

## VARI-VAC® DIFFERENTIAL HEATING SYSTEM

- EFFICIENT FUEL SAVINGS
- AUTOMATIC STEAM AND TEMPERATURE CONTROL
- LOW MAINTENANCE
- CENTRALIZED CONTROLS
- EQUAL STEAM DISTRIBUTION
- SIMPLE RETROFIT



MARSHALL ENGINEERED PRODUCTS CO.



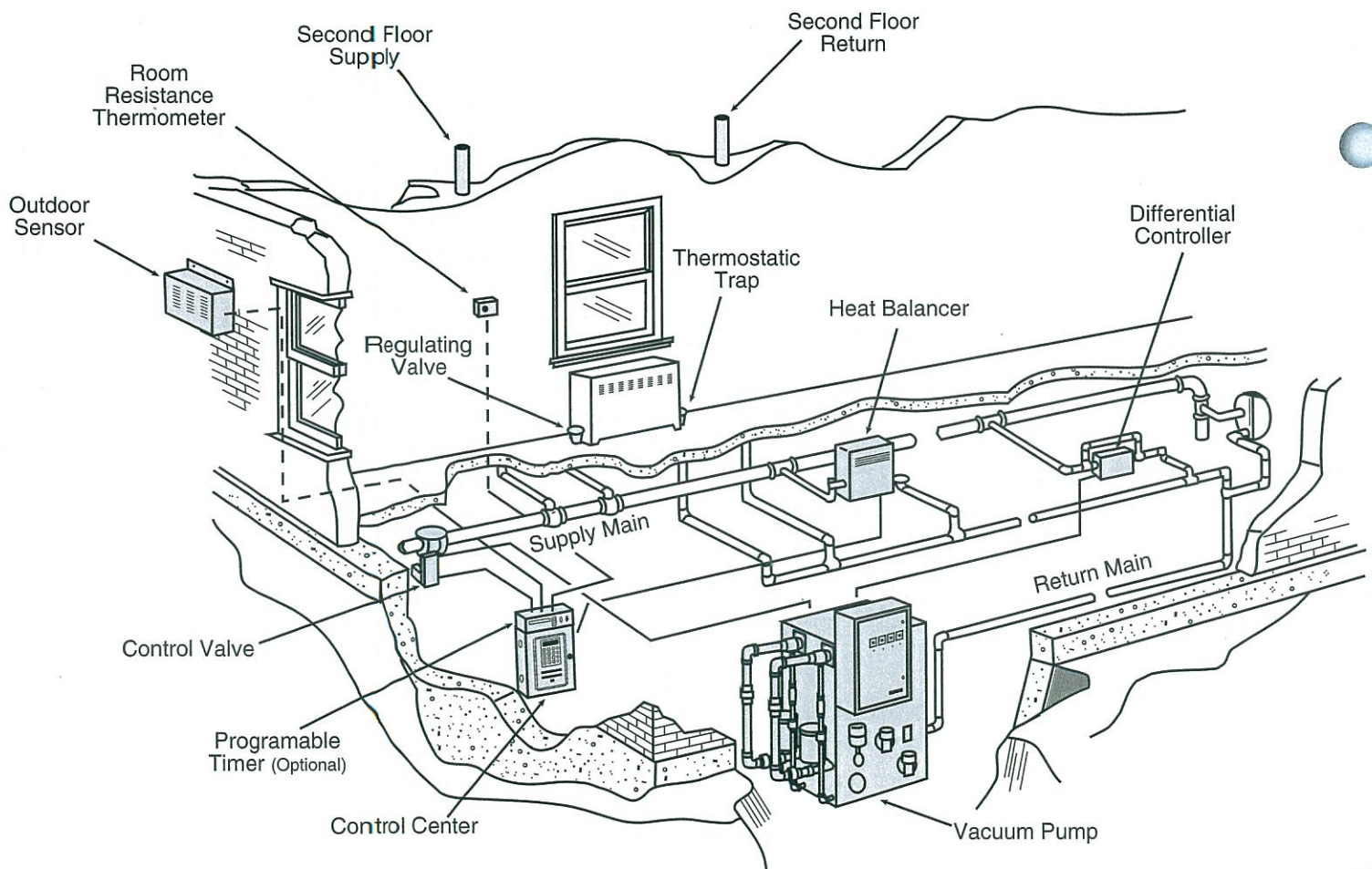
# FULL STEAM AHEAD!

**An aging, outmoded pressure heating system satisfies very few. Tenants have to contend with wide temperature fluctuations. Owners have to contend with a system that needs daily coddling. It seems the only ones that are satisfied are energy companies.**

**There is a simple solution: The MEPCO Variable Vacuum Differential Heating Control System.**

The Vari-Vac® system can modernize your inefficient steam heating units without the high cost of a new system, without removing existing pipes and mains, without weeks of disruption.

Made in its entirety by MEPCO, the Vari-Vac system can be retrofitted into any current pressure heating system and operate with the existing boilers, pipes and radiators. After installation, your new Vari-Vac system will reduce energy bills significantly while providing constant, evenly distributed heat throughout the building.



*MEPCO's Vari-Vac Differential Steam Heating System creates energy-efficient heating while employing a building's original pipes and mains. See back cover for the descriptions and functions of the system's component parts.*



## THE SECRETS OF THE SYSTEM

The Vari-Vac system utilizes a basic principle of physics: Steam, whether compressed under high pressure or expanded under a low vacuum, contains the same BTUs per pound.

By utilizing this knowledge, the Vari-Vac system saves heating costs by controlling the system pressure, expanding a smaller amount of steam to heat the same amount of space. Depending on the heat required, this pressure ranges from 2 psig to a vacuum of 25 inches of mercury.

A simple, two-pipe system is utilized to maintain a continuous flow of pressurized steam through its mains. The need for heat is constantly monitored and the system pressure automatically adjusted to precisely match the need for heat and maintain steady temperatures.

For convenience, all system settings, readings and calibrations can be made automatically through MEPCO's Digital Control Center, which can be located on the premises or off-site for centralized remote control of the system.

## SYSTEM REQUIREMENTS

For proper operation, the Vari-Vac system requires few additions and alterations to existing buildings:

- **Regulating Valves**-Calibrated regulating valves must be used to control the flow of steam through radiators.
- **Traps**-Deep vacuum radiator traps are needed for condensate draining, and air venting.
- **Vacuum Pump**-A vacuum pump is required to maintain circulation and to return condensate to the boiler.

## CUT FUEL COSTS UP TO 40%

Because the Vari-Vac system reduces pressure to expand steam up to five times its normal volume-*while maintaining the same heat units*-it significantly reduces the need for steam and, therefore, energy costs. And MEPCO's Control Center only releases steam in response to actual building temperatures to eliminate overheating waste.

Temperature of the steam is also monitored to control costs. On warm days, Vari-Vac maintains a highly economical steam temperature in the range of 130° F. On frigid days, this is increased to 220° F.

## SAVE IN OTHER WAYS

In addition to lower energy bills, a heating system with a Vari-Vac control update reduces equipment maintenance costs.

Lower steam temperatures reduce pipe expansion, and constant steam pressure alleviates contraction/expansion strains. Best of all, trap and valve maintenance is substantially reduced!

## EVEN, CONSTANT HEAT

While operating costs go down, so will tenant complaints. Steam is distributed evenly through buildings for total comfort on every floor. And the system works quietly, without the banging and noise tenants usually have to live with.

But the best benefit of the Vari-Vac system is its immediate response to outside temperature changes-so fast that inside temperatures remain the same throughout the day.

# THE VARI-VAC SOLUTION: THE VERY SMART UPGRADE

### HIGH FUEL EFFICIENCY

Cooler steam. Less steam. Continuous steam. All help reduce heating bills up to 40%!

### STOP TEMPERATURE FLUCTUATIONS

The Vari-Vac controls monitor and respond to outside temperature changes so efficiently that rooms rarely vary more than one degree.

### NOISELESS OPERATION

Continuous steam flow eliminates the bangs and clangs of system warm-ups. Tenants may forget what an old pressure heating system sounds like.

### CENTRALIZED CONTROL

Control all of the settings or take readings from one single control panel located either on site or at a remote location.

### LOW MAINTENANCE

Less wear! Replace fewer traps and valves.

### EQUAL HEAT DISTRIBUTION

Give the entire building, from the top floor to ground level, the same heat input at exactly the same time.

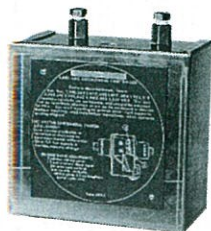
### EASY INSTALLATION

Because existing pipes and mains are used, upgrade the whole system with a minimum of disruptions or time.



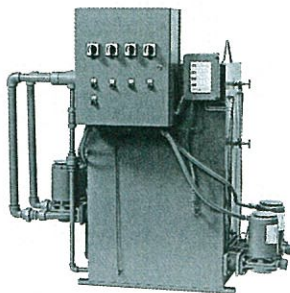
# VARI-VAC COMPONENTS

**MEPCO** manufactures every component in the Vari-Vac system to assure the highest quality and part availability as long as your system is running. Components include:



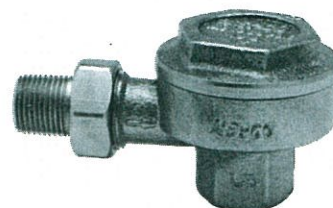
## **DIFFERENTIAL CONTROLLER**

The Differential Controller assures continuous steam circulation and precise temperature control by making the vacuum pump maintain a constant differential between steam supply and return main pressures.



## **VACUUM PUMP**

The Vacuum Pump promotes steam circulation, sustains system vacuum, minimizes warm-up periods, and lowers the operating temperature of system components by exhausting the air and other non condensable gases from the system.



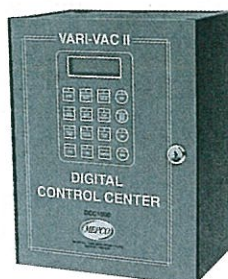
## **RADIATOR TRAP**

The Radiator Trap efficiently drains water and vents air from radiators to prevent steam from entering return piping.



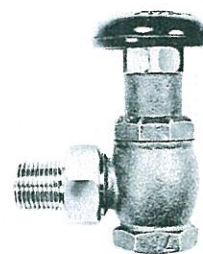
## **HEAT BALANCER**

The Heat Balancer measures the system rate of heat flow in order to balance the heat input with heat demand.



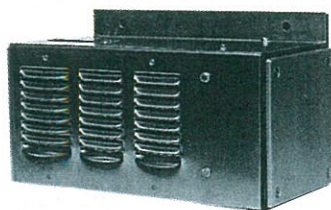
## **DIGITAL CONTROL CENTER**

The MEPCO DCC1000 Digital Control Center uses microprocessor technology to continuously monitor the system sensors and adjust the control valve to supply the required amount of steam. Its two-line 16 character display and keypad allow communications, setting activations, readings, and adjustments from one location.



## **REGULATING VALVE**

The SWRF Regulating Valve allows for precise control over steam to radiation ratios.



## **OUTDOOR SENSOR**

The Outdoor Sensor measures exterior weather conditions to determine the demand for heat inside the building.



## **RESISTANCE THERMOMETER**

The Resistance Thermometer measures the room temperature to prevent under-and overheating.



## **CONTROL VALVE**

The Control Valve regulates the amount of steam entering the system as dictated by the Digital Control Center.



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*Formerly Dunham Division of Dunham-Bush*