
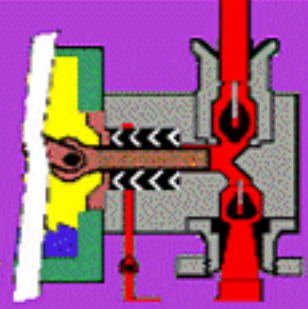


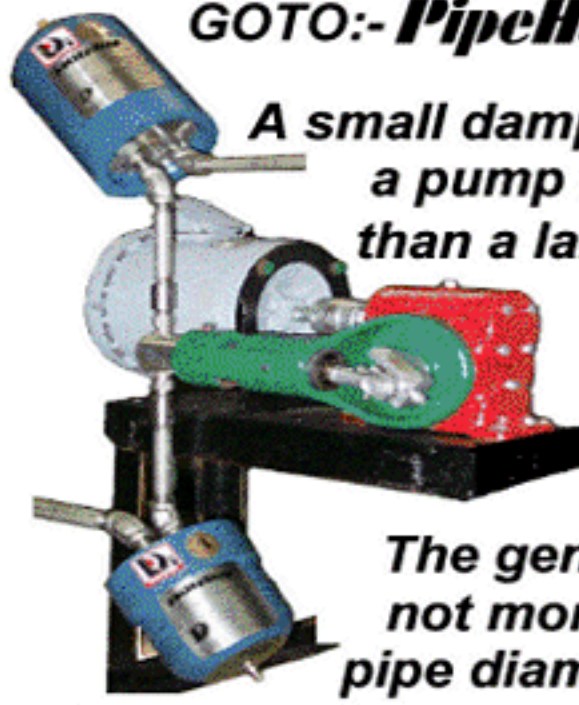
BELOW: How to ensure lowest in place cost and most performance by standard installation methods.

P19 **Constant pressure and flow with packed plunger pumps**
 The high volumetric efficiency of the packed plunger pump, with minimal dead volume in the pump head, (unlike diaphragm head pumps) the level of pulsation is already small, and lack of lost motion reduces pressure shock generation, small flow thru. dampers kill what remains
PUMPS make FLOW, SYSTEMS cause PRESSURE, pressure pulsation is a system response, AND a system responsibility NOT a pump manufacturers liability.

When applying plunger pumps at 1,000psi to 15,000psi, pressure pulsation interception is advisable.

GOTO:- PipeHugger ①
 A small damper close to a pump is far better than a large damper installed remotely.
 The general rule is not more than 12 pipe diameters from dampener to pump, and always a straight line, or not tighter than a 45°L or a 5D bend.
 Install suction acceleration head loss preventors with connections upwards, to stop bubbles collecting.



PLUNGER PUMPS and PULSEGUARD®
Guards against Pulsation

Dampeners:

All items shown are lowest cost, standard off the shelf inventory items.

All: In place flushable, constant temperature, non sedimenting.

PIPEHUGGER ①

With liquid in the elastomer bladder, and stainless wetted parts.

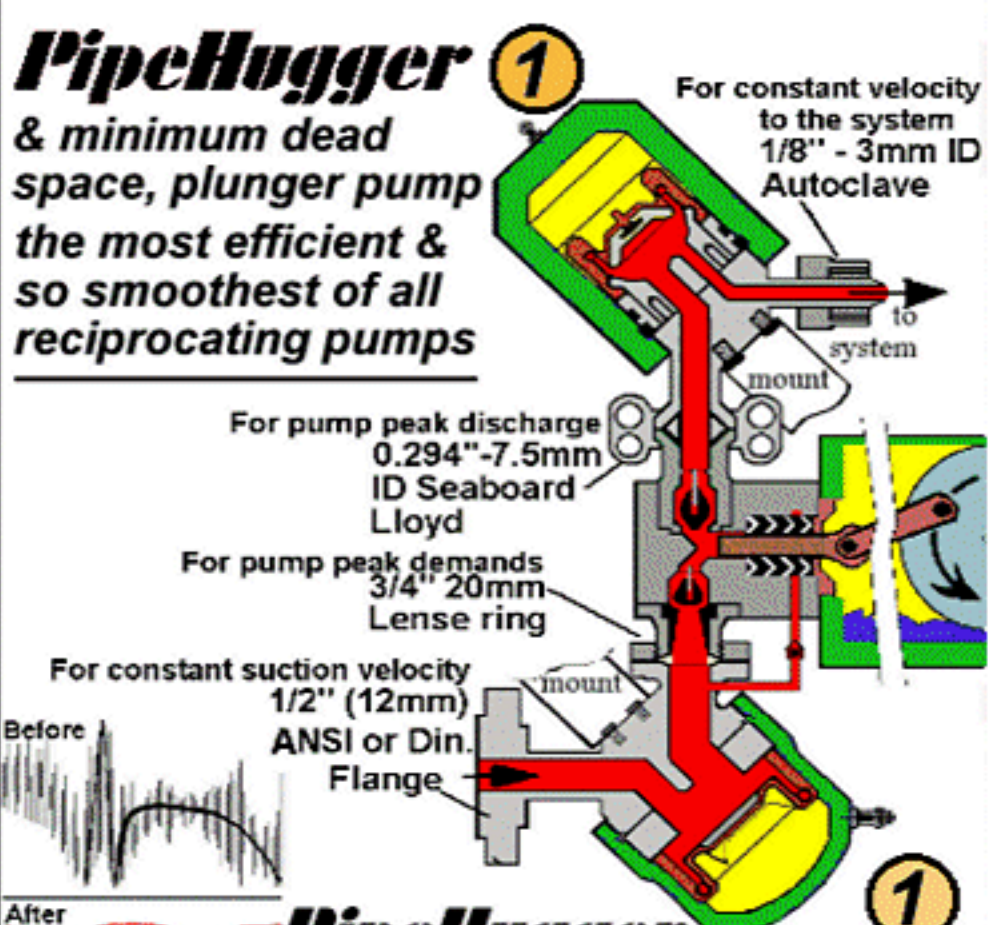
FLEXORBER ②

LDi Flexflon or DuPont Teflon diaphragms, & stainless liquid chamber.

PIPEGUARD ③

Gas in the bag, and an all stainless pressure vessel.


PipeHugger ①
 & minimum dead space, plunger pump the most efficient & so smoothest of all reciprocating pumps



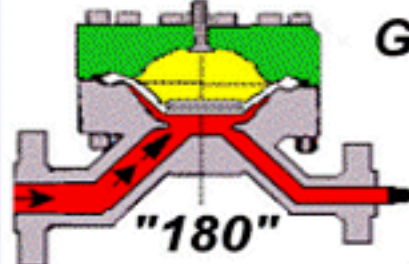
For constant velocity to the system 1/8" - 3mm ID Autoclave
 For pump peak discharge 0.294"-7.5mm ID Seaboard Lloyd
 For pump peak demands 3/4" 20mm Lense ring
 For constant suction velocity 1/2" (12mm) ANSI or Din. Flange

PipeHugger ①
 The large diameter of PipeHugger ensures pressure pulsation dissipation. Liquid in bladder, gas in drive bonnet enables low cost construction.

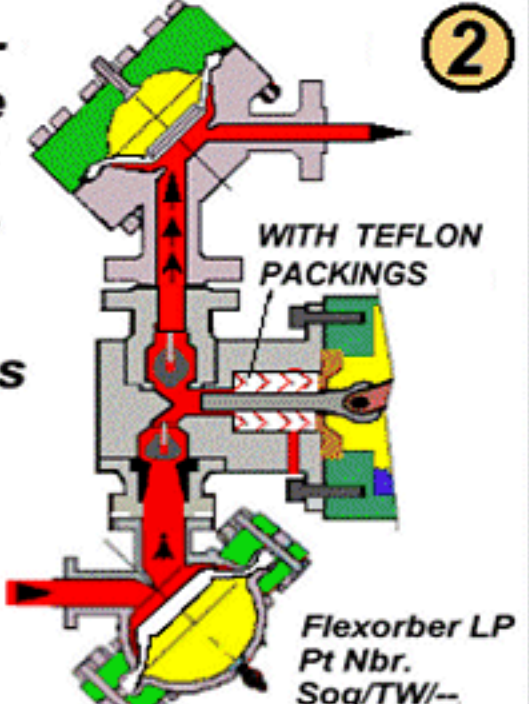
①
 Pt Nbr. Jkt/Peg/TW/-
 ② opposite may also be Jacketed.
 Typically, Jacketed dampers are purchased with system pipes radiating from a separate base block, from which the damper capsule is released by removing 4 bolts, for minimum down time.



GOTO:- Flexorber Pt Nbr. Flo/HP/TW/-
 Available with separate piping base blocks to preserve system integrity during service, and or with heating or cooling jackets.
 PTFE compatibility diaphragms are offered in two forms :-
 "LDi" FLEXFLON or DuPont virgin Teflon backed with elastomer.
 The FLEXFLON appears to have 4 times the life at 50% the cost.

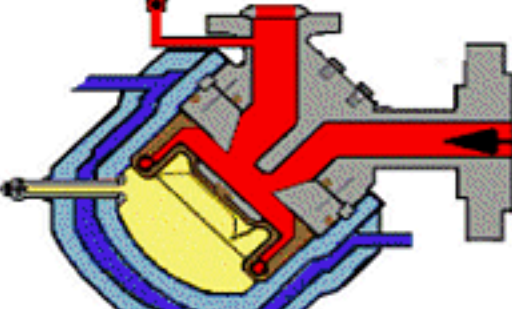


"180" "Long Horns" aka TEXAS style connection configuration, Flanged Hubbed or Screwed.

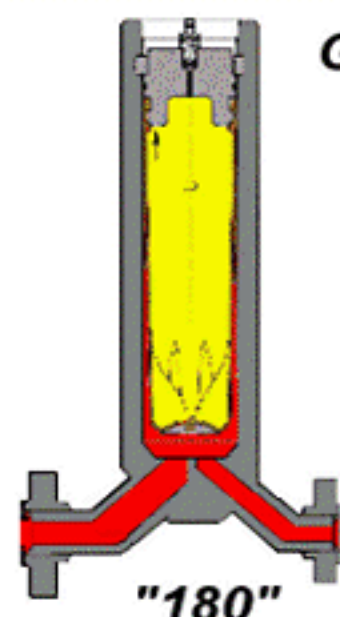


WITH TEFLON PACKINGS
 Flexorber LP Pt Nbr. Sog/TW/-

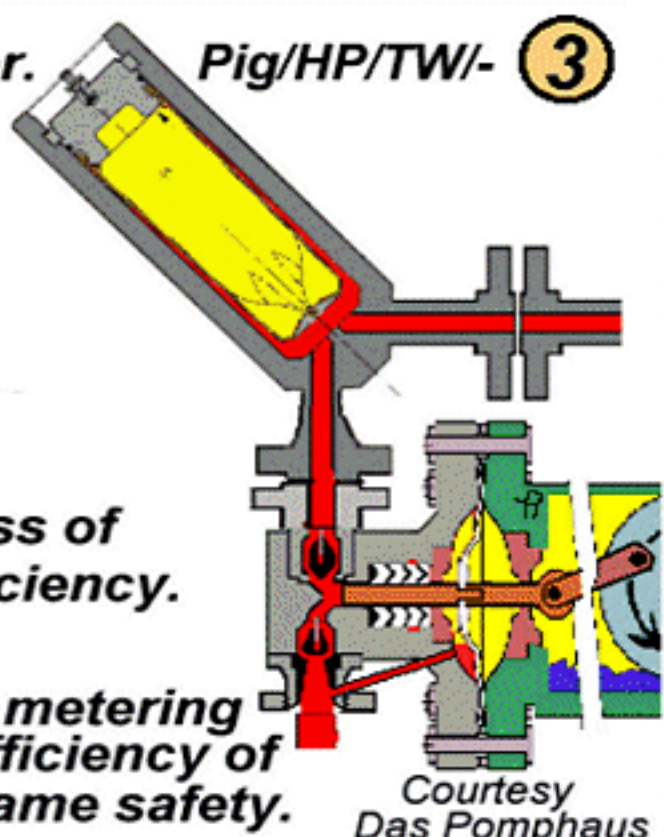
GOTO:- JACKETED PipeHugger LP
 The ability to cool the suction & so reduce the vapor pressure at the same time as removing suction acceleration head loss enables pumps to prime, that would otherwise not be able to run at all.



GOTO:- PipeGuard Pt Nbr. Pig/HP/TW/- ③
 For corrosive environments the complete pressure vessel is manufactured from stainless steel in accordance with ASME VIII code.
 The tall slim configuration enables volume at lower cost. The sacrifice of diameter, is a loss of pressure pulsation damping efficiency.
 The "PakFram" HP hermetic metering pump, one twentieth the inefficiency of a diaphragm head, but the same safety.



"180" "Long Horns" aka TEXAS style connection configuration



Courtesy Das Pomphaus

When you see a damper or a pump of particular interest, please request literature dedicated to that subject.

FLOWING THROUGH A DAMPER STOPS THE PRESSURE FLUCTUATION FROM THE FLOW REVERSAL IN A "T" BRANCH.

Dampers that do. Flow goes through, BUT Pressure Pulsation does not.
 In USA Toll Free, 1-888-DAMPERS (326-7377)
 For the Americas --01(1)910-270-2737
 BW & Color Fax, --01(1)910-270-0320
 Color fax is 10 times faster than email attach, and there are no viruses.



