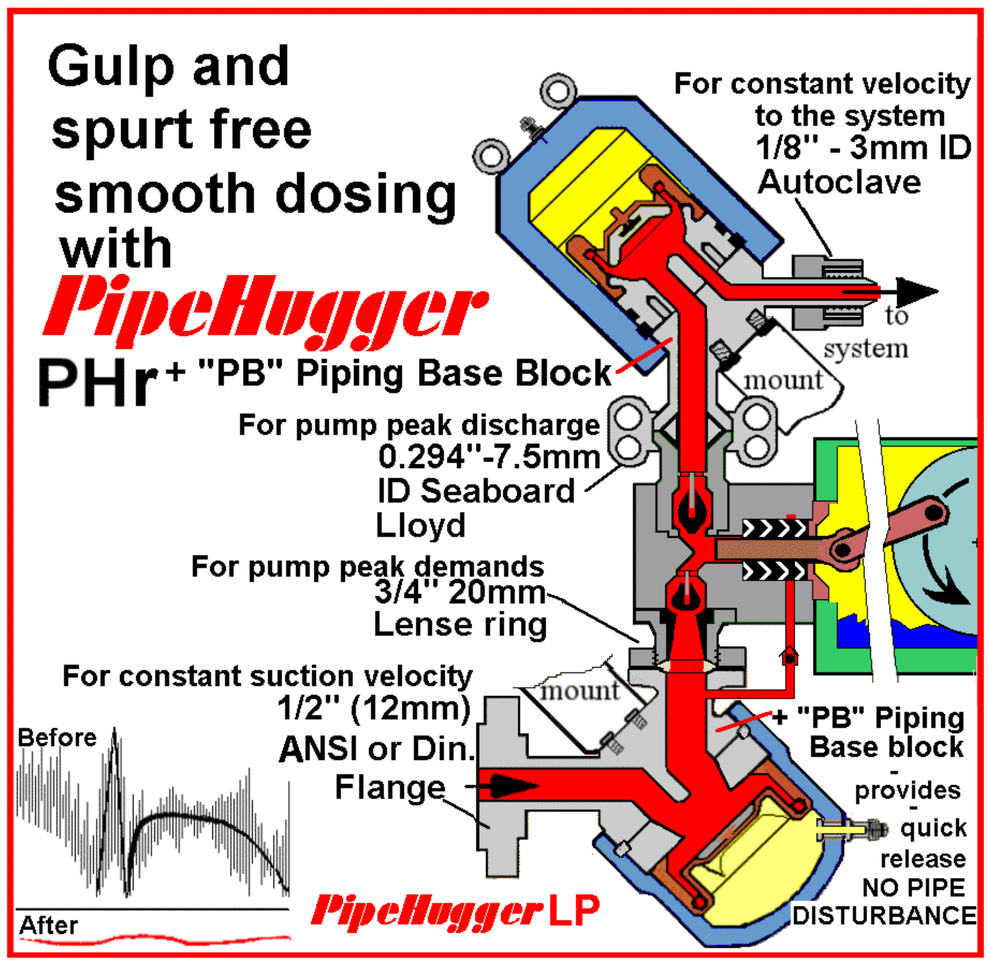
You chose the EFFICIENCY of – a PACKED PLUNGER PUMP,
You have the least pressure pulsation – from a variable stroke metering pump
(Excluding "lost motion - limited back stroke" machines) .

TECH NOTE: *It is not necessary to read these highlighted sections*

The distance between the end of the plunger stroke, and the cylinder head, plus the volume in the suction and discharge check valve pockets, are together , less than a quarter of the dead volume of a diaphragm head pump, 1/4th the Inefficiency of a diaphragm head .

Because of this high efficiency of plunger pumps, the liquid is accelerated progressively , prevents pressure shocks, & provides a smoother flow.



THE RULE OF "2:6:3:1" ratio of cross sectional areas inside the pipes More flow and pressure stabilization is achieved by having : 1). A pipe sized for 0.6 Meters per sec. constant velocity to the suction damper. 2). A pipe sized for peak velocity from suction damper to pump inlet check valve 3). Pipe for peak velocity from pump discharge to damper. 4). Sized for 3 Meters per sec from damper for the system.

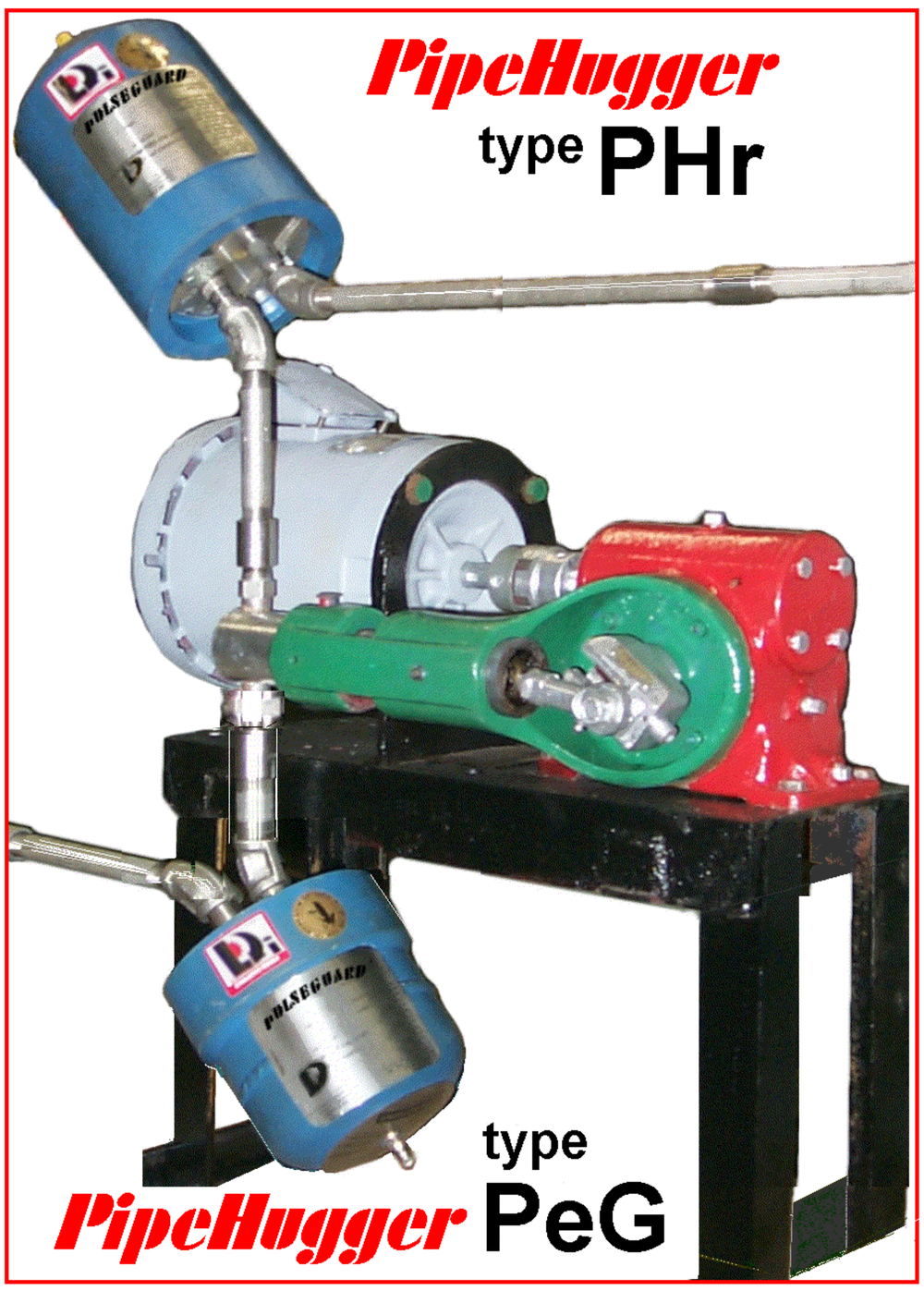
An extruder producing foam insulation for pipe cover, needs a constant feed of foaming agent. This is like a refrigerant. These foaming liquids are highly compressible, and despite the high efficiency of plunger pumps, in general, it is necessary to intercept the decompression shock wave with a "flow through" PipeHugger.

PROBLEM

1. Provide flow thru. in place flushability for extruder flush cycle.
2. Intercept pressure transients @ 1300 Meters/Sec &180Hz.
3. Reduce the 3 Meter per second flow fluctuation to + - 0.5%

ANSWER

A separate connection, in and out, "flow through", PipeHugger 70 times the volume of one stroke of the pump, rated at 2250 psi (150 Bar) 3/8" pump connection & 1/8" system connection, available off the shelf.



RESULTS

1. The **CORIOLIS** (vibrating tube) mass transfer **meter gives ACCURATE READINGS** Instead of being over excited at its natural frequency of 90 Hz.
2. The ratio of damper inlet hole size to damper internal diameter is in excess of 1:6 . This ratio gives a "discharge coefficient" which in effect **KILLS THE PRESSURE PULSE** The residue of the pressure wave is prevented from escaping from the outlet by the even higher "convergence coefficient"
3. The flow fluctuations are stabilized to **LESS THAN A 1% FLOW SWING** by the accumulation capability of the Nitrogen volume

The right size of pipe, small enough to be "dissipative" , does as much to stabilize flow fluctuations, and reduce pressure pulsation, & prevent resonance, as is achieved with "dampers" , and smaller pipe costs less.

High Hz. = Comments by - "Pulse-Doctor" Liquid Dynamics International Analytical , Diagnostic and Software services

Dampers that do, flow goes through, Pressure problems do not.

First address the suction system, no pump can give you smooth flow unless it can fill properly

PHr-p3.bmp

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