ITT

Bulletin S-500C

Bell & Gossett® Domestic® Series MJ™ and MJS Clinical & Industrial Vacuum Units

- Rugged Construction, Low Maintenance – Designed and built for many years of dependable service
- Smoke-free Exhaust – No internal lubrication or sealing oils, exhaust is free of oil smoke and fumes
- Vapor and Liquid can be easily handled
- Quick Recovery Time – Easily handles surge loads caused by abnormal operating conditions
- Non-Pulsating Suction – Smooth steady vacuum without equalizing or accumulator tanks
- Vertical Horizontal Storage tanks available

Engineered for life

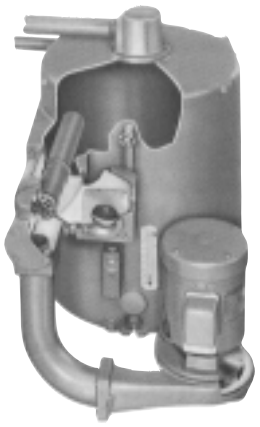
Design Simplicity and Reliability

The heart of the MJ is the dependable multi-jet vacuum producer. It is a simple yet effective device designed to give years of trouble-free service.

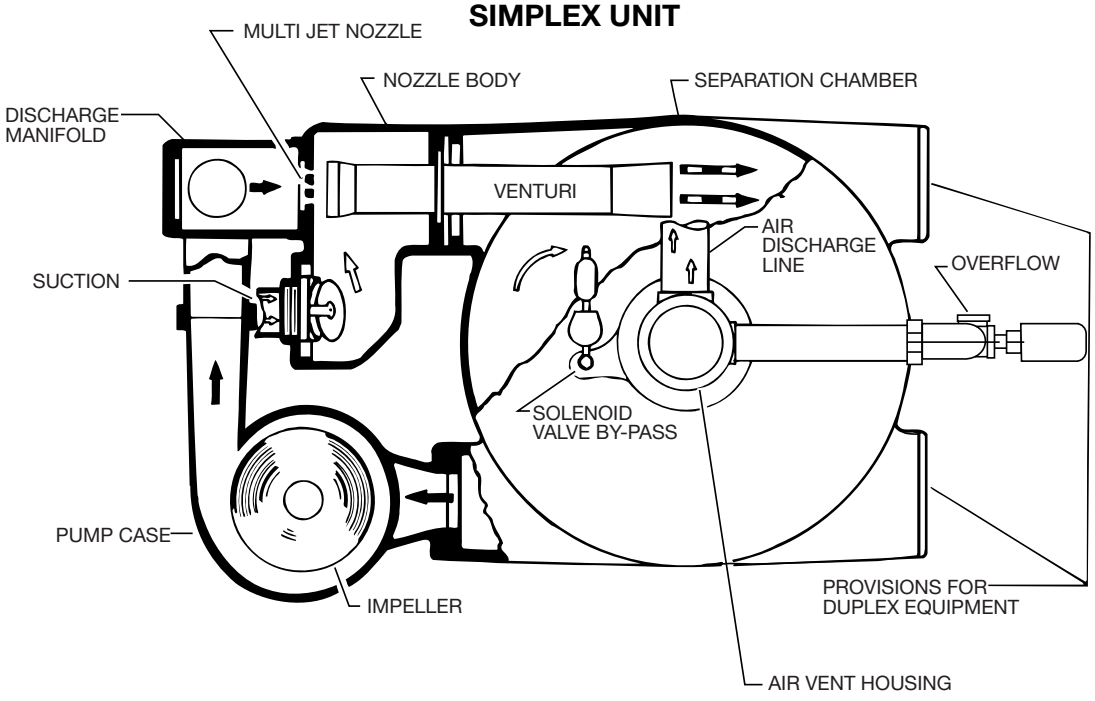
The Centrifugal Pump circulates water (the usual hurling medium) through the multi-jet nozzle, venturi and returns it to the separation chamber. The water, forced at high velocity across the gap between nozzle and venturi entrains air and gases in multiple jet streams, creating a smooth, steady vacuum in the air suction line and vacuum system. The mixture is discharged through the venturi tangentially into the separation chamber. This causes the water in the separation chamber to rotate, resulting in a centrifugal action which forces the water to the periphery of the chamber while the lighter air flows to the center and is discharged. Besides effectively separating the air and gases from the water, the centrifugal motion in the same direction as the discharge from the venturi reduces the resistance pressure at the outlet of the venturi and simultaneously increases the pressure at the centrifugal pump suction, promoting high efficiency.

Replacement of the hurling water evaporated from the unit is controlled by a solenoid valve actuated by a probe controller. When hot gases or vapors are handled, the heat transfer to the hurling water may make it necessary to add cooling water. A temperature limit switch can be supplied for this purpose which will also actuate the solenoid valve if the hurling water temperature rises above a predetermined level. Any excess water will overflow to a drain.

The operation is similar for hurling media other than water, except that other cooling methods are employed.



SIMPLEX UNIT



Centrifugal Pump Impeller

Simplicity . . . one moving part, the centrifugal pump impeller directly coupled to motor shaft . . . no close tolerances . . . no wear adjustments . . . no pistons . . . no belts to wear or adjust . . . no internal lubrication.

MJ units also solve industrial wet vacuum application problems

Generally, vacuum systems can be classified as handling:

A. Dry or noncondensable gases, for example, vacuum lifting.
B. A mixture of gases and condensable vapors; for example, vacuum heating systems.
C. Principally condensable vapors; for example, removal of liquid from materials.
D. A mixture of gases and liquid; for example, priming pumps.

The versatility of the MJ is inherent in its design, which makes it universally adaptable for any of these systems, but the MJ is especially valuable where condensable vapors or even slugs of liquid are present in the air handled.

Dry gases, at low or high temperatures, can be handled effectively. The MJ is, however, particularly practical where a dust condition exists, which can present a serious contamination problem with other type pumps which use oil as the sealing medium.

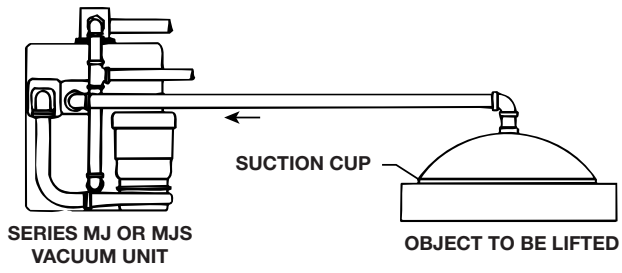
The MJ has a decided advantage when vacuum systems liberate appreciable quantities of WATER VAPORS or even slugs of water. The MJ Unit depends on a liquid (hurling medium), usually water, for its vacuum producing cycle. When vapors are entrained in the jet stream between nozzle and venturi outlet a condensing action can take place. The MJ then performs the function of a direct contact (jet) condenser, without appreciably impairing its air handling capacity. This exclusive design feature offers functional as well as economic advantages in contrast to other type pumps which have to depend on special equipment, water cooled condensers or refrigerated traps to maintain their operating efficiency. With the MJ its frequently possible to eliminate expensive supplementary equipment.

When Condensable Vapors Other Than Water Vapors or slugs of liquid are present in the system, process material (solvents) can frequently be used as hurling medium. The MJ can again function as a direct contact condenser or, if used in conjunction with a water cooled condenser, carry-over vapors are condensed in the separation chamber. Therefore, vapor loss is negligible and process material can be recovered. Again the separation chamber can be used as a direct contact condenser, although the method of cooling will be more complex. For instance, a refrigeration coil might be installed in the separation chamber to provide heat transfer, or some of the liquid pumped by the MJ can be diverted to a heat exchanger.

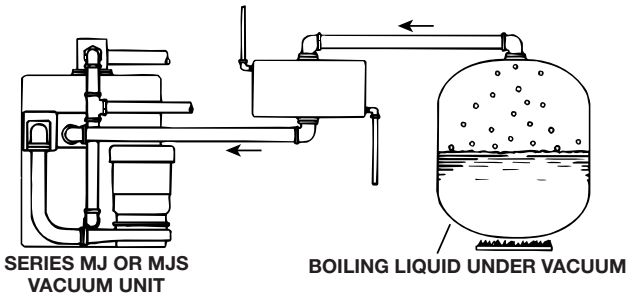
Other practical and economical uses for the MJ include its application as combination vacuum-condenser, as a fluid or slurry “pump” without direct pumping, as a liquid scavenger, or as a “gas scrubber”. Consult factory for application.

Industrial Vacuum Pump Systems

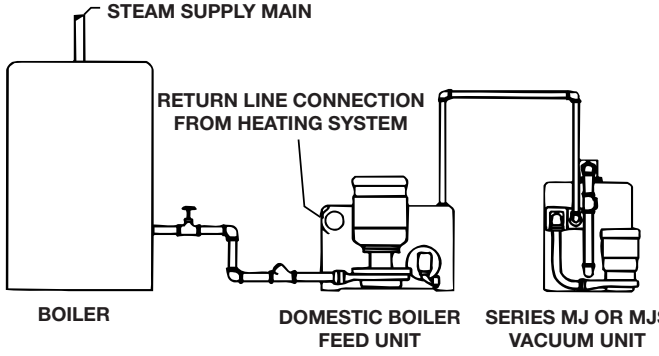
A - “DRY” OR NONCONDENSABLE GASES



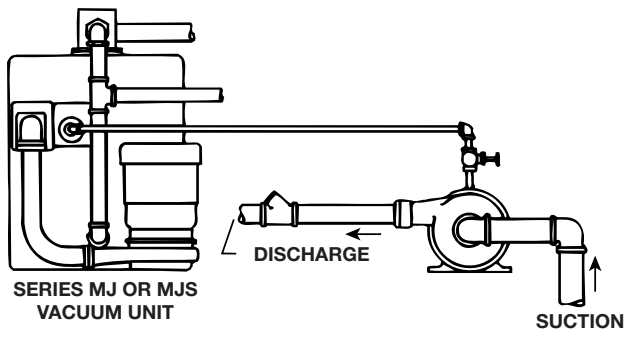
C - PRINCIPALLY CONDENSABLE VAPORS



B - MIXTURE OF GASES AND CONDENSABLE VAPORS



D - MIXTURE OF GASES AND LIQUID



Domestic Series MJ or MJS Clinical/Laboratory Vacuum Units

For hospital central vacuum systems . . . where dependable performance is a “must”

Quiet operation

Domestic MJ Vacuum Units are so silent in operation you can install them next to an operating room. No soundproofing or vibration isolators needed. This makes them ideal for hospital expansion/modification programs, and eliminates long and costly vacuum piping system.

Clean operation

MJ Multi-jet Vacuum Units satisfy continuous need of drainage throughout hospitals, clinics, and laboratories. They provide scrubbing of system carry-over before discharging exhaust air to atmosphere. Disinfectant may be added to hurling water if desired. Vertical storage tank design offers option of adding disinfectant solution to carry-over for pre-scrubbing before entering vacuum unit. Exhaust is completely free of oil and smoke.

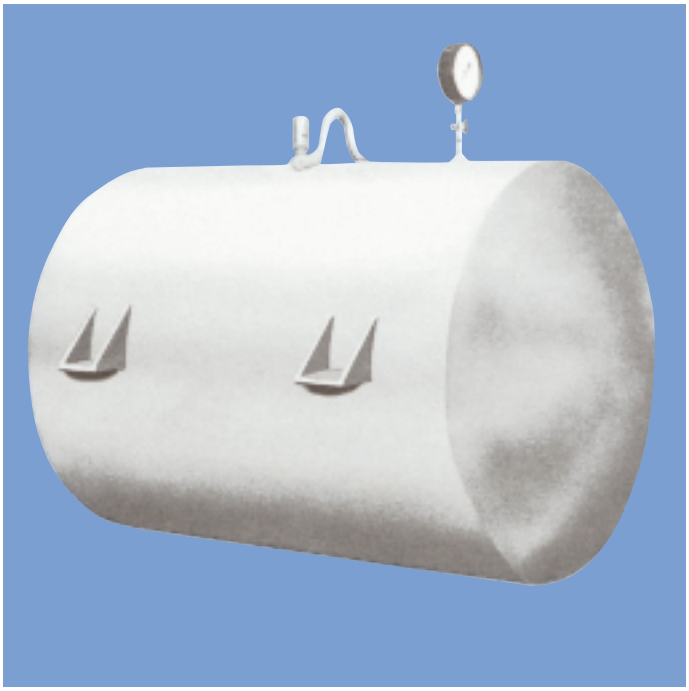
Reliable operation

Domestic MJ Multi-Jet Units have only one moving part: the impeller. Since there are no close clearances, no wear adjustments, no pistons, no belts to adjust or replace – MJ Units maintain original rated capacities for years.

Minimum servicing

Single moving part, lack of close tolerances, plus balanced vibration-free design are features that combine to eliminate need for major maintenance. Functional parts – centrifugal pump, multi-jet nozzle plate and venturi tube – are easy to remove for inspection.

Your choice of vertical or horizontal storage tank. All vacuum storage tanks are hot-dipped galvanized after fabrication.



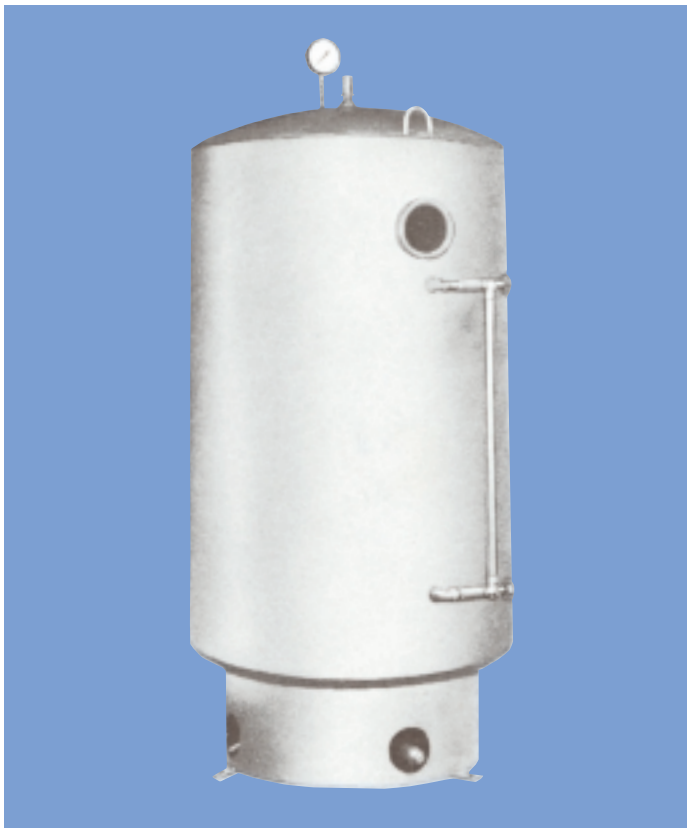


Fig. 1

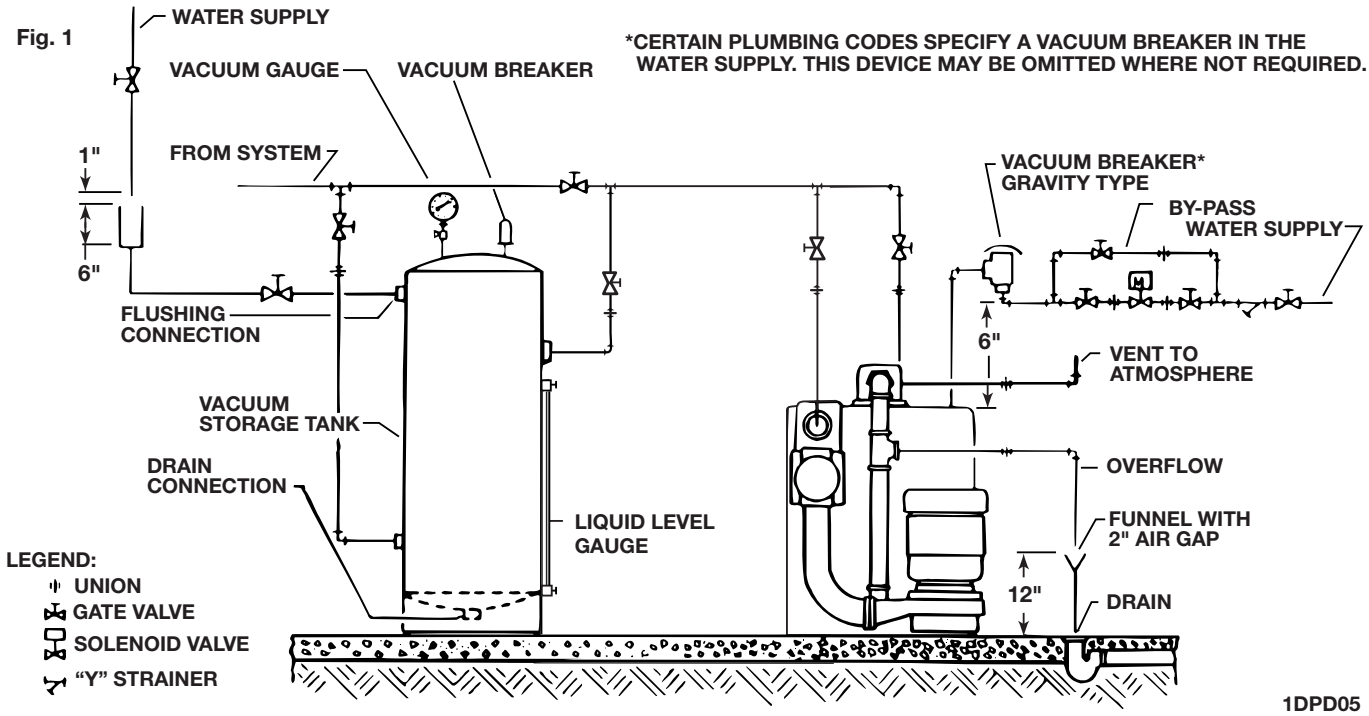


Fig. 2

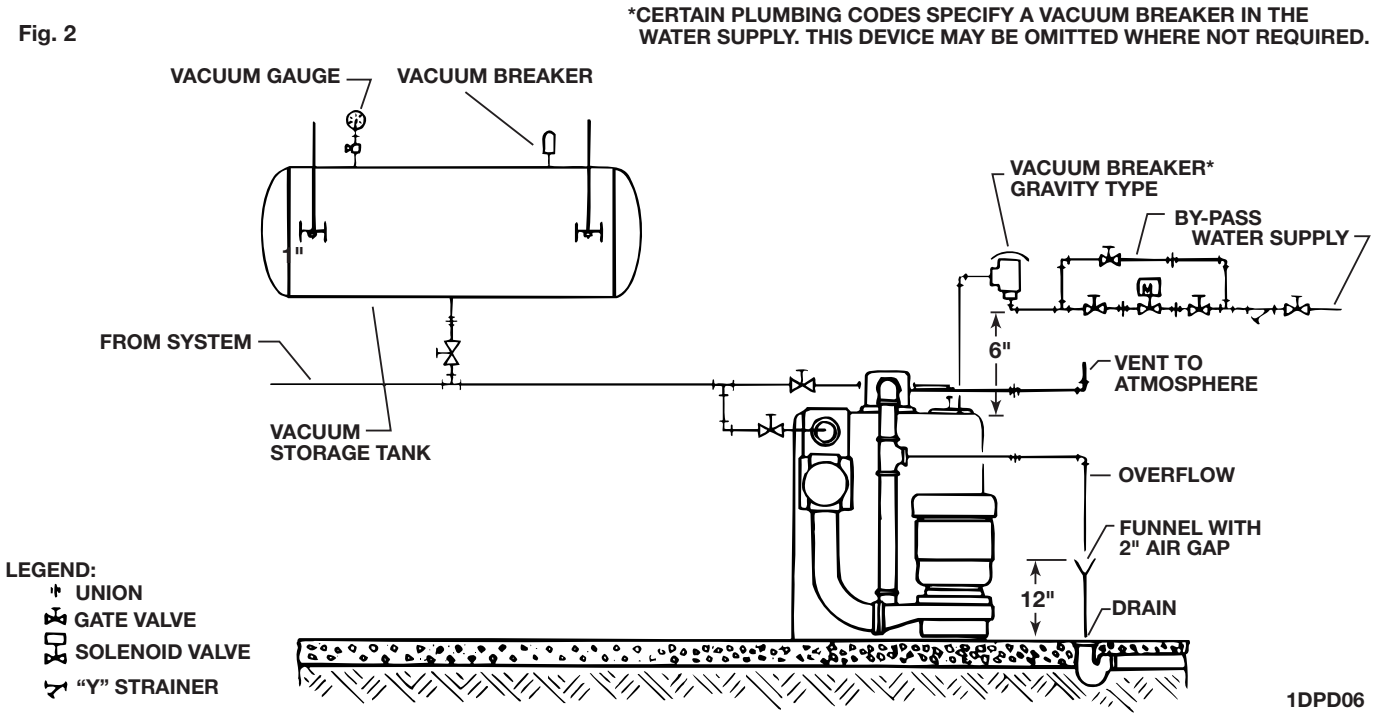


Fig. 1 and 2 above show piping arrangements for both vertical and horizontal vacuum storage tanks. As shown in Fig. 1, with a vertical storage tank, the supply line from the system enters the bottom of the storage tank. The vacuum line from the tank to the MJ unit is near the top. This arrangement allows solids and fluids to collect in the storage tank. Drain and flushing connections are provided in the storage tank for periodic cleaning of the vessel.

The piping arrangements in Fig. 2 shows the horizontal storage tank conveniently suspended from overhead. This arrangement eliminates occasional flushing since condensation from the piping system drains directly into the pump section, by-passing the tank. The pump uses water as hurling medium. Any liquid entering the pump is quickly disposed of through the automatic overflow.