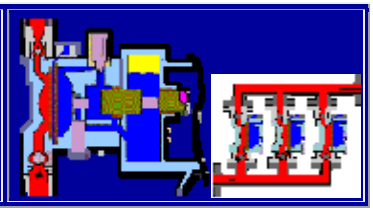
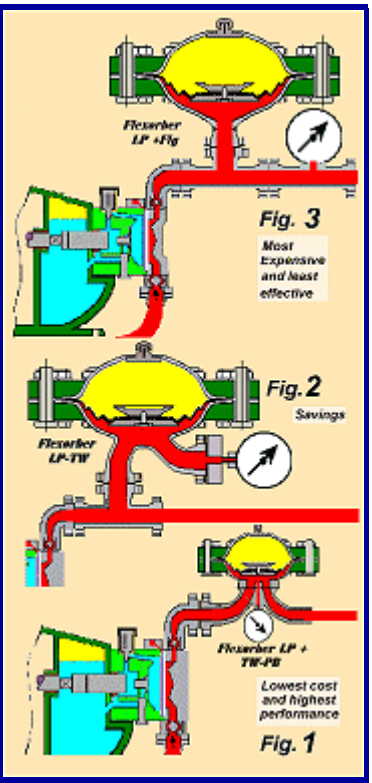
The COST $$ of HP METERING PUMPS with Various PULSEGUARD Dampers



Increase volumetric efficiency, catch shocks coming back from pipes stop the check valves bouncing, and produce smooth flow. Intercept pressure pulsation, isolate pump excitation from system response.

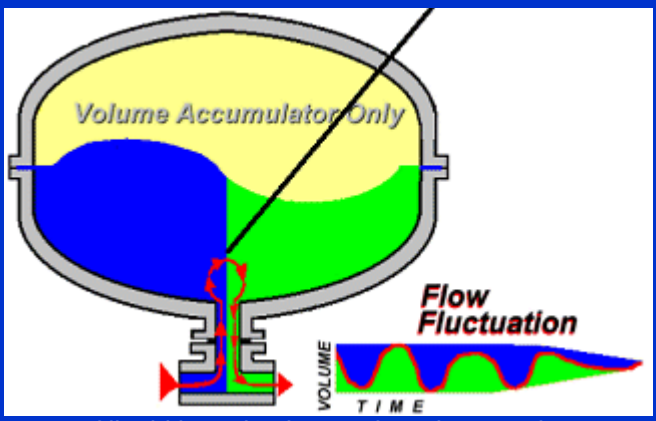
13.7 Meters3/hr. being transferred at 1 M/sec through a 3" Sch 80 pipe at 173 pulses/Minute. and 100 Bar (1450psi) produces a 2200 psi pressure swing - which is greater than the 900# flange capability at 250 Degrees F. A 500 in3 900# damper should reduce the pressure swing to 10 Bar. BUT IT DOES NOT.	5 x 3" 900# @ $175 = $875 3" XH Ts @ $161 = $322 6.5 hrs. fit & weld = $406 4.5 hrs. QA & Hydro = $280 Specially single flanged, 8.2 Liter 316 ss 140 Bar FLEXFLON diaphragmed, Accumulator $3,900 **3. Total $5,783**
The specially single ported "damper" is replaced with a low cost standard twin flanged unit. A "T" is saved, but it is piped "Off-Line". There is no performance improvement - just cost reduction. Our advice was followed "use a Flo-thru" the pressure recorder was protected instead of the system.	3 Flgs. & 1T $683 4 hrs. fabrication $250 QA & test $180 Standard FLEXFLON twin flanged damper $3,042 **2. Total $4,155**
A twin flanged 300in3 Flexorber LP was sent, complete with an instrument tap, installed to protect the pump & entire system, works better than the 800 ins3 off line unit. Try asking yourself two questions: 1. Would I invest in a single connection filter? 2. Would I invest in a single connection muffler?	No Ts no Flgs. $0,000 Absolutely standard "off the shelf" Ex-inventory tri-port piping based DAMPER 230 in3 (3.8 Liter) with 900# flanges. **3. Total $2,708**



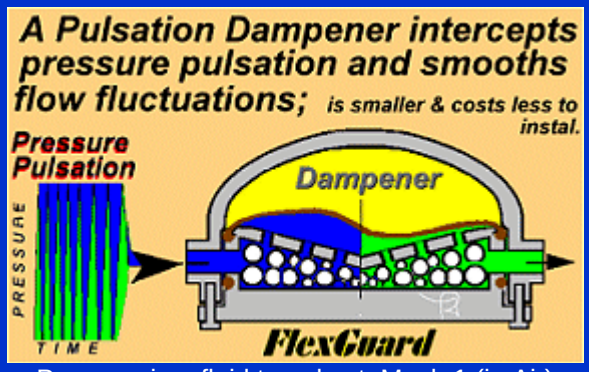
Multi-ports are standard, off shelf inventory cost.

Interceptor "isolators" = smooth flow AND pressure pulse free.

Because flow is so slow, there is time to flow up, come to a stop, and flow back down a "T" on the other hand, whatever the residual pressure pulsation level is, it will fly straight past a "T".



Mass of liquid in a pipe is transferred at not above 180 inches/sec or say 460 cm/sec



Pressure in a fluid travels at, Mach 1 (in Air)
In harder substances (liquid) is transferred at up to 4000 MPH, or say 140,000 cm/sec.

CONCLUSION:- With 300% greater efficiency, because flow fluctuations & pressure pulsation are forced to see the inside of PULSEGUARD PULSE DAMPERS, are more compact vessels and DO MORE WORK FOR A LOWER COST. Hence the saying:-

Dampers that do, flow goes through, BUT pressure pulsation is caught