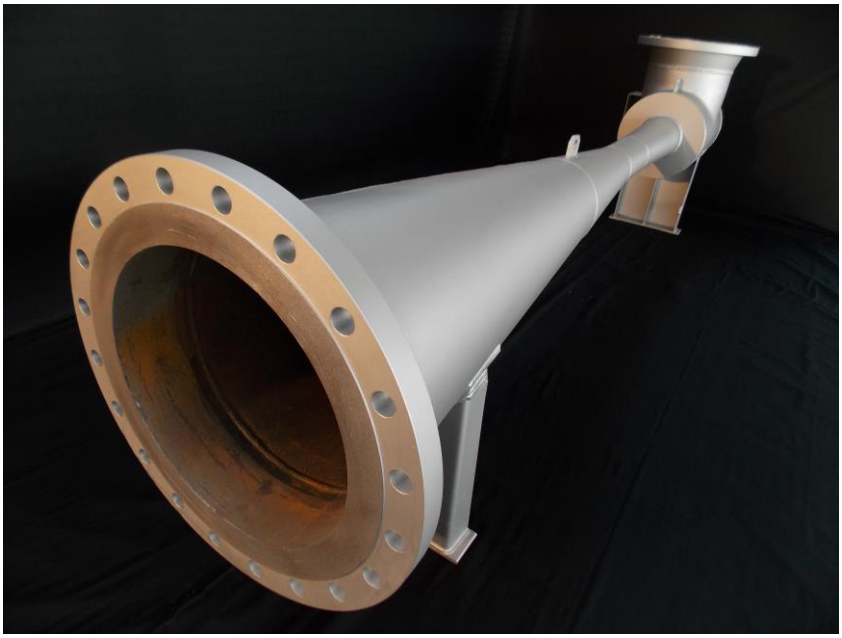
Steam Jet Liquid Pump

Steam jet liquid pumps are driven by water steam. The driving and suction medium are mixed by impulse exchange and the steam condenses during this process. The pressure of suction and discharge depends on the liquid temperature, the driving steam pressure and the jet pump design.



Advantages

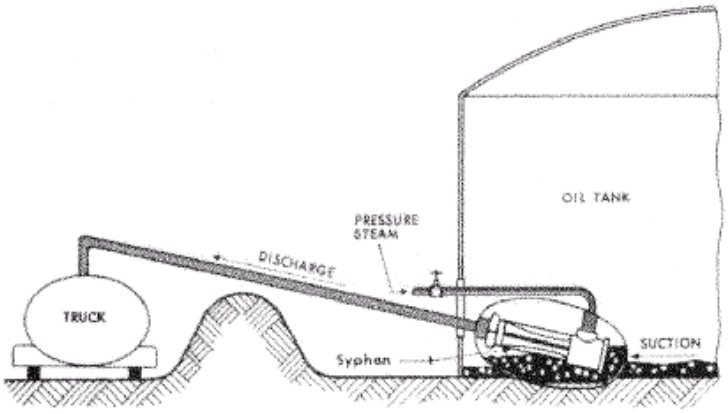
- Can be installed in any position.
- Simple erection and servicing
- No moving parts, therefore, no wear
- Freedom from maintenance
- Great reliability and safety of operation
- Long life
- Low cost

Applications

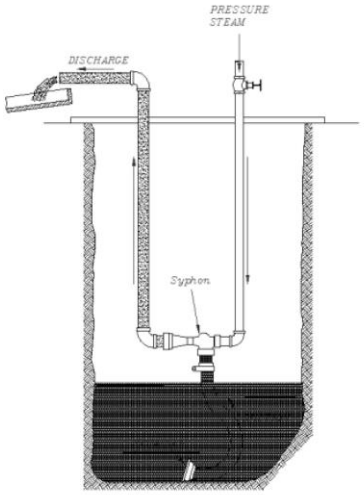
Applications are conveying/circulating of water, mainly in cases the water is to be warmed up at the same time. Also corrosive liquids, muddy liquids, sewage and suspensions are conveyed. Typical applications are

- Chemical and pharmaceutical industry
- Shipyards and the building industry
- Elevating and conveying of caustic solutions and liquid chemicals such as lyes, acids, tanning liquors, lime milk
- Elevating and conveying of slime liquids, such as effluent water, spent wash, mash, bilge water
- Circulating and conveying aggressive and radioactive liquids in the unapproachable "hot zone" of nuclear plants owing to their maintenance-free operation

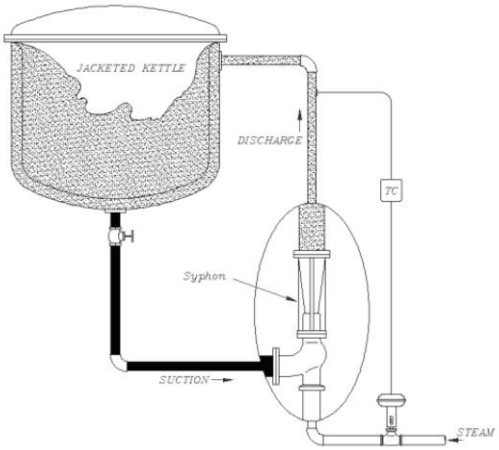
Typical applications:



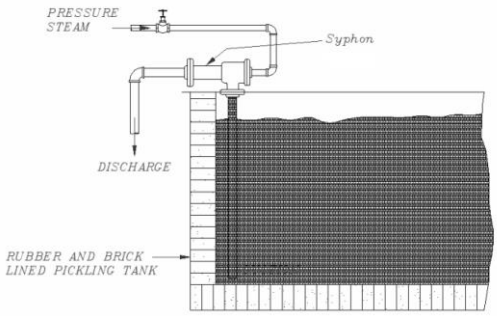
Pumping sludge without clogging. The sludge would be fluid enough to be handled by a centrifugal pump thereafter.



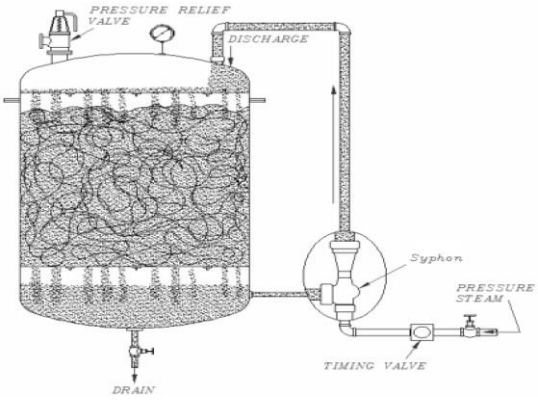
Extracting liquids from vessels and tanks



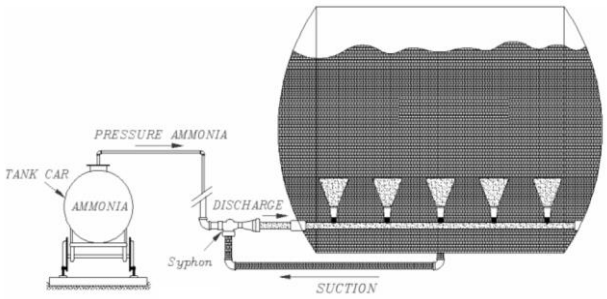
Maintaining uniform temperature in vessels



Conveying acids



Simultaneous circulation and heating



Uniform mixing

Range of Operation

In compliance with the varying demands, two different classes of standard steam jet liquid pumps are constructed:

- Type A, for lower suction heights (**up to 1 m**) or for flooded inlet and large delivery heads (**up to 5 barg**)
- Type B, for larger suction heights (**up to 8 m**) and lower delivery heads (**up to 1.5 barg**)

Other restrictions:

- At liquid temperature of less than 20 °C, the performance of the steam jet pump will decrease.
- The temperature of the suction flow should be about 30 K lower than the boiling temperature corresponding to the suction pressure.
- The suction pipe should be installed absolutely tightly.
- Narrowly bended elbows or pipe reducing parts have to be avoided on all connections.
- Strainer to catch bigger particles out of the fluid are recommended.
- Dry saturated steam is best for the operation. The capacity of the jet pumps can decrease by using superheated steam. A steam pipe insulation and a dewatering device should be provided for.
- The liquid to be conveyed must not be too hot, namely cooler than 60 °C, because only if the motive steam condenses and thereby loses its volume, can the total energy available to convey the liquid become fully effective
- Higher specific gravities of the liquid to be conveyed reduce the performance of the pumps.

Materials

- Grey cast iron
- Steel with and without corrosion protection
- Stainless steel
- Other materials on request