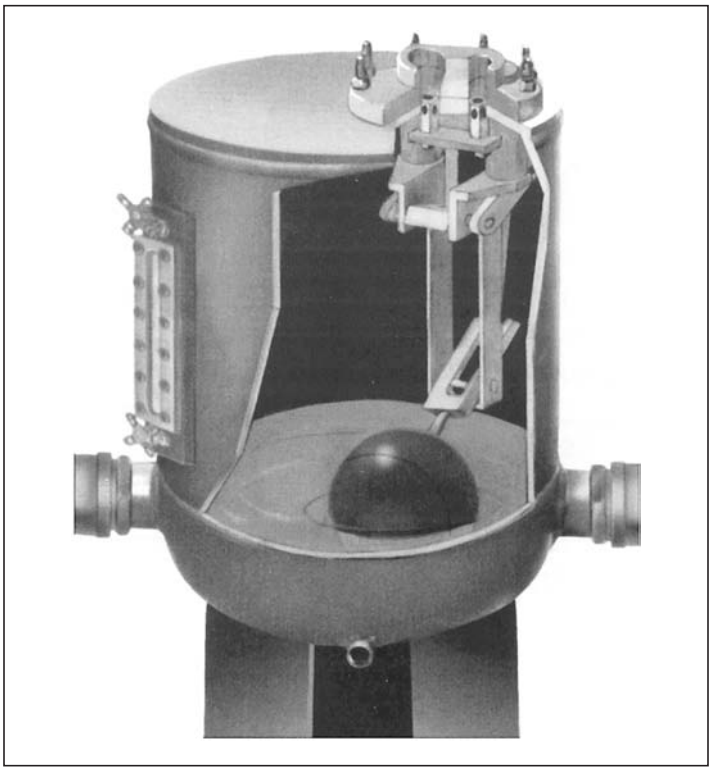
Clark·Reliance®
Instrumentation and Controls Group

Section: E
Bulletin: E6.1
Date: 7/1/04
Supersedes: NEW

NON-ELECTRIC GAS POWERED CONDENSATE RECOVERY PUMP



- Returns high-temperature condensate to conserve energy and save water treatment chemicals.
- Fabricated steel body has been constructed to ASME material and welding specifications. Designed for greater reliability – less maintenance downtime.
- Fabricated steel body meets criteria for safe operation in hazardous environments. All stainless steel internal working mechanism offers corrosion resistance.
- For steam, air or gas operation, up to 125 PSIG/8.6 Bar.
- No electricity, electric motors or packing glands required.
- Easily replaceable stainless steel valves & seats. Lifetime guarantee for single compression spring.
- Internal tank baffle plates prevent damage to the mechanism – reduces surge flow readings on sight gage.
- Drain port allows complete drainage & maintainability.
- Less flash loss – condensate can be reclaimed above maximum 210°F temp of conventional electric pumps.
- Upgrading easy with one pump body design for three check valve sizes.
- Discharge rates from 10 to 13 gallons per cycle.
- No adjustments needed.

LOWERS OPERATING COSTS, ENHANCES SAFETY

The Clark-Reliance Non-Electric Fluid Recovery Pump provides substantial operating economies in the transfer of high temperature liquids such as condensate from a low point, low pressure, or vacuum to an area of higher pressure or elevation.

The non-electric design offers significant advantages including performance reliability in remote areas where electrical service is not readily available. Safety concerns are minimized on applications involving hazardous explosive atmospheres.

The Fluid Recovery Pump unit can easily by installed to collect condensate or other liquids from single or multiple return lines.

SPECIFICATIONS

Motive Substance.....Gas, Steam, or Air

Maximum working pressure .....125 PSIG

Approximate weight.....250 lbs.

Minimum inlet pressure .....12" H_2O W/2" inlet check

Internal working parts.....Stainless Steel
Hardened stainless steel valves & seats (Renewable)

Maximum temperature .....400°F

Body material .....AS-53 grade B STL

Bottom cover material .....AS16-70 STL

Top plate material.....ASTM A515 Grade 70

Top cover material.....Ductile Iron

Inlet and outlet check valves ....Stainless Steel

Bolts .....B7 studs, nuts-H2 heavy hex

SPARE PARTS

- Gasket
- Inlet and Outlet Valves
- Check Valves

DESIGNED TO ASTM ACCEPTED STANDARDS

The Fluid Recovery Pump can be operated by steam, compressed air, or other gas to 125 PSIG. No electrical energy is required, making the pump safe in hazardous environments. Maximum temperature is 400°F. Body construction is of fabricated steel with all stainless steel check valves for pumping liquids of .9 to 1.0 SG. Valve sizes must be specified when ordering.

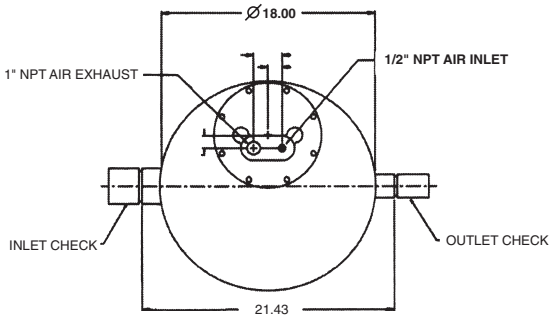
An all stainless steel, float-operated snap acting mechanism has hardened stainless steel valves and seats. There are no external seats or packing to leak.

Note: Acutal check valves are specified per application and are required for pump operation.

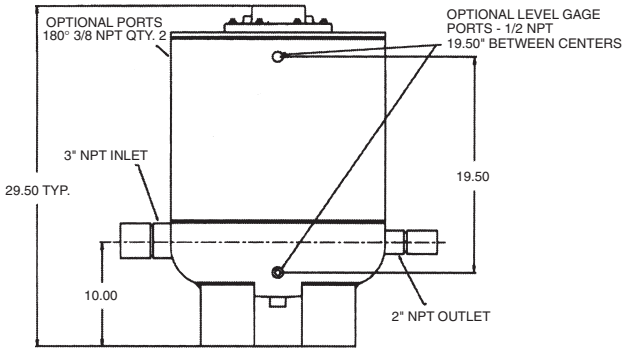
OPTIONAL FEATURES

- Pressure Reducing Valves for Inlet Motive Gas
- Lined Tanks
- Tubular Glass Gage & Weld Pad Flat Glass Gage
- Cycle Counters

PUMP DIMENSIONAL DATA



TOP VIEW



SIDE VIEW

PUMP HOUSING PORT SIZE (NPT)	3 x 2 1/2			4 x 2
CHECK VALVE SIZE INLET/OUTLET (NPT)	1 x 1	1 1/2 x 1 1/2	2 x 2	2 H.C. x 2
CHECK VALVE PORT FACE TO FACE (IN)	28 3/4	28	32 1/2	27 1/2

SIZING YOUR FLUID RECOVERY PUMP

EXAMPLE

1. What is the desired lbs./hr. of fluid to be pumped? _____ 2800 lbs./hr.
2. What is the available motive gas or steam pressure? _____ 25 PSIG
3. What is your total lift or back pressure? _____ 15 PSI*

   Total lift and back pressure is the total pressure that the pump will be working against. This includes changes in fluid elevation, check valve cracking pressures, and any minor losses due to the piping system. A one foot change in elevation is equivalent to a .5 PSI back pressure.

   Total Lift or Back Pressure = (.5 x Total Feet of Lift) + Minor Losses of Piping

   ***Example** Vertical lift = **28 ft.** Minor Loses = **1 PSI**
   *Total Lift or Back Pressure = (.5 x 28) + 1 = **15 PSI**

4. With the above specifications and a minimum of a 12-inch filling head, select the pump from the table below. Find 25 PSIG Operating Inlet Pressure. Then, find 15 PSIG Total Lift or Back Pressure. You can see that a 1 inch check valve kit will allow you to achieve the 2800 lbs./hr. pumping rate you desire. 1" Check Valve

PUMP CAPACITIES

In pounds per hour for liquids of 0.9 to 1.0 specific gravity (lower on request), with 12" filling head installed as recommended above pump top. Inlet port 3" N.P.T.; Outlet port 2" N.P.T. Optional ports and check valves available.

OPERATING INLET PRESSURE		TOTAL LIFT OR BACK PRESSURE		CHECK VALVE & PIPING SIZE			
PSIG	BAR	PSIG	BAR	1"	1 1/2"	2" STD.	2" H.C.
125	8.6	15	1.0	3640	6580	9380	15,820
		40	2.8	3360	6300	8820	14,840
		60	4.1	3220	6020	8400	14,280
100	6.9	15	1.0	3640	6440	9240	15,680
		40	2.8	3360	5880	8540	14,560
		60	4.1	3080	5040	8120	13,860
75	5.2	15	1.0	3500	5880	9240	15,680
		40	2.8	3360	5320	8120	13,720
		60	4.1	2800	4760	7000	11,900
50	3.4	10	0.69	3360	5600	8960	15,120
		25	1.7	3220	5180	8120	13,720
		40	2.8	2800	4480	6720	11,480
25	1.7	5	0.34	3220	4880	8540	14,560
		10	0.69	2940	5460	7840	13,440
		15	1.0	2800	4620	7140	12,180
10	.69	2	0.14	2800	4620	7140	12,180
		5	0.34	2520	4060	5740	9,800
5	.34	2	0.14	2240	3780	5400	8,600

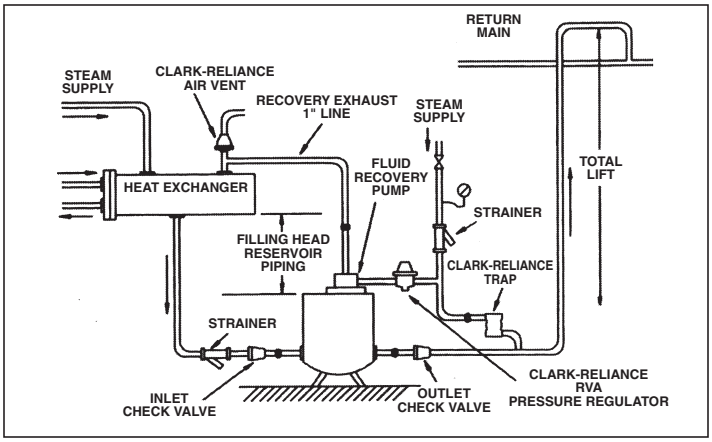
CONVERSION TABLE

For capacities in GPM, multiply lbs./hr. by .002. For Kg/hr., multiply by .454. For liquid specific gravities below .9, call the factory.

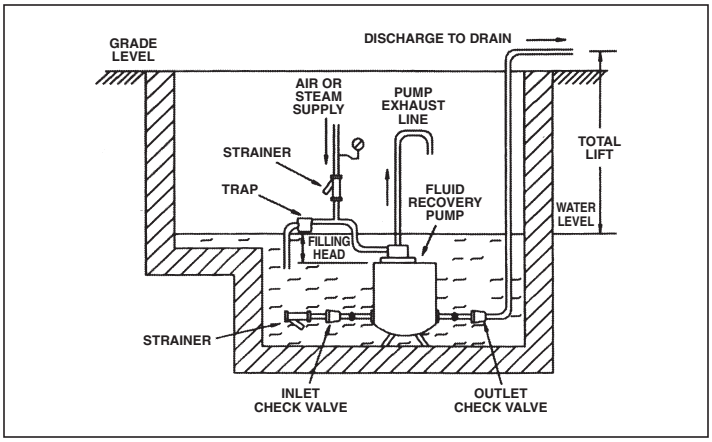
CHECK VALVE PIPING SIZE		FILLING HEAD SIZE & CONVERSION FACTOR			
		6" 152 mm	12" 305 mm	24" 610 mm	36" 914 mm
1"	1 1/2"	.70 x	1.0 x	1.2 x	1.35 x
2" Std.	2" High	.85 x	1.0 x	1.2 x	1.35 x

TYPICAL CONFIGURATIONS FOR FLUID RECOVERY PUMP

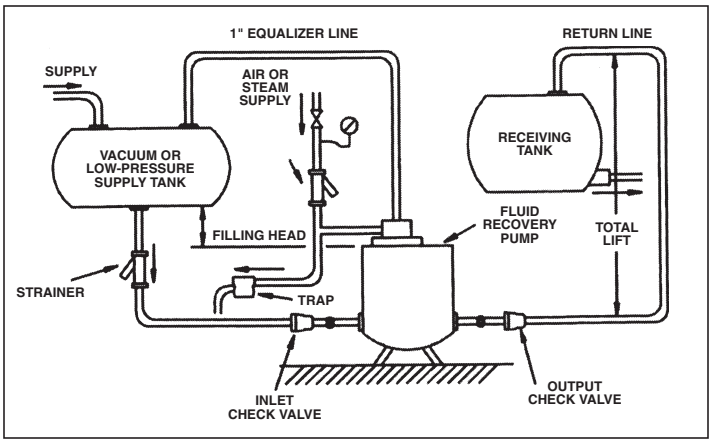
Heat Exchanger



Submerged Sump Pump



Low Pressure Source to Higher Level Receiver Tank



RECOMMENDED APPLICATIONS

Applications for the non-electric Fluid Recovery Pump include condenser, turbines, or any other steam condensing equipment.

Applications where liquids must be transferred to a higher pressure or elevation, including draining sump pits, can use the advantages of this pump.

CLARK-RELIANCE® WARRANTY

Clark-Reliance will only warrant the use of Clark-Reliance Replacement Parts, which can be obtained from the factory or representative. The use of non-authorized parts results in a pump not tested or rated by the Clark-Reliance Engineering Group. Catalog ratings apply only to pumps containing authentic repair parts.

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