chamber by the gears, and the frequency of rotation is directly related to the volume of fluid through the meter.

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