

either throughout the 24 hours of the day or during the daytime hours only. The setting of a switch may provide no service, continuous service, or periodic service. For the latter, by means of several intermittent settings, steam will be supplied during each period in increments of a certain number of minutes for each successive setting of the switch, steam being shut off during the balance of the period. These settings afford from 15 to 80 per cent of that maximum heating effect, required on days of zero temperature.

A night switch with a variety of settings, may be adjusted so as to maintain throughout the night the intermittent supply called for by the day switch setting, or may be set to interrupt the operation of the day switch and entirely cut off the supply of steam to the radiation at night during certain hours which are selected by the operating engineer.

A morning service switch may operate independently of the day and night switches to supply full steam service to the radiation during the early morning hours, 6.00 A.M. to 9.00 A.M., or afford an excess heat supply when desired by the operator.

FLUID METERS AND METERING

No one thing has contributed more to the advancement of district heating than that of the perfection of fluid meters, which may be classified as follows:

1. *Positive Meters:* The fluid passes in successive isolated quantities—either weights or volumes. These quantities are separated from the stream and isolated by alternately filling and emptying containers of known capacity.

2. *Differential Meters:* The fluid does not pass in isolated separately-counted quantities but in a continuous stream which may flow through the line without actuating the primary device of the meter. In the differential meter, the quantity of flow is not determined by simple counting, as with the positive meter, but is determined from the action of the steam on the primary element.

Additional subdivisions of these two general classifications can be made as follows:

Fluid Meters	Positive - quantity	Weighing	{ Weighers Tilting trap
		Volumetric	{ Rotary Bellows
	Differential	Quantity - Current - Turbine	
		Head (Kinetic)	{ Venturi Flow nozzle Orifice Pitot tube
		Rate of flow	{ Area (Geometric) { Orifice and plug Cylinder and piston
		Head area (Weir)	{ V-notch Special notch

In selecting a meter for a particular installation, the number of different makes and types of meters suitable for that job is usually limited as a result of one or more of the following requirements:

1. Its use in a new or an old installation.
2. Type of rate to be used in charging for the service.
3. Location of the meter.
4. Large or small quantity to be measured.
5. Temporary or permanent installation.
6. Cleanliness of the fluid to be measured.
7. Temperature of the fluid to be measured.
8. Accuracy expected.
9. Nature of flow: Turbulent, pulsating or steady.
10. Cost.
 - (a) Purchase price.
 - (b) Installation cost.
 - (c) Calibration cost.
 - (d) Maintenance cost.
11. Servicing facilities of the manufacturer.

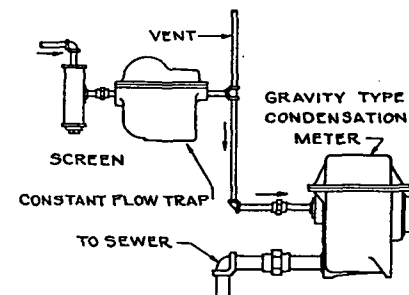


FIG. 5. TYPICAL GRAVITY INSTALLATION OF CONDENSATION METER

12. Pressure at which fluid is to be metered.
13. Type of record desired as to indicating, recording or totalizing.
14. Stocking of repair parts.
15. Use of open jets where steam is to be metered.
16. Metering to be done by one meter or by a combination of meters.
17. Use as a check meter.
18. Its facilities for determining or recording information other than flow.

The majority of the meters used by district heating companies for the sale of steam to their customers are of either the condensation or flow meter type.

Condensation Meters

The condensation meter is a popular type for use on small and medium sized installations, where all of the condensate can be brought to a common point for metering purposes. Its simplicity of design, ease in testing, accuracy at all loads, low cost and adaptability to low pressure distribution has made it standard equipment with many heating companies.