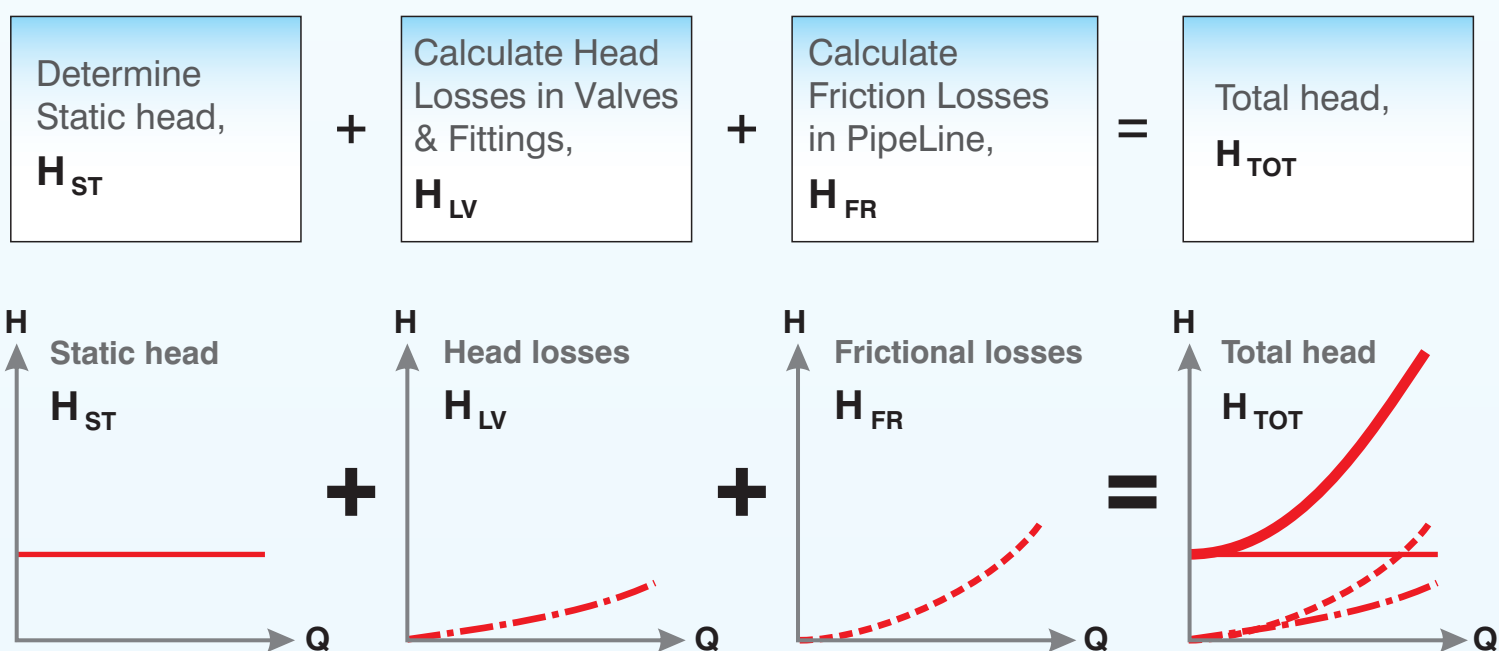


Q : *How will a Single Pumpset (or a Pumping Station with all similar pumpsets) behave when it is used to Transfer water to Various Different Locations ..?*

A : **We have to Understand:**

- What is head (*energy*): The Total Energy of Fluid - either in form of Static (*Geoditic*) or in form of Head Losses or in form of Frictional Losses. Please note that Head has two aspects:
 - **System Resistance:** (*head*) to be **Overcome** (*i.e. Effort to be done by fluid (ultimately to be developed by pump)*) to Transfer Fluid satisfactorily to desired disposal point
 - **Pump Energy:** (*head*) Energy Developed by Pump
- **Check Point:**
 - the Energy (*head*) Developed by the Pump should always be more than the **Static** Head for Water to be Transferred.
 - the Energy (*head*) Developed by the Pump should always be more than the Total System Resistance (*head*) for Water to be Transferred at DESIRED (*or Higher*) Flow Rate.

Steps to Calculate System Head (*Resistance*)



Whenever, the pump is to do Duty at Multiple Locations (*i.e. Systems*); we have to make Multiple System Resistance Curves.

However, as a rule of thumb, some guidelines are given as below :

- Discharge at Different Elevations (*Static Head Changes*) :
 - If the same pump discharges to different points having different elevations
 - Higher discharge point (*Higher Static head*): System & Pump flow decreases.
 - Lower discharge point (*Lower Static head*) : System & Pump flow increases.:
- Discharge Through Pipelines of Different Lengths &/or Diameters:
 - Changing the pipeline changes friction losses:
 - Longer or Smaller diameter pipe : Higher friction losses & System/Pump Flow Decreases
 - Shorter or Longer diameter pipe : Lower friction losses & System/ Pump Flow Increases
- Discharging to Multiple Different Points/ Locations
 - If a single pump is connected to a manifold and can discharge parallelly / simultaneously to different destinations:

Discharge Point	System Resistance	System Flow Rate
Nearby Point - Same Elevation	Low	High
Far Away Point - Same Elevation	Medium	Medium
Far Away Point - High Elevation	High	Low

- The pump automatically tries to settle at an Operating Point where its H-Q curve intersects the respective system curve. The effect on the Pump **will Not be Directly Related** to whether it pushes water into a single or multiple tanks - **it will be dependent upon** the Back Pressure (*head*) imposed onto the Pump by the System & the **Resultant Flow per pump**.
 - ! However, please note that irrespective of Total System Resistance, if the Pump's Shut Off head is Lower than the Static head to be overcome - No Water will be transferred at all...! Hence, for Single Pump discharging into Multiple reservoirs; ensure that the Maximum Static Head of All & Any system is always well covered by the pump.
- Upon request from RH/SH, our Design Department can assist Client in Detailed System Pump Interaction Calculations which will help :
 - Optimize Energy,
 - Pumpset's Long Term Reliability,
 - Avoiding Unnecesary Head Losses,
 - Avoiding a Variety of Pump Configurations, etc.

Single Pumping Station Serving Multiple Tanks

