I. L. 1414-A
*(Class RP 15580.2)

Westinghouse

Type KN-2 Overload Relay

Double-Pole

Instructions

CONSTRUCTION

The special type of relay shown in the illustration is made only as a double-pole combination, two trip coils connected in separate lines of a polyphase system acting to break a single contact in the control circuit when the current in either trip coil exceeds a certain value. Inverse time limit is obtained by means of an oil dashpot which is attached to each plunger. Quick opening of the contacts is obtained by providing a by-pass in the dashpot wall which opens at a suitable height and allows oil to flow freely to the under side of the piston. The speed is thus very much increased at the end of the travel and the plunger hits the stem with a hammer blow which opens the contacts very rapidly. Quick return of the plunger after the overload is cleared is obtained by means of a flat washer carried in the piston cup which acts as a check valve to allow free motion downward but not upward.

APPLICATION

This relay differs from the standard Type KN overload relay only in the construction of the electric reset details. The relay as illustrated is always supplied with a special form of reset latch which engages with a projection on the contact lever and prevents its return after the relay has tripped. A shunt reset coil mounted between the dashpots of the relay allows the latch to be depressed magnetically. Thus the relay may be reset by the operator at a remote push button station. The relay may be used as a hand reset relay without change or it may be made into an automatic reset relay by removing the complete reset mechanism. The latter may be accomplished by removing the two upper screws from the reset bracket.

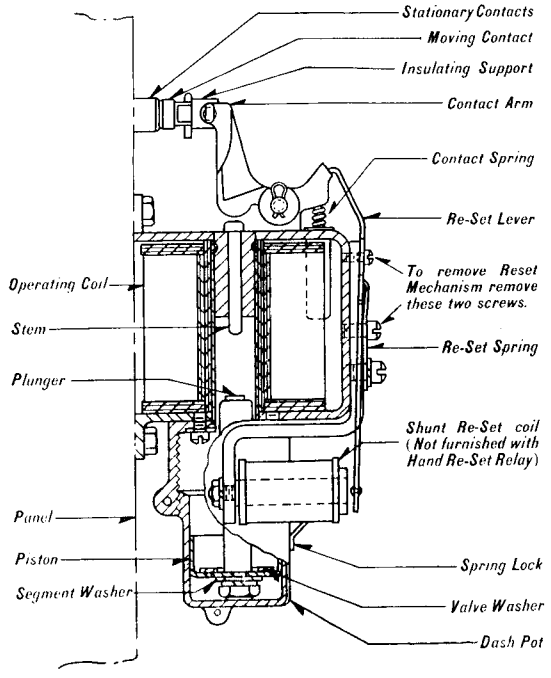
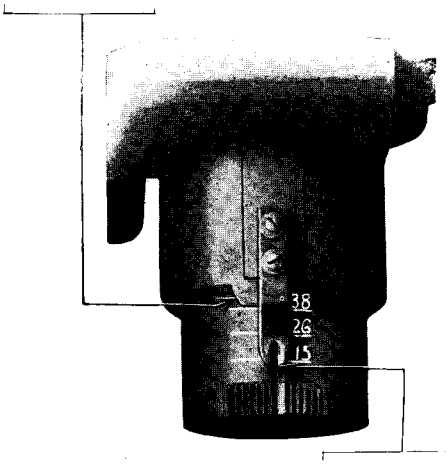


FIG. 1

To adjust overload setting turn Dashpot until proper calibration line coincides with lug on bottom of upper casting.



The clip is only to prevent turning of Dashpot and consequent change of setting due to vibration.

FIG. 2

Hand reset or electric reset relays must be used on "low voltage release" service where the reseting af the relay would automatically reenergize the controller. This is the case when the relay is used on full magnetic control apparatus which is started by an automatic master switch such as a float switch or pressure gauge master switch or a manually operated master switch which maintains its contact until it is released by the operator.

Automatic reset relays are used on "low voltage protection" service where the resetting of the relay will not automatically reenergize the controller. This is the case when the relay is used on full magnetic control apparatus which is started by a momentary contact push button or other master switch which does not maintain the starting contact in the operating position or on manually operated controllers.

OPERATION

Before putting the relay in operation the dashpots must be removed to receive the special dashpot oil supplied with the relay. To avoid air pockets remove the pistons and fill the dashpots half full of oil. Replace the pistons and try the suction by pulling on the armature. If the suction seems weak or unreliable, inspect the condition of the check valve surfaces to see whether the washer is being held away from its seat by particles of dirt. Great care should be taken to keep the interior of the dashpots clean, as dirt will spoil the valve action and will also change the time settings.

Replace the dashpots and screw up to the current setting desired as indicated by markings on the dashpot. As shown in Fig. 2 the correct indicating point for the current setting is the lower edge of the lug on the bottom of the stationary casting, and not the spring clip. The dashpots have three calibration lines marked with tripping current values and proper positions for

*To be filed as an Instruction Leaflet and as Renewal Parts Data.

any other currents may be estimated from the marked points.

The time element depends upon the number of holes covered by the segment washer on the bottom of the piston. Relays are usually shipped with all holes closed giving a maximum time element. To decrease the time element move the washer so that one or more holes are uncovered.

The oil furnished with these relays is specially adapted for this purpose and will give satisfactory operation at all ordinary temperatures. Relays subjected to temperatures below freezing require a lighter oil. If temperatures are so high that the relay does not give sufficient time element, a heavier oil should be used.

Style No. 229296 includes enough oil for two dashpots.

When a relay with hand or electrical reset is supplied and an automatic reset relay is desired, remove the reset parts by removing two screws in front of frame.

Inspection of the relays should be made regularly to see that the current limit setting has not been changed, that there is sufficient oil in the dashpot and that the contacts are in good condition.

Renewal Parts

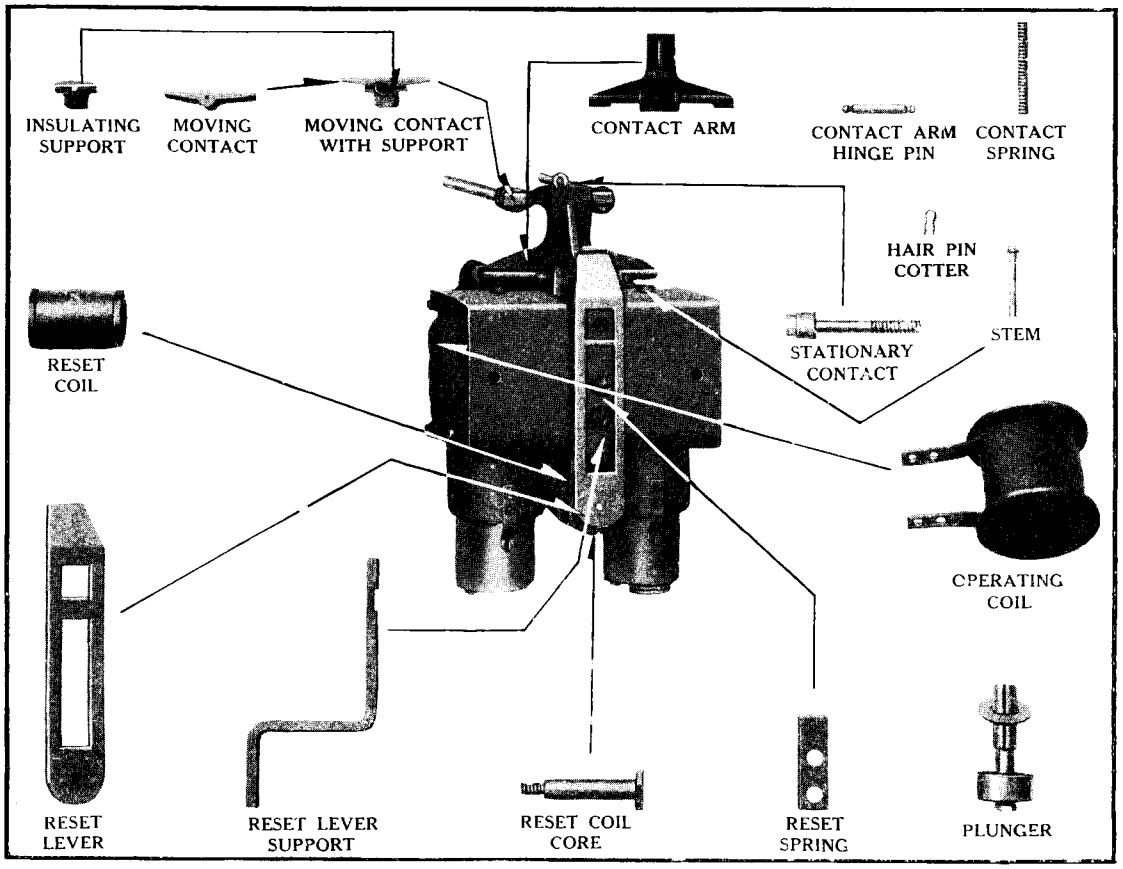


FIG. 3—RENEWAL PARTS FOR TYPE KN-2 OVERLOAD RELAY

ORDERING INSTRUCTIONS

Quick shipments from district office stock and prompt replies to inquiries, without the necessity of referring to the works for information, are possible only when complete identifying information for the part is given. Careful observance of the following points on inquiries or orders are essential for correct shipments and prompt service.

1. Name the part, using the name shown on the illustration above and state quantity desired.

2. Specify the style number of the relay that is shown an the name plate. (See illustration below). When ordering coils, give the number stamped on the old coil.

3. State whether shipment is to be made by freight, express (and name the route) or by parcel post. If by parcel post shall we insure the shipment?

4. Send all orders or Correspondence to the nearest district office of the company.

5. Small orders should be combined so as to amount to the value of at least one dollar, as shipping expenses prevent is from billing a smaller amount.

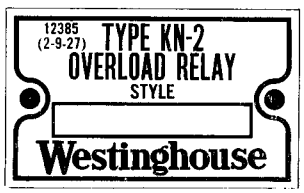


FIG. 4—TYPE KN-2 OVERLOAD RELAY NAME PLATE

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

East Pittsburgh Works **East Pittsburgh, Pa.**

Printed in U.S.A.

TYPE KN-2 DOUBLE POLE OVERLOAD RELAYS
INSTRUCTIONS

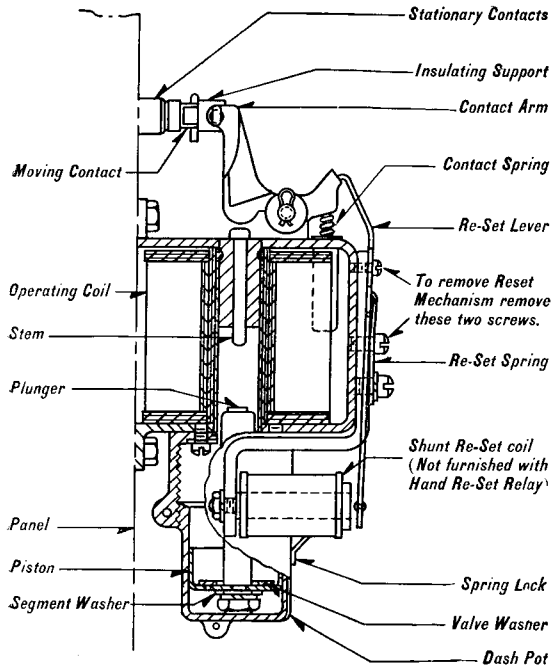


FIG. 1—TYPE KN-2 RELAY

Construction

The type KN-2 relay is a two-pole oil dashpot type overload relay, with an electric reset attachment used in polyphase alternating-current circuits. Inverse time element is obtained by the operation of two plungers, operating in two dashpots, used to break the control circuits, which are actuated by trip coils when the current in either or both of the trip coils exceeds a predetermined figure. A by-pass for the oil in the dash pot wall, at a suitable height, permits an increase in the speed of the plunger during the last part of the stroke thus giving a quick opening of the control circuit contacts. Quick return of the plunger after the overload is cleared, is obtained by means of a flat washer, carried in the piston cup, which acts as check valve to allow free motion downward but not upward.

The electric reset attachment includes a reset lever which engages with a projection on the contact arm, and prevents its return after the relay has tripped. A shunt reset coil mounted between the dashpots of the relay allows the latch to be depressed magnetically. Thus the relay may be reset by the operator at a remote pushbutton station.

Application

The type KN-2 relay is chiefly used in type AF magnetic auto-starters. It is also occasionally used on other control where the special features of electric reset, described above, are desired.

Electric reset (and hand reset) relays must be used on "low voltage release" service, where the resetting of the relay will automatically reenergize the controller. This occurs when the relay is used on full magnetic control apparatus, which is started by an automatic master switch, such as a float switch or pressure gauge master switch, or even a manually-operated master switch, that maintains its contact until released by the operator.

The type KN-2 relay may be converted into the ordinary type KN relay, having automatic reset, by removing the complete reset mechanism. This may be accomplished by removing the two upper screws from the reset lever. The relay with automatic reset may be used on "low voltage protection" service, where the resetting of the relay will not automatically reenergize the controller. This occurs when the relay is used on magnetic controllers started by a momentary contact push-button, or a master switch which does not maintain the starting contact in the running position, or on manually-operated auto-starters.

Installation

Before putting the relay in operation, the dashpots must be removed to receive the special dashpot oil supplied with the relay. The can of oil supplied with the relay contains sufficient oil for two dashpots.

To avoid air pockets, remove the pistons and fill the dashpots half full of oil. Replace the pistons and try the suction by pulling on the plunger. If the suction seems weak or unreliable, inspect the condition of the check valve surfaces to see whether the washer is being held away from its seat by particles of dirt. Great care should be taken to keep the interior of the dashpots clean, as dirt will spoil the valve action and will also change the time settings.

Replace the dashpots and screw up to the current setting desired as indicated by markings on the dashpot, as shown in Fig. 2. The correct indicating point for the current setting is the lower edge of the lug on the bottom of the stationary casting, and not the spring clip. The dashpots have three calibration lines marked with tripping current values and any intermediate current values may be estimated from the marked points.

The time element depends upon the number of holes covered by the segment washer on the bottom of the piston. Relays are usually shipped with all holes closed giving a maximum time element. To decrease the time element, move the washer so that one or more holes are uncovered.

Maintenance

Inspection of the relays should be made regularly to see that the current limit setting has not been changed, that there is sufficient oil in the dashpot and that the contacts are in good condition.

The oil furnished with these relays is specially adapted for this purpose and will give satisfactory operation at all ordinary temperatures. Relays subjected to temperatures below freezing require a lighter oil. If temperatures are so high that the relay does not give sufficient time element, a heavier oil should be used.

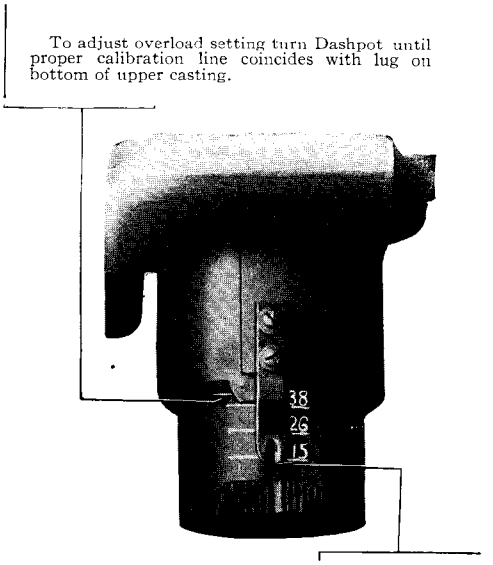


FIG. 2—DASHPOT FOR TYPE KN-2 RELAYS

*To be filed as an Instruction and Renewal Parts Leaflet; for Renewal Parts, see reverse side of this sheet.

TYPE KN-2 DOUBLE POLE OVERLOAD RELAYS

RENEWAL PARTS DATA

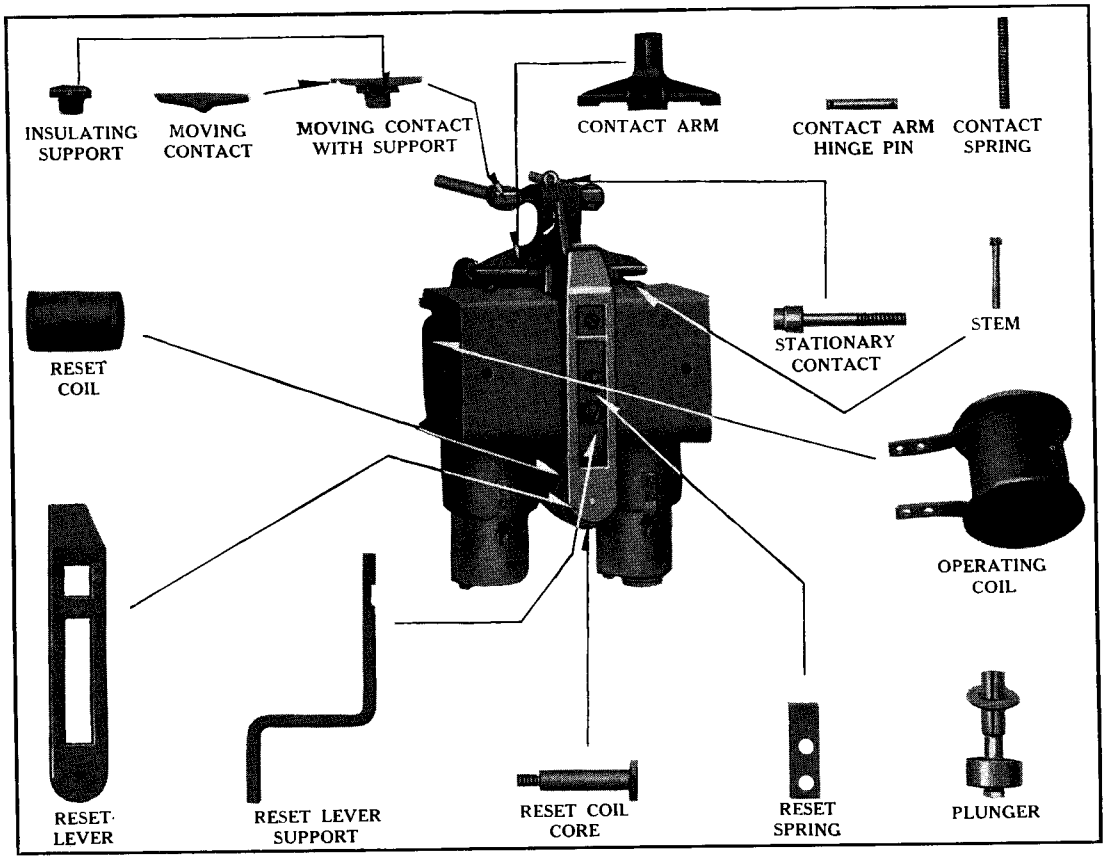


FIG. 3—RENEWAL PARTS FOR TYPE KN-2 OVERLOAD RELAY

RECOMMENDED STOCK OF RENEWAL PARTS

Style Number of Relay				379356,A,B,C
Relays in use up to and including		1	5	Style Number of Part
Name of Part	No. Per Relay	Recommended For Stock		
Moving Contact with Support	1	1	2	197 383
Moving Contact	1	1	2	266 584
Insulating Support	1	1	2	187 250
Contact Arm	1	0	0	266 600
Contact Spring	1	0	1	194 510
Contact Arm Hinge Pin	1	0	0	662 207
Stationary Contact	2	2	4	705 233
Reset Lever	1	0	0	379 595
Reset Lever Support	1	0	0	379 596
Reset Spring	1	0	1	379 597
Reset Coil Core	1	0	0	379 598
°Plunger Core	2	0	0	273 340
Plunger	2	0	1	370 611
°Plunger Stem	2	0	0	273 341
°Piston	2	0	0	266 597
°Valve Washer	2	0	0	22 106
°Segment Washer	2	0	0	242 090
Stem	2	0	1	266 595
°Dash Pot	2	0	0	263 933
°Dash Pot Sleeve	2	0	0	263 934
°Spring Lock	2	0	1	247 440
†°Dash Pot Oil in Can	2	0	1	229 296
Reset Coil	1	0	1	‡
Operating Coil	1	1	1	‡

° Not illustrated.
† Not part of relay.
‡ When ordering, specify identification number stamped on coil.
Parts indented are included in the part under which they are indented.

This is a list of the Renewal Parts and the quantities of each that we recommend should be stocked by the user of this apparatus to minimize interrupted operation caused by breakdowns. The parts recommended are those most subject to wear in normal operation or those subject to damage or breakage due to possible abnormal conditions.

This list of Renewal Parts is given only as a guide. When continuous operation is a primary consideration, additional insurance against shutdowns is desirable. Under such conditions more renewal parts should be carried, the amount depending upon the severity of the service and the time required to secure renewals.

Ordering Instructions

Name the part and give the complete name plate reading. State whether shipment is desired by express, freight or by parcel post. Send all orders or correspondence to nearest Sales Office of the Company. Small orders should be combined so as to amount to a value of at least $1.00 net; where the total of the sale is less than this, the material will be invoiced at $1.00.

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Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

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