NIAGARA®

Niagara Positive Displacement

Installation Manual

Installation

Layout of Piping: It is necessary to install the meter correctly if an accurate measurement is to be obtained. Note the diagrams of correct installation and the following principles of installation:

Set the meter in a horizontal pipe with the register up so that air vapors or other gases do not pass through. The meter must remain flooded at all times. To help keep air out, do not let the meter drain between periods of usage. Trap the meter in a depression in the pipe line if necessary. Keep suction lines and pump stuffing boxes tight. If air cannot be kept out of a line handling light oils or solvents, use an air release valve between the pump and the meter.

When needed, protect the meter from sediment, pipe scale, etc. by a trap strainer. Arrange installation so that the strainer can be easily cleaned.

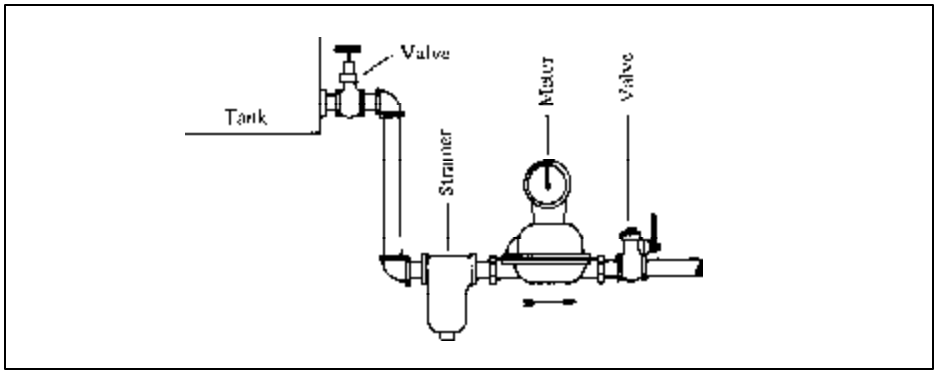
In gravity-pressure installation, set the meter to take advantage of all possible pressure head. In pump-pressure installations, set the meter on the discharge side of the pump, if possible.

Use the meter only with the liquid for which it was ordered and within the specified limits of pressure, temperature, and flow rate.

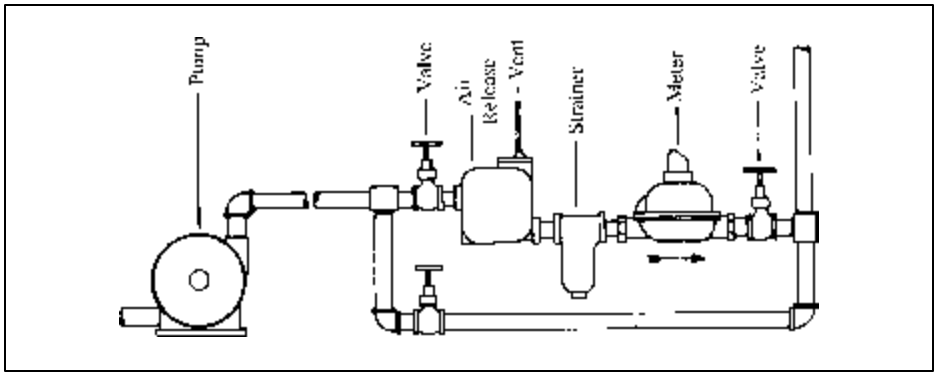
If the line must be kept in continuous service, install a bypass around the meter and strainer with appropriate valves.

Before placing the meter in the pipe line and after the meter couplings are connected into place, flush the line thoroughly with liquid to remove pipe cuttings, chips, etc. Then set the meter in position. **When starting up the meter, open the control valve just a little, to fill the line and the meter with liquid very slowly. Some meter internals may be damaged if run rapidly before the line is full.**

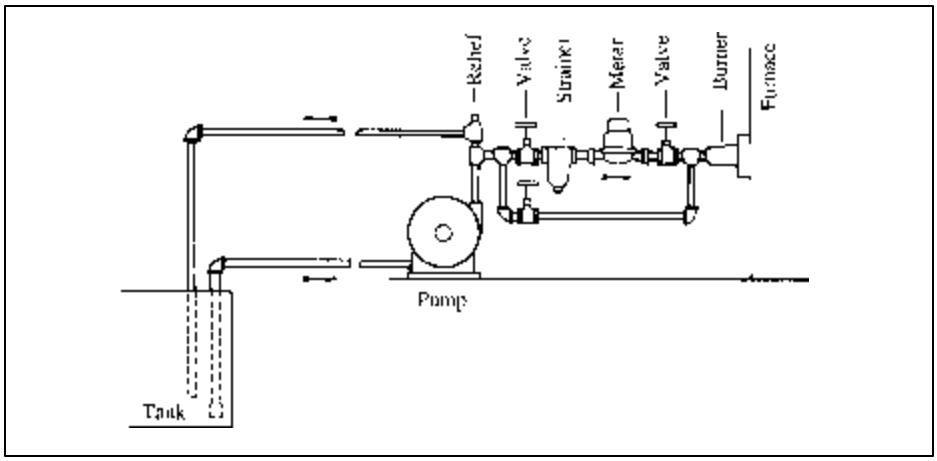
Typical installations are shown to illustrate principles involved. (For installation of auxiliary equipment with Electricontact meters, see the Electricontact sheet shipped with that meter.)



A – Gravity flow from storage tank with tank valve, strainer, meter, and control valve respectively. If there are many elbows or if very fast flow is wanted, the net drop should be at least two feet more.



B – Pump pressure flow from the storage tank with pump, air release valve, strainer, meter, control valve, and riser pipe respectively. The air release may be omitted if the supply tank will never be emptied. If the supply tank is below the pump level, valves on the suction line must be tight. If the delivery tank is below meter level, a 1-foot riser pipe on the meter outlet should be used with a vacuum breaker or vent at the high point.



C – Installation on pump pressure oil burners having circulating system. Meter should be kept outside the circulating loop if possible. If two meters must be used on supply and return lines, first pump oil through the system with the burner shut off to check the exact uniformity of registration of the two meters. Be sure that the valve on the suction pipe is tight. The system must be air free to ensure the accuracy of the meters.

To Obtain Accurate Measurement: Avoid passing air or vapor through the meter. Air registers like liquid and produces inaccurate measurement. Use an air release valve to accomplish this if necessary. Do not let the pump run after the supply tank is empty. Sometimes small leaks on the suction line of the pump will cause air to be sucked into the pipe line causing inaccurate registration of the meter. These cannot usually be detected by any leakage of oil; therefore, care must be taken to keep the pipe absolutely tight, especially on suction lines.

Keep the meter clean as described below.

If the meter registers much more then the liquid that actually passes through it, this is, in most cases, due to air passing through the meter with the liquid. The only remedy is to keep the air out. If the meter stops or registers much less than what actually passes through it, this is due to dirt (or sometimes to wear). The meter should be cleaned or repaired as described below.

Each meter is individually calibrated before being shipped from the factory.

Care of the Meter: If the meter shows evidence of needing repairing or cleaning of the measurement unit, write for the Service Manual which gives complete repair instructions, form M110. For emergency cleaning or inspection, proceed as follows: Unbolt the main flange and lift off the entire top half of the casing. Lift out the measuring chamber in which the nutating disc moves. Separate the two halves, removing any screws which hold the two halves together. Lift out the measuring piston and inspect this carefully for wear or for dirt embedded in the metal. Clean off any embedded dirt with fine emery paper but do not attempt to cut away any metal.

Next, inspect the measuring chamber for wear in the lower ball seat or for rubbing of the edge of the piston on the vertical chamber wall. If either wear or rubbing is found, the chamber should be replaced. Otherwise, clean out any dirt and reassemble the piston in the chamber.

Try the register by turning the gearing inside the top casing. If the register hand fails to move or moves irregularly, remove the register of the meter and inspect the calibrating or change gears located just beneath the register base plate. Tighten the set screws of these gears if necessary, and see that they match squarely with a little play between the teeth.

Replace the measuring chamber and piston into the bottom casing of the meter. Replace the flange gasket or use a new one obtained from the factory. Then carefully set the top casing to avoid damage to the internal gears. After reassembly, the meter should operate when held to the mouth and air blown through it.

If leakage occurs at the base of the register mounting, this is due to a leaking stuffing box. Two types of stuffing box packings may be used. If the packing is of high temperature type, the nut should be tightened down snugly by hand. New packing must be procured from the factory if leaking occurs. If a leak occurs with all other types of stuffing box packing, tighten down the nut one-eighth turn at a time until the leakage stops. Meters used at a temperature above 180°F or on corrosive liquids must have suitable type packing.

Clean the strainer ahead of the meter occasionally to prevent clogging and allow full flow through the meter.

Speed of Operation: A meter must be operated within its proper capacity range. Niagara meters can be operated up to their full rated capacity without damage. However, continuous operation above 50% of maximum flow capacity should be avoided to prevent reduction in normal service life. For details, see the Selection Guide issued by Niagara.

Service: If you ever need to service the meter, contact Niagara. Niagara has a full service department.

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