REFERENCE

CATALOGUE LIBRARY

APR 21 1932

G23

ULTIMHEAT®
VIRTUAL MUSEUM

# ELECTRIC HEATING UNITS AND DEVICES

GENERAL ELECTRIC

ULTIMHEAT®
VIRTUAL MUSEUM

# ELECTRIC HEATING UNITS AND DEVICES

## THE ANSWER TO A THOUSAND HEATING PROBLEMS

EVERYTHING NEEDED FOR SMALL HEATING JOBS AND

ULTIMHEAT®
VIRTUAL MUSEUM

# FOREWORD

HERE, in one small book, are the answers to the hundreds of small heating problems that bob up daily in industrial plants to puzzle electrical engineers, superintendents, foremen, owners, and maintenance men.

Before General Electric originated and developed this line of small heating units and devices, the installation of a "spot," or "handful," or "zone" of heat in machinery, processes, and isolated buildings was a complicated and expensive job—usually necessitating considerable piping and equipment. Ofttimes, too, it was necessary to operate an expensive steam boiler during the summer months solely to supply heat to machines or processes.

Now, you can turn to this convenient catalog, pick out the electric unit which will best do the job, order by mail and, when the unit arrives, install it according to the simple directions given herein. Instead of piece-by-piece buying, you may find it profitable before long to order a small stock of the more commonly used units so that when one is needed, it may be picked right off your storeroom shelf.

You will swear by electric heat the first time you try it. You will keenly appreciate its cleanliness, convenience, flexibility, accuracy, safety, and economy. It requires no tinkering to keep it just right; no skilled operator hovering over it to adjust it. Simply touch a button and the precise, automatic control does the rest.

You will like these electric heating units and devices. There is a wide enough variety to satisfy almost any conceivable heating requirement. They have been designed for the utmost convenience of installation. They will stand up far longer than you would think good units should stand up. They are built to the highest standards of General Electric craftsmanship—yet in such large volumes as to be very reasonably priced. Moreover, when purchasing machines that utilize process heat, it will pay you to specify "Equipped with G-E heating units."

On the last page of your catalog you will find a blank for your guidance in ordering. We hope you will be pleased with this handy catalog and with the equipment it lists—and that we may be privileged shortly to serve you.

ULTIMATE VIRTUAL MUSEUM

# G-E IMMERSION HEATERS

G-E immersion heaters offer the most economical method of heating liquids in kettles, tanks, metal barrels, etc. They are of substantial construction and high efficiency, utilizing the well-known G-E Helicoil sheath wire.

For heating water, a tinned copper-sheathed unit of high heat density and having a threaded brass header is used. For heating heavier liquids, such as oil and paraffin, a heater having a much lower watts density is used because of possible damage to such liquids and to the heaters caused by carbonization, etc. Steel is used as the sheath and header material in oil-immersion heaters.

| Kw. Demand (Max.) | No. of Heats | Symbol | Volts | Cat. No. | Price | Approx. Ship. Wt. in Lb. | APPROX. DIMENSIONS IN INCHES: Length from End of Unit to Nut on Threaded Collar "B" Dimen. | Diameter of Threaded Collar (Diam. is Standard Pipe Thread of Size Given) | Fig. No. | Over-all Length | SWITCHES FOR HAND CONTROL 250 VOLTS MAX.: Description (See Illustrations on page 21) | Cat. No. | Price |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FOR WATER IMMERSION** | | | | | | | | | | | | | |
| 0.6 | 1 | Y-2055 | 115 | 15X820 | $6.50 | 2 | 5 | 1¼ | 1 | 8½ | | | |
| 0.6 | 1 | Y-2055 | 230 | 15X821 | 6.50 | 2 | 5 | 1¼ | 1 | 8½ | | | |
| 0.75 | 1 | Y-2036 | 115 | 15X822 | 7.00 | 2 | 8 | 1¼ | 2 | 11½ | Single-heat snap switch | 60451 | $1.00 |
| 0.75 | 1 | Y-2036 | 230 | 15X823 | 7.00 | 2 | 8 | 1¼ | 2 | 11½ | | | |
| 1.0 | 1 | Y-2037 | 115 | 15X824 | 8.00 | 2 | 10 | 1¼ | 2 | 13½ | | | |
| 1.0 | 1 | Y-2037 | 230 | 15X825 | 8.00 | 2 | 10 | 1¼ | 2 | 13½ | | | |
| 1.2 | 3 | Y-2049 | 115 | 15X826 | 9.50 | 3 | 8 | 1¼ | 3 | 11½ | 3-heat snap switch | 29X924 | 1.50 |
| 1.2 | 3 | Y-2049 | 230 | 15X827 | 9.50 | 3 | 8 | 1¼ | 3 | 11½ | | | |
| 2.0 | 3 | Y-2050 | 115 | 15X828 | 10.50 | 3½ | 10 | 1¼ | 3 | 13½ | | | |
| 2.0 | 3 | Y-2050 | 230 | 15X829 | 10.50 | 3½ | 10 | 1¼ | 3 | 13½ | | | |
| 2.0 | 3 | Y-2069 | 115 | 15X830 | 13.50 | 3½ | 1¼ | ‡ 1⅝ | 4 | 4½ | 3-heat snap switch | 278607 | 2.40 |
| 2.0 | 3 | Y-2069 | 130 | 15X831 | 13.50 | 3½ | 1⅛ | ‡ 1⅜ | 4 | 4½ | | | |
| 3.0 | 3 | Y-2041 | 115 | 15X832 | 16.00 | 6 | 14 | 2 | 3 | 18 | | | |
| 3.0 | 3 | Y-2041 | 230 | † 15X833 | 16.00 | 6 | 14 | 2 | 3 | 18 | | | |
| 4.0 | 3 | Y-2042 | 115 | 15X834 | 17.50 | 7 | 18 | 2 | 3 | 22 | | | |
| 4.0 | 3 | Y-2042 | 230 | † 15X835 | 17.50 | 7 | 18 | 2 | 3 | 22 | | | |
| 5.0 | 3 | Y-2043 | 115 | 15X836 | 18.50 | 8 | 22 | 2 | 3 | 26 | 3-heat snap switch | 278610 | 4.00 |
| 5.0 | 3 | Y-2043 | 230 | † 15X837 | 18.50 | 8 | 22 | 2 | 3 | 26 | | | |
| 7.5 | 3 | Y-2047 | 230 | † 50X595 | 23.50 | 11 | 30 | 2 | 3 | 34 | | | |
| 10.0 | 3 | Y-2046 | 230 | † 14X426 | 28.00 | 14 | 42 | 2 | 3 | 46 | | | |
| **FOR OIL IMMERSION** | | | | | | | | | | | | | |
| 1.0 | 3 | Y-2094 | 115 | 33X825 | $9.50 | 5 | 10 | 1¼ | 3 | 13½ | | | |
| 1.0 | 3 | Y-2094 | 230 | 33X826 | 9.50 | 5 | 10 | 1¼ | 3 | 13½ | 3-heat snap switch | 29X924 | $1.50 |
| 1.5 | 3 | Y-2056 | 115 | 32X820 | 15.00 | 6 | 14 | 2 | 3 | 18 | | | |
| 1.5 | 3 | Y-2056 | 230 | † 32X821 | 15.00 | 6 | 14 | 2 | 3 | 18 | | | |
| 2.0 | 3 | Y-2057 | 115 | 32X822 | 16.50 | 7 | 18 | 2 | 3 | 22 | | | |
| 2.0 | 3 | Y-2057 | 230 | † 32X823 | 16.50 | 7 | 18 | 2 | 3 | 22 | | | |
| 2.5 | 3 | Y-2058 | 115 | 15X838 | 17.50 | 8 | 22 | 2 | 3 | 26 | 3-heat snap switch | 278607 | 2.40 |
| 2.5 | 3 | Y-2058 | 230 | † 15X839 | 17.50 | 8 | 22 | 2 | 3 | 26 | | | |
| 3.0 | 3 | Y-2059 | 115 | 32X824 | 19.50 | 10 | 26 | 2 | 3 | 30 | | | |
| 3.0 | 3 | Y-2059 | 230 | † 32X825 | 19.50 | 10 | 26 | 2 | 3 | 30 | | | |
| 4.0 | 3 | Y-2060 | 115 | 32X826 | 23.50 | 12 | 36 | 2 | 3 | 40 | | | |
| 4.0 | 3 | Y-2060 | 230 | † 32X827 | 23.50 | 12 | 36 | 2 | 3 | 40 | 3-heat snap switch | 278610 | 4.00 |
| 5.0 | 3 | Y-2061 | 115 | 32X828 | 26.50 | 14 | 42 | 2 | 3 | 46 | | | |
| 5.0 | 3 | Y-2061 | 230 | † 32X829 | 26.50 | 14 | 42 | 2 | 3 | 46 | | | |

† These heaters for operation on a 230-volt circuit can be operated single-heat on a 440-volt circuit by running the two elements in series. Switches listed above should not be used on circuits of over 250 volts.

‡ Straight thread—not pipe thread.

Fig. 1

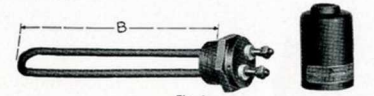


Fig. 2

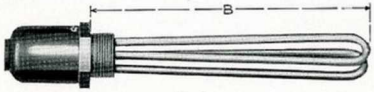


Fig. 3

Fig. 4

During operation, all immersion units must be entirely immersed from the end of the unit to the nut on the threaded collar to prevent overheating, a condition which would cause the units to burn out in a short time.

The General Electric Company is prepared to build immersion units in other sizes and wattages when warranted by the individual demand.

For control equipment, see pages 22 to 26.

**EVERYTHING NEEDED FOR SMALL HEATING JOBS AND**

ULTIMHEAT®
VIRTUAL MUSEUM

## OPERATION

The single-heat units having two terminals are equipped with screws and clamps for connecting to the power supply. The 3-heat units having four terminals are equipped in the same manner. These heaters are provided with a japanned, sheet-steel cap which serves to protect the terminals from injury. The 3-heat units dissipate one-half and one-quarter respectively of the maximum wattage on intermediate and low heats.

## INSTALLATION AND APPLICATION

The immersion-type electric heating unit is easily installed. It is necessary only to drill a hole in the tank, kettle, or barrel to be heated and to thread the hole for a standard pipe thread, as indicated in the table on page 4. Where the wall is not ⅜ of an inch or more in thickness, it should be reënforced with a metal plate.

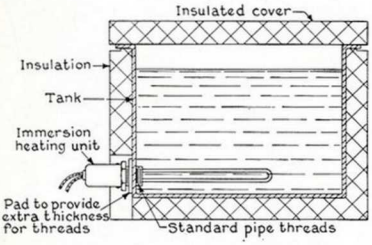
If units are installed in pipe, the minimum size of standard pipe for the units with the 1¼-in. threaded collar should be 1½ inches. Units with the 2-in. collar should not be installed in pipe of less than 2½-in. diameter.

Cat. No. 15X830 and Cat. No. 15X831 differ from the other units in that they are installed from within the container by passing the terminal header through a straight hole in the bottom or side wall of the container. The heater is provided with a shoulder on the header, the necessary gasket, and a nut. After the header has been inserted through the hole in the tank and the gasket is in place, the shoulder inside is drawn up tight by the nut on the outside, making a watertight joint. These units are particularly adaptable to containers where the clearance allowable for the heater is small or where the water is shallow.

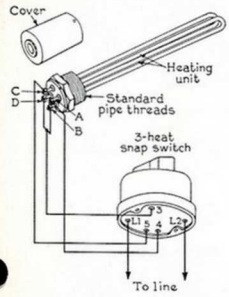
Care should be taken to keep immersion units clean. A free circulation of liquid around the heaters should be provided at all times. Immersion heaters should be inspected regularly and any accumulations of carbon or foreign material should be removed.

Do not install heaters vertically from the top of a tank, as heat rises and steam pockets are easily formed in water, tending to overheat the units and cause them to burn out. Heaters should be installed either vertically through the bottom of the tank or through the side. See that they are covered with at least 2 inches of liquid.

After the units have been firmly screwed in and connected to the power supply, they are ready to operate.

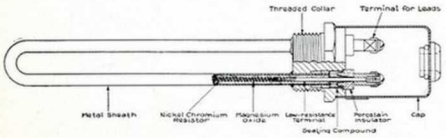



Application of G-E immersion heater to tanks and kettles

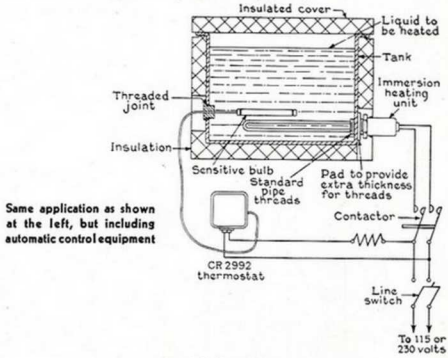



G-E immersion heater connected for three heats

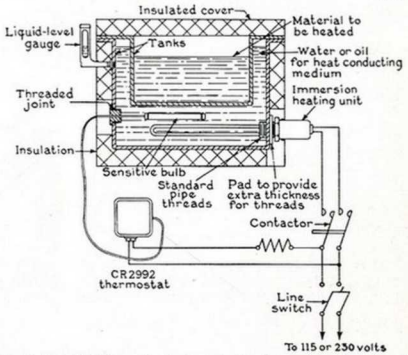
*Note: Switch shown is Cat. No. 278610. Each size is connected differently. Connection diagram accompanies every switch.*




Details of typical immersion heaters




**Same application as shown at the left, but including automatic control equipment**



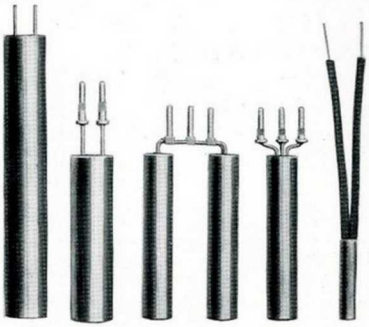

Application of G-E immersion heater in heating heavy viscous liquids and other materials which carbonize readily

ULTIMHEAT®
VIRTUAL MUSEUM

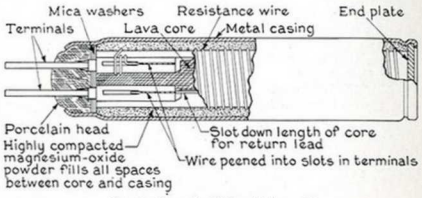
# G-E CARTRIDGE UNITS

Recognizing the need for an efficient, self-contained unit for localized heating, the General Electric Company has perfected the cartridge-type electric heating unit. It consists of an insulator core on which is wound the resistance element of nickel-chromium alloy. This element is connected to two terminals, which are embedded in one end of the core. Magnesium-oxide powder is used as the insulating material between the heating element and the brass casing, or sheath. After assembly, the unit is reduced in diameter by swaging, forming a compact and solid mass of high density, which is not affected by vibration.

These units are eminently suited for heating process machinery and afford the most convenient means of heating many devices, such as gluepots, compound pots, and soldering irons.



Typical G-E cartridge units




Construction of a G-E cartridge unit

## MAXIMUM SHEATH TEMPERATURE—750 DEG. F.

| Volts | Watts | Length in In. | Diameter in In. | Symbol | Price |
|---|---|---|---|---|---|
| 115 | 250 | 3 3/8 | 15/16 | 102-H | $3.10 |
| 115 | 600 | 5 | 1.293 | 103-H | 4.30 |
| 230 | 600 | 5 | 1.293 | 103-X | 4.30 |
| 115 | 70 | 4 3/8 | 15/16 | 109-H | 3.00 |
| 230 | 70 | 4 3/8 | 15/16 | 109-X | 3.00 |
| 115 | 90 | 4 3/8 | 15/16 | 110-H | 3.00 |
| 115 | 140 | 4 3/8 | 15/16 | 111-H | 3.00 |
| 115 | 600 | 5 | 1.293 | 113-H | 4.00 |
| 230 | 600 | 5 | 1.293 | 113-X | 4.00 |
| 115 | 75 | 2 3/8 | 1/2 | 141-H | 2.00 |
| 230 | 75 | 2 3/8 | 1/2 | 141-X | 2.00 |
| 115 | 100 | 2 3/8 | 1/2 | 142-H | 2.00 |
| 230 | 100 | 2 3/8 | 1/2 | 142-X | 2.00 |
| 115 | 150 | 2 3/8 | 5/8 | 143-H | 2.25 |
| 230 | 150 | 2 3/8 | 5/8 | 143-X | 2.25 |
| 115 | 275 | 2 1/2 | 15/16 | 145-H | 2.50 |
| 230 | 275 | 2 1/2 | 15/16 | 145-X | 2.50 |
| 115 | 340 | 4 3/8 | 15/16 | † 147-H | 5.50 |
| 115 | 440 | 4 3/8 | 15/16 | † 148-H | 3.85 |
| 230 | 440 | 4 3/8 | 15/16 | † 148-X | 3.85 |
| 115 | 200 | 2 3/8 | 3/4 | 151-H | $2.35 |
| 230 | 200 | 2 3/8 | 3/4 | 151-X | 2.35 |
| 115 | 1200 | 8 1/2 | 1.293 | 152-H | 5.00 |
| 230 | 1200 | 8 1/2 | 1.293 | 152-X | 5.00 |
| 230 | 250 | 3 3/4 | 1.293 | 154-X | 3.40 |
| 115 | 600 | 5 | 1.293 | 156-H | 3.75 |
| 230 | 600 | 5 | 1.293 | 156-X | 3.75 |
| 115 | 1000 | 8 1/2 | 1.293 | 162-H | 5.90 |
| 230 | 1000 | 8 1/2 | 1.293 | 162-X | 5.90 |
| 115 | 300 | 5 | 1.293 | 163-H | 4.50 |
| 230 | 300 | 5 | 1.293 | 163-X | 4.50 |
| 115 | 650 | 8 1/2 | 1.293 | 164-H | 5.25 |
| 230 | 650 | 8 1/2 | 1.293 | 164-X | 5.25 |
| 115 | 1040 | 8 1/2 | 1.293 | 170-H | 6.00 |
| 230 | 1040 | 8 1/2 | 1.293 | 170-X | 6.00 |
| 115 | 500 | 8 1/2 | 1.293 | 171-H | 5.60 |
| 230 | 500 | 8 1/2 | 1.293 | 171-X | 5.60 |
| 230 | 90 | 4 3/8 | 15/16 | 172-X | 3.20 |
| 230 | 140 | 4 3/8 | 15/16 | 173-X | 5.00 |
| 115 | 300 | 4 3/8 | 15/16 | †179-H | 4.40 |
| 230 | 300 | 4 3/8 | 15/16 | †179-X | 4.40 |
| 115 | 460 | 4 3/8 | 15/16 | †180-H | 4.00 |
| 230 | 460 | 4 3/8 | 15/16 | †180-X | 4.00 |
| 115 | 660 | 6 | 15/16 | †181-H | 5.00 |
| 230 | 660 | 6 | 15/16 | †181-X | 5.00 |

† Single unit with double winding to give three heats. Watts are maximum.

The length for the solid leads for the different units vary as follows:

| Symbol | 152-H, -X | 156-H, -X | 163-H, -X | 164-H, -X | 170-H, -X |
|---|---|---|---|---|---|
| Length of Lead | 2 7/16 in. | 3/4 in. | 3 1/2 in. | 7 3/16 in. | 7 3/16 in. |

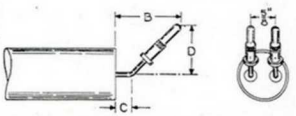
Shipping weights of cartridge units vary from ½ to 2 lb. depending on size.

**For control equipment, see pages 22 to 26.**

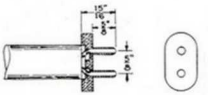
**EVERYTHING NEEDED FOR SMALL HEATING JOBS AND**

ULTIMHEAT®
VIRTUAL MUSEUM

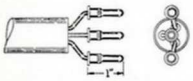
| Symbol | DIMEN. IN IN. (Fig. 1) | | |
|---|---|---|---|
| | B | C | D |
| 102-H | 49/64 | 9/64 | 1 17/32 |
| 103-H, -X | 1 5/8 | 13/32 | 1 1/4 |
| 113-H, -X | 49/64 | 7/64 | 1 9/16 |
| 154-X | 49/64 | 7/64 | 1 9/16 |



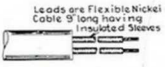

Symbols 102, 103, 113, and 154



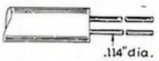
Symbols 109, 110, 111, 172, and 173



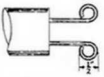
Symbols 147, 148, 179, 180, and 181




Symbols 141, 142, 143, 145, and 151



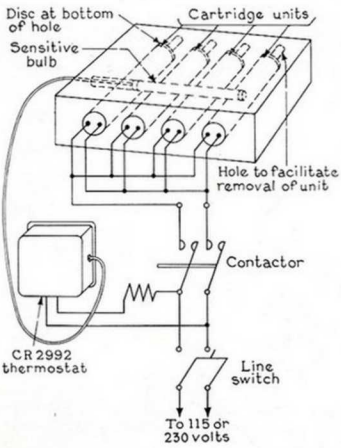

Symbols 152, 156, 163, 164, and 170



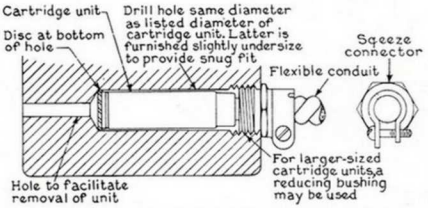
Symbols 162 and 171

## INSTALLATION AND APPLICATION

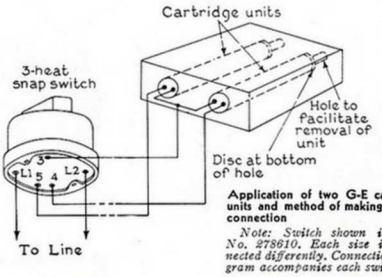
When installing a G-E cartridge-type heating unit, it is necessary only to provide a hole in the part to be heated of a diameter equal to the listed diameter of the cartridge unit to be inserted, which is slightly undersize. Wherever possible, it is advisable to extend the hole entirely through the part so that the unit can be driven out readily if the necessity for removing it ever arises. This is because a cartridge-type unit has the desirable feature of expanding when in use until it fits very tightly in its hole. This is advantageous from the standpoint of efficient thermal conductivity, but makes the unit difficult to remove unless a means is provided for driving it out, in which case it can be removed easily.




Application of G-E cartridge units with automatic temperature control




**Method of installing G-E cartridge unit in metal block to be heated**
*(This method can be varied to suit conditions and size of units.)*




**Application of two G-E cartridge units and method of making 3-heat connection**

*Note: Switch shown is Cat. No. 278610. Each size is connected differently. Connection diagram accompanies each switch.*

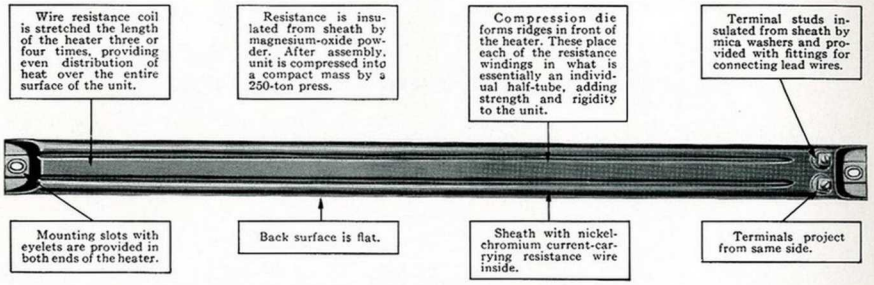
ULTIMHEAT®
VIRTUAL MUSEUM

# G-E STRIP HEATERS

The G-E strip heater serves the double purpose of air heater and clamp-on heater. As such, it is readily adaptable to the hundreds of varied uses throughout modern industry. A few of the common applications are for:

| | |
|---|---|
| Process machinery | Pipe lines |
| Drying ovens | Incubators |
| Matrix scorchers | Valve and pump houses |
| Warming tables | Telephone switchboards |
| Glue tables | Crane cabs |
| Water baths | Roll heating |
| Drying cabinets | Package machinery |

Compound tanks




**Front view of a G-E strip heater (both terminals at one end)**

**Back view of a G-E strip heater**

*G-E strip heaters are built to handle the most difficult heating jobs. They afford the following features:*

*Uniform heat distribution*
*Construction that withstands vibration*
*Compressed installation gives long life*
*Ridged construction gives unusual strength*
*Uniformity in every unit*
*Ease of installation*
*Moderate cost*

G-E strip heaters are available in two classes. The first is a steel-sheath heater for operation at sheath temperatures up to 750 deg. F. The other is a chrome-steel sheath heater for operation at sheath temperatures up to 1200 deg. F. Standard sizes of both are listed on page 9.

**EVERYTHING NEEDED FOR SMALL HEATING JOBS AND**

ULTIMHEAT® VIRTUAL MUSEUM

## MAXIMUM SHEATH TEMPERATURE, 750 DEG. F.

| Cat. No. | Symbol | Watts | Volts | Price | Approx. Ship. Wt. in Lb. | DIMENSIONS IN INCHES (See Fig. 1 and 2 below) Fig. | B | D | E |
|---|---|---|---|---|---|---|---|---|---|
| **TERMINALS AT ONE END** | | | | | | | | | |
| 51X340 | Y-3222 | 500 | 115 | $1.70 | 2 | 1 | 23½ | 22¾ | .... |
| 51X341 | Y-3222 | 500 | 230 | 1.70 | 2 | 1 | 23½ | 22¾ | .... |
| 51X338 | Y-3221 | 350 | 115 | 1.60 | 2 | 1 | 17⅝ | 16⅞ | .... |
| 51X339 | Y-3221 | 350 | 230 | 1.60 | 2 | 1 | 17⅝ | 16⅞ | .... |
| 51X336 | Y-3220 | 250 | 115 | 1.50 | 2 | 1 | 11¾ | 11 | .... |
| 51X337 | Y-3220 | 250 | 230 | 1.50 | 2 | 1 | 11¾ | 11 | .... |
| 51X334 | Y-3219 | 150 | 115 | 1.40 | 1 | 1 | 7 | 6 5/16 | .... |
| 51X335 | Y-3219 | 150 | 230 | 1.40 | 1 | 1 | 7 | 6 5/16 | .... |
| **TERMINALS AT BOTH ENDS** | | | | | | | | | |
| 51X348 | Y-3226 | 500 | 115 | $1.70 | 2 | 2 | 23½ | 22¾ | 20¾ |
| 51X349 | Y-3226 | 500 | 230 | .70 | 2 | 2 | 23½ | 22¾ | 20¾ |
| 51X346 | Y-3225 | 350 | 115 | 1.60 | 2 | 2 | 17⅝ | 16⅞ | 14⅞ |
| 51X347 | Y-3225 | 350 | 230 | 1.60 | 2 | 2 | 17⅝ | 16⅞ | 14⅞ |
| 51X344 | Y-3224 | 250 | 115 | 1.50 | 2 | 2 | 11¾ | 11 | 9 |
| 51X345 | Y-3224 | 250 | 230 | 1.50 | 2 | 2 | 11¾ | 11 | 9 |
| 51X342 | Y-3223 | 150 | 115 | 1.40 | 1 | 2 | 7 | 6 5/16 | 4¼ |
| 51X343 | Y-3223 | 150 | 230 | 1.40 | 1 | 2 | 7 | 6 5/16 | 4¼ |

## MAXIMUM SHEATH TEMPERATURE, 1200 DEG. F.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **TERMINALS AT ONE END** | | | | | | | | | |
| 45X915 | Y-3213 | 750 | 115 | $2.80 | 2 | 1 | 23½ | 22¾ | .... |
| 45X916 | Y-3213 | 750 | 230 | 2.80 | 2 | 1 | 23½ | 22¾ | .... |
| 45X913 | Y-3212 | 500 | 115 | 2.60 | 2 | 1 | 17⅝ | 16⅞ | .... |
| 45X914 | Y-3212 | 500 | 230 | 2.60 | 2 | 1 | 17⅝ | 16⅞ | .... |
| 45X911 | Y-3211 | 350 | 115 | 2.40 | 2 | 1 | 11¾ | 11 | .... |
| 45X912 | Y-3211 | 350 | 230 | 2.40 | 2 | 1 | 11¾ | 11 | .... |
| 45X909 | Y-3210 | 200 | 115 | 2.20 | 1 | 1 | 7 | 6 5/16 | .... |
| 45X910 | Y-3210 | 200 | 230 | 2.20 | 1 | 1 | 7 | 6 5/16 | .... |
| **TERMINALS AT BOTH ENDS** | | | | | | | | | |
| 45X923 | Y-3217 | 750 | 115 | $2.80 | 2 | 2 | 23½ | 20¾ | 20¾ |
| 45X924 | Y-3217 | 750 | 230 | 2.80 | 2 | 2 | 23½ | 20¾ | 20¾ |
| 45X921 | Y-3216 | 500 | 115 | 2.60 | 2 | 2 | 17⅝ | 16⅞ | 14⅞ |
| 45X922 | Y-3216 | 500 | 230 | 2.60 | 2 | 2 | 17⅝ | 16⅞ | 14⅞ |
| 45X919 | Y-3215 | 350 | 115 | 2.40 | 2 | 2 | 11¾ | 11 | 9 |
| 45X920 | Y-3215 | 350 | 230 | 2.40 | 2 | 2 | 11¾ | 11 | 9 |
| 45X917 | Y-3214 | 200 | 115 | 2.20 | 1 | 2 | 7 | 6 5/16 | 4¼ |
| 45X918 | Y-3214 | 200 | 230 | 2.20 | 1 | 2 | 7 | 6 5/16 | 4¼ |

These heaters can be connected in series for use on 440- or 550-volt circuits. For these higher voltages, secondary insulation is recommended, especially at sheath temperatures above 600 deg. F.

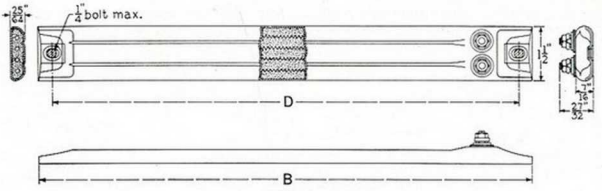



Fig. 1
Dimensions of G-E single-end strip heater

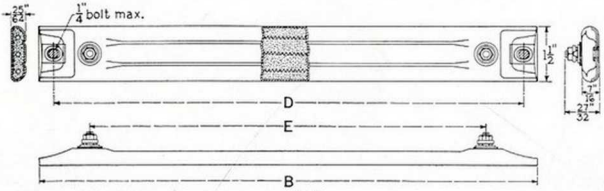


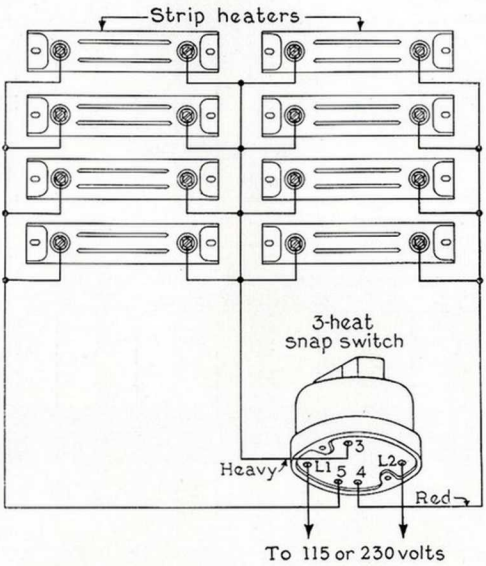

Fig. 2
Dimensions of G-E double-end strip heater

For control equipment, see pages 22 to 26.

ULTIMHEAT®
VIRTUAL MUSEUM

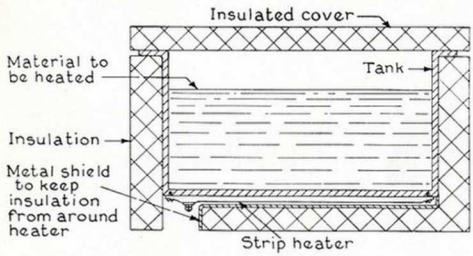
# G-E STRIP HEATERS

## INSTALLATION AND APPLICATION

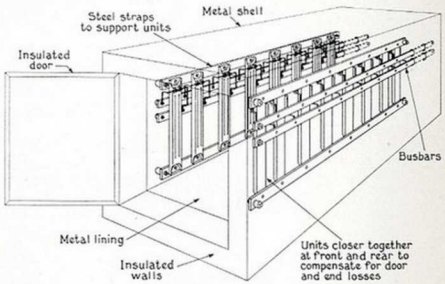



**Arrangement of G-E strip heaters with 3-heat manual control**

*Note: Switch shown is Cat. No. 278610. Each size is connected differently. Connection diagram accompanies every switch.*




**Contact heating of tanks by means of G-E strip heaters**




**G-E strip heaters mounted in a small oven**

EVERYTHING NEEDED FOR SMALL HEATING JOBS AND

# MISCELLANEOUS G-E HELICOIL SHEATH-WIRE HEATING UNITS

ULTIMHEAT® VIRTUAL MUSEUM

G-E Helicoil sheath wire of some rating, material, or form can be applied to practically every low-temperature (1200 deg. F. or less) requirement. The units are ductile and can be bent (on a minimum radius equal to the diameter of the sheath) to almost any shape without injury. Neither the sheath nor the core will crack or break, and the heating element remains centrally located in the tube.

Not only can the units be formed into various shapes, but the steel-sheath units also lend themselves admirably to casting into metals such as iron and aluminum.

The sheath-wire construction is well adapted to the heating of liquids such as water and oil. The unit is immersed directly into the liquid with the terminals brought outside, the sheath being of suitable material to withstand the action of the liquid, and the rating being such as will operate successfully without overheating. Copper sheath is used for water immersion and steel sheath for mineral oil.

A steel-sheath unit of suitable rating can be operated in the air or clamped to a metal surface without injury, provided the temperature does not exceed a safe limit.

Where the unit is to be clamped in close contact with a metal surface, the heat dissipation per square inch can be greatly increased because the metal surface conducts the heat away from the unit and prevents overheating.

Straight-length, annealed, sheath-wire units available for immediate shipment are listed below.

## STRAIGHT-LENGTH, SHEATH-WIRE UNITS

| Watts | * Volts | Cat. No. | Price | Approx. Ship. Wt. in Lb. | APPROX. DIMENSIONS IN INCHES (See Fig. BELOW) A | B | C | Effective Heating Length | Watts per Sq. In. | Sheath Material | Suggested Applications | Maximum Sheath Temperature |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 500 | 115 | 28X690 | $ 2.40 | 2 | 23⅜ | 22 | 0.333 | 17½ | 27 | | | |
| 500 | 230 | 28X691 | 2.40 | 2 | 23¾ | 22 | 0.333 | 17½ | 27 | | | |
| 1000 | 115 | 54X172 | 6.40 | 3 | 39½ | 37¾ | 0.496 | 31 | 20 | | | |
| 1000 | 230 | 54X173 | 6.40 | 3 | 39½ | 37¾ | 0.496 | 31 | 20 | | | |
| 1500 | 115 | 54X174 | 8.20 | 4 | 55 | 53¼ | 0.496 | 48½ | 20 | | | |
| 1500 | 230 | 54X175 | 8.20 | 4 | 55 | 53¼ | 0.496 | 48½ | 20 | | | |
| 2000 | 115 | 54X176 | 10.50 | 5 | 75 | 73¼ | 0.496 | 67 | 20 | | | |
| 2000 | 230 | 54X177 | 10.50 | 5 | 75 | 73¼ | 0.496 | 67 | 20 | | | |
| 2500 | 115 | 54X178 | 12.00 | 5 | 87 | 85¼ | 0.496 | 78½ | 20 | | | |
| 2500 | 230 | 54X179 | 12.00 | 5 | 87 | 85¼ | 0.496 | 78½ | 20 | | | |
| 5000 | 115 | 54X184 | 14.50 | 5 | 97 | 95½ | 0.550 | 68 | 42 | | | |
| 5000 | 230 | 28X696 | 14.50 | 5 | 97 | 95½ | 0.550 | 68 | 42 | | | |
| 500 | 115 | 28X697 | 10.70 | 5 | 102½ | 101 | 0.280 | 96 | 6 | | | |
| 500 | 230 | 28X698 | 10.70 | 5 | 102½ | 101 | 0.280 | 96 | 6 | | | |
| 650 | 115 | 28X699 | 10.70 | 5 | 94½ | 92¾ | 0.280 | 86 | 8½ | | | |
| 650 | 230 | 54X171 | 10.70 | 5 | 94½ | 92¾ | 0.280 | 86 | 8½ | | | |
| 600 | 115 | 28X692 | 2.40 | 2 | 19½ | 17¾ | 0.333 | 14 | 41 | | | |
| 600 | 230 | 28X693 | 2.40 | 2 | 19½ | 17¾ | 0.333 | 14 | 41 | | | |
| 1000 | 115 | 28X694 | 2.60 | 2 | 23½ | 21¾ | 0.333 | 18 | 53 | | | |
| 1000 | 230 | 28X695 | 2.60 | 2 | 23½ | 21¾ | 0.333 | 18 | 53 | | | |
| 2500 | 115 | 54X180 | 7.40 | 4 | 47 | 45¼ | 0.496 | 39 | 41 | | | |
| 2500 | 230 | 54X181 | 7.40 | 4 | 47 | 45¼ | 0.496 | 39 | 41 | | | |
| 5000 | 115 | 54X182 | 12.00 | 5 | 87 | 85¼ | 0.496 | 79 | 41 | | | |
| 5000 | 230 | 54X183 | 12.00 | 5 | 87 | 85¼ | 0.496 | 79 | 41 | | | |

| | | | | |
|---|---|---|---|---|
| 500–5000 | 115–230 | 54X184–54X183 | 14.50–12.00 | 5 |
| | | | | |
| 500–650 | 115–230 | 28X697–54X171 | 10.70 | 5 |
| | | | | |
| 600–1000 | 115–230 | 28X692–28X695 | 2.40–2.60 | 2 |
| | | | | |
| 2500–5000 | 115–230 | 54X180–54X183 | 7.40–12.00 | 4–5 |

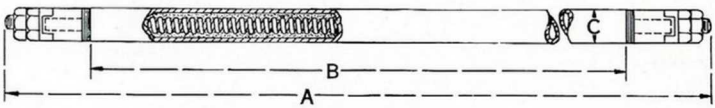
Steel — Contact heating of metal, casting-in, heating of oils, etc. — 750° F.

Steel — Soft-metal melting and casting-in. — 750° F.

Calorized steel — Air heating, contact heating of metal. — 1000° F.

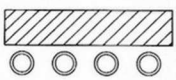
Copper — Water heating. — 212° F.

* 230-volt units of diameters 0.496 in. and larger can be operated in series on 440 volts.

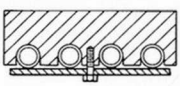



## INSTALLATION AND APPLICATION

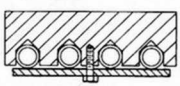
A few suggested applications of straight-length, sheath-wire units are mentioned in the table above, but their field of utility is practically unlimited. A common use for a straight-length, steel-sheath unit is in the heating of metal plates. Four methods of doing this are illustrated below:



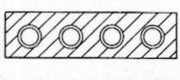
*Indirect heating using air as the conductor. Especially suited for medium- and low-temperature work where uniform heat distribution is essential.*



*Straight-length G-E Helicoil sheath-wire units are readily applied in machined grooves, in the manner illustrated, for heating flat metal plates.*



*Formations of sheath wire, placed in grooves, which are more readily cast than machined.*



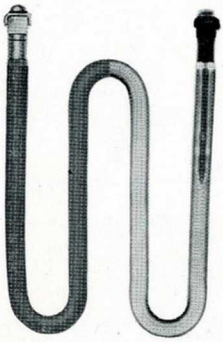
*Unit cast integral. This arrangement, because of better heat distribution and transfer, is the most effective method of mounting, where it can possibly be utilized.*

**Four methods of heating a metal plate with G-E Helicoil sheath wire**

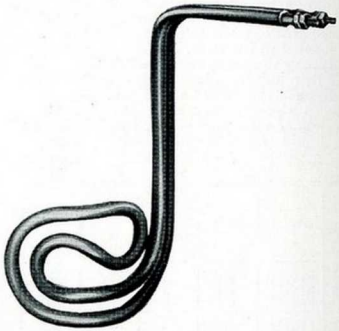
**For control equipment, see pages 22 to 26.**

ULTIMHEAT®
VIRTUAL MUSEUM

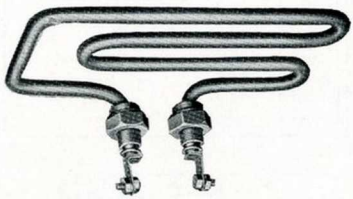
# MISCELLANEOUS G-E HELICOIL SHEATH-WIRE HEATING UNITS



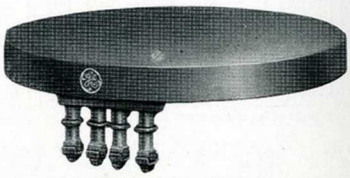
X-ray view of formed sheath-wire unit



Steel-sheath-wire unit showing possibilities of unusual formation



This 1250-watt unit heats oil in an egg sealer (Note bushing for bringing out terminal)



A cast-in hotplate, rated 1000 watts, used for heating compound

In many cases, a straight unit, as described on page 11, cannot be used. In fact, by far the larger proportion of sheath-wire units in use are bent into different shapes. Helicoil sheath wire lends itself especially to such applications, as it may be formed (on a minimum radius equal to the diameter of the sheath) in practically any shape without injury. Neither the sheath nor the core will crack or break, and the heating element remains centrally located in the tube as shown in the x-ray view. Some of the forms and types of Helicoil sheath wire in use to-day are illustrated above.

The sheath or tube of the unit is made of different metals and alloys, depending upon the conditions under which it is to be used.

A steel sheath is used when the unit will not exceed a temperature of about 750 deg. F., such as in heating air, hotplates, process machines, etc. It is also used in heating mineral oils.

A special nickel-silver alloy sheath which is practically rust-proof is used where the unit may be subjected to temperatures up to 1000 deg. F.

A rust-resisting chrome-steel sheath is used where the unit is operated at sheath temperatures up to 1200 deg. F.

A copper sheath is used for immersion in water and similar liquids.

A nickel-plated copper sheath is used for heating vegetable oils, such as are used in frying doughnuts.

It is frequently necessary to provide a unit with a large radiating surface which will be evenly heated and will withstand relatively high temperatures. For such cases, the sheath-wire unit is cast into iron and is known as a cast-in unit. This is done by actually placing the unit in the mold and pouring the molten iron around it. Units of this nature are used in electrically heated pots for melting tin, lead, babbitt, and solder. They are also used as hot plates for heating mixing cylinders, autoclaves, molds, and many other applications.

# G-E CAST-IN HOTPLATES

## MAXIMUM PLATE-SURFACE TEMPERATURE, 950 DEG. F.

ULTIMHEAT®
VIRTUAL MUSEUM

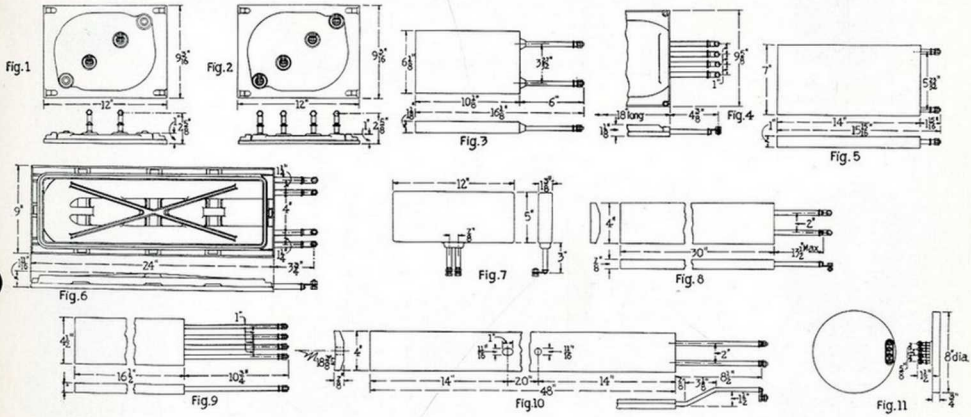
G-E cast-in hotplates, consisting of G-E Helicoil sheath wire cast into iron, are widely used for clamping to metal surfaces to be heated. They are also used for making electric stoves for heating kettles, compounds before molding, etc. A typical hotplate is shown on the page opposite.

| Watts | Volts | Symbol | Cat. No. | Price | APPROX. DIMENSIONS IN INCHES | | | | No. of Heats |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Width | Length | Thickness | Fig. | |
| **RECTANGULAR** | | | | | | | | | |
| 1600 | 115 | Y-2462 | 28X717 | $35 | 9 3/16 | 12 | 1 | 1 | 1 |
| 1600 | 230 | Y-2462 | 28X718 | 35 | 9 3/16 | 12 | 1 | 1 | 1 |
| 1750 | 115 | Y-2461 | 28X719 | 40 | 9 3/16 | 12 | 1 | 2 | 3 |
| 1750 | 230 | Y-2461 | 28X720 | 40 | 9 3/16 | 12 | 1 | 2 | 3 |
| 1875 | 115 | Y-1519 | 28X713 | 20 | 6 1/8 | 10 1/8 | 1 1/8 | 3 | 1 |
| 1875 | 230 | Y-1519 | 28X714 | 20 | 6 1/8 | 10 1/8 | 1 1/8 | 3 | 1 |
| 2000 | 115 | Y-1556 | 28X715 | 30 | 7 | 14 | 1 | 5 | 1 |
| 2000 | 230 | Y-1556 | 28X716 | 30 | 7 | 14 | 1 | 5 | 1 |
| 2000 | 115 | Y-1546 | *28X721 | 50 | 9 5/8 | 18 | 1 1/8 | 4 | 3 |
| 2000 | 230 | Y-1546 | *28X722 | 50 | 9 5/8 | 18 | 1 1/8 | 4 | 3 |
| 2200 | 115 | Y-1537 | 28X709 | 23 | 4 1/2 | 16 1/2 | 1 | 9 | 3 |
| 2200 | 230 | Y-1537 | 28X710 | 23 | 4 1/2 | 16 1/2 | 1 | 9 | 3 |
| 2500 | 115 | Y-1589 | *28X711 | 20 | 5 | 12 | 1 3/8 | 7 | 1 |
| 2500 | 230 | Y-1589 | *28X712 | 20 | 5 | 12 | 1 3/8 | 7 | 1 |
| 2800 | 115 | Y-1577 | 28X707 | 36 | 4 | 30 | 7/8 | 8 | 1 |
| 2800 | 230 | Y-1577 | 28X708 | 36 | 4 | 30 | 7/8 | 8 | 1 |
| 4000 | 115 | Y-1573 | *28X723 | 66 | 9 | 24 | 1 11/16 | 6 | 3 |
| 4000 | 230 | Y-1573 | *28X724 | 66 | 9 | 24 | 1 11/16 | 6 | 3 |
| 4500 | 115 | Y-1152 | 28X705 | 60 | 4 | 48 | 7/8 | 10 | 1 |
| 4500 | 230 | Y-1152 | 28X706 | 60 | 4 | 48 | 7/8 | 10 | 1 |
| **CIRCULAR** | | | | | | | | | |
| 1000 | 115 | Y-2451 | 28X725 | $20 | 8-in. diameter | | 3/4 | 11 | 3 |
| 1000 | 230 | Y-2451 | 28X726 | 20 | 8-in. diameter | | 3/4 | 11 | 3 |

* May be operated in series on 440-volt circuit.

None of the hotplates listed above is carried in stock but any will be made up to purchaser's individual orders. When sizes other than the above are required, they can be manufactured when warranted by the individual demand.

When a hotplate, as listed above, is suitable as to size but not satisfactory as to rating, it is sometimes possible to change the rating without influencing the price.




For control equipment, see pages 22 to 26.

ULTIMHEAT®
VIRTUAL MUSEUM

# G-E METAL-MELTING POTS

## FOR SOFT METALS

### MAXIMUM OPERATING TEMPERATURE, 950 DEG. F.

These pots are designed for melting lead, babbitt, tin, solder, type metal, and similar alloys or metals, except spelter or zinc, at temperatures not exceeding 950 deg. F. Each pot consists of a durable, sheet-steel, cylindrical casing, in which is supported a cast-iron crucible of the dimensions specified in the table. The space between the casing and crucible is efficiently insulated with a compact heat insulator. The heating units, which are the G-E cast-in immersion type, are suspended from the rim of the pot and extend directly into the metal to be melted —affording maximum efficiency and speed in heating.

| CAPACITY IN LB. (Approx.) | | | | Voltage A-c. or D-c. | Cat. No. | * Price | Approx. Ship. Wt. in Lb. | WATTAGE | | | APPROX. DIMENSIONS IN INCHES | | | | SINGLE HEATING UNITS (See Dimensions Below) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Inside | | Outside | | | | | |
| 50/50 Solder | Lead | Babbitt | Tin | | | | | High | Medium | Low | Diam. | Depth | Diam. | Depth | Rating in Watts | Cat. No. of Unit | Price | Approx. Ship. Wt. in Lb. |
| 28 | 35 | † | 25 | 230 | 2881146G3 | $42 | 50 | 750 | ..... | .... | 6 | 4 | 9 | 10 | 750 | 4X994 | $20 | 12 |
| 28 | 35 | 33 | 25 | 115 | 2881146G2 | 42 | 50 | 750 | ..... | .... | 6 | 4 | 9 | 10 | 750 | 4X993 | 20 | 12 |
| 28 | 35 | 33 | 25 | 230 | 2881146G5 | 44 | 50 | 1000 | ..... | .... | 6 | 4 | 9 | 10 | 1000 | 4X996 | 22 | 12 |
| 28 | 35 | 33 | 25 | 115 | 2881146G4 | 44 | 50 | 1000 | ..... | .... | 6 | 4 | 9 | 10 | 1000 | 4X995 | 22 | 12 |
| 100 | 135 | 125 | 90 | 230 | 2666404G1 | 110 | 130 | 2500 | 1500 | 1000 | 8 | 6 | 14 | 14 | 1000<br>1500 | 297549<br>297551 | 22<br>24 | 12<br>12 |
| 100 | 135 | 125 | 90 | 115 | 2666404G2 | 110 | 130 | 2500 | 1500 | 1000 | 8 | 6 | 14 | 14 | 1000<br>1500 | 297548<br>297550 | 22<br>24 | 12<br>12 |
| 330 | 425 | 390 | 270 | 230 | 2666407G1 | 215 | 250 | 5000 | 3000 | 2000 | 12 | 9 | 18¾ | 20½ | 2000<br>3000 | 297553<br>297555 | 39<br>41 | 30<br>30 |
| 330 | 425 | 390 | 270 | 115 | 2666407G2 | 215 | 250 | 5000 | 3000 | 2000 | 12 | 9 | 18¾ | 20½ | 2000<br>3000 | 297552<br>297554 | 39<br>41 | 30<br>30 |

**Larger sizes, up to 3000-lb. capacity, are also standard and available for quick delivery.**
* Price covers pot with heating unit installed. Control equipment not included. For control equipment see page 27.
† When this size of pot is wanted for melting babbitt, it is necessary to use either Cat. No. 2881146G4 or Cat. No. 2881146G5.

**Fig. 1**
**Metal-melting pot, Cat. No. 2881146G2, 2881146G3, 2881146-G4, or 2881146G5**

| Cat. No. of Unit | DIMENSIONS IN INCHES (Fig. 2) | | | | | Volume in Cu. In. |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | |
| 4X994<br>4X993<br>4X996<br>4X995 | 5½ | 4½ | 2½ | 1½ | 2½ | 26 |

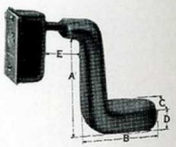



**Fig. 2**
**Type of cast-in immersion unit used with metal-melting pots illustrated by Fig. 1**

**Fig. 3**
**Metal-melting pot, Cat. No. 2666404G1, 2666404G2, 2666407G1, or 2666407G2**

| Cat. No. of Unit | DIMENSIONS IN INCHES (Fig. 4) | | | | | Volume in Cu. In. |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | |
| 297551<br>297549<br>297550<br>297548 | 8¼ | 7 5/16 | 1⅜ | 2 | 3¾ | 36 |
| 297555<br>297553<br>297554<br>297552 | 11½ | 11 | 2⅜ | 2¾ | 4¼ | 96 |

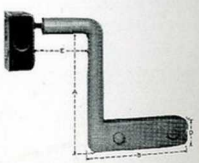


**Fig. 4**
**Type of cast-in immersion unit used with metal-melting pots illustrated by Fig. 3**

For control equipment, see page 27.

EVERYTHING NEEDED FOR SMALL HEATING JOBS AND

ULTIMHEAT®
VIRTUAL MUSEUM

# G-E METAL-MELTING POT

## FOR SOFT METALS

### MAXIMUM OPERATING TEMPERATURE, 850 DEG. F.

| CAPACITY IN LB. (APPROX.) | | | Volts A-c. or D-c. | Cat. No. | * Price | Approx. Ship. Wt. in Lb. | Watts | APPROX. DIMEN. IN IN. | | | | SINGLE HEATING UNIT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Inside | | Outside | | | | |
| 50/50 Solder | Lead | Babbitt | | | | | | Diam. | Depth | Diam. | Depth | Cat. No. | Price | Approx. Ship. Wt. in Lb. |
| 12 | 16 | 15 | 115 | 3887185G2 | $20.00 | 18 | 500 | 4¼ | 3 7/8 | 9 | 6½ | 48X260 | $9.00 | 3 |
| 12 | 16 | 15 | 230 | 3887185G3 | 20.00 | 18 | 500 | 4¼ | 3 7/8 | 9 | 6½ | 48X261 | 9.00 | 3 |

* Price covers melting pot with unit, 6 ft. of cable, and connecting plug.

Cat. No. 48X260 and 48X261 heating unit

Cat. No. 3887185G2 and 3887185G3 melting pots are similar in construction to the melting pots listed on page 14. The heating unit is of G-E Helicoil sheath wire utilizing heavy-wall steel tubing.

Each pot is equipped with a bail and 6 ft. of cord with suitable attaching plug, affording ready portability.

Cat. No. 3887185G2 and 3887185G3 metal-melting pot

# G-E PORTABLE TINNING POT

### MAXIMUM OPERATING TEMPERATURE, 500 DEG. F.

| Watts | Volts | †Cat. No. | Price | Approx. Ship. Wt. in Lb. | APPROX. DIMENSIONS IN INCHES | | | | RENEWAL PARTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Inside | | Outside | | Heating Unit | §Cord and Plug |
| | | | | | Diam. | Depth | Diam. | Depth | Price | Price |
| 150 | 115 | 3648750G1 | $10.00 | 6 | 2½ | 1 | 5 | 4½ | $2.25 | $0.90 |

†Cat. No. includes pot, cord, and plug, as shown below.

§ Consists of 4 ft. of heavy Deltabeston heater cord and Cat. No. GE1582 plug.

Cat. No. 3648750G1 portable tinning pot

## APPLICATION

The portable tinning pot, Cat. No. 3648750G1, is a convenient device for small tinning and soldering operations. It is of good mechanical design and efficiently heat insulated, being built on the same principle as the larger melting pots.

## DESCRIPTION

The heating unit is of the G-E cartridge type and dissipates 150 watts. It is placed in a boss cast on the bottom of the crucible and is readily removable. The crucible and base are made of cast iron and the jacket is made of sheet steel. The cord is heavy Deltabeston heater cord and the plug is of the armored type.

This pot is particularly designed for solder and tin, having a maximum operating temperature of 500 deg. F. Only about 15 minutes is required to reduce the full contents of the pot to working temperature.

ULTIMHEAT®
VIRTUAL MUSEUM

# G-E CAST-IN IMMERSION UNITS

## FOR METAL-MELTING POTS

MAXIMUM TEMPERATURE, 950 DEG. F.

G-E cast-in immersion units of the type employed with G-E metal-melting pots are available in a great variety of sizes and shapes for larger-production melting pots handling lead, solder, babbitt, tin, type metal, and similar alloys. Some of these units are listed below.

| Watts | Volts | Cat. No. | * Price | Approx. Ship. Wt. in Lb. | Fig. No. | APPROX. DIMENSIONS IN INCHES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | A | B | C | D | E (Should be specified when ordering) |
| 5000 | 115 | 15X736 | $55 | 30 | 1 | 12¼ | 16 | 1⅞ | 3 | 4" min. to 9" max. |
| 5000 | 230 | 15X737 | 55 | | | | | | | |
| 2000 | 115 | 39X79 | 39 | 15 | 3 | 4⅞ | 7 | 2½ | 1½ | 4¼" min. to 4¾" max. |
| 2000 | 230 | 39X80 | 39 | | | | | | | |
| 1500 | 115 | 39X65 | 24 | 15 | 2 | 2 | 8½ | 3¼ | 2 | ..... |
| 1500 | 230 | 39X66 | 24 | | | | | | | |
| 2200 | 115 | 39X67 | 27 | 20 | 2 | 2 | 12½ | 3¼ | 2 | ..... |
| 2200 | 230 | 39X68 | 27 | | | | | | | |
| 3000 | 115 | 39X69 | 30 | 25 | 2 | 2 | 18 | 3¼ | 2 | ..... |
| 3000 | 230 | 39X70 | 30 | | | | | | | |
| 4500 | 220 | 29X741 | 59 | 32 | 4 | 13¾ | 7 | .... | 10⅝ | 4½" min. to 9" max. |
| 5000 | 230 | 29X741 | 59 | | | | | | | |
| 5500 | 240 | 29X741 | 59 | | | | | | | |
| 4500 | 220 | 29X742 | 59 | 35 | 5 | 18½ | 7 | .... | 10⅝ | 4½" min. to 9" max. |
| 5000 | 230 | 29X742 | 59 | | | | | | | |
| 5500 | 240 | 29X742 | 59 | | | | | | | |
| 9000 | 220 | 29X743 | 100 | 60 | 6 | 19 | 9 | .... | 11 | 4½" min. to 9" max. |
| 10000 | 230 | 29X743 | 100 | | | | | | | |
| 11000 | 240 | 29X743 | 100 | | | | | | | |

* Price covers unit with terminal box as illustrated in Fig. 1 to 6. Where units are used in the presence of acid fumes, excessive oil, or moisture, the sealed-terminal box illustrated by Fig. 7 should be specified. Price $3.00 additional.

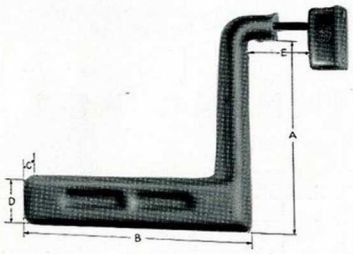



Fig. 1
Cat. No. 15X736 and 15X737

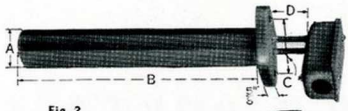



Fig. 2
Cat. No.
39X65 to 39X70
inclusive

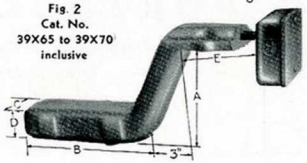



Fig. 3
Cat. No. 39X79 and 39X80

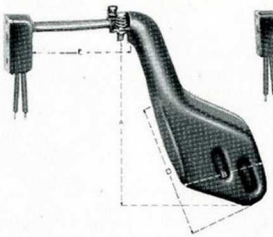



Fig. 4
Cat. No. 29X741

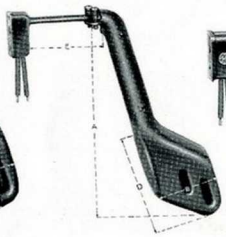



Fig. 5
Cat. No. 29X742

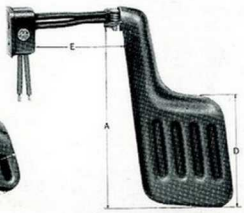



Fig. 6
Cat. No. 29X743

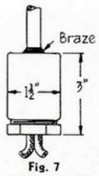



Fig. 7
Moisture-proof terminal

For control equipment, see pages 22 to 26.

EVERYTHING NEEDED FOR SMALL HEATING JOBS AND

# G-E GLUEPOTS

ULTIMHEAT® ARTIFACT MUSEUM

G-E gluepots are manufactured in two distinct types distinguished by their method of heating the glue. The jacketless type has no water jacket and heats the glue by direct thermal contact with the walls of the pot. It is designed for continuous operation and serves admirably as a temperature-holding pot in cases where glue is supplied from some central cooker. The water-jacketed type has an interposed heating medium, water, and is particularly adapted for quick, intermittent service. G-E cartridge units are used in both types.

**JACKETLESS (Single Heat)**

| Capacity in Quarts | Volts | Watts | Fig. No. | Type | * Cat. No. | Price | Approx. Ship. Wt. in Lb. | OUTSIDE DIMEN. IN IN. | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Height | Diameter |
| 1 | 115 | 70 | 1 | I-1 | 269853 | $16.00 | 4¾ | 6 1/16 | 6 |
| 1 | 230 | 70 | 1 | I-1 | 269855 | 16.00 | 4¾ | 6 1/16 | 6 |
| 2 | 115 | 90 | 1 | I-64 | 259989 | 18.50 | 5½ | 7¼ | 7 |
| 2 | 230 | 90 | 1 | I-64 | 259991 | 18.50 | 5½ | 7¼ | 7 |
| 4 | 115 | 140 | 1 | I-68 | 259994 | 20.75 | 7⅜ | 9⅛ | 8 5/16 |
| 4 | 230 | 140 | 1 | I-68 | 259996 | 20.75 | 7⅜ | 9⅛ | 8 5/16 |

**WATER-JACKETED (Three Heats)**

| Capacity in Quarts | † Volts | WATTS | | | Fig. No. | Type | ‡Cat. No. | PRICE | | Approx. Ship. Wt. in Lb. | OUTSIDE DIMEN. IN IN. | | Average Time Required to Heat from 70 to 150 Deg. F. on High Heat in Minutes | Average Constant Temperature in Pot at Low Heat in Deg. F. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Low Heat | Medium Heat | High Heat | | | | Complete | Less Cover | | Height | Diam. | | |
| 1 | 115 | 75 | 150 | 300 | 2 | I-72 | 280486 | $16.50 | $15.25 | 25 | 6¼ | 7¼ | 45 | 165 |
| 1 | 230 | 75 | 150 | 300 | 2 | I-72 | 280487 | 16.50 | 15.25 | 25 | 6¼ | 7¼ | 45 | 165 |
| 2 | 115 | 115 | 230 | 460 | 2 | I-73 | 280488 | 18.50 | 17.25 | 28 | 8¼ | 8¼ | 40 | 165 |
| 2 | 230 | 115 | 230 | 460 | 2 | I-73 | 280489 | 18.50 | 17.25 | 28 | 8¼ | 8¼ | 40 | 165 |
| 4 | 115 | 165 | 330 | 660 | 2 | I-74 | 280490 | 24.00 | 21.75 | 40 | 8½ | 11 | 60 | 165 |
| 4 | 230 | 165 | 330 | 660 | 2 | I-74 | 280491 | 24.00 | 21.75 | 40 | 8½ | 11 | 60 | 165 |

* Each pot is provided with contact plug, 8 ft. of cable, and socket attaching plug.
† The 115-volt pot operates satisfactorily on voltages from 110 to 120 and the 230-volt pot on from 220 to 240 volts.
‡ Each pot is provided with contact plug, 8 ft. of cable, and a 3-heat plug on the cable.

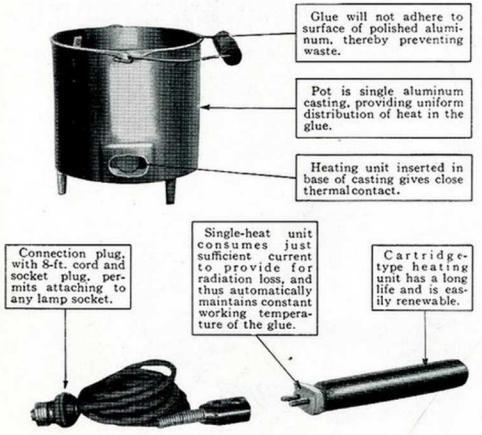



Fig. 1
Jacketless gluepot

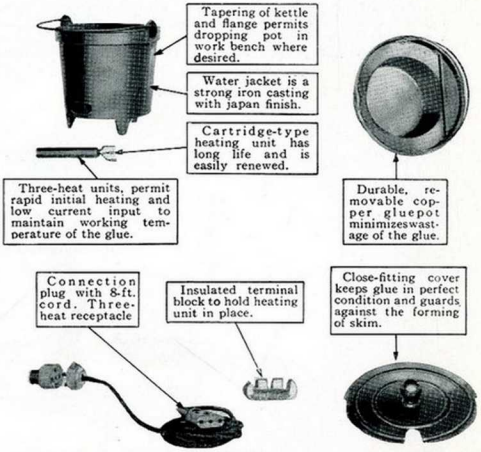



Fig. 2
Water-jacketed gluepot

**ALL OBTAINABLE FROM ONE DEPENDABLE MANUFACTURER**

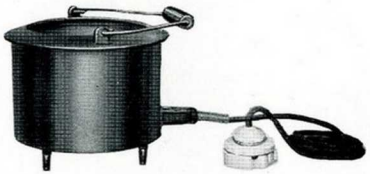
ULTIMHEAT®
VIRTUAL MUSEUM

# G-E COMPOUND-MELTING POT

The G-E compound-melting pot, made in 4-quart size and 3-heat design, is widely used for the melting of battery compounds and compositions of like nature. It requires approximately 50 minutes at 680 watts to melt the compound thoroughly (with the pot containing 4 quarts of compound). After the compound has been melted, either medium or low heat is sufficient to maintain working conditions. The heating element is a standard G-E cartridge unit.

| WATTS | | | Cat. No. | PRICE | | Approx. Ship. Wt. in Lb. | APPROX. DIMENSIONS IN IN. | |
|---|---|---|---|---|---|---|---|---|
| High | Medium | Low | | *115 Volts | *230 Volts | | Height | Diam. |
| 680 | 340 | 170 | 224377 | $22.00 | $22.00 | 31 | 8 3/16 | 9 5/8 |

* *Specify voltage when ordering.*



3-heat compound-melting pot

# G-E SOLDERING IRONS

G-E electric soldering irons are the result of considerable study and experiment. In addition to many features which have long been recognized as essential, there are incorporated several new improvements which make these electric soldering irons the best on the market to-day.

The Types I-80 and I-75 irons are designed primarily for light service, such as on radio sets and for splicing small wire.

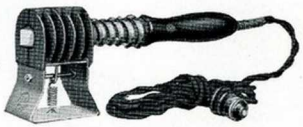
Types I-76 and I-77 are designed primarily for intermittent service, such as soldering light metal sheets and soldering jobs around the garage and house where a general-service iron should be used.

Types I-78 and I-79 are designed primarily for relatively heavy continuous work, such as cornice work, soldering armature coils, etc. They are also particularly adaptable to heavy intermittent work, since they may be kept at the correct soldering temperature indefinitely in the radiating stands without danger of overheating or burning out. These irons must not be allowed to remain idle with the current on when not in use unless placed in the radiating stand, because otherwise they will overheat and are liable to burn out.

All of these irons are equipped with G-E cartridge-type heating units.

Typical light-duty soldering iron, Type 1-80

Typical light- or intermittent-duty soldering iron, Type I-75, I-76, or I-77



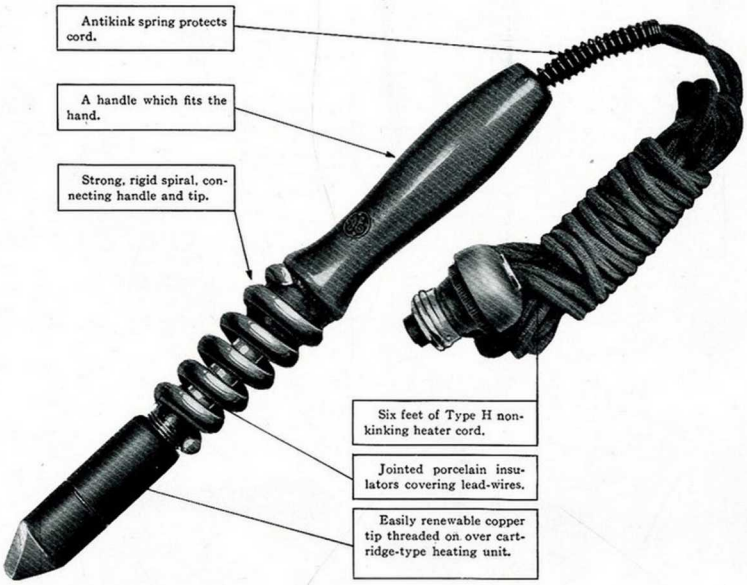
Typical heavy-duty soldering iron, Type -78 or I-79, with radiating stand

# G-E SOLDERING IRONS

ULTIMHEAT®
VIRTUAL MUSEUM

| COMPLETE IRONS | | | | | | | | RENEWAL PARTS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | WEIGHT | | COPPER TIPS | | HEATING UNITS | | | |
| Diam. of Tip in In. | Watts | Type No. | Cat. No. | Volts | Price | Net in Oz. Excl. Stand | Ship. in Lb. | Price | Net Wt. in Oz. | Symbol | Price | Supporting and Radiating Stands Price | Socket Plug and Heater Cord Price |
| **FOR LIGHT DUTY** | | | | | | | | | | | | | |
| 3/4 | 100 | I-80 | 43X700 | 115 | $4.50 | 15 | 1 1/2 | $0.30 | 1 | 183-H | $2.00 | $0.20 | $0.90 |
| 3/8 | 100 | I-80 | 43X701 | 230 | 4.50 | 15 | 1 1/2 | .30 | 1 | 183-X | 2.00 | .20 | .90 |
| 1/4 | 75 | I-75 | 291880 | 115 | 5.25 | 15 | 1 1/4 | .90 | 3 | 174-H | 2.00 | .20 | .90 |
| 1/2 | 75 | I-75 | 291882 | 230 | 5.25 | 15 | 1 1/2 | .90 | 3 | 174-X | 2.00 | .20 | .90 |
| **FOR INTERMITTENT DUTY** | | | | | | | | | | | | | |
| 3/4 | 100 | I-76 | 291883 | 115 | $5.25 | 16 | 1 1/2 | $0.90 | 4 | 175-H | $2.00 | $0.20 | $0.90 |
| 3/4 | 100 | I-76 | 291885 | 230 | 5.25 | 16 | 1 1/2 | .90 | 4 | 175-X | 2.00 | .20 | .90 |
| 1 | 150 | I-77 | 291886 | 115 | 5.85 | 27 | 2 1/4 | 1.20 | 9 | 176-H | 2.20 | .20 | .90 |
| 1 | 150 | I-77 | 291888 | 230 | 5.85 | 27 | 2 1/4 | 1.20 | 9 | 176-X | 2.20 | .20 | .90 |
| **FOR HEAVY DUTY** | | | | | | | | | | | | | |
| 1 | 225 | I-78 | 291889 | 115 | * $8.55 | 27 | 4 1/2 | $1.00 | 9 | 177-H | $2.30 | $3.00 | $0.90 |
| 1 | 225 | I-78 | 291891 | 230 | * 8.55 | 27 | 4 1/2 | 1.00 | 9 | 177-X | 2.30 | 3.00 | .90 |
| 1 1/4 | 350 | I-79 | 291892 | 115 | * 10.25 | 34 | 5 1/4 | 1.50 | 16 | 178-H | 2 50 | 3.80 | .90 |
| 1 1/4 | 350 | I-79 | 291894 | 230 | * 10.25 | 34 | 5 1/4 | 1.50 | 16 | 178-X | 2.50 | 3.80 | .90 |

* Price includes radiating stand as shown in illustration on page 18.




**ALL OBTAINABLE FROM ONE DEPENDABLE MANUFACTURER**

ULTIMHEAT®
VIRTUAL MUSEUM

# G-E INDUSTRIAL AIR HEATERS

These convenient, easily installed air heaters are just the thing for heating those out-of-the-way places that are a perplexing problem in cold weather. Here is a list of common applications which are suggestive of many others:

| | | |
|---|---|---|
| Substations | Electric locomotives | Scale rooms |
| Valve houses | Blower rooms | Watchmen's houses |
| Pump houses | Repair shops | Elevators |
| Warehouses | Service stations | Drying rooms |
| Crane cabs | Laboratories | Waiting stations |
| Airplane hangars | Garages | Ticket booths |

G-E industrial air heaters serve all of these applications well, and others too, because of the following important features:

Free air circulation provides maximum heat.
Easily installed—simply mount on wall or floor and connect to power line.
Light but strong—easily moved from one job to another.
Always ready—heat available at the turn of the switch.
The 3-heat switch provides simple regulation of temperature and economy of operation.
No soot, dirt, or dust—no odors or obnoxious gases.

## HORIZONTAL TYPE, WALL-MOUNTED

G-E horizontal-type, wall-mounted industrial air heaters consist of a number of G-E strip heaters mounted in a black-japanned, perforated, pressed-steel case. Each heater is equipped with three feet of armored cable and a 3-heat snap switch mounted on a standard conduit box as shown in Fig. 1.

| Watts | Volts | Cat. No. | Price | Approx. Ship. Wt. in Lb. | DIMENSIONS IN INCHES (See Fig. 2 and 3) A | B |
|---|---|---|---|---|---|---|
| 1000 | 115 | 50X14 | $19.50 | 20 | 7¾ | 6⅛ |
| 1000 | 230 | 50X15 | 19.50 | 20 | 7¾ | 6⅛ |
| 2000 | *230 | 50X13 | 28.00 | 25 | 10 7/16 | 8¾ |
| 3000 | *230 | 50X7 | 33.50 | 30 | 14¼ | 12⅝ |
| 4500 | *230 | 50X5 | 45.00 | 35 | 14¼ | 12⅝ |

*115-volt heaters are also available at the same price—shipment, one week.

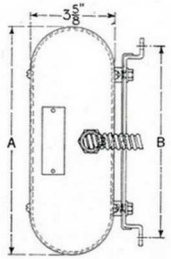


Fig. 2

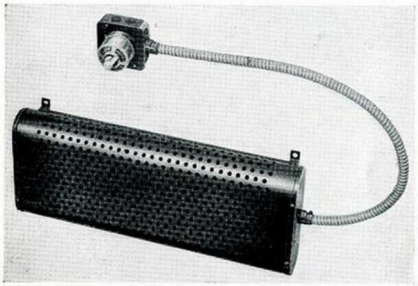


Fig. 1

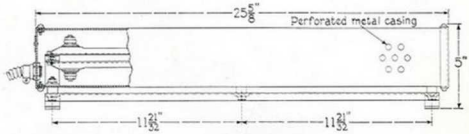


Fig. 3

## EVERYTHING NEEDED FOR SMALL HEATING JOBS AND

ULTIMHEAT®
VIRTUAL MUSEUM

## HORIZONTAL TYPE, FLOOR-MOUNTED

These convenient, portable air heaters consist of a number of G-E strip heaters mounted in a black-japanned, perforated pressed-steel case. Each heater is equipped with a 3-heat snap, switch mounted on one end as shown in Fig. 4 below.

| Watts | Volts | Cat. No. | Price | Approx. Ship. Wt. in Lb. | DIMENSIONS IN INCHES (See Fig. 4) | |
|---|---|---|---|---|---|---|
| | | | | | A | B |
| 1000 | 115 | 54X146 | $19.50 | 20 | 7¾ | 10¾ |
| 1000 | 230 | 54X147 | 19.50 | 20 | 7¾ | 10¾ |
| 2000 | *230 | 54X149 | 28.00 | 25 | 10 7/16 | 13 7/16 |
| 3000 | *230 | 54X151 | 33.50 | 30 | 14¼ | 17¼ |
| 4500 | *230 | 54X153 | 45.00 | 35 | 14¼ | 17¼ |

* 115-volt heaters are also available at the same price—shipment one week.

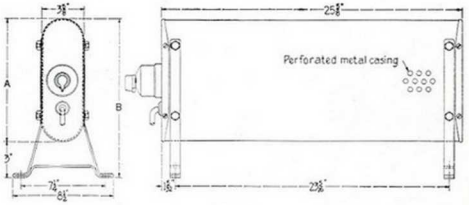



Fig. 4

## G-E AUTOMATIC TEMPERATURE CONTROL FOR INDUSTRIAL AIR HEATERS

This consists of a thermostat, an a-c. enclosed relay panel, and a fusible line disconnecting switch as illustrated below.

### FEATURES

The features of this control apparatus are very unique and desirable.

Unusually close temperature control is provided. The thermostat will operate within one or two deg. F. of its setting on both opening and closing. By having the great advantage of a preheat coil, the thermostat unfailingly tends to reduce "overshooting" in temperature rise. Since, even with automatic temperature control, the 3-heat snap switch is supplied, the three different rates of heating are controlled automatically. Temperature settings between 50 deg. and 80 deg. F. can be made by the external knob on the thermostat. A scale calibrated in degrees moves with the knob. The thermostat is provided with a small, ventilated, attractive cover, finished in dull bronze.

Since the contactor and thermostat operate on 18 volts from the secondary of the transformer, which is on the contactor panel, it is not necessary to use conduit or BX cable between the contactor and thermostat. No. 18 B&S wire is sufficient.

### INSTALLATION

To obtain the best operation, the thermostat should be mounted neither in a draft, nor directly over the heater, but on a vertical surface such as a wall. To control for human comfort, mount at shoulder height or "the breathing line." Remove the cover and attach the thermostat to the surface with screws through the mounting holes provided. The contacts should be at the bottom. Take care not to bend the blade or damage other parts. The wires (No. 18 B&S) from the contactor should be brought through the slot in the thermostat base and connections made in accordance with the color scheme on the binding screws. Leads should not touch the thermostat blade. A wiring diagram is furnished with the equipment.

The relay panel (suitable for a-c. circuits only) can be mounted at any convenient location. It consists of a small magnetic contactor, together with a transformer in a wall-mounted enclosing case, having a hinged cover. Outgoing terminal studs are grouped at the bottom of the panel and knockouts for wiring are provided in the case.

| HEATER AND ‡AUTOMATIC CONTROL EQUIPMENT | | RATING AND TYPE OF HEATER | |
|---|---|---|---|
| † Cat. No. | † Price | Wall-mounted | Floor-mounted |
| 54X243 | $60.50 | 1000 w., 115 v. | ..... |
| 54X244 | 60.50 | 1000 w., 230 v. | ..... |
| 54X245 | 70.00 | 2000 w., 230 v. | ..... |
| 54X246 | 73.50 | 3000 w., 230 v. | ..... |
| 54X247 | 85.00 | 4500 w., 230 v. | ..... |
| 54X248 | 60.50 | ..... | 1000 w., 115 v. |
| 54X249 | 60.50 | ..... | 1000 w., 230 v. |
| 54X250 | 70.00 | ..... | 2000 w., 230 v. |
| 54X251 | 73.50 | ..... | 3000 w., 230 v |
| 54X252 | 85.00 | ..... | 4500 w., 230 v. |

† Price and Cat. No. include heater with 3-heat snap switch, thermostat, panel, and line switch.

‡This automatic control equipment is for alternating current only. Heaters with d-c. control will be quoted on application.

Where more than one industrial air heater is employed in a single installation, individual automatic control for each is usually unnecessary.

Prices and specifications covering a single automatic control equipment for two or more industrial air heaters will be quoted on application.

Line disconnecting switch

Enclosed relay panel (Cover open)

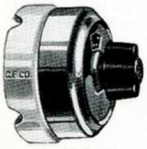
Thermostat

ULTIMHEAT®
VIRTUAL MUSEUM

# G-E CONTROL EQUIPMENT

## MANUAL

### SNAP SWITCHES



Single-heat snap switch
Cat. No. 60451—Price $1.00
10 amp., 250 volts

For reliable manual control, General Electric offers the strong, dependable snap switches shown. There are two styles—single- and 3-heat. A complete connection diagram accompanies each switch.


3-heat snap switch
Cat. No. 29X924: 7½ amp., 250 volts; 15 amp., 125 volts—price $1.50
Cat. No. 278607: 10 amp., 250 volts; 30 amp., 125 volts—price $2.40
Cat. No. 278610: 30 amp., 250 volts; 50 amp., 125 volts—price $4.00

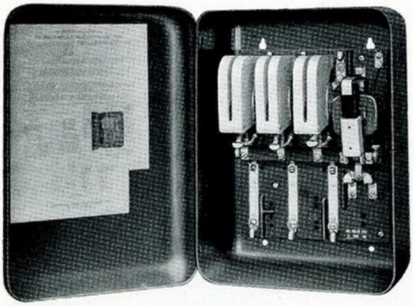
## AUTOMATIC

While manual control is sufficient in some cases, the use of automatic temperature-control equipment is regarded with much favor for most installations, because:

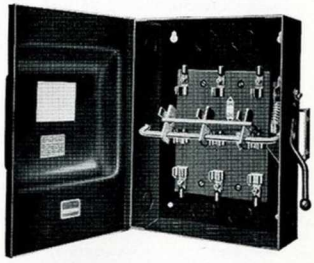
1. Uniformity of temperature is provided.
2. Ample heat is supplied without waste of power.
3. No attendance is required.

G-E automatic temperature-control equipment gives all of this and more. It is built to last and will perform consistently day after day. It is simple in arrangement, consisting only of a thermostat, an enclosed-type magnetic switch, and a fusible line disconnecting switch. In cases where the thermostat can carry the current direct, the magnetic switch is not required.

A convenient tabulation is given on page 23, from which may be chosen suitable G-E automatic temperature-control equipment for practically every condition.



Typical magnetic switch, showing 3-pole a-c. contactor



Typical fusible line disconnecting switch

EVERYTHING NEEDED FOR SMALL HEATING JOBS AND

ULTIMHEAT® VIRTUAL MUSEUM

## AUTOMATIC

| CONDITIONS TO BE MET | | | | CONTROL TO BE USED | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Heater Circuit Amperes* | HEATER CIRCUIT (60 Cycles Where A-c.) Volts | Phase | Control Circuit Volts (Single Phase 60 Cycles Where A-c.) | Thermostat Price and Specifications | MAGNETIC SWITCH Cat. No. | Price | FUSIBLE LINE DISCONNECTION SWITCH Trumbull Cat. No. | Price | Wiring Diagram See Fig. |
| 15 or less | 115 to 230 a-c. | 1 | 115 to 230 a-c. | See pages 24–26 | None | ..... | 40221 | $3.60 | 1 |
| 22 or less | 115 a-c. | 1 or 3 | 115 a-c. | " | 3885954G102 | $12.00 | 40321 | 4.50 | 2 |
| 22 or less | 230 a-c. | " | 230 a-c. | " | 3885954G103 | 12.00 | 40321 | 4.50 | 2 |
| 22 to 45 | 115 a-c. | " | 115 a-c. | " | 4383134G2 | 20.00 | 40322 | 6.60 | 2 |
| 22 to 45 | 230 a-c. | " | 230 a-c. | " | 4383134G3 | 20.00 | 40322 | 6.60 | 2 |
| 45 to 75 | 115 a-c. | " | 115 a-c. | " | 4383280G2 | 27.00 | 40323 | 10.20 | 2 |
| 45 to 75 | 230 a-c. | " | 230 a-c. | " | 4383280G3 | 27.00 | 40323 | 10.20 | 2 |
| 75 to 135 | 115 a-c. | " | 115 a-c. | " | 4383590G2 | 81.00 | 40324 | 17.40 | 2 |
| 75 to 135 | 230 a-c. | " | 230 a-c. | " | 4383590G3 | 81.00 | 40324 | 17.40 | 2 |
| 0 to 60 | 230 to 440 a-c. | " | 115 a-c. | " | † 4388311G2 | 27.00 | 40362 | 9.00 | 3 |
| 0 to 60 | 230 to 440 a-c. | " | 230 a-c. | " | † 4388311G3 | 27.00 | 40362 | 9.00 | 3 |
| 22 or less | 115 d-c. | ..... | 115 d-c. | " | 3656232G2 | 40.00 | Included on magnetic switch | ..... | 4 |
| 22 or less | 230 d-c. | ..... | 230 d-c. | " | 3656232G3 | 40.00 | | ..... | 4 |
| 22 to 40 | 115 d-c. | ..... | 115 d-c. | " | 1772615G2 | 45.00 | 40222 | 5.40 | 5 |
| 22 to 40 | 230 d-c. | ..... | 230 d-c. | " | 1772615G3 | 45.00 | 40222 | 5.40 | 5 |
| 40 to 80 | 115 d-c. | ..... | 115 d-c. | " | 1772617G2 | 60.00 | 40223 | 8.40 | 5 |
| 40 to 80 | 230 d-c. | ..... | 230 d-c. | " | 1772617G3 | 60.00 | 40223 | 8.40 | 5 |
| 80 to 150 | 115 d-c. | ..... | 115 d-c. | " | 1772619G2 | 77.00 | 40224 | 13.20 | 5 |
| 80 to 150 | 230 d-c. | ..... | 230 d-c. | " | 1772619G3 | 77.00 | 40224 | 13.20 | 5 |

* To determine amperes:

Single phase a-c. or d-c.—amperes = $\frac{\text{watts}}{\text{volts}}$

Three phase a-c. —amperes = $\frac{\text{watts}}{\text{volts} \times 1.73}$

(Note: In cases of unbalanced loads, amperes should be the maximum on any phase.)

† For control switch, use Trumbull Cat. No. 2221—price $1.65.

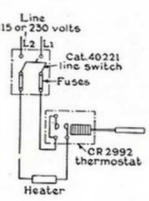



Fig. 1

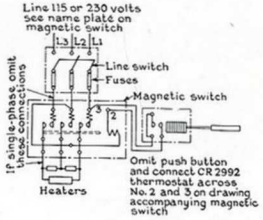



Fig. 2

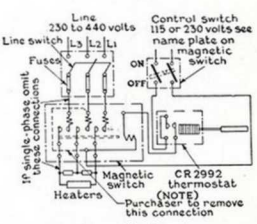



Fig. 3

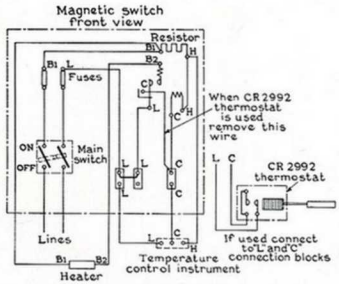



Fig. 4

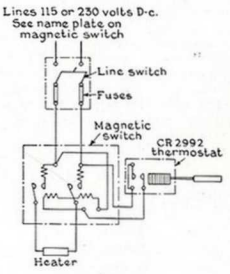



Fig. 5

ULTIMHEAT®
VIRTUAL MUSEUM



# AUTOMATIC

## THERMOSTAT, NONINDICATING

**For Use with Industrial Heating Units**

### DESCRIPTION

The thermostats are as efficient in operation as they are neat in appearance. They consist of a strong, well-machined snap mechanism similar in principle of operation to the well-known G-E refrigerator control.

On temperature rise, the irresistible expansion of incompressible liquid within the bellows assembly operates the mechanism in one direction, while, with temperature fall, a heavy spring moves the mechanism in the other direction. The latter action is permitted because of the contraction of the liquid.

Attention is called to the feature that the contact pressure is unusually strong and does not change with use as when a permanent magnet is used. This contact pressure is strongest just before throw-over to either the "on" or the "off" position and abruptly passes through zero on throw-over.

Clearances between all live parts and ground are in accordance with Underwriters' specifications. All steel parts are cadmium-plated to resist corrosion. The contacts are silver, affording long wearing qualities.

These thermostats can be mounted in any position without the slightest effect on their operation.

This line of thermostats has been developed primarily for use with small industrial heating units. Their reasonable price makes available, on even the smallest applications, the following advantages of automatic temperature control: saving in labor, power, and material; protection to the machine; and assurance of consistent operation day after day.

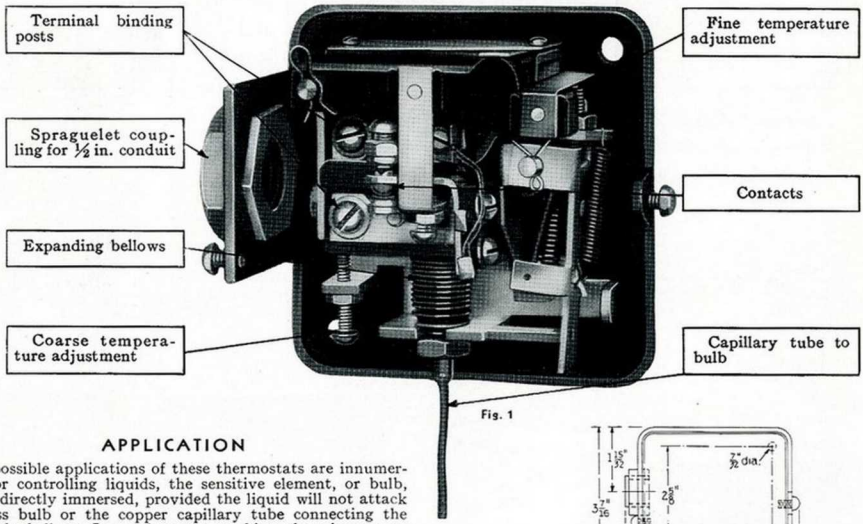



Fig. 1

### APPLICATION

The possible applications of these thermostats are innumerable. For controlling liquids, the sensitive element, or bulb, may be directly immersed, provided the liquid will not attack the brass bulb or the copper capillary tube connecting the bulb to the bellows. In nearly every machine, there is room to get the bulb next to the material to be controlled. Where it is objectionable to open the contact in an explosive gas atmosphere, it is suggested that the entire mechanism be immersed in a *very* thin oil but with the bulb at, or in, the medium whose temperature is to be controlled.

Some suggested applications are:

Wax pots on shoe machinery
Laundry machinery
Pressing and cleaning machinery
Stills and sterilizers
Vulcanizers
Paper-box machinery
Oil-burner equipments
Embossing machinery
Incubators and brooders
Glue cookers
Doughnut-cooking machines
Match-making machines
Water heaters
Many process machines
Hotbeds

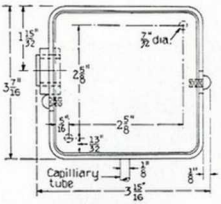



Fig. 2

**EVERYTHING NEEDED FOR SMALL HEATING JOBS AND**

ULTIMHEAT®
VIRTUAL MUSEUM

## THERMOSTAT, NONINDICATING

**For Use with Industrial Heating Units**

§ 15 amp., 115 or 230 volts, a-c.
or
§ ¼ amp., 115 or 230 volts, d-c.

| TEMPERATURE RANGE OR POSSIBLE SETTING IN DEG. F. | | Temperature Differential within * Deg. F. of Setting | CR2992-D2 Normally Closed Contacts Cat. No. | CR2992-B2 Normally Open Contacts Cat. No. | Price | Approx. Ship. Wt. in Lb. | *Factory Setting Switch Off at Deg. F. | Length of Capillary Tube in In. (See Dimen. "D," Fig. 3) | Length of Bulb in In. (See Dimen. "F," Fig. 3) | Diameter of Bulb in In. (See Dimen. "C," Fig. 3) | ‡RENEWAL PARTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Bellows Assembly | |
| Min. | Max. | | | | | | | | | | Cat. No. | Price |
| 40 | 110 | 3 | 4387133G18 | 4387131G18 | $11.00 | 3 | 60 | 18 | 6 3/4 | 7/16 | 4924969P18 | $4.50 |
| 40 | 110 | 3 | 4387133G41 | 4387131G41 | 11.00 | 3 | 60 | 36 | 6 3/8 | 7/16 | 4924969P40 | 4.50 |
| 40 | 110 | 3 | 4387133G39 | 4387131G39 | 11.00 | 3 | 60 | 84 | 6 3/8 | 7/16 | 4924969P38 | 4.50 |
| 40 | 110 | 3 | 4387133G38 | 4387131G38 | 11.00 | 3 | 60 | 120 | 6 3/8 | 7/16 | 4924969P25 | 4.50 |
| 80 | 150 | 4 | 4387133G16 | 4387131G16 | 11.00 | 3 | 100 | 8 | 7 1/8 | 1/2 | 4924969P16 | 4.50 |
| 80 | 150 | 4 | 4387133G28 | 4387131G28 | 11.00 | 3 | 100 | 14 | 7 1/8 | 1/2 | 4924969P28 | 4.50 |
| 80 | 150 | 4 | 4387133G10 | 4387131G10 | 11.00 | 3 | 100 | 25 | 6 1/8 | 9/16 | 4924969P9 | 4.50 |
| 80 | 150 | 4 | 4387133G34 | 4387131G34 | 11.00 | 3 | 100 | 120 | 7 1/8 | 1/2 | 4924969P34 | 4.50 |
| 100 | 200 | 5 | 4387133G22 | 4387131G22 | 11.00 | 3 | 100 | 6 | 4 1/2 | 7/16 | 4924969P22 | 4.50 |
| 100 | 200 | 5 | 4387133G3 | 4387131G3 | 11.00 | 3 | 100 | 18 | 4 1/2 | 7/16 | 4924969P3 | 4.50 |
| 100 | 200 | 5 | 4387133G4 | 4387131G4 | 11.00 | 3 | 100 | 25 | 4 1/2 | 7/16 | 4924969P4 | 4.50 |
| 100 | 200 | 5 | 4387133G30 | 4387131G30 | 11.00 | 3 | 100 | 60 | 4 1/2 | 7/16 | 4924969P30 | 4.50 |
| 100 | 200 | 5 | 4387133G19 | 4387131G19 | 11.00 | 3 | 100 | 120 | 4 1/2 | 7/16 | 4924969P19 | 4.50 |
| 150 | 300 | 7½ | 4387133G8 | 4387131G8 | 11.00 | 3 | 212 | 5 3/4 | 4 1/2 | 7/16 | 4924969P7 | 4.50 |
| 150 | 300 | 7½ | 4387133G1 | 4387131G1 | 11.00 | 3 | 212 | 18 | 4 1/2 | 7/16 | 4924969P1 | 4.50 |
| 150 | 300 | 7½ | 4387133G2 | 4387131G2 | 11.00 | 3 | 212 | 25 | 4 1/2 | 7/16 | 4924969P2 | 4.50 |
| 150 | 300 | 7½ | 4387133G6 | 4387131G6 | 11.00 | 3 | 212 | 36 | 4 1/2 | 7/16 | 4924969P5 | 4.50 |
| 150 | 300 | 7½ | 4387133G12 | 4387131G12 | 11.00 | 3 | 212 | 58 | 2 15/16 | 9/16 | 4924969P11 | 4.50 |
| 150 | 300 | 7½ | 4387133G15 | 4387131G15 | 11.00 | 3 | 212 | 84 | 3 5/8 | 1/2 | 4924969P15 | 4.50 |
| 250 | 400 | 10 | 4387133G29 | 4387131G29 | 11.00 | 3 | 250 | 4 | 3 | 7/16 | 4924969P29 | 4.50 |
| 250 | 400 | 10 | 4387133G5 | 4387131G5 | 11.00 | 3 | 250 | 18 | 3 | 7/16 | 4924969P12 | 4.50 |
| 250 | 400 | 10 | 4387133G14 | 4387131G14 | 11.00 | 3 | 250 | 25 | 3 | 7/16 | 4924969P14 | 4.50 |
| 250 | 400 | 10 | 4387133G33 | 4387131G33 | 11.00 | 3 | 250 | 48 | 3 | 7/16 | 4924969P33 | 4.50 |
| ¶350 | 500 | 12½ | 4387133G40 | 4387131G40 | 11.00 | 3 | 400 | 25 | 3 | 7/16 | 4924969P39 | 4.50 |
| ¶350 | 500 | 12½ | 4387133G46 | 4387131G46 | 11.00 | 3 | 400 | 72 | 3 | 7/16 | 4924969P46 | 4.50 |
| ¶450 | 600 | 18 | 4387133G21 | 4387131G21 | 13.00 | 3 | † | 18 | 3 | 7/16 | 4924969P21 | 6.50 |
| ¶450 | 600 | 18 | 4387133G20 | 4387131G20 | 13.00 | 3 | † | 25 | 3 | 7/16 | 4924969P20 | 6.50 |

* User will make adjustment to fit requirements. Check should be made with a high-grade thermometer placed in the immediate vicinity of the bulb.
† No definite setting.
‡ Renewal stationary contacts are covered by Cat. No. 3866795G2. Price $0.15. Renewal movable contacts for CR2992-D2 are covered by Cat. No. 3866795G1. Price $0.15. Renewal movable contacts for CR2992-B2 are covered by Cat. 3866795G3. Price $0.15.
§ For larger current-carrying capacities, use thermostat in connection with G-E automatic control panels as listed on page 23.
¶ Not suitable for use in metal-melting pots unless bulb and capillary tube are protected from contact with the molten metal by close fitting, surrounding, dead-end tube (to be furnished by purchaser).

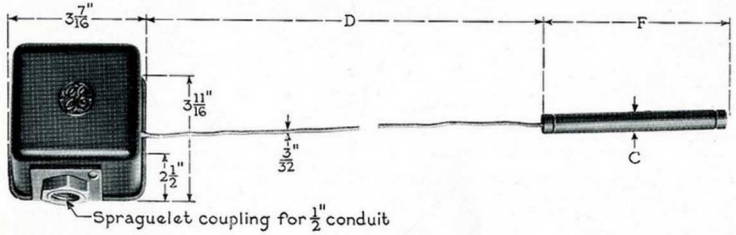



Fig. 3

The thermostats with the normally closed contacts open the electric circuits when the temperature of the medium being controlled rises to the point at which the thermostat is set. With temperature fall past this point, the contacts will close before the drop exceeds the differential. When thermostats with normally open contacts are used, the action is the reverse.

The only difference between the groups of the listed thermostats lies in the bellows assembly, consisting of the bellows, capillary tube, and bulb. The bulb is the sensitive element which determines the temperature range and differential. Bellows assemblies are interchangeable on all of the thermostats listed, whether normally open or normally closed.

ULTIMHEAT®
VIRTUAL MUSEUM



# AUTOMATIC
## THERMOSTAT, NONINDICATING
**For Use with Industrial Heating Units**

### LIMITS OF MODIFICATION

The thermostats listed are standard. Modifications, within certain limits, can be made in temperature range and dimensions of capillary tube and bulb at a charge of $15.00 net additional. This charge to be allocated to the quantity of similar thermostats on the initial order.

These thermostats can not be furnished for controlling at temperatures below 40 deg. F. or above 600 deg. F.

Modification is limited so that the difference between minimum and maximum settings must not exceed that indicated in the table for the next lower standard temperature range. The differential will be plus or minus 2.5 per cent of the maximum possible setting, except where this maximum setting is below 110 deg. F. and above 500 deg. F. (See table on page 25.)

Since the bulb dimensions are related to the temperature range and differential, all combinations are not practical. Bulb dimensions for special temperature ranges will be approximately the same as for nearest standard range. If definite bulb dimensions are required, they should be specified on order and will be adhered to if possible.

The maximum "D" dimension as shown in Fig. 3, page 25, is 10 ft.

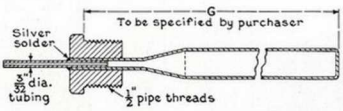



Fig. 4

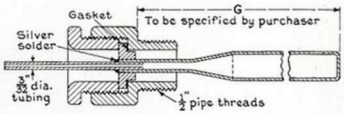



Fig. 5

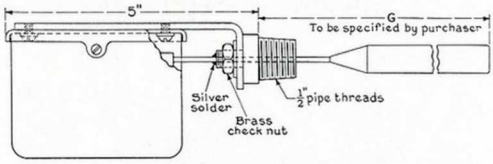



Fig. 6

### WHEN USED IN CLOSED LIQUID OR GAS SYSTEMS

When it is desired to control temperature from within a closed liquid or gas system, rather than using a dead-end tube, it is recommended that the thermostats be ordered with plug fittings as illustrated in Fig. 4, 5, or 6. These will allow direct immersion of the bulb, the sensitive element. The fittings will make a pressure-tight installation, having a ½-in. pipe thread. Where they are to be inserted through holes of larger diameter, the purchaser should provide an ordinary reducing bushing. *In ordering give Cat. No. of the thermostat and specify desired plug by Fig. No. The "G" dimension must be specified on the order.*

The plug fitting shown in Fig. 4 is stationary on the capillary tube. Hence, the bellows assembly will turn when screwing into the tank. To facilitate installation, the bellows assembly can be removed from the mechanism of the thermostat very easily and without changing the temperature setting. This is not necessary but is recommended. When any of the listed thermostats are desired with the plug fitting as shown in Fig. 4, add $1.00 to the price of each standard thermostat.

Only the small flange is stationary on the capillary tube with the arrangement shown in Fig. 5. Hence, only the plugs need be turned when screwing into the tank. When any of the listed thermostats are desired with the plug fitting as shown in Fig. 5, add $2.00 to the price of each standard device.

If it is desired to have the mechanism supported by the plug, the listed thermostats should be ordered equipped with plug fittings as in Fig. 6. For this arrangement, add $1.00 to the price of each standard thermostat. The bracket allows the mechanism to be revolved to any position around the capillary tube as an axis. The threaded plug is stationary on the capillary tube.

Where it is desired to equip mechanisms already in the field, with bellows assemblies to which are attached plugs as illustrated in Fig. No. 4, 5, or 6, order as follows: *Bellows assembly for thermostat Cat. No. (here give Cat. No. of present thermostat) but with plug as in Fig. No. (here give No. from illustration). Specify "G" dimension. The prices will be the listed prices of the bellows assembly, plus the price of the specified plug.*

## INDICATING THERMOSTATS

In addition to the nonindicating thermostat described, General Electric maintains a stock of many types of indicating thermostats. Write us about your requirements.

ULTIMHEAT® VIRTUAL MUSEUM

## FOR METAL-MELTING POTS (See page 14)

## MANUAL CONTROL

| Cat. No. of Pot | SINGLE-HEAT CONTROL | | TWO-HEAT CONTROL | | | |
|---|---|---|---|---|---|---|
| | * Trumbull Switch Cat. No. | Price | † Panel Cat. No. | Price | Wattage High | Wattage Low |
| 2881146G2 | 2221 | $2.25 | 3651328 | $25.00 | 750 | 550 |
| 2881146G3 | 2221 | 2.25 | 3651328 | 25.00 | 750 | 550 |
| 2881146G4 | 2221 | 2.25 | 3651328 | 25.00 | 1000 | 750 |
| 2881146G5 | 2221 | 2.25 | 3651328 | 25.00 | 1000 | 750 |

*This is a CR1047 Trumbull indicating starting switch.
†Cat. No. 3651328 consists of a 9-in. by 9-in. panel on which are mounted a 2-heat snap switch and resistor tubes.

Push-button switch
Cat. No. 2698009G2
20 amp., 250 volts

| Cat. No. of Pot | THREE-HEAT CONTROL | | | | | |
|---|---|---|---|---|---|---|
| | Cat. No. of Switch | Price | No. Required for Each Pot | Wattage High | Wattage Med. | Wattage Low |
| 2666404G1 | 2698009G2 | $9.00 | 1 | 2500 | 1500 | 1000 |
| 2666404G2 | 2698009G2 | 9.00 | 1 | 2500 | 1500 | 1000 |
| 2666407G1 | 2698009G2 | 9.00 | 1 | 5000 | 3000 | 2000 |
| 2666407G2 | 40221 | 6.00 | 2 | 5000 | 3000 | 2000 |

Trumbull safety switch
Cat. No. 40221
30 amp., 250 volts

## AUTOMATIC CONTROL

### THERMOSTAT, NONINDICATING

### MAXIMUM OPERATING TEMPERATURE, 950 DEG. F.

| *Range in Deg. F. | Cat. No. | Price | Approx. Ship. Wt. in Lb. | Length of Sensitive Element in Inches | Current-carrying Capacity of Contacts |
|---|---|---|---|---|---|
| 450-950 | 2884860G1 | $36.50 | 13 | 10 | † |

*User will make adjustment to fit requirements. Check should be made with a high-grade thermometer. This thermostat will control temperatures within ± 14 deg. F. of its setting.
†Designed to be used for operating standard control panels. See below.

#### APPLICATION

This device fills a need for an inexpensive thermostat which will operate to the maximum temperature of G-E melting pots and other melting pots using G-E cast-in immersion units. This thermostat should be applied where very close control is not necessary. It may be used to control temperatures in lead, tin, solder, babbitt, and other soft metals.

#### DESCRIPTION

This thermostat consists of an enclosed switch and a nickel-chrome-iron tube extending from the base of the switch and surrounding a steel piston and a quartz rod.

The thermostat has a cadmium-plated steel base in which there are four mounting holes each $\frac{11}{32}$ inch in diameter. There is an opening for a ½-in. conduit in the back of the switch. This back, also, is cadmium-plated steel. A die-cast aluminum cover, hinged from the top of the back, completes the enclosure of the switch. The movable contact is silver and the stationary contacts are tungsten.

The sensitive element consists of a nickel-chrome-iron tube surrounding a quartz rod and a steel piston. The quartz rod has a negligible coefficient of expansion. As the temperature increases, the tube is lengthened by expansion, and the quartz rod moves down, allowing a spring to force the steel piston down. This motion of the piston acts on a lever, which, in turn, opens a circuit. With contraction of the tube as the temperature decreases, the action is reversed.

General Electric also carries in stock many models of indicating-type thermostats. Write us about your requirements.

## CONTROL PANELS

(For use with thermostat shown above)

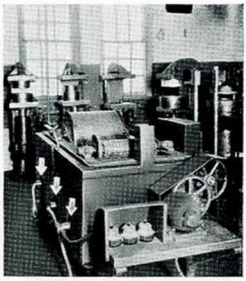
| For Melting Pot Cat. No. | CONTROL PANELS | | | | | |
|---|---|---|---|---|---|---|
| | 115 Volts, 60 Cycles Single-phase, A-c. | | 230 Volts, 60 Cycles Single-phase, A-c. | | 230 Volts, D-c. | |
| | Cat. No. | Price | Cat. No. | Price | Cat. No. | Price |
| 2881146G3 or 2881146G5 | | | 3653702G9 | $35.00 | 3656232G3 | $40.00 |
| 2881146G2 or 2881146G4 | 3653702G8 | $35.00 | | | | |
| 2666404G1 | | | 3653702G9 | 35.00 | 3656232G3 | 40.00 |
| 2666404G2 | 3653702G8 | 35.00 | | | | |
| 2666407G1 | | | 3653702G9 | 35.00 | 3656232G3 | 40.00 |
| 2666407G2 | 3651361G8 | 71.00 | | | | |

ALL OBTAINABLE FROM ONE DEPENDABLE MANUFACTURER

ULTIMHEAT®
VIRTUAL MUSEUM

# G-E HEATING UNITS AND DEVICES

## ARE GIVING FAITHFUL DAILY SERVICE IN THESE INSTALLATIONS— AND IN HUNDREDS OF OTHERS

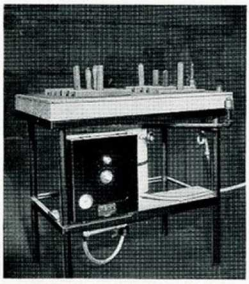


**PROBLEM:** To heat this metal tank used for impregnating packing-cup discs. Answer: Three liquid-heating units were screwed into the outer tank of oil to furnish a heated jacket for the inner tank containing oils and waxes.

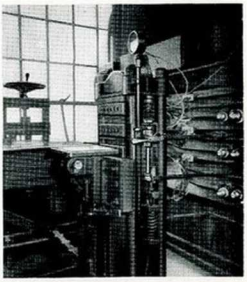
**WANTED,** a homemade package sealer—so a cartridge unit was embedded in a block of brass on each side of sealer and a third cartridge in the bottom hotplate. Packages are pushed through the tight-fitting, heated frames.

**LARGE** oil company develops trucks to rush oil to airports—oil must be at airplane-engine temperature, so eight liquid-heating units are screwed into the oil tanks of the novel airport tenders. Automatic control maintains temperature.

**CHICKENS** lay more eggs in winter in uniformly heated houses, so a progressive farmer installs a strip heater near the ceiling in each of his fifty or more houses.



**A CELLULOID**-forming table in the plant of a novelty manufacturer required a limited amount of process steam. A very small electric steam generator was installed beneath table top and met the requirements ideally. Economy, convenience, and better work resulted.

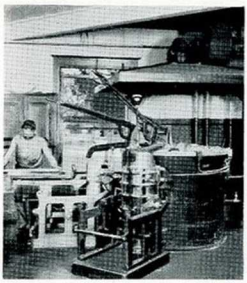


**A MANUFACTURER** of hot-molded plastic lead pencils formerly heated his presses with steam. A few simple cartridge units inserted in the platens enabled him to dispense with the expensive steam plant. Of course, better pencils resulted.

**EVERYTHING NEEDED FOR SMALL HEATING JOBS AND**

ULTIMHEAT®
VIRTUAL MUSEUM

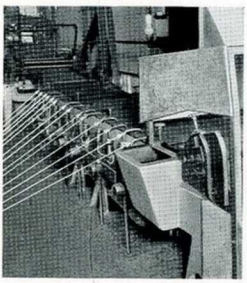
**IT IS** practically universally agreed that in a few years every metropolitan newspaper plant will be using electric metal-melting units in all furnaces and pots. This is an 8-ton stereotype furnace equipped with thirty 10-kw. metal-melting units.



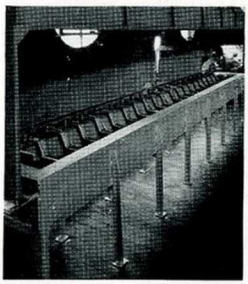
**MEDIUM**-circulation newspapers, and even those of quite limited circulation, are rapidly adopting electric heat for stereotype melting. This is a 5-ton stereotype furnace equipped with nine 5-kw. metal-melting units.

**A LEADING** brush manufacturer has equipped all his plants with cement-melting pots heated by a bottom hotplate in which are embedded six (200-watt) cartridge units.

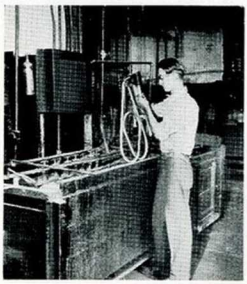
**AN ELECTRICAL** repair shop after using these metal-melting pots reports it will never again use anything else—so great is the convenience, so uniform the babbitt, so improved are working conditions.



**FOURTEEN** liquid-heating units suspended over the side of the tank supply heat to melt the paraffin in this process machine, which turns out milk-bottle caps by the thousands.

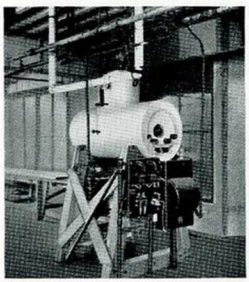


**A FEW** pieces of standard steel shapes and 20 metal-melting units. The result, an inexpensive, homemade tinning pot of huge capacity.



**A SIMPLE** liquid-heating unit easily suspended over the side supplies all the heat necessary for this nickel-plating tank in a printing plant. This effective installation led to the eventual adoption of electric heat throughout the plant.

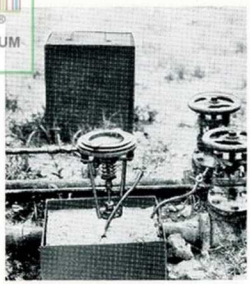
**ANY** fuel-fired melting pot can be changed over easily and quickly to electric heat with our melting units, as this one has been.



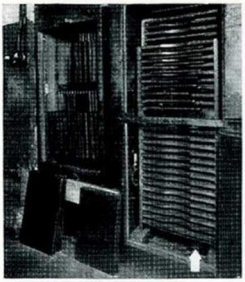
**THIS** 50-kw. electric steam generator is one of the most valuable pieces of equipment in the entire plant of a candy manufacturer because of its simplicity, capability, and economy in supplying all the steam needed in the cooking kettles, tanks, etc.

**ALL OBTAINABLE FROM ONE DEPENDABLE MANUFACTURER**

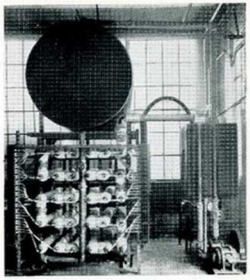
ULTIMHEAT®
VIRTUAL MUSEUM



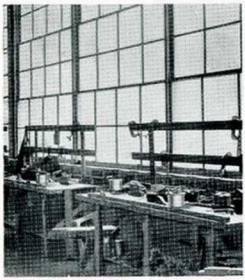
**THE** problem of heating scores of automatic valves on a natural-gas line to keep them from freezing was quickly solved by hooking up one of the odd-shaped heating units, in our miscellaneous family, to each valve on the line.



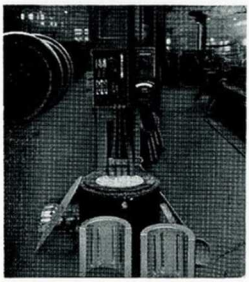
**HOW** best to heat these case-warming cabinets, puzzled the owner of an electrotype plant. Nothing easier, as was proved by the insertion of two simple strip heaters in each cabinet.



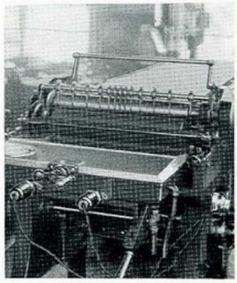
**SIXTY** liquid-heating units are installed in this pipe line used to heat oil which is in turn used for melting rosin in tank cars.



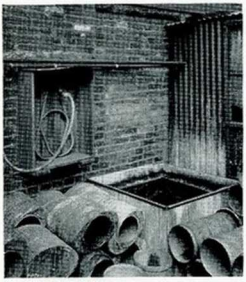
**THIS** woodworking plant of an automobile manufacturer required glue-melting pots, hundreds of them, and found our electric pots so satisfactory that it installed 350 of them. Excellent results, no complaints.



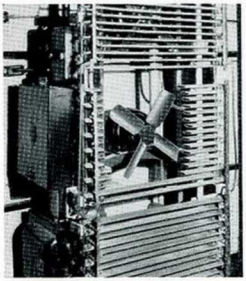
**ELECTRIC** metal-melting pots, such as this one, are widely used for melting solder, tin, lead, babbitt, and type metal. Full-automatic control provides accurate temperature conditions.



**THIS** automatic gluing machine for box wraps, labels, etc., uses two 1000-watt immersion heaters in the water jacket surrounding the glue tank.



**JUST** as you'd get out your toaster for breakfast, this retinning manufacturer takes down a liquid-heating unit from a hook on the wall and slips it into a metal-cleaning tank of caustic soda. Work formerly requiring eight hours is now done in two.



**24-STRIP** heaters offered a simple yet highly effective solution to the problem of heating this drying system. Strip heaters, in addition to their advantage of low cost, offer an excellent means of distributing heat over a wide area.

**WHEN** this manufacturer wanted a paraffin-melting pot he simply slipped three liquid-heating units into the pot and added some inexpensive automatic control to regulate the temperature with unerring accuracy.

**EVERYTHING NEEDED FOR SMALL HEATING JOBS AND**

ULTIMHEAT®
VIRTUAL MUSEUM

## CALCULATING POWER REQUIREMENTS

The amount of heat required to maintain the proper temperature in a given part or substance is often dependent upon so many varied conditions that it is practically impossible to calculate the power requirements. In such cases, it is best to experiment with units of various ratings until the proper size is determined by trial and error. Where this is not practicable, calculations should be made to determine the rating as closely as possible, and the unit or units chosen should be of ample capacity, since it is easier and safer to reduce the rating than to increase it. The data following will be of assistance in estimating power requirements.

To determine the energy required to heat a given substance, the total of the individual requirements must be calculated and added, such as:

Heat absorption of the substance
Heat absorption of the racks or trays, if used
Heat absorption of ventilating air, if used
Heat losses through walls, doors, exposed surfaces, etc.

The following formulas, curves, tables, and examples will prove useful in calculating these values:

The energy required to heat any substance
= wt. in lb. × specific heat × temp. rise in deg F. = energy in Btu.

To convert Btu. to kw-hr. divide by 3412.

When necessary, the heat of fusion or heat of vaporization must be added to this value, keeping the values in the same units, either Btu. or kw-hr.

## DATA ON SPECIFIC HEATS, ETC.

### Solids

| Substance | Average Specific Heat | Heat of Fusion, Btu. per Lb. | Melting Point Deg. F. | Weight in Lb. per Cu. Ft. |
|---|---|---|---|---|
| Aluminum | .23 | 138 | 1216 | 160 |
| Antimony | .052 | 25 | 1166 | 423 |
| Asphalt | .40 | 40 | 250 ab | 65 |
| Beeswax | .. | 75 | 144 | 60 |
| Bismuth | .031 | 23 | 520 | 610 |
| Brass | .10 | .. | 1700 ab | 525 |
| Brickwork and Masonry | .220 | .. | .... | 140 |
| Carbon | .204 | .. | .... | ... |
| Copper | .10 | 75 | 1981 | 550 |
| Glass | .20 | .. | 2200 ab | 165 |
| Graphite | .20 | .. | .... | 130 |
| Iron, cast | .13 | .. | 2300 ab | 450 |
| Iron, wrought | .12 | .. | 2800 ab | 480 |
| Lead, solid | .031 | 10 | 621 | 710 |
| Lead, melted | .04 | .. | .... | ... |
| Nickel | .11 | 8 | 2642 | 550 |
| Paper | .45 | .. | .... | 58 |
| Paraffin | .70 | 63 | 133 | 56 |
| Pitch, hard | ... | .. | 300 ab | 83 |
| Rubber | .40 | .. | .... | 95 ab |
| Silver | .057 | 38 | 1761 | 655 |
| Solder (50% lead—50% tin) | .04 | 17 | 415 | 580 |
| Steel | .12 | .. | 2550 ab | 490 |
| Sugar | .30 | .. | 320 | 105 |
| Sulphur | .203 | 17 | 230 | 125 |
| Tallow | ... | .. | 90 ab | 60 |
| Tin, solid | .056 | 25 | 450 | 455 |
| Tin, melted | .064 | .. | .... | ... |
| Type metal (85% lead—15% antimony) | .040 | .. | 500 | 670 |
| Wood | .45 ab | .. | .... | 34—pine<br>50—oak |
| Zinc | .095 | 51 | 787 | 445 |

ULTIMHEAT®
VIRTUAL MUSEUM

# USEFUL INFORMATION

## DATA ON SPECIFIC HEATS, ETC. (Continued)

### Liquids

| Substance | Average Specific Heat | Heat of Vaporization Btu. per Lb. | Boiling Point Deg. F. | Weight in Lb. per Cu. Ft. |
|---|---|---|---|---|
| Acetic acid | .472 | 153 | 245 | 66 |
| Alcohol | .65 | 365 | 172 | 55 |
| Benzine | .45 | 166 | 175 | 56 |
| Ether | .503 | 160 | 95 | 46 |
| Glycerine | .58 | ... | 554 | 79 |
| Mercury | .0333 | 117 | 675 | 845 |
| Oil, cotton-seed | .47 | ... | ... | 60 |
| Oil, machine | .40 | ... | ... | 58 |
| Oil, olive | .471 | ... | 570 abs | 58 |
| Paraffin, melted | .71 | ... | 750 abs | 56 |
| Petroleum | .51 | ... | ... | 56 |
| Sulphur, melted | .234 | 652 | 601 | .. |
| Turpentine | .41 | 133 | 319 | 54 |
| Water | 1.0 | 965 | 212 | 62.5 |

### Gases and Vapors

| Substance | Average Specific Heat Constant Pressure | Weight in Lb. per Cu. Ft. at Approx. 70° F. and Atmospheric Pressure |
|---|---|---|
| Acetylene | .35 | .073 |
| Air | .237 | .080 |
| Alcohol | .453 | ... |
| Ammonia | .520 | .048 |
| Carbon dioxide | .203 | .123 |
| Carbon monoxide | .243 | .078 |
| Chlorine | .125 | .20 |
| Hydrochloric acid | .195 | .102 |
| Hydrogen | 3.41 | .0056 |
| Methane | .60 | .0447 |
| Nitrogen | .245 | .078 |
| Oxygen | .218 | .09 |
| Sulphur dioxide | .155 | .179 |

## ENERGY REQUIRED TO HEAT AIR AND WATER

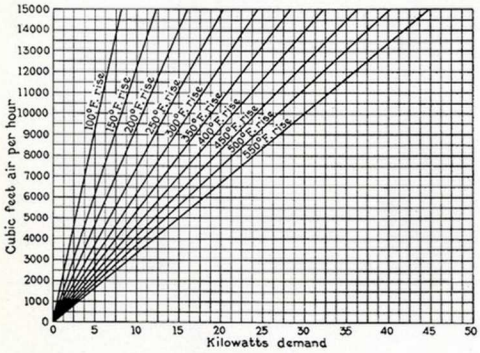



Fig. 1—Air heating
Curve based on specific heat of 0.27 and weight of 0.08 lb. per cu. ft.

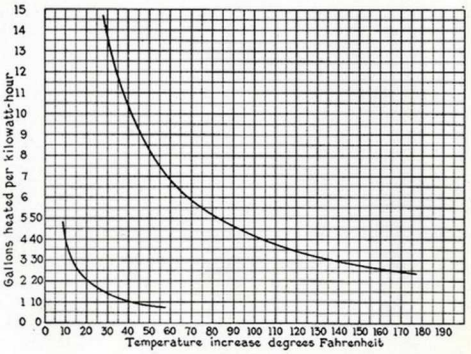



Fig. 2—Water heating
Curve based on 100 per cent efficiency

EVERYTHING NEEDED FOR SMALL HEATING JOBS AND

ULTIMHEAT®
VIRTUAL MUSEUM

# USEFUL INFORMATION

## HEAT LOSSES

### HEAT LOSSES THROUGH INSULATED OVEN WALLS

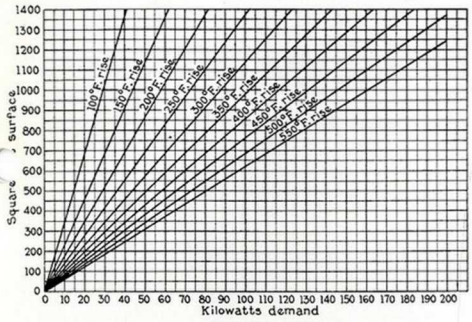



Fig. 3

**Curve based on an insulation 1 in. thick of standard high-grade material, such as 85 per cent magnesium, Rockwool, Filinsul, etc. If insulation is 2 in. thick, divide curve values by 2; if 4 in. thick, divide by 4, etc.**

### HEAT LOSSES FROM SOLID SMOOTH SURFACES

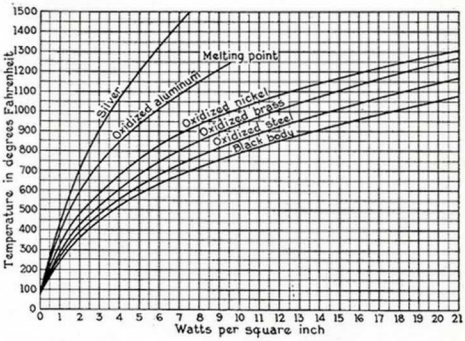



Fig. 4

**Heat losses from a horizontal surface laid flat on one side are: top surface 110 per cent of curve values; bottom surface 55 per cent of curve values; averages of losses from top and bottom surface are 82½ per cent of curve values**

### HEAT LOSSES FROM MOLTEN METAL SURFACES

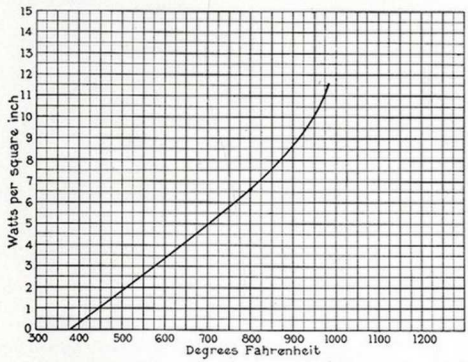



Fig. 5

**Heat losses for lead, tin, type metal, babbitt, etc.**

## EXAMPLES OF ESTIMATING POWER REQUIREMENTS

### 1. LEAD MELTING

Given a pot having a holding capacity of approximately 425 lb. of lead (inside dimensions of pot 12 in. diameter by 9 in. deep).

Required to melt 350 lb. lead per hour and heat to 750 deg. F.; lead at 70 deg. F. when charged.

Kw-hr. to melt the lead =

$$\frac{\text{wt. (lb.)} \times \text{specific heat} \times (t - t)}{3412} + \frac{\text{heat of fusion (Btu.)}}{3412} =$$

ULTIMHEAT®
VIRTUAL MUSEUM



## EXAMPLES OF ESTIMATING POWER REQUIREMENTS (Continued)

$$\frac{300\times.031\ (621-70)+10\times300}{3412}=2.40 \text{ kw-hr.}$$

To this must be added the energy required to raise the temperature from 621 to 750 deg. F.

$$\frac{2.40 \text{ kw-hr.}+300\times.04\ (750-621)}{3412}=2.85 \text{ kw-hr.}$$

The heat losses from this pot are 1.56 kw-hr. per hr. at 750 deg. F. The maximum losses will be taken, but the bath will be at 750 deg. F. only a small part of the time.

There will be needed 2.84+1.56=4.4 kw.

The pot should have a rating slightly higher than the actual requirements, or approximately 5 kw.

### 2. OVEN BAKING

Given an oven having inside clearances of 24 in. wide by 36 in. deep by 36 in. high with 2 in. insulated walls

Required to bake 150 lb. of steel parts per charge to a temperature of 250 deg. F.

Weight of trays used—50 lb.

Time of bake—45 minutes

Ventilation required—4 changes per charge

Initial temperature of steel and air 70 deg. F.

Summation of the heat requirements are:

200 lb. steel heated from 70 to 250 deg. F.

$$\frac{200\times.12\ (250-70)}{3412}=1.27 \text{ kw-hr.}$$

4 changes of air $=4\times2\times3\times3=72$ cu. ft. per charge

$72\times.08$ lb. per cu. ft. $=5.76$ lb.

$$\frac{5.76\times.237\ (250-70)}{3412}=.072 \text{ kw-hr. to heat air}$$

1.27+.072=1.34 kw-hr. needed in 45 minutes

$$\text{Power to be installed}=\frac{1.34}{.75}=1.80 \text{ kw.}+\text{losses}$$

Losses from the walls, door cracks, etc. (Fig. 3), equal 2.9 kw-hr. per hr. for 53.3 sq. ft. (taking 0.1 of the loss for 533 ft.) with a 1-in. wall. For 2-in. wall, divide by 2, which gives 1.45 kw.+15% for extra door loss=1.67 kw-hr. 1.8+1.67+approx. 25 per cent for controlling and contingencies=4.5 kw.

### 3. ROOM HEATING

$$\text{Watts}=(0.5\ nc+30\ g+7\ s)\ 0.01\ t$$

Let: $n$ = No. times air is to be changed

$c$ = Volume of air in room in cu. ft.

$g$ = Area of window glass in sq. ft.

$s$ = Area of exposed wall in sq. ft.

$t$ = Difference in temperature deg. F.

### 4. WATER HEATING

Given a hot-water tank having inside dimensions of 1¾ ft. wide by 3 ft. long by 1½ ft. high, filled to within 6 in. of the top.

Required to heat this water from 50 to 150 deg. F. within two hours and from then on to heat approximately 4 gallons per hour.

The amount of water to be heated is $1¾\times3\times1=5¼$ cu. ft.; $5¼\times7.5$ gal. per cu. ft. $=39.4$ gallons of water.

From Fig. 2, it can be seen that approximately four gallons of water can be heated for each kw-hr.

There will be needed $\frac{39.4}{4}=10$ kw-hr. approximately, plus the radiation losses, the losses depending on the construction, insulation, etc. Since this was to be heated in two hours, there will be needed $\frac{10 \text{ kw-hr.}}{2 \text{ hr.}}=5$ kw. plus losses, to be installed.

Four gallons of water to be heated from 50 to 150 deg. F. now requires, from Fig. 2, 1 kw-hr. or, since it is to be heated within one hour $=\frac{1 \text{ kw-hr.}}{1 \text{ hr.}}=1$ kw. plus losses.

Therefore, the installation should consist of: one 5-kw., 3-heat water-immersion unit. After the bath has reached temperature, the "low-heat" connection of 1¼ kw. will be sufficient for the 4-gallon-per-hour rate.

Checking the above by means of the formula:

$$\text{Energy}=\frac{\text{Weight}\times\text{specific heat}\times\text{temp. rise deg. F.}}{3412}$$

$$\text{Energy}=\frac{327\times1\times100}{3412}=9.6 \text{ kw-hr.}$$

$$\text{For a 2-hr. heat-up}=\frac{9.6}{2}=5 \text{ kw. (approximately)}$$

## CONVERSION TABLES, FACTORS, ETC.

Deg. Fahrenheit = (1.8 × Deg. C.) + 32

Deg. Centigrade = .555 (Deg. F. − 32)

1 Gal. water = 8.3 lb.

1 Hp. = 745.2 watts

1 Btu. = .252 kg. calories = 0.2930 watts

1 Btu. per lb. = 1.8 cal. per gram.

1 Kw-hr. = 3412 Btu. per hr.

1 Kw-hr. will evaporate 3.5 lb. water from and at 212 deg. F.

1 Kw-hr. will raise 22.75 lb. water from 62 deg. F. to 212 deg. F.

1 Gal. = 231 cu. in = 3.785 litres = .1337 cu. ft.

1 Cu. ft. = 1728 cu. in. = .03704 cu. yd. = 7.481 gal.

Wattage varies directly as ratio of voltages squared

$$\left[W_2=W_1\times\left(\frac{E_2}{E_1}\right)^2\right]$$

# MODEL ORDER BLANK

## GENERAL ELECTRIC COMPANY

*{See reverse side for list of offices}*

We suggest that you retain this blank in your catalog using it simply as a model in writing out your orders.

ULTIMHEAT® VIRTUAL MUSEUM

State How You Want Your Products Shipped by Placing an X in Proper Square Below

Parcel Post ☐ Express ☐ Freight ☐

Your Order No.....

Please Do Not Write In This Space

Date.....193.....

Charge

Firm.....

Street.....

City.....State.....

Sign Here.....
(First Name) (Middle Initial) (Last Name)

If you want this order shipped to an address other than that shown above, give directions here

.....

.....

| Catalog Number | Quantity Desired | Name of Article Wanted | Electrical Rating | | Price | |
|---|---|---|---|---|---|---|
| | | | Watts | Volts | Each | Total |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## STOP! Have you forgotten the control?

For every heating unit or device listed in this catalog, there is a corresponding G-E control device which will give you the finest possible results. Be sure to include the control with each order.

ULTIMHEAT®
VIRTUAL MUSEUM

# OTHER G-E INDUSTRIAL HEATING PRODUCTS

| Product | Publication |
|---|---|
| Electric furnaces, large, custom-built | GEA-1146A |
| Bell-type furnaces for bright-annealing coiled steel strip | GEA-1495 |
| Copper brazing and copper-brazing furnaces | GEA-1291 |
| Electric furnaces for vitreous enameling | GEA-1115 |
| Electric heating equipment for glass-annealing lehrs | GEA-1379 |
| Electric heating equipment for hot-galvanizing tanks | GEA-1102 |
| Electric furnaces, standard stock types | |
| Air-draw furnaces | GEA-1324A |
| Air drawing-oven | GEA-785B |
| Conveyor furnace, mesh-belt | GEA-1174B |
| Direct-heat electric furnaces, box-type | GEA-37F |
| Pot-type electric furnaces for cyanide hardening | GEA-972 |
| Pot-type electric furnaces for lead hardening | GEA-930 |
| Tempering baths, electrically-heated | GEA-801A |
| Electric heating equipment for industrial ovens | GEA-408A |
| Electric steam generators | GEA-1372A |

Any of the above publications may be obtained from your nearest G-E sales office.

## GENERAL ELECTRIC COMPANY

GENERAL OFFICE SCHENECTADY, N. Y.

### Sales Offices—Address Nearest Office

Akron, Ohio ..... 106 South Main Street
Amarillo, Tex. ..... 806 South Grant Street
Atlanta, Ga. ..... 187 Spring Street, Northwest
Baltimore, Md. ..... 39 West Lexington Street
Beaumont, Tex. ..... 398 Pearl Street
Binghamton, N. Y. ..... 19 Chenango Street
Birmingham, Ala. ..... 2031 First Avenue, North
Bluefield, W. Va. ..... 307 Federal Street
Boston, Mass. ..... 140 Federal Street
Buffalo, N. Y. ..... 1 West Genesee Street
Butte, Mont. ..... 20 West Granite Street
Canton, Ohio ..... 700 Tuscarawas Street, West
Charleston, W. Va. ..... 304 Capitol Street
Charlotte, N. C. ..... 200 South Tryon Street
Chattanooga, Tenn. ..... 536 Market Street
Chicago, Ill. ..... 230 South Clark Street
Cincinnati, Ohio ..... 215 West Third Street
Cleveland, Ohio ..... 925 Euclid Avenue
Columbus, Ohio ..... 17 South High Street
Dallas, Tex. ..... 1801 North Lamar Street
Davenport, Iowa ..... 511 Pershing Avenue
Dayton, Ohio ..... 25 North Main Street
Denver, Colo. ..... 650 Seventeenth Street
Des Moines, Iowa ..... 418 West Sixth Avenue
Detroit, Mich. ..... 700 Antoinette Street
Duluth, Minn. ..... 14 West Superior Street
El Paso, Tex. ..... 109 North Oregon Street
Erie, Pa. ..... 10 East Twelfth Street
Fort Wayne, Ind. ..... 1635 Broadway
Fort Worth, Tex. ..... 408 West Seventh Street
Grand Rapids, Mich. ..... 148 Monroe Avenue, Northwest
Hartford, Conn. ..... 18 Asylum Street
Houston, Tex. ..... 1016 Walker Avenue
Indianapolis, Ind. ..... 110 North Illinois Street
Jackson, Mich. ..... 212 Michigan Avenue, West
Jacksonville, Fla. ..... 700 East Union Street
Kansas City, Mo. ..... 1004 Baltimore Avenue
Knoxville, Tenn. ..... 602 South Gay Street
Los Angeles, Calif. ..... 5201 Santa Fe Avenue
Louisville, Ky. ..... 453 South Fourth Street
Memphis, Tenn. ..... 8 North Third Street
Miami, Fla. ..... 120 Northeast Twentieth Street
Milwaukee, Wis. ..... 940 West St. Paul Avenue
Minneapolis, Minn. ..... 107 South Fifth Street
Nashville, Tenn. ..... 234 Third Avenue, North
Newark, N. J. ..... 744 Broad Street
New Haven, Conn. ..... 129 Church Street
New Orleans, La. ..... 837 Gravier Street
New York, N. Y. ..... 120 Broadway
Niagara Falls, N. Y. ..... 201 Falls Street
Oklahoma City, Okla. ..... 15 North Robinson Street
Omaha, Nebr. ..... 409 South Seventeenth Street
Philadelphia, Pa. ..... 1405 Locust Street
Phoenix, Ariz. ..... 11 West Jefferson Street
Pine Bluff, Ark. ..... 316 West Fifth Avenue
Pittsburgh, Pa. ..... 535 Smithfield Street
Portland, Ore. ..... 329 Alder Street
Providence, R. I. ..... 76 Westminster Street
Richmond, Va. ..... 700 East Franklin Street
Roanoke, Va. ..... 202 South Jeffers.n Street
Rochester, N. Y. ..... 89 East Avenue
St. Louis, Mo. ..... 112 North Fourth Street
Salt Lake City, Utah ..... 200 South Main Street
San Antonio, Tex. ..... 201 Villita Street
San Francisco, Calif. ..... 235 Montgomery Street
Schenectady, N. Y. ..... 1 River Road
Seattle, Wash. ..... 821 Second Avenue
Shreveport, La. ..... 513 Marshall Street
Spokane, Wash. ..... 421 Riverside Avenue
Springfield, Ill. ..... 607 East Adams Street
Springfield, Mass. ..... 1387 Main Street
Syracuse, N. Y. ..... 113 South Salina Street
Tacoma, Wash. ..... 1019 Pacific Avenue
Tampa, Fla. ..... 604 Ella Mae Street
Toledo, Ohio ..... 405 Madison Avenue
Trenton, N. J. ..... 143 East State Street
Tulsa, Okla. ..... 409 South Boston Street
Utica, N. Y. ..... 258 Genesee Street
Washington, D. C. ..... 800 Fifteenth Street, Northwest
Waterbury, Conn. ..... 195 Grand Street
Wheeling, W. Va. ..... 40 Fourteenth Street
Worcester, Mass. ..... 340 Main Street
Youngstown, Ohio ..... 16 Central Square

Canada: Canadian General Electric Company, Ltd., Toronto Hawaii: W. A. Ramsay, Ltd., Honolulu
Motor Dealers and Lamp Agencies in all large cities and towns



March, 1932 (25M)

ULTIMHEAT®
VIRTUAL MUSEUM

# DISCOUNTS

## Applying to Publication GEA-1520

## G-E ELECTRIC HEATING UNITS AND DEVICES

**PAGES 4, 6, 9, 11, 13, 17, 18, 19, 20, 21, 22, 25, AND 26.**

*Value of total order at published prices*

| | Less than $50 | $50 to $199 | $200 to $399 | $400 to $999 | $1000 to $1999 | $2000 to $3999 | $4000 and more |
|---|---|---|---|---|---|---|---|
| Published Price | | 10% | 17% | 24% | 29% | 33% | 35% |

**PAGES 14, 15, 16, AND 27**

*Value of total order at published prices*

| Less than $150 | $150 to $399 | $400 to $799 | $800 to $1599 | $1600 to $7999 | $8000 and more |
|---|---|---|---|---|---|
| 25% | 30% | 33% | 35% | 37% | 39% |

**PAGE 23,** Published Prices.

*General*

Prices and discounts subject to change without notice.
All prices are f.o.b. point of shipment.
Terms: Net, 30 days.

# SHIPMENT

## Applying to Publication GEA-1520

## G-E ELECTRIC HEATING UNITS AND DEVICES

| Material | Page No. | Shipment | *Shipping Point |
|---|---|---|---|
| Immersion heaters | 4 and 5 | Stock | Pittsfield, Mass. |
| Cartridge units | 6 and 7 | Stock | Pittsfield, Mass. |
| Strip heaters | 8, 9, and 10 | Stock | Pittsfield, Mass. |
| Sheath-wire units | 11 | 1 to 2 wk. | Pittsfield, Mass. |
| Sheath-wire units | 12 | 4 to 5 wk. | Pittsfield, Mass. |
| Hotplates | 13 | 4 to 5 wk. | Pittsfield, Mass. |
| Metal-melting pots | 14 and 15 | Stock | Schenectady, N. Y. |
| Cast-in immersion units | 16 | 1 wk. | Pittsfield, Mass. |
| Gluepots | 17 | Stock | Pittsfield, Mass. |
| Compound-melting pot | 18 | Stock | Pittsfield, Mass. |
| Soldering irons | 18 and 19 | Stock | Pittsfield, Mass. |
| Industrial air heaters | 20 and 21 | Stock | Pittsfield, Mass. |
| Automatic control equipment for industrial air heater | 21 | Stock | Pittsfield, Mass. |
| Snap switches | 22 | Stock | Pittsfield, Mass. |
| Automatic control equipment (general) | 23 | Stock | Schenectady, N. Y. |
| Thermostats | | | |
| All groups except 39, 38, 34, 19, 6, 15, 33, 46, and 21 | | | |
| CR2992-D2 | 25 | Stock | Schenectady, N. Y. |
| CR2992-B2 | 25 | 1 wk. | Schenectady, N. Y. |
| Groups 39, 38, 34, 19, 6, 15, 33, 46, and 21 | | | |
| CR2992-D2 | 25 | 3 wk. | Schenectady, N. Y. |
| CR2992-B2 | 25 | 3 wk. | Schenectady, N. Y. |
| Thermostats | 26 | 3 wk. | Schenectady, N. Y. |
| Melting-pot switches | 27 | Stock | Schenectady, N. Y. |
| Melting-pot thermostats | 27 | Stock | Schenectady, N. Y. |
| Melting-pot panels | 27 | Stock | Schenectady, N. Y. |

*Points indicated are points of manufacture. In many cases, your nearest G-E warehouse can ship from stock.

ULTIMHEAT®
VIRTUAL MUSEUM