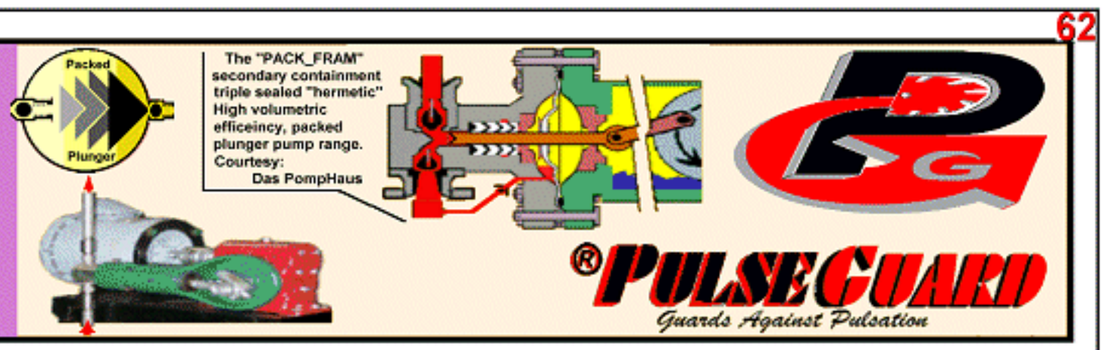
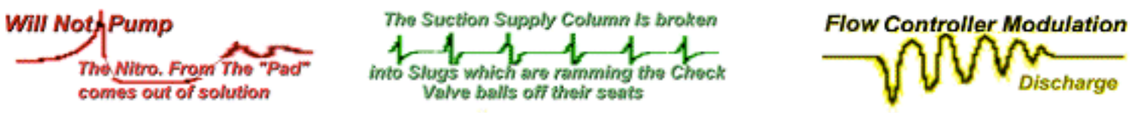
Check List :- Dampener "bottle" Selection For System Pressure Pulsation & Suction Pipe Acceleration Head Loss Recovery.

Where the excitation of pressure response from the piping system is caused by flow fluctuations with a Packed Plunger Pump



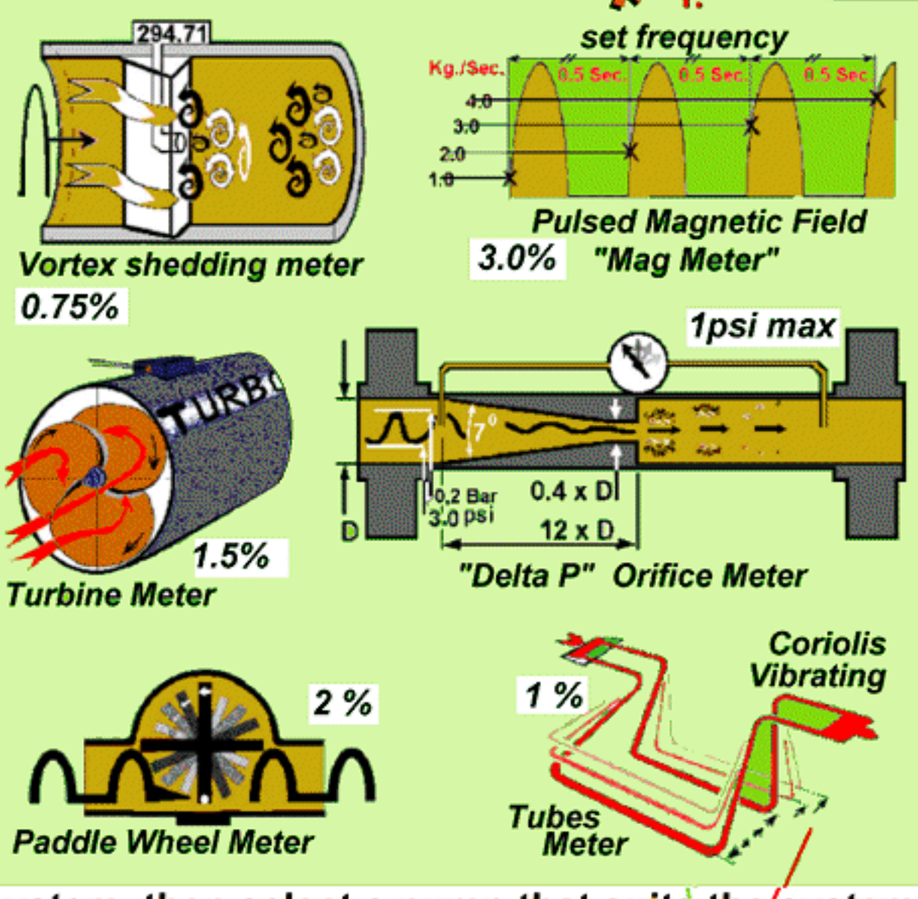


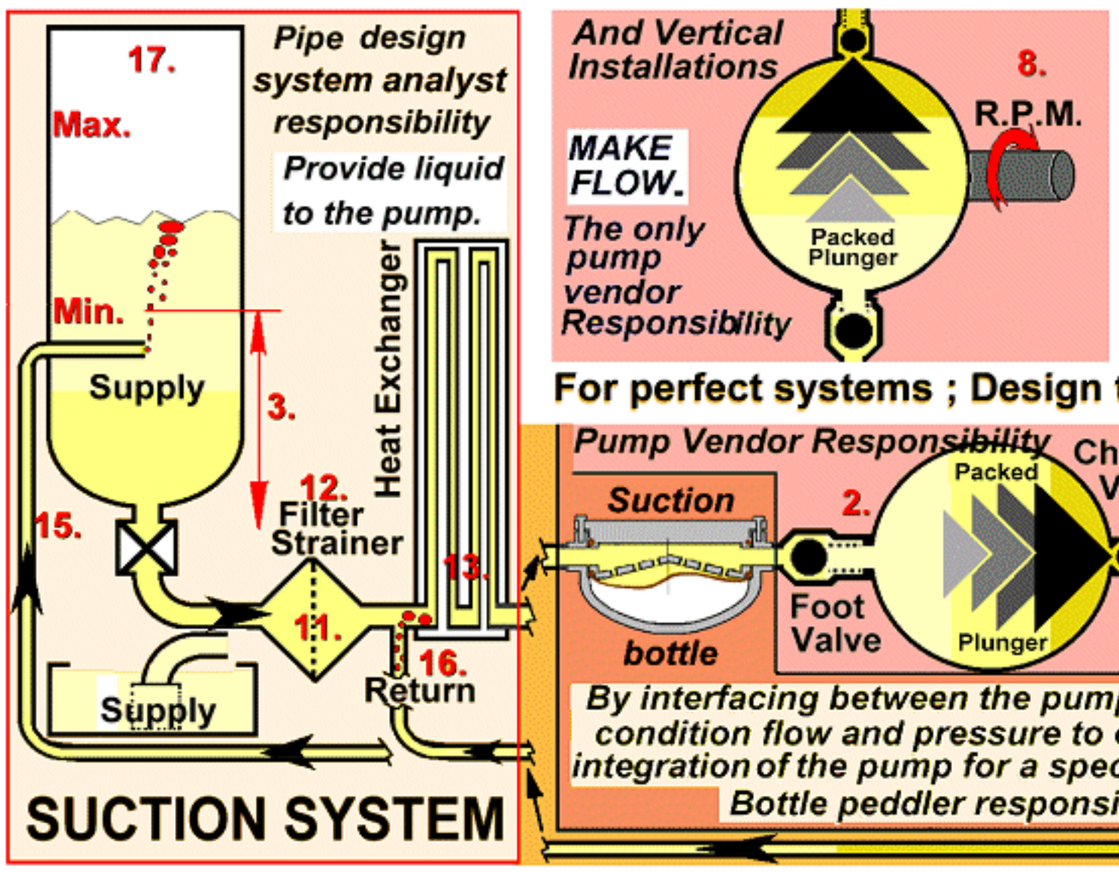
Allowable Pressure Pulsation %

System Pressure Pulsation Attenuation, please review all System Specifics, plus items 8,9,&10

1. Suitable allowable level, residual pressure pulsation, % of system pressure . Example from right, a damper for use with a "DP" Meter is 50 times larger than for preventing pipe shake.
2. How much of the suction system acceleration head losses are to be recovered ?
3. Vertical height from minimum liquid supply level in the supply tank to the centerline of the pump.
4. Pipe run distance from tank outlet to pump inlet.
5. Internal diameter supply pipe. 6. SG of liquid 7. cP
8. RPM. 9. Nbr. Packed Plunger Hds. Phased ^{0} 10. GPM

Make your pipe System work with a :- * 1.





11. Strainer DP. 12. Filter DP 13. Heat exchanger DP
14. Is there a spill back loop ? 15. Back to tank. 16. Froth back to suction 17. Is there a pressurised gas "pad" in the supply tank forcing gas into absorption which then flashes out and causes suction side gas lock? 18. Are there modulating devices after the pump putting pulsation back in the system
19. DP from restrictions 20. DP from valves 21. final resistance. psi 22. Pipe Length pump to end & ID.

Check your system need.	TO STOP :-	Residual % fluctuation allowed.	SOME TYPICAL SYSTEM REQUIREMENTS
	Pump Parts Fatigue Drive tooth wear, Belt breakage,	12 %	
	Burst Disc fracture. Relief weep. Unreadable pres. Indication.	9 % 6 %	
	Spray blobs, have atomization.	5 %	
	Gasket extrusion, weld fracture. Pipe shake.	4 %	
	First in 1st out bad static mixing with continuous flow	3.5%	Pulseless in Mixed out

Simple size calc. for pump flow fluctuation reduction.
(This disregards system presure response pulsation entirely)

$$\frac{100 \times \text{The Volume Displaced by One stroke of One Plunger}}{\text{Number of displacers}^2 \times F \times \text{The Percentage figure of allowable residual fluctuation}}$$

Packed Plunger (High Efficiency) F=1.2, N^2 Simplex = 1, N^2 Duplex @ 180^0 = 4

Abbreviation $\frac{100 \cdot V}{N^2 \cdot F \cdot \%\text{age fig.}}$

"F" Is a correction Factor on the square of number of displacers, Example , Centrifugals are intrinsically good - have a high F number typically 7.0

N : N Squared, N^2 N Exponent 2, means multiply the Number of displacers by that same number.
"%age figure" : 5% allowable residual fluctuation - use the figure 5 in the equation, for a residual fluctuation

A 1,750 rpm motor is driving a Radicon worm wheel 20:1 gear box, that drives the crank of a packed plunger pump at 87 SPM for 0.75 GPM
V = The volume of 1 stroke is therefor 2 in^3

$$\therefore \frac{100 \times V}{N^2 \times F \times \%_{fig.}} = \frac{100 \times 2\ in^3}{1 \times 1.2 \times 5} = \frac{200\ in^3}{6.25} \triangleq \text{"1/2 Qt."}$$

The frequency is so low, 1.5 Hz. that even a "T"d off line balloon in a bottle with a 3/8" connection will suffice.

For a Quotation:-

Please fax a copy of this work sheet to USA 011 910-270-2739 or UK 01144-(0)161-443-1486 or GOTO:→

PUMPS make FLOW, SYSTEMS cause PRESSURE, pressure pulsation is a system response, AND a system responsibility NOT a pump manufacturers liability.

E&OE

Suitability for purpose recommendations made on the basis of data & calculations above are with with the following normal responsibilities of the parties :- System Design S.D. to consider. Pump Vendor. Bottle Peddler.

http://www.pulseguard.com/pulsation_dampening/select_smooth_percentage/how_smooth