

YEOMANS SHONE

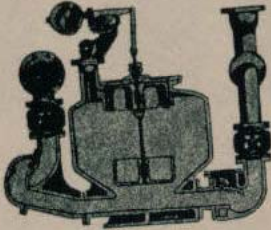
SERIES 4000 PNEUMATIC EJECTORS



- THE superior pumping solution for low flows, high heads and heavy solids applications
- Reliable all-mechanical operation
- Comprehensive 25-year warranty

YEOMANS

SHONE®
PNEUMATIC EJECTOR
Mechanically-Controlled



Twenty-Five Year Warranty

Subject to the limitations herein contained, YEOMANS CHICAGO CORPORATION warrants its mechanically-controlled Shone Pneumatic Ejector against defects in workmanship and materials under normal use and service for twenty-five (25) years after installation as specified in factory recommendations. Yeomans Chicago Corporation's responsibility under this twenty-five year warranty is limited to replacing or repairing without charge, F.O.B., its works, any of the following components: sewage (or waste) receiver, mechanical air linkage and air exhaust control valves. All other parts are subject to the manufacturer's warranty of one year.

Written notice must be given to Yeomans Chicago Corporation immediately upon discovery of any defect. Yeomans Chicago Corporation shall have the option of requiring the return of a defective component or material, transportation prepaid, before accepting a claim. In no event shall YEOMANS CHICAGO CORPORATION be responsible or held liable for delay or damages of any kind or character resulting from or caused directly or indirectly by any defective component or material. This warranty shall not apply to any component or material repaired or altered outside of Yeomans Chicago Corporation's works unless Yeomans Chicago Corporation's written approval in that respect is first obtained and no allowance will be made for such repairs or alterations without the written consent or approval of Yeomans Chicago Corporation.

This Warranty is in lieu of all other warranties, expressed or implied, and is in lieu of all other obligations or liabilities on the part of Yeomans Chicago Corporation. No other person is authorized to vary the terms or provisions hereof in any respect.

YEOMANS CHICAGO CORPORATION

John L. Keeley
PRESIDENT

SERIAL NO. OF UNIT _____

Why this warranty is so extraordinary

Yeomans can offer a 25-Year warranty on mechanically-controlled Shone Ejectors knowing that this represents but a fraction of the unit's inherent years of potential trouble-free service. Shone, the *original* pneumatic ejector, has no known lifetime—the *first units installed in the United States, over 100 years ago, are still operating.*

The Shone warranty is based on actual service records—not on a theoretical life expectancy.

The impressive records of trouble-free longevity of a Shone Ejector reflect the use of a sound combination of components—proven designs built by Yeomans exclusively for Shone Ejectors and their service requirements.

The Shone ejector is the only unit of its type carrying an extended warranty, that does not incorporate "general purpose" components built by others and backed by the

component manufacturer with a standard one-year warranty. Each part of the Shone Ejector is manufactured and tested by Yeomans to rigid quality standards.

Yeomans' experience in the application, manufacture, and service of pneumatic ejectors is unequalled by any other manufacturer of this type of equipment in the world. Yeomans offers the oldest line, the broadest line, the most types and sizes of both special and standard units, and the largest number of pneumatic ejector installations—over 10,000.

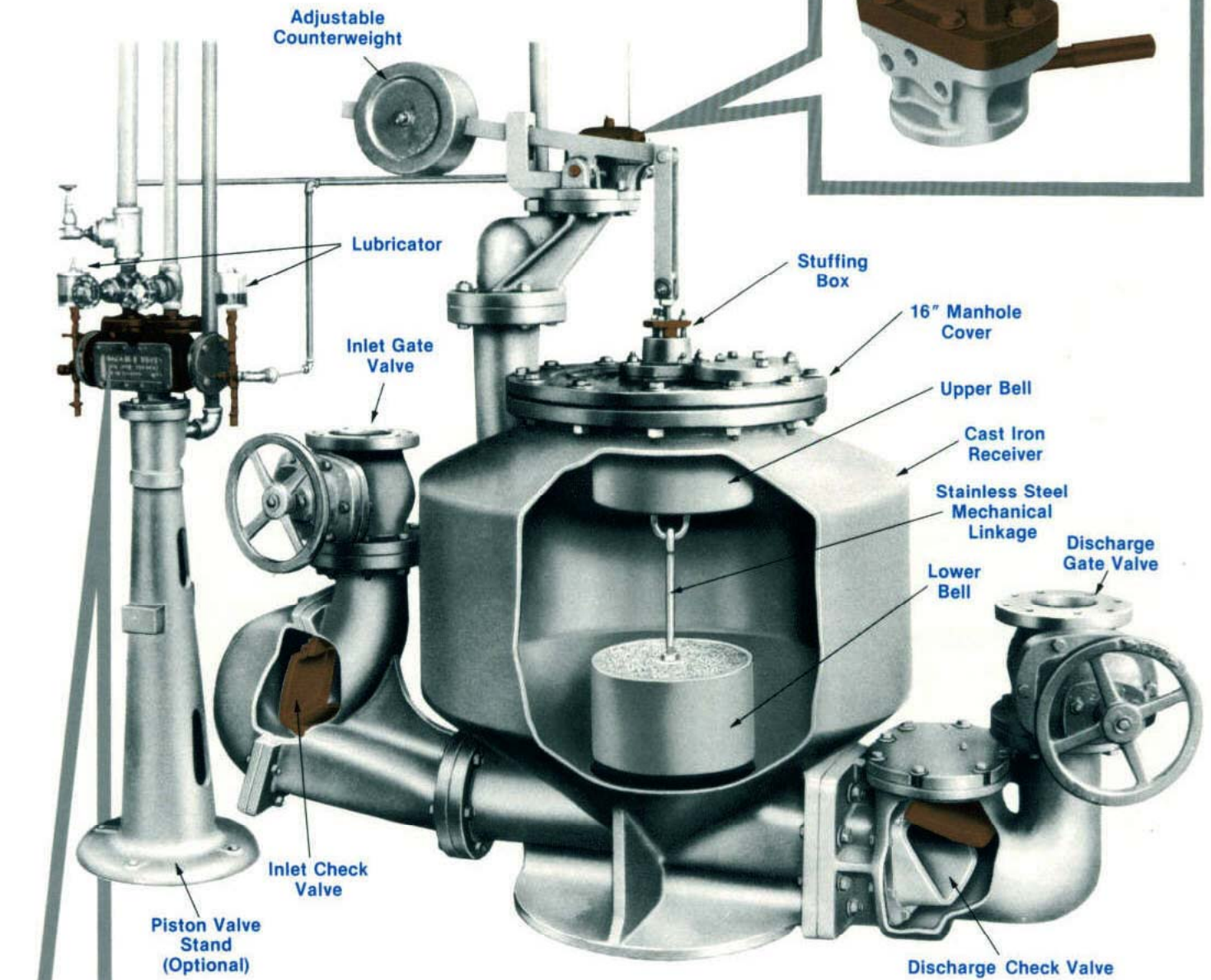
This unequalled ejector experience, coupled with a corporate history of integrity, is why Yeomans Pump gives a written 25-Year Warranty Certificate with each mechanically-controlled Shone.

YEOMANS

Built to last a lifetime—and longer!

SHONE Ejectors installed over 100 years ago are still operating.

Excellent for clarifier scum pumping applications.



Critical components of cast bronze

- Piston Valve Body and Pistons
- Pilot Valve
- Check Valve Flaps
- Packing Gland

Additional Features and Benefits

- Variable volume pumping while preserving consistent discharge scouring velocities
- No springs, diaphragms or bearings to wear out
- Duplex units can be mechanically interlocked and/or alternated
- No electrical devices at or near the pumped media

The Original Pneumatic Ejector—SHONE®

Type SDV Ejectors—The first pneumatic ejector was a Shone, Type SDV, built in England in 1870.

The SDV is the standard mechanically-controlled type of Shone Ejector and most commonly recommended for all installations—municipal, building and industrial. In this design, the piston valve is mounted on a heavy cast iron floor stand, or wall bracket, where it is readily accessible. In that position, the valve will not be in contact with material being handled should power failure or other abnormal conditions cause a surcharging of the system.

The pilot valve in the pit has no sewage connection with the ejector receiver. All working parts are lubricated from floor level. SDV Type Ejectors are furnished for stored air and plant air systems.

Typical specifications for the Stored Air System appear on Page 6.

The free air required by a pneumatic ejector increases not only as the capacity of the ejector is increased, but also with an increase in working head and operating pressure. This is because a greater volume of free air must be compressed to the required pressure for each increment in head.

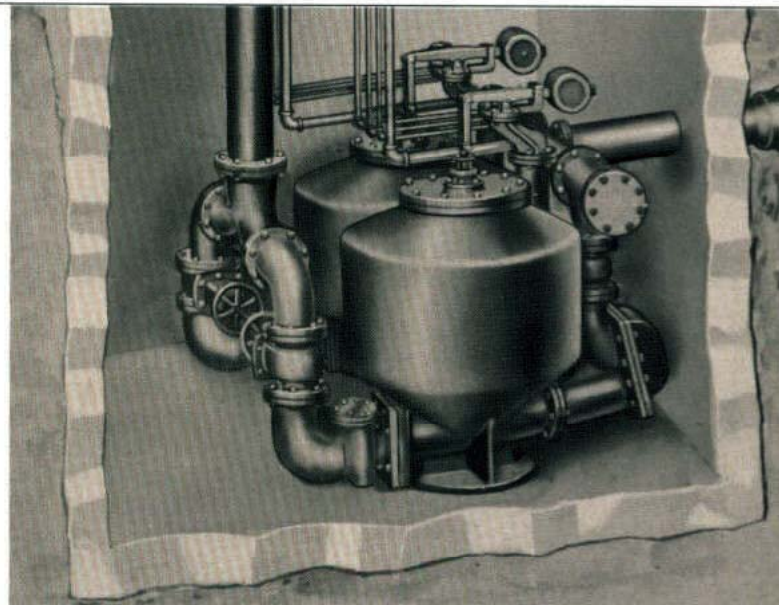
To allow time for refilling the ejector receiver within one minute, the air volume required must be delivered to it in not over 30 seconds. In a stored air system, such as the Shone SDV with a large air storage tank, the compressor is controlled by a tank pressure switch and is independent of the ejector operation. The compressor can run continuously, storing enough air in the tank in 60 seconds to discharge the contents of the ejector in 30 seconds.

In the tankless system, such as the Shone SAC Type with the small air chamber on which the piston valve is mounted, very little air is stored in the chamber. Therefore, the compressor capacity (in cfm of free air) must be twice that required of the stored air system.

Any number of compressors can be used with any number of SDV ejectors. At one installation, nine duplex ejector stations are powered by one central motor-driven compressor plant.

Where uninterrupted service is of vital importance, duplex ejectors with two compressors are recommended. In some cases, batteries of three or more ejectors are used with several compressors. In determining the size of compressors to be used, consideration must be given to the question whether each compressor should be capable of supplying sufficient air for one or more than one ejector unit.

Total Head Calculation (EXAMPLE)—The flow rate in the discharge line from one 100 gallon single ejector will be 200 GPM. In a 100-gallon duplex system with both units discharging at the same time, the flow rate in the discharge line would be 400 gpm. If the discharge line is long or of small diameter (or both), this double flow rate may greatly increase the friction loss. Pipe friction losses are calculated on the basis of the flow *rate* in the discharge line, and ejector can be interlocked to prevent simultaneous discharge if necessary.



Why SHONE Ejectors are Preferred

Unchallenged Dependability—Built to last as long as the system—and warranted by the manufacturer for 25 years. No high speed moving parts to wear or need frequent replacement. Operation is positive, completely mechanical. Frequent check-ups are unnecessary.

Lowest Overall Cost—Pumping costs must be considered over the life of the equipment. Cost of maintaining the equipment must be included in with the original and installation cost. For a Shone this is a difficult figure to determine, as the life of the equipment is yet to be established.

Completely Sanitary—Liquid wastes are never exposed to atmosphere. There's no release of odors or gasses, no sewage retention or sludge accumulation. The ejector serves as its own storage well.

SHONE Gives Trouble-free Pumping

The Shone Ejector is designed for extreme dependability in pumping jobs where gallonage is limited but solids are not—**domestic wastes, industrial wastes, scum, sludge, heavy slurries, hospital wastes, animal wastes, food processing**. It is clogproof. It has no rotating pump parts, no airtight floats, no high-speed shafts or bearings... there's nothing to restrict the flow through the receiver.

The Shone is completely sanitary and safe. Being hermetically sealed, it can't expose liquids to the atmosphere. There is no release of noxious or toxic gases, no wastes retention, no sludge accumulation.

Why not investigate the possibilities of the Shone for those special pumping applications in the 30-1000 gpm range.

Essential Components: Features and Benefits

Sewage Receiver—Cast iron is used for all sizes up to and including 600 gallons; steel receivers are available for all sizes. The cast iron cover for the sewage receiver has a removable stuffing box, bronze packing gland to seal off the bell rod, and handhole with cover.

Sewage Check Valves—Inlet and discharge sewage check valves are of the special reversed bend design; rectangular passages do not allow clogging by rags, trash, or similar material. These valves have large water passages, liberal solids drop clearances and are equipped with solid bronze flaps and hinges. The discharge check valve is equipped with a seat renewable without disconnecting the valve body. Large inspection covers permit rapid periodic inspections of the condition of the equipment.

Pilot Air Valve—As the cast iron bells rise, they actuate, through the stainless steel bell rods, the pilot air valve. The pilot valve consists of a valve body, bronze plate and bronze "D" slide. The bronze slide and plate are hand lapped to assure proper and lasting operation. This valve functions as a control to the piston valve.

Piston Air Valve—Air from the pilot slide valve directs pressure to one side or the other of a double piston valve, which alternately admits air to the sewage receiver for discharge of the sewage, or vents air from the sewage receiver during the filling cycle. The piston air valve has a solid bronze body, bronze pistons, stainless steel connecting rod, and cast iron end caps. This massive automatic valve is designed especially for Shone ejectors, and is twice tested before it leaves the factory, to assure successful operation in the field.

Pipe Connections—All pipe connections, air and sewage, to the receiver are flanged. Also, special fittings are furnished that have been specially designed for the Shone to effect the most desirable hydraulic characteristics and the most efficient use of space.

Simple, Mechanical Operation

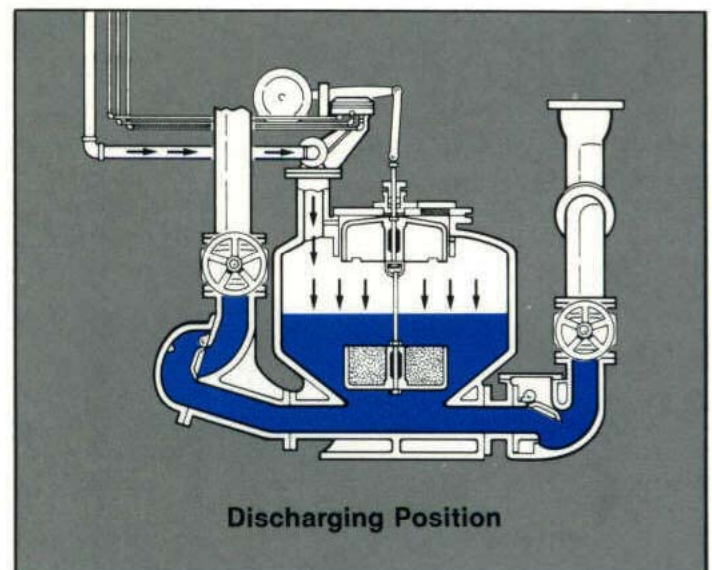
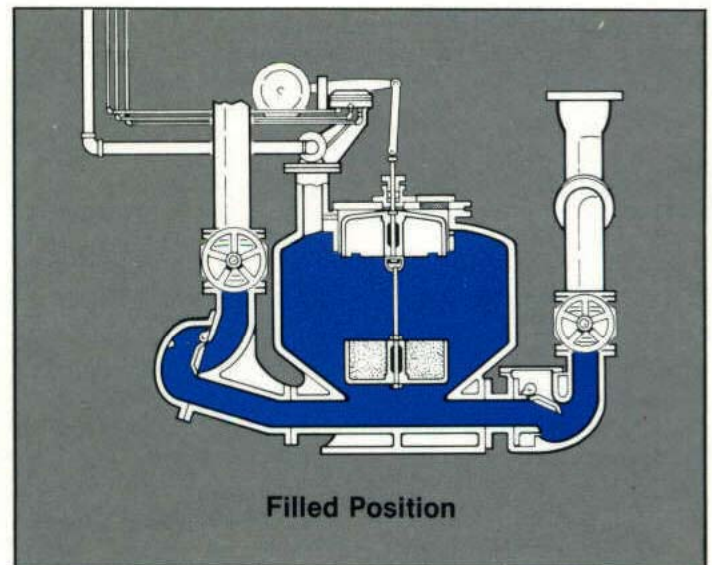
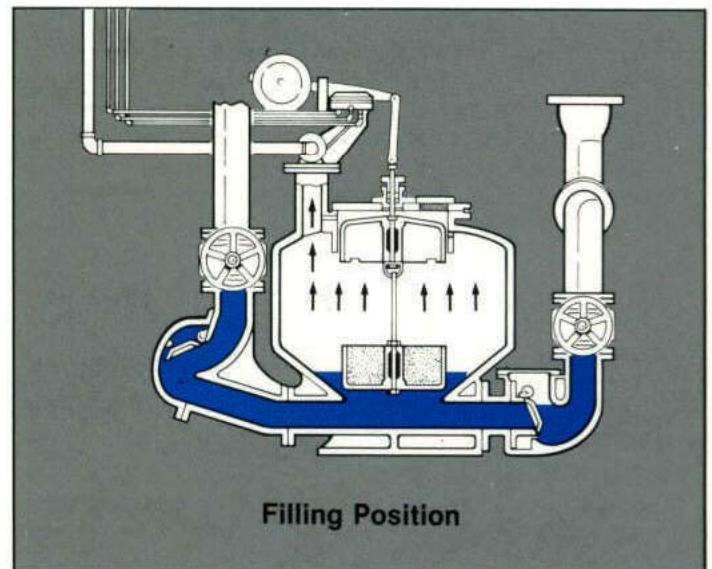
The operation is accomplished by the rise and fall of two open cast iron bells. Through a pilot valve the motion of the bells actuates a piston valve that admits compressed air to the receiver, pushing liquid out through the discharge line. In the filling position, the receiver is vented to atmosphere and the bells are in the lower position. Weight of the incoming liquid holds the inlet check valve open, while the weight of liquid in the lift line holds the discharge check valve closed.

As the level of the liquid rises above the lower bell, it is buoyed by the weight of the water displaced. Continuing to rise, the liquid partially submerges the upper bell, trapping air beneath it. The upper bell is given sufficient buoyancy to remove still more weight from the rod.

With this final decrease in weight, the counterbalance on the pilot valve lowers and shifts the pilot slide valve, sending air to the other side of the piston valve. This closes the exhaust connection in the piston valve and admits compressed air to the receiver.

The pressure of the air on the surface of the liquid is greater than either that of the inlet line or the discharge lift line. The inlet check valve closes and the discharge check valve opens. Liquid is discharged under pressure into the lift line.

As the receiver empties, first the upper bell loses buoyancy as the liquid level falls below it. When the lower bell becomes exposed, its added weight on the rod overcomes the counterweight. The pilot and piston valves change, shutting off the supply of compressed air and venting the receiver to atmosphere. The check valves automatically assume positions to permit the receiver to refill.



YEOMANS

Typical Specifications Type SDV, Stored Air

Furnish and install as shown on plans a (single)(duplex) Shone Pneumatic Ejector System, consisting of (one)(two) ejector receiver(s) with necessary valves and (one)(two) motor-driven Yeomans Rotary Air Compressor(s) with automatic controlling devices; and, one air storage tank.

General: The Shone Pneumatic Ejector shall be a Type "SDV" as manufactured by Yeomans Pump Company of Melrose Park, Illinois. The ejector shall have a capacity of _____ gpm when pumping against a head of _____ feet; and shall be capable of one operation per minute continuously when supplied with the recommended quantity of air at the recommended pressure. All parts of the ejector shall be warranted in writing by the manufacturer for a minimum of twenty-five years against defects in workmanship and materials.

Receiver: The receiver shall be cast iron, designed for 50 psi maximum working pressure. It shall have _____ inch inlet and _____ inch discharge sewage openings at the bottom on opposite sides, and a 16 inch diameter manhole in the top. A handhold with cover is to be provided in the receiver cover. The inlet and discharge openings shall terminate with flanges for attaching the inlet and discharge valves. Except for the control equipment, there shall be no moving parts in the ejector receiver.

Valves and Fittings: The inlet and discharge check valves shall be the Shone design having rectangular solid bronze flaps and cast iron bodies. Each flap shall be connected to a fixed leaf attached to the valve body with cap screws. The flap shall be fixed to a stainless steel hinge pin which in turn shall pivot freely on the stationary leaf. Cotter pins, or similar devices, projecting beyond the surface of the hinge or flap will be rejected. Gate valves on the inlet and discharge shall be bronze mounted, double disc, flanged valves of the non-rising stem type.

Control: Control of ejector operation shall be entirely mechanical and no electrical connections will be approved. Control mechanism shall consist of two 35-pound cast iron bells; one 50-pound cast iron counterweight, steel counterweight lever; stainless steel bell rod; steel trunnion pieces; bronze pilot valve with bronze shaft; and, bronze piston valve. The rise and fall of the liquid in the receiver causes the bells to rise and fall, the travel not to exceed 1½ inches, and, in conjunction with the counterweight, to exert a force in excess of 30 pounds. Rotation of the shaft with movement of the pilot valve slide shall be caused by the travel of the bells and counterweight. Movement of the pilot valve slide shall cause air under pressure to be applied to one side or the other of the piston valve, venting the opposite side to atmosphere. The pilot valve shall have lapped bronze seat and slide, with no springs or similar attachments. The pneumatically operated double piston valve shall have bronze body, bronze pistons, stainless steel rod connecting the pistons, and cast iron end caps. In either position of the piston valve there shall be no leakage of air pressure to atmosphere.

The piston valve shall be mounted on a separate (wall)(floor) stand above the maximum high water level. There shall be provided by others three ¼ inch air lines to connect the pilot and piston valves. When installed according to specifications, it shall be impossible for sewage to enter the pilot or piston valves.

Air Compressor: Furnish and install on foundation (one)(two) Yeomans oil lubricated rotary sliding vane type air compressor(s) to supply sufficient air at the required pressure while operating at _____ rpm to operate the ejector continuously at the rated capacity. The compressor shall be complete with mechanical shaft seals, flexible coupling, and automatic lubricating systems. Accessories to be furnished with the compressor shall include discharge safety valve, check valve, inlet air filter and silencer. The compressor shall be direct connected through the flexible coupling to a _____ volt, _____ phase, _____ cycle (open drip proof)(totally enclosed)(totally enclosed explosion proof) electric motor which shall be non-overloading at the normal operating conditions.

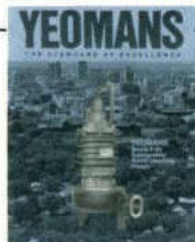
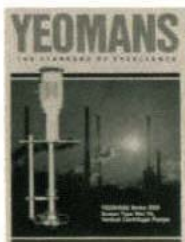
The compressor control shall be completely independent of the ejector operation, and shall consist of across-the-line magnetic starters in (NEMA I, IV or VII) enclosure with H.O.A. selector switch, overload protection and undervoltage release suitable for wall mounting, and an adjustable automatic pressure switch to operate on a pressure variation of not over 6 psi.

Air Exhaust Piping: An exhaust line one size larger than the exhaust valve shall be run downgrade to the low level manhole, exhaust ventilating duct, or independent vent to atmosphere, at a point above any possible high water level. Air exhaust shall not be run to a plumbing vent.

Air Storage Tank: Furnish and install one hot rolled steel plate air receiver manufactured in accordance with ASME Code for unfired pressure vessels and bearing an ASME stamp for a 50 psi working pressure, and of ample capacity for satisfactory operation of the ejector. It shall be supplied with a blowoff cock, pressure gauge (saddles for horizontal receiver). The air receiver shall be _____ inch diameter and _____ inch long minimum.

Future Duplex: For a single unit with future cross connection to form a duplex system specify an inlet and discharge cross connection to provide for installation of a second receiver to make a duplex system at a future date. Cross connections shall include inlet header arranged for (end)(center) inlet and the discharge cross connection fittings. The extra opening shall be closed with a blind flange.

Mechanical Interlock Valves: The air control shall include two air operated three-way mechanical interlocking valves which will at all times prevent simultaneous discharge. Electrically operated interlocks or alternators for ejectors will not be approved.



Please write or call for information on other Yeomans solids handling waste water pump lines.

YEOMANS PUMP

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