DESCRIPTION • INSTALLATION • OPERATION

INSTRUCTIONS

THERMOSTATIC RELAYS

Type HQ

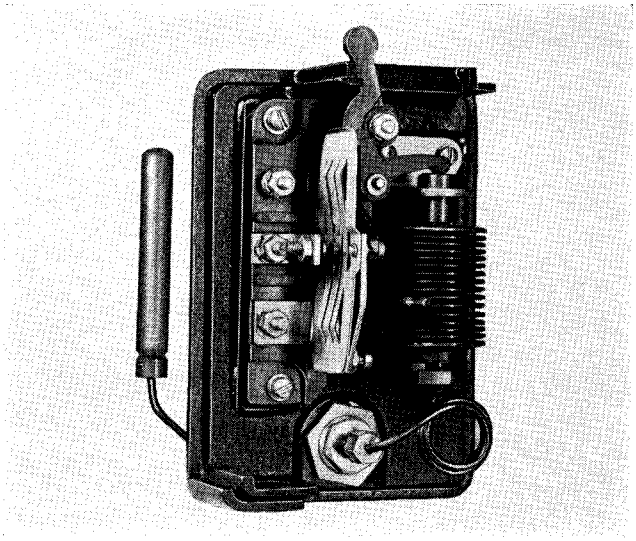


FIG. 1. Type HQ Relay with Cover Removed

TYPE HQ RELAY is a device designed to "make" or "break" a circuit at a predetermined temperature. (See Fig. 1). It is used to give over-temperature protection to bearings, resistors, cables, transformers and other equipment. Relays are available which operate at approximately 80, 100, or 300 degrees C. Operation at other temperatures is possible when relays are specially ordered.

The relay comprises a bellows, tube and bulb unit, a spring toggle switch and a bell crank transmitting motion from one to the other. The relay parts, with the exception of the thermostatic bulb and connecting tube, are mounted on a cast iron base and protected by a dust-proof metal cover secured by a thumb-nut.

INSTALLATION

For protection of grids, cables or transformers, the relay is mounted against a flat surface. (See Fig. 2). On bearings, the relay is mounted by means of a special ½-inch pipe bushing extending to the rear of the relay. Bushings of two lengths (standard and extension bushings) are available for use depending on the space requirements (See Fig. 3).

To mount a bearing-type relay:

1. Remove the bushing from the base and insert into a ½-inch pipe-tapped hole on the machine.

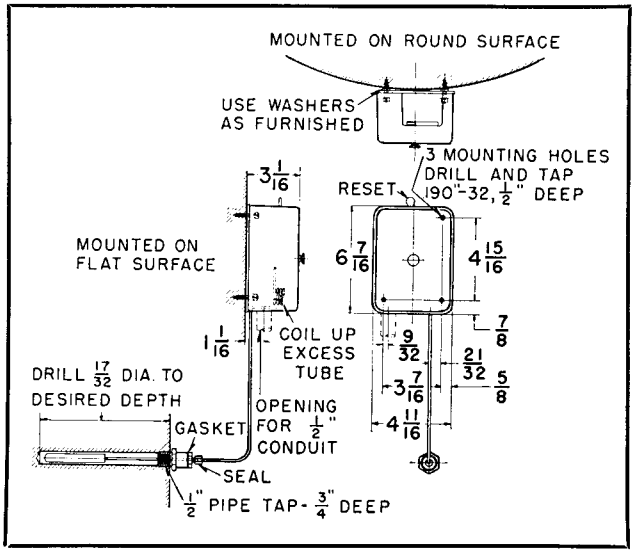


FIG. 2. Details for Mounting Type HQ Relay on Transformer Tank (Approximate Dimensions are Shown for Reference Only)

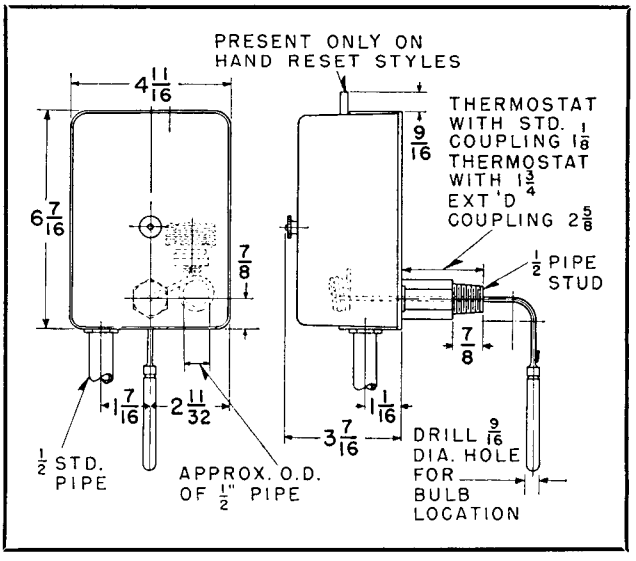


FIG. 3. Outline and Drilling Plan for Type HQ Relay (Approximate Dimensions are Shown for Reference Only)

2. Tighten the bushing so that two opposite sides of the hexagonal bushing are in vertical planes.

3. Loosen the guide bracket screw and the bellows locknut and remove the bellows and tube.

4. Secure the relay base to the bushing by means of the locknut.

5. Extend the bulb into its location to determine the excess length of tube which must be absorbed by coiling within the relay case. Form the coils around a convenient mandrel, such as a piece of ½-inch pipe, taking care to prevent kinks or sharp bends.

6. Place the bulb and bellows in their locations, with the tube passing through the hole in the base. If the bulb is located horizontally, care should be taken that the tag marked "top" be uppermost, and a sealing gland provided. The sealing jamnut should not be tightened until the sealing nipple is turned tightly into place.

7. Finally secure the guide bracket and bellows locknut.

The mounting of a relay for the protection of grids or cables is accomplished in a similar manner, except that a flat mounting bracket is used instead of a stud support, and the bulb is suspended at a height of approximately one inch above the heat-producing parts to be protected.

Connections are made to the relay through ½-inch standard conduit pipe brought to a hole in the bottom of the base. Three terminals are provided, the top terminal being connected to the right or "make" stationary contact, the center terminal to the left or "break" stationary contact, and the bottom terminal of the moving contact.

The relay is adjusted at the factory before shipment, and no further alteration of bellows or switch adjustment should be made.

OPERATION

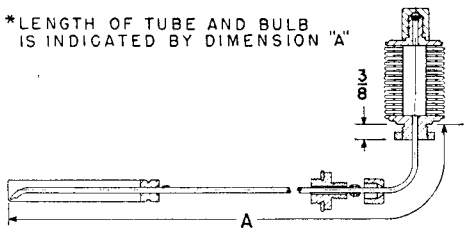
The thermostatic bulb is located at the point where excessive temperature is likely to occur. As the temperature of the material surrounding the bulb rises, a liquid enclosed in the bulb and bellows volatilizes and creates a vapor pressure that expands the bellows lengthwise. The movement is transmitted by the bell crank to the spring toggle switch which with quick action opens one circuit and closes a second circuit, one leg of the two circuits being common. In relays designed to protect bearings, the switch is retained in the tripped position by a mechanical latch which serves as a semaphore signal, swinging into view when the relay has tripped. Resetting is accomplished by manually moving the semaphore arm to its normal position out of view within the relay case. In grid, cable, or transformer thermostatic relays, the latch is omitted and automatic resetting occurs.

Volatilization of the liquid enclosed in the bulb and bellows system takes place only in the bulb, the vapor pressure formed there being transmitted by the liquid in the tube to the bellows. To prevent gas from leaving the bulb and thereby altering the relay calibration, the tube extends to the bottom of the bulb, where it is bent to one side. The bulb may be located vertically with tube uppermost or horizontally in the proper position, as indicated by a tag on the tube marked "top". The bulb may be located at any level with respect to the relay, as long as the bulb is in its proper position. Tube lengths greater than standard may be specially ordered. A "gasoline seal" gland is provided on the tube for the prevention of loss of the medium in which the bulb is imbedded.

TYPE HQ THERMOSTATIC RELAYS

RELAY COMPLETE STYLE NO.	MECHANISM STYLE NO.	RESET	BELLOWS AND TUBE			BUSHING STYLE NO.		
			Style No.	Temp. (Deg. C.)	* Length of Tube and Bulb (Inches)	Standard	Extended	Round
596 424	671 783	Hand	671 778	96	24	674 208	... ...	... ...
596 425	671 783	Hand	671 778	96	24	... ...	674 209	... ...
667 379	671 783	Hand	671 779	96	39	674 208	... ...	... ...
667 380	671 783	Hand	671 779	96	39	... ...	674 209	... ...
667 381	671 783	Hand	671 780	96	51	674 208	... ...	... ...
667 382	671 783	Hand	671 780	96	51	... ...	674 209	... ...
684 504	684 503	Auto.	671 782	80	24	674 208	... ...	... ...
684 505	684 503	Auto.	671 781	300	24	... ...	... ...	... ...
690 864	684 503	Auto.	671 778	96	24	... ...	... ...	... ...
698 118	671 783	Hand	698 117	70	24	674 208	... ...	... ...
755 187	671 783	Hand	755 202	96	75	674 208	... ...	... ...
755 188	671 783	Hand	755 202	96	75	... ...	674 209	... ...
760 603	671 783	Hand	698 117	70	24	... ...	... ...	760 602
760 604	671 783	Hand	671 780	96	51	... ...	... ...	760 602
760 605	671 783	Hand	671 778	96	24	... ...	... ...	760 602
766 641	766 640	Hand	671 778	96	24	685 903 △	... ...	... ...
766 642	766 640	Hand	755 202	96	75	685 903 △	... ...	... ...
808 765	766 040	Hand	808 764	80	24	685 903 △	... ...	... ...
1 596 987	301P455G01	Hand	16B9641G14	85	39	674 208	... ...	... ...

△ This style bushing does not include the gasket or locknut.



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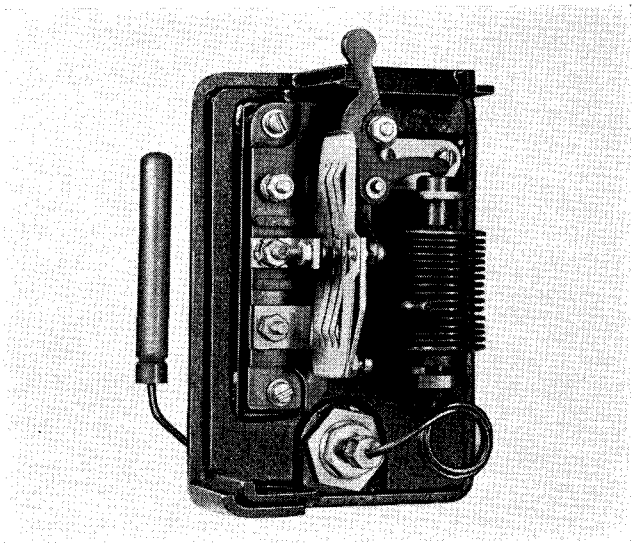

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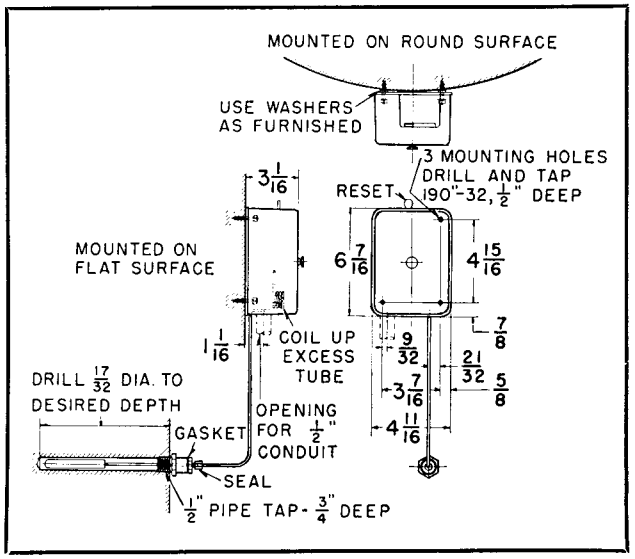
The relay comprises a bellows, tube and bulb unit, a spring toggle switch and a bell crank transmitting motion from one to the other. The relay parts, with the exception of the thermostatic bulb and connecting tube, are mounted on a cast iron base and protected by a dust-proof metal cover secured by a thumb-nut.

INSTALLATION

For protection of grids, cables or transformers, the relay is mounted against a flat surface. (See Fig. 2). On bearings, the relay is mounted by means of a special ½-inch pipe bushing extending to the rear of the relay. Bushings of two lengths (standard and extension bushings) are available for use depending on the space requirements (See Fig. 3).

To mount a bearing-type relay:

1. Remove the bushing from the base and insert into a ½-inch pipe-tapped hole on the machine.



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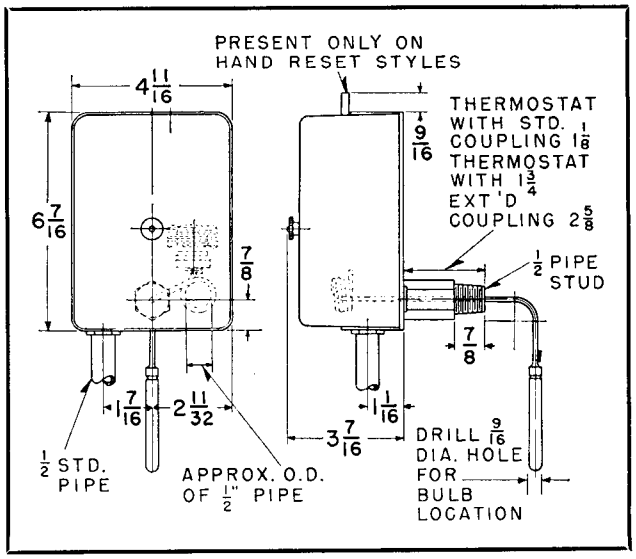

FIG. 3. Outline and Drilling Plan for Type HQ Relay (Approximate Dimensions are Shown for Reference Only)

2. Tighten the bushing so that two opposite sides of the hexagonal bushing are in vertical planes.

3. Loosen the guide bracket screw and the bellows locknut and remove the bellows and tube.

4. Secure the relay base to the bushing by means of the locknut.

5. Extend the bulb into its location to determine the excess length of tube which must be absorbed by coiling within the relay case. Form the coils around a convenient mandrel, such as a piece of ½-inch pipe, taking care to prevent kinks or sharp bends.

6. Place the bulb and bellows in their locations, with the tube passing through the hole in the base. If the bulb is located horizontally, care should be taken that the tag marked "top" be uppermost, and a sealing gland provided. The sealing jamnut should not be tightened until the sealing nipple is turned tightly into place.

7. Finally secure the guide bracket and bellows locknut.

The mounting of a relay for the protection of grids or cables is accomplished in a similar manner, except that a flat mounting bracket is used instead of a stud support, and the bulb is suspended at a height of approximately one inch above the heat-producing parts to be protected.

Connections are made to the relay through ½-inch standard conduit pipe brought to a hole in the bottom of the base. Three terminals are provided, the top terminal being connected to the right or "make" stationary contact, the center terminal to the left or "break" stationary contact, and the bottom terminal of the moving contact.

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