

# CATALOG SECTION 65

ZCG UTILITY SCRAP  
UNION, MO 63084

## Type K Relays

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*Parts lists are available on request*



**GENERAL RAILWAY SIGNAL COMPANY**

ROCHESTER, NEW YORK

Printed in U. S. A.



## GENERAL INFORMATION

A.A.R. Specifications are adhered to in the design of these relays.

### Contacts

All Type K relays, unless otherwise described, are furnished with regular duty (RD) contacts with a 0.050" front contact opening and are equipped with metal-impregnated-carbon-to-metal front and metal-to-metal back contacts.

Regular-duty contacts are designed to carry four amperes continuously at first-range voltages (30 volts or less).

Certain Type K relays, as stated in their accompanying descriptions, are furnished with heavy-duty (HD) contacts and some, with extra-heavy duty (EHD) contacts.



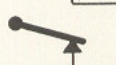

Heavy-duty (HD) contacts are used with loads which exceed the capacity of RD contacts yet do not require extra-heavy-duty contacts.

Extra-heavy-duty (EHD) contacts are for second range voltages (over 30 volts and up to 175 volts inclusive). They are equipped with magnetic blowouts that extinguish the arc instantly. Type K relays with EHD contacts can safely interrupt 50 amperes in a highly inductive 110-volt d-c. circuit on loads of very short duration.

Contact post designations are shown on the name plate of each relay. See also diagrams on page 12 keyed to relay ordering descriptions.

*NOTE: Always connect POSITIVE to the HEEL of an EHD contact to obtain maximum effect of magnetic blowout.*

Contacts are designated under relay descriptions as follows (symbols show de-energized positions):

<u>ABBREVIATION</u>	<u>MEANING</u>	<u>SYMBOL</u>
F	Front	
FB	Front-Back	
B	Back	
NR	Normal-Reverse	

### Mountings

All Type K relays come complete with mounting brackets as shown in the illustrations on pages 3 to 11. These brackets can be used for resiliently mounting Type K relays on a wall or on a shelf.

Dimensions shown include mounting brackets. Depths and heights without brackets are slightly less than shown.

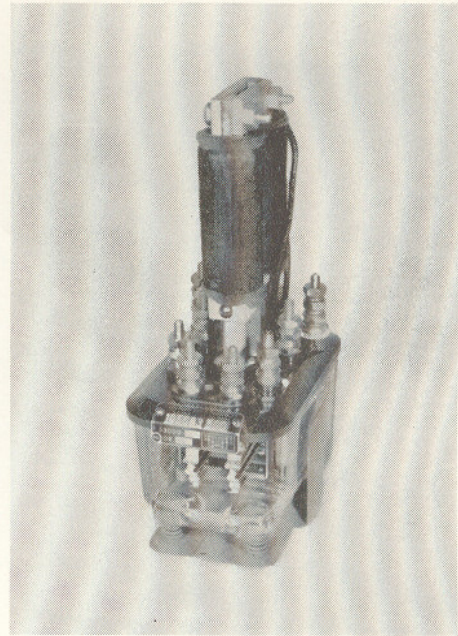
## HOW TO ORDER

Order Type K relay and give catalog number and quantity.





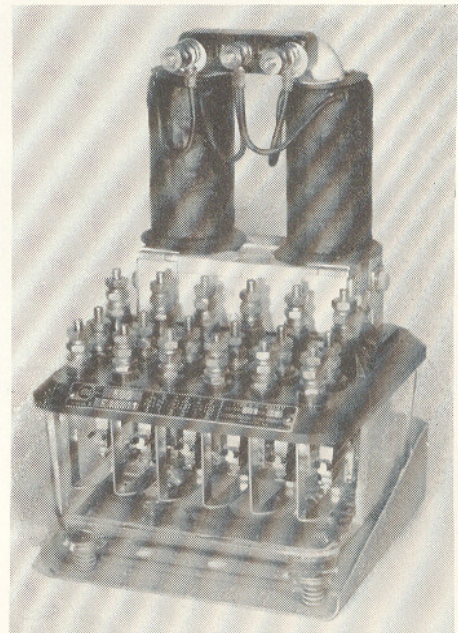
Approach, Size 2  
 Height  $8\frac{1}{8}$ " —Depth  $6\frac{1}{4}$ " —Width  $3\frac{7}{8}$ "  
 Mounting Centers— $2\frac{3}{8}$ "



Biased-Neutral, Size 2  
 Height 10" —Depth  $6\frac{1}{4}$ " —Width  $3\frac{7}{8}$ "  
 Mounting Centers  $2\frac{3}{8}$ "



Biased-Neutral, Size 4  
 Height  $11\frac{3}{4}$ " —Depth  $6\frac{3}{4}$ " —Width  $7\frac{3}{8}$ "  
 Mounting Centers— $5\frac{7}{8}$ "



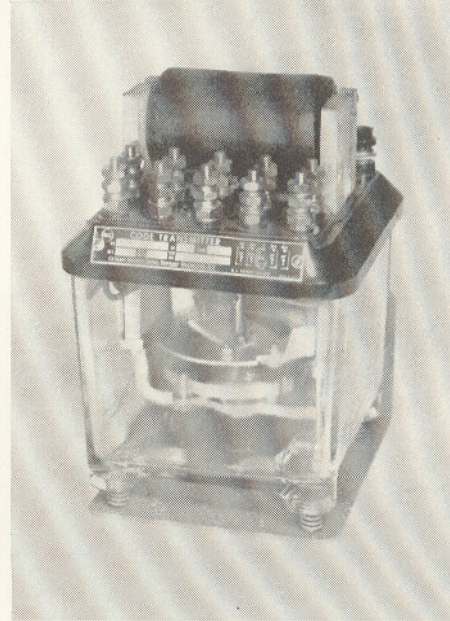
Biased-Neutral, Size 6  
 Height 12" —Depth  $7\frac{3}{4}$ " —Width  $7\frac{3}{4}$ "  
 Mounting Centers— $5\frac{7}{8}$ "





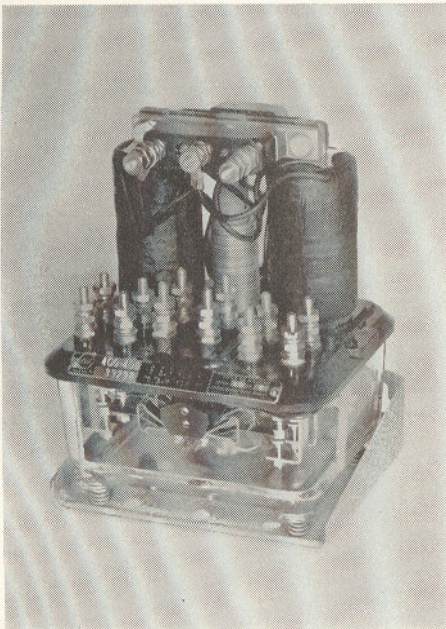
Code-Responsive

Height  $7\frac{3}{8}$ " — Depth  $8\frac{1}{16}$ " — Width  $4\frac{15}{16}$ "  
Mounting Centers— $3\frac{1}{4}$ "



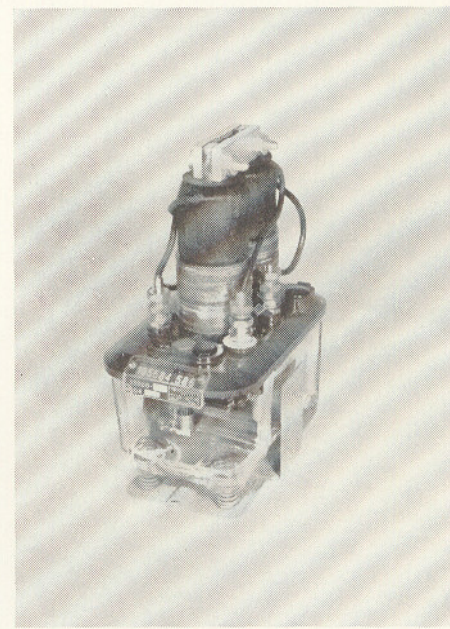
Code Transmitter

Height  $9\frac{3}{4}$ " — Depth  $7\frac{1}{2}$ " — Width  $6\frac{1}{2}$ "  
Mounting Centers— $4\frac{3}{4}$ "



Highway Crossing Flasher, Size 4

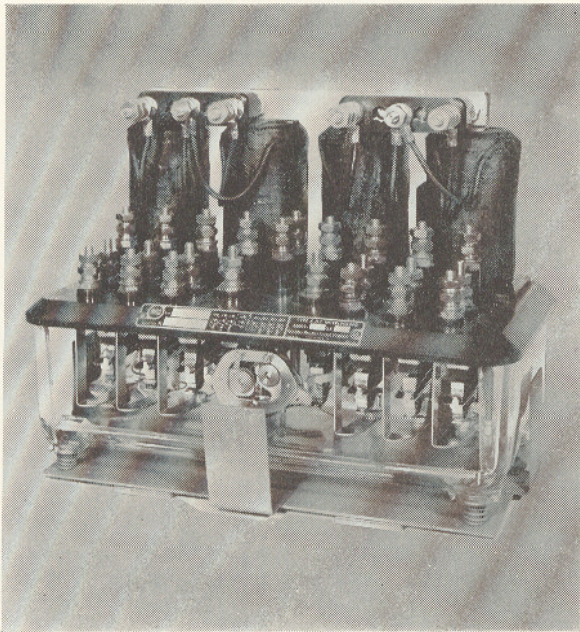
Height  $9\frac{1}{4}$ " — Depth  $6\frac{3}{4}$ " — Width  $7\frac{3}{8}$ "  
Mounting Centers— $5\frac{7}{8}$ "



Signal Flasher, Size 2

Height  $8\frac{1}{8}$ " — Depth  $6\frac{1}{4}$ " — Width  $3\frac{7}{8}$ "  
Mounting Centers— $2\frac{3}{8}$ "





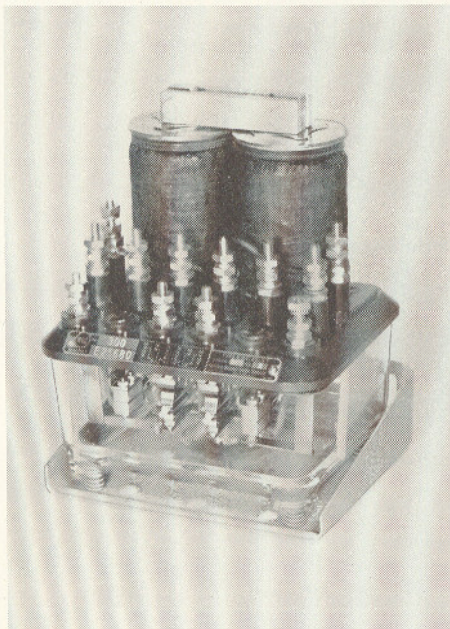
Interlocking, Size 8

Height  $9\frac{1}{8}$ "—Depth 8"—Width  $12\frac{1}{8}$ "  
Mounting Centers— $5\frac{1}{2}$ "



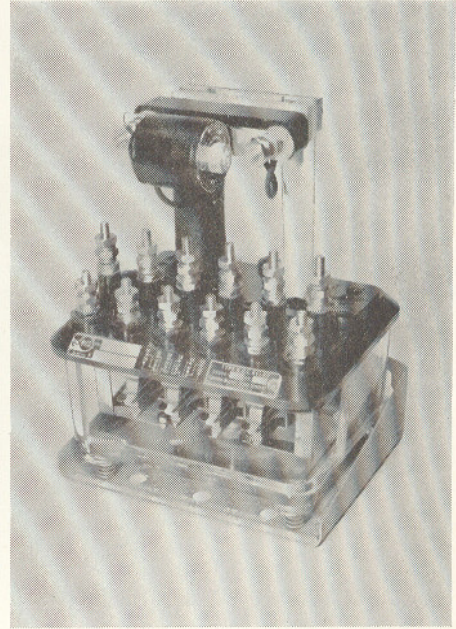
Light-Out, Size 2

Height  $8\frac{1}{2}$ "—Depth  $6\frac{1}{4}$ "—Width  $3\frac{7}{8}$ "  
Mounting Centers— $2\frac{3}{8}$ "



Lamp-Control, Size 4

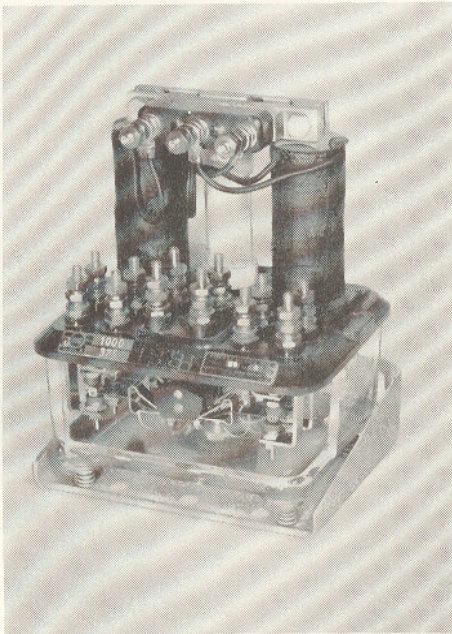
Height  $9\frac{1}{4}$ "—Depth  $6\frac{3}{4}$ "—Width  $7\frac{3}{8}$ "  
Mounting Centers— $5\frac{7}{8}$ "



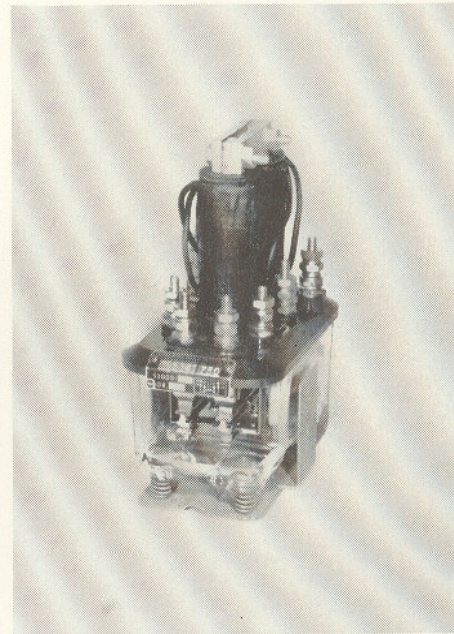
Light-Out, Size 4

Height  $9\frac{3}{8}$ "—Depth  $6\frac{3}{4}$ "—Width  $7\frac{3}{8}$ "  
Mounting Centers— $5\frac{7}{8}$ "

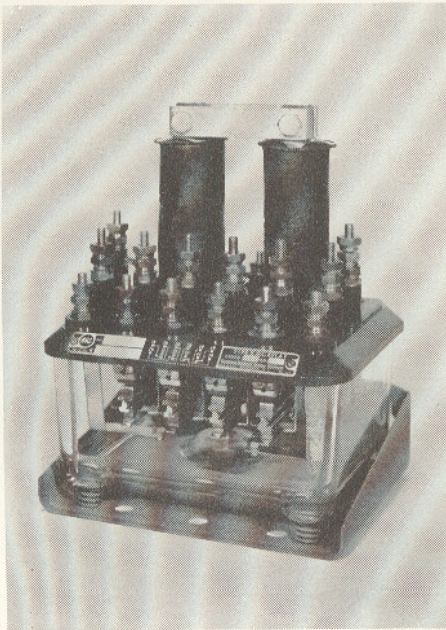




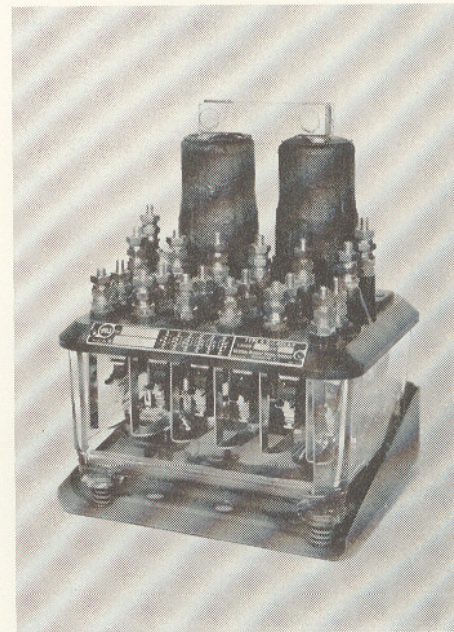
Magnetic-Stick, Size 4  
 Height  $9\frac{1}{4}$ " —Depth  $6\frac{3}{4}$ " —Width  $7\frac{3}{8}$ "  
 Mounting Centers— $5\frac{7}{8}$ "



Neutral, Size 2  
 Height  $8\frac{1}{8}$ " —Depth  $6\frac{1}{4}$ " —Width  $3\frac{7}{8}$ "  
 Mounting Centers— $2\frac{3}{8}$ "

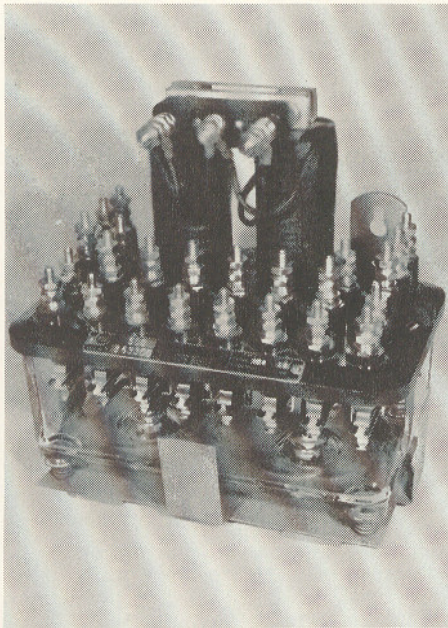


Neutral, Size 4  
 Height  $9\frac{1}{4}$ " —Depth  $6\frac{3}{4}$ " —Width  $7\frac{3}{8}$ "  
 Mounting Centers— $5\frac{7}{8}$ "

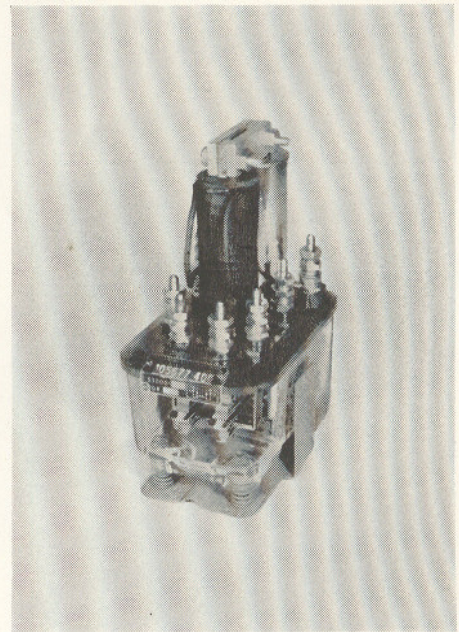


Neutral, Size 6  
 Height  $9\frac{3}{4}$ " —Depth  $7\frac{3}{4}$ " —Width  $7\frac{3}{4}$ "  
 Mounting Centers— $5\frac{7}{8}$ "





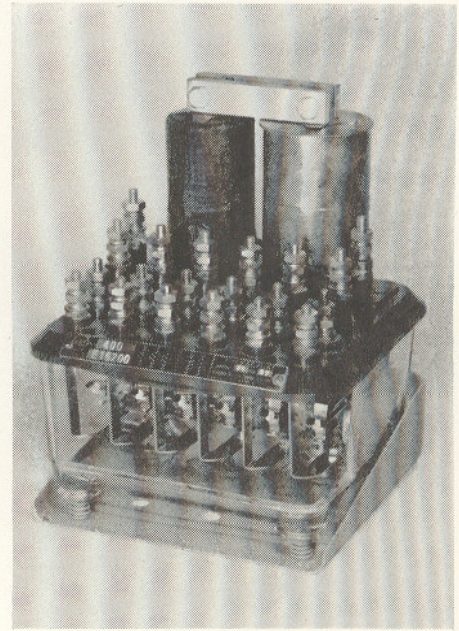
Neutral, Size 8  
 Height 9 $\frac{3}{4}$ "—Depth 6 $\frac{7}{8}$ "—Width 10 $\frac{1}{8}$ "  
 Mounting Centers—5 $\frac{7}{8}$ "



Slow-Acting, Size 2\*  
 Height 8 $\frac{1}{8}$ "—Depth 6 $\frac{1}{4}$ "—Width 3 $\frac{3}{8}$ "  
 Mounting Centers—2 $\frac{3}{8}$ "



Slow-Acting, Size 4\*  
 Height 9 $\frac{1}{4}$ "—Depth 6 $\frac{3}{4}$ "—Width 7 $\frac{3}{8}$ "  
 Mounting Centers—5 $\frac{7}{8}$ "



Slow-Acting, Size 6\*  
 Height 9 $\frac{3}{4}$ "—Depth 7 $\frac{3}{4}$ "—Width 7 $\frac{3}{4}$ "  
 Mounting Centers—5 $\frac{7}{8}$ "

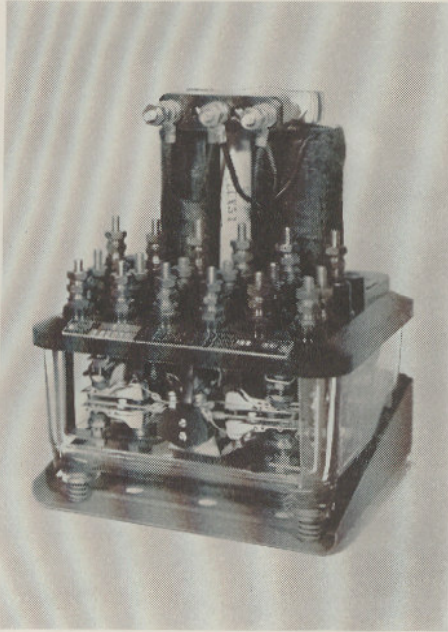
*\*These illustrations cover all slow-acting relays such as, slow-release; slow-pickup; slow-pickup and slow-release; secondary of primary-secondary combination and slow-pickup, slow-release and quick-crossover relays, the only difference being in the size of slugs, amount of copper washers or their location on the relay cores.*

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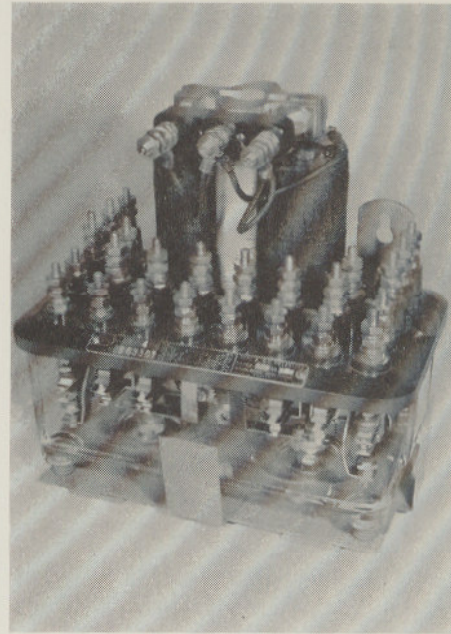
April 1958

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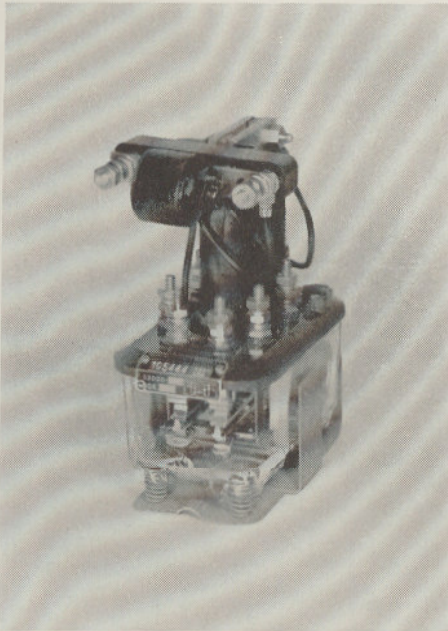




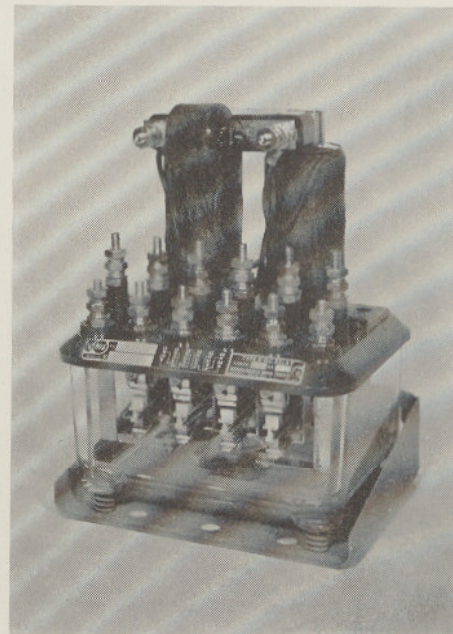
Polarized, Size 6  
Height 9 $\frac{3}{4}$ " —Depth 7 $\frac{3}{4}$ " —Width 7 $\frac{3}{4}$ "  
Mounting Centers—5 $\frac{7}{8}$ "



Polarized, Size 8  
Height 9 $\frac{3}{4}$ " —Depth 6 $\frac{7}{8}$ " —Width 10 $\frac{1}{8}$ "  
Mounting Centers—5 $\frac{7}{8}$ "

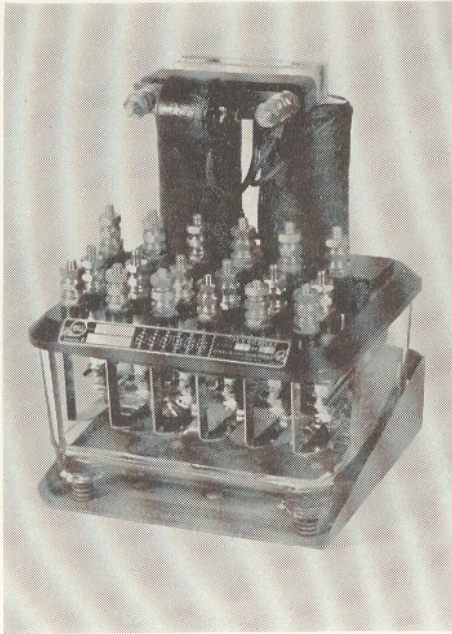


Power-Transfer, Size 2  
Height 8 $\frac{1}{2}$ " —Depth 6 $\frac{1}{4}$ " —Width 3 $\frac{7}{8}$ "  
Mounting Centers—2 $\frac{3}{8}$ "

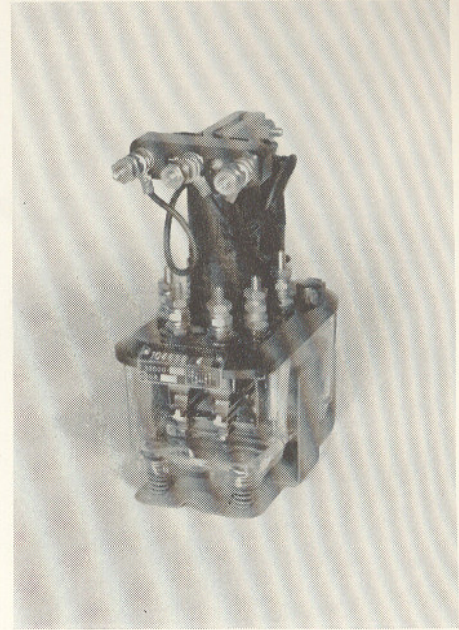


Power-Transfer, Size 4  
Height 9 $\frac{5}{8}$ " —Depth 6 $\frac{3}{4}$ " —Width 7 $\frac{3}{8}$ "  
Mounting Centers—5 $\frac{7}{8}$ "

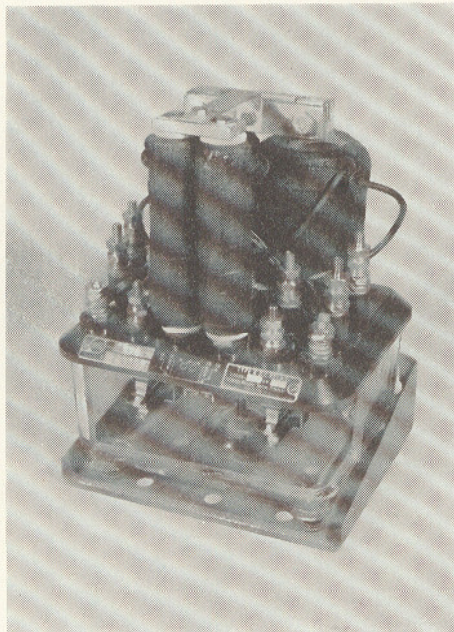




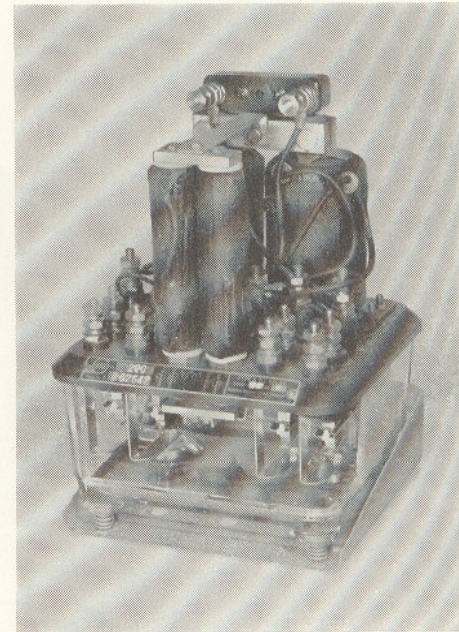
Power-Transfer, Size 6  
Height 10 $\frac{1}{8}$ "—Depth 7 $\frac{3}{4}$ "—Width 7 $\frac{3}{4}$ "  
Mounting Centers—5 $\frac{7}{8}$ "



Primary of Primary-Secondary  
Height 8 $\frac{1}{2}$ "—Depth 6 $\frac{1}{4}$ "—Width 3 $\frac{7}{8}$ "  
Mounting Centers—2 $\frac{3}{8}$ "

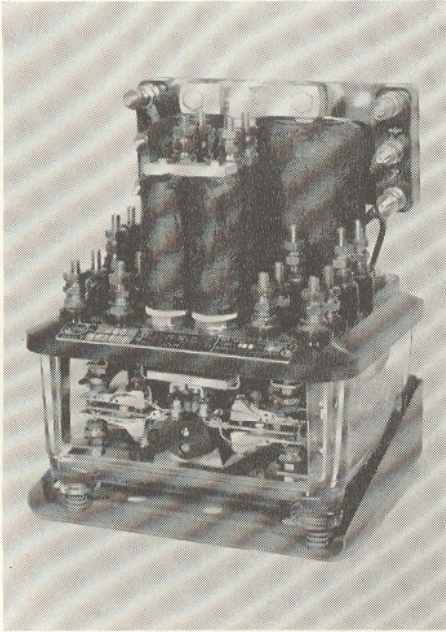


Retained-Neutral, Size 4  
Height 9 $\frac{3}{8}$ "—Depth 6 $\frac{3}{4}$ "—Width 7 $\frac{3}{8}$ "  
Mounting Centers—5 $\frac{7}{8}$ "

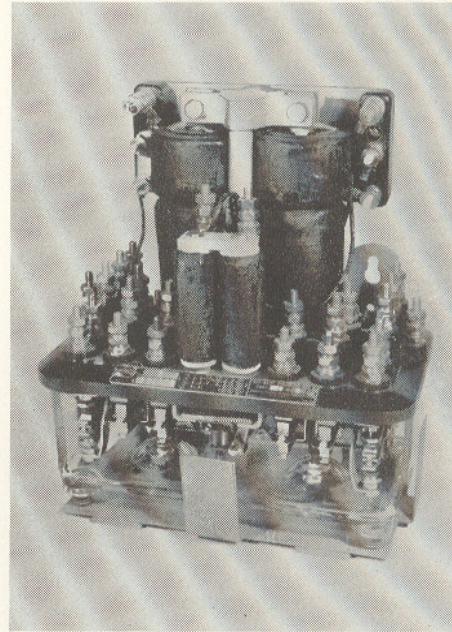


Retained-Neutral, Size 6  
Height 10"—Depth 7 $\frac{3}{4}$ "—Width 7 $\frac{3}{4}$ "  
Mounting Centers—5 $\frac{7}{8}$ "





Retained-Neutral Polarized, Size 6  
Height  $10\frac{1}{8}$ "—Depth  $7\frac{3}{4}$ "—Width  $7\frac{3}{4}$ "  
Mounting Centers— $5\frac{7}{8}$ "

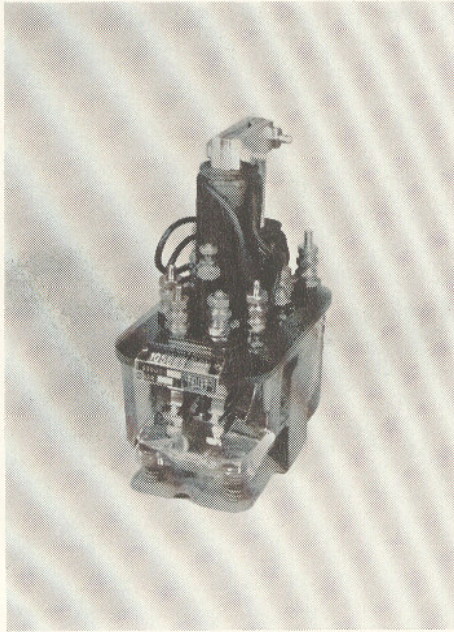


Retained-Neutral Polarized, Track, Size 8  
Height  $11\frac{1}{8}$ "—Depth  $6\frac{7}{8}$ "—Width  $10\frac{1}{8}$ "  
Mounting Centers— $5\frac{7}{8}$ "

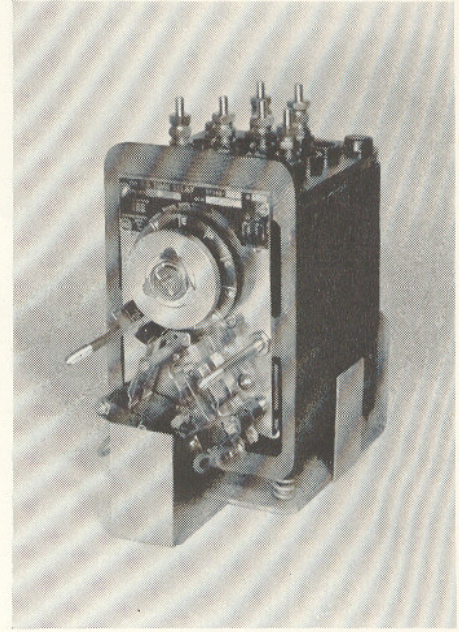


Retained-Neutral Polarized, Line, Size 8  
Height 10"—Depth  $6\frac{7}{8}$ "—Width  $10\frac{1}{8}$ "  
Mounting Centers— $5\frac{7}{8}$ "

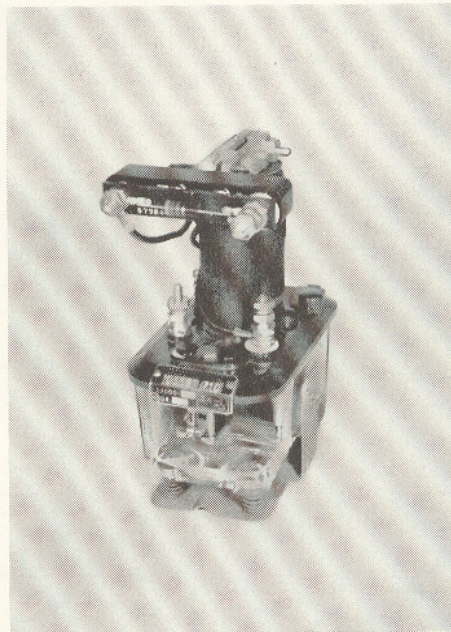




Switch-Overload, Size 2  
Height  $8\frac{1}{8}$ " —Depth  $6\frac{1}{4}$ " —Width  $3\frac{7}{8}$ "  
Mounting Centers— $2\frac{3}{8}$ "



Timing, Motor-Operated  
Height  $8\frac{5}{16}$ " —Depth  $8\frac{3}{4}$ " —Width  $4\frac{3}{4}$ "  
Mounting Centers—3"



Two-Rate Charge-Control  
Height  $8\frac{1}{8}$ " —Depth  $6\frac{1}{4}$ " —Width  $3\frac{7}{8}$ "  
Mounting Centers— $2\frac{3}{8}$ "



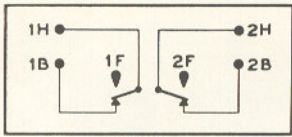


FIG. 1

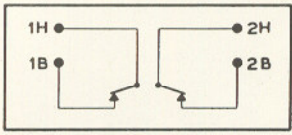


FIG. 2

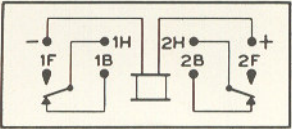


FIG. 3

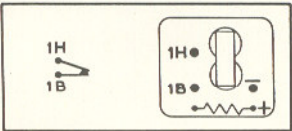


FIG. 4

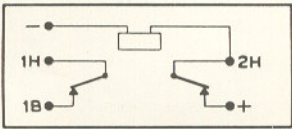


FIG. 5

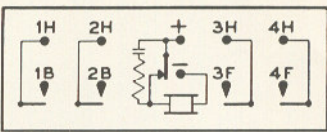


FIG. 6

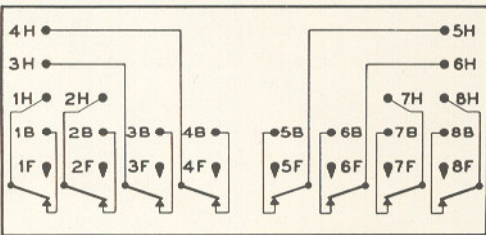


FIG. 7

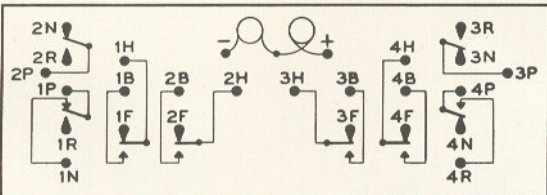


FIG. 8

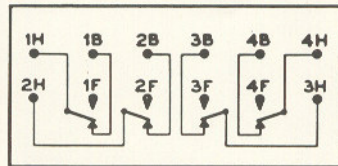


FIG. 9

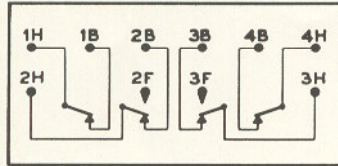


FIG. 10

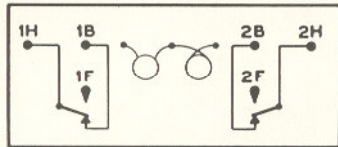


FIG. 11

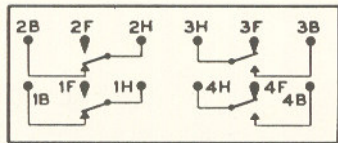


FIG. 12

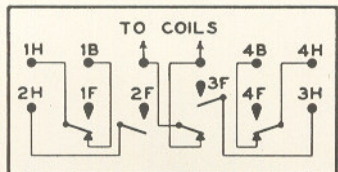


FIG. 13

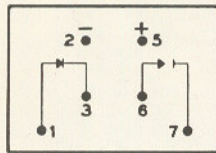


FIG. 14

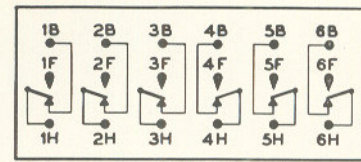


FIG. 15

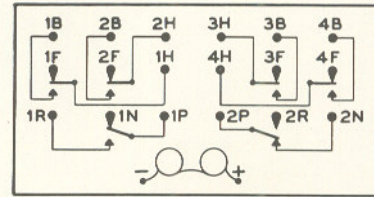


FIG. 16

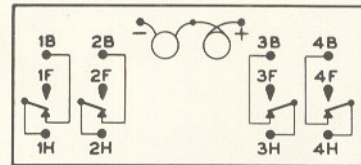


FIG. 17

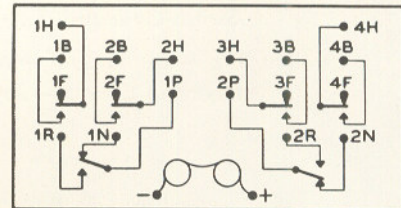


FIG. 18

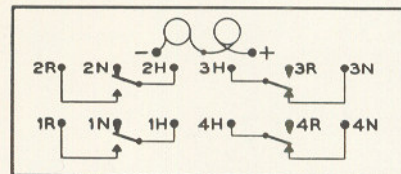


FIG. 19

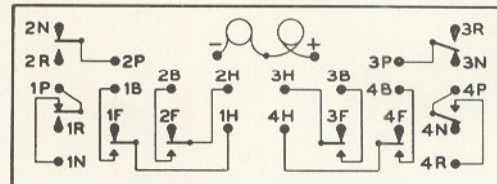


FIG. 20

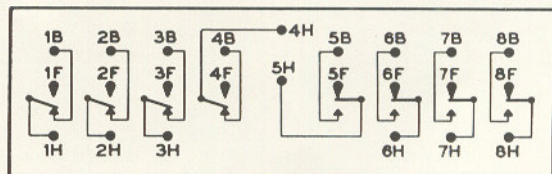


FIG. 21

Terminal Designations



## APPROACH RELAY, SERIES TRACK

Type K Size 2, Direct-Current

This relay, connected in series with the track feed, provides a means to light signal lamps as the train approaches the feed end of the track circuit. An adjustable core provides a means to vary the operating values to suit track circuit conditions. Contacts are metal-to-metal.

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES*	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	.42	.282	Fig. 1	A65-100

\*Values shown are for adjustable core turned entirely in; to increase values turn core counter-clockwise.

## APPROACH RELAY, SERIES LINE

Slow Release

Type K Size 2, Direct-Current

This relay, connected in series, with a signal control relay or with a searchlight signal mechanism of similar operating amperes, provides a means to light signal lamps in advance of trains.

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	TIME OF RELEASE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	17	.018	Approx. .35 seconds at .35 volts.	Fig. 1	A65-110

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April 1958

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## BIASED-NEUTRAL RELAY

### Type K Sizes 2, 4 and 6, Direct-Current

This relay is biased to pick up on one polarity only. It will not pick up or hold up when the polarity is reversed. The magnitude of reverse voltage as well as the time it is applied, will not affect the operating characteristics.

### STANDARD RELAYS

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	RELAY SIZE	NOTES	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	500	.011	2		Fig. 1	A65-120
4FB	2	.110	4		Fig. 9	A65-125
"	4	.075	"		"	A65-126
"	500	.0093	"		"	A65-127
6FB	2	.124	6		Fig. 15	A65-135
"	4	.085	"		"	A65-136
"	500	.011	"		"	A65-137

### SPECIFIC APPLICATION RELAYS

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	RELAY SIZE	NOTES	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	300	.025	2	(EHD) contacts .090" front contact opening.	Fig. 1	A65-145
"	1000	.0074	"		"	A65-146
4FB	66	.018	4		Fig. 9	A65-150
"	300	.0122	"		"	A65-151
"	500	.013	"	(EHD) contacts .125" front contact opening.	"	A65-152
"	1000	.0064	"		"	A65-153
6FB	66	.021	6		Fig. 15	A65-159
"	1000	.0072	"		"	A65-160



## CODE-RESPONSIVE RELAY (CR)

### Type K Size 2, Direct-Current

This relay is made with a light armature and contact structure so that it will respond quickly to coded pulses of energy. Contacts are metal-to-metal. It is polar biased, and the armature is spring returned to the normal position.

### STANDARD RELAYS

NOMINAL SYSTEM VOLTAGE	CONTACTS	RESISTANCE OHMS	NOTES	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
—	2FB	.16	Track Line code repeater.	Fig. 3	A65-170
10	"	180		"	A65-175

### SPECIFIC APPLICATION RELAYS

NOMINAL SYSTEM VOLTAGE	CONTACTS	RESISTANCE OHMS	NOTES	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
—	2FB	10	Operates from output of resonant track unit. Impulse relay for inverse code.	Fig. 3	A65-180
10	"	30		"	A65-185

## CODE TRANSMITTERS

### Type K, Direct-Current

This transmitter has an oscillating armature carried on a vertical shaft. Contacts are metal-to-metal and are actuated by cams on the vertical shaft. When the driving coil is deenergized, all contacts used to control the external circuits are open. When energized, the contacts close and open at the code rate.

CODE RATE	CONTACTS	RESISTANCE OHMS	NOMINAL SYSTEM VOLTAGE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
75	2F-2B	150	10	Fig. 6	A65-190
120	"	"	"	"	A65-195
180	"	"	"	"	A65-199



## FLASHER RELAY, HIGHWAY CROSSING

### Type K Size 4, Direct-Current

This relay is furnished with four sets of metal-to-metal contacts for controlling the lamp load and one set of coil-control contacts.

NOMINAL SYSTEM VOLTAGE	CONTACTS	RESISTANCE OHMS	FLASHES PER MINUTE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
8	4FB	260 - 260	40 to 45	Fig. 12	A65-205
10	"	400 - 400	"	"	A65-209
12	"	500 - 500	"	"	A65-211

## FLASHER RELAY, SIGNAL

### Type K Size 2, Direct-Current

This relay is used for controlling the flashing aspects of a wayside signal. It is equipped with one back contact for use in outside circuits. The remaining back contact is required for relay operation.

NOMINAL SYSTEM VOLTAGE	CONTACTS	FLASHES PER MINUTE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
10	1B	Approx. 60	Fig. 5	A65-215
12	"	"	"	A65-216



# INTERLOCKING RELAY

## Type K Size 8, Direct-Current

This relay is used to control highway crossing signals where it is desired to furnish protection for train operation in either direction. It consists, in effect, of two relays mounted side by side on the same base, with an interlocking mechanism between the two armatures. When one armature drops to close its back contacts, it actuates the interlocking device so as to allow the other armature, when it is in turn deenergized, to open its front contacts but not to close its back contacts. This relay has heavy-duty (HD) back contacts.

### STANDARD RELAYS

CONTACTS EACH SIDE	RESISTANCE EACH SIDE OHMS	FRONT CONTACT POSITION	PICKUP AND WORKING AMPERES		TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
			LEFT	RIGHT		
4FB	4 - 4	All open in interlocked position.	.075	.075	Fig. 21	A65-220
"	500 - 500	All open in interlocked position.	.0093	.0093	"	A65-221
"	4 - 500	All open in interlocked position.	.075	.0093	"	A65-222
"	4 - 4	Contacts 1 & 8 closed in interlocked position.	.089	.089	"	A65-230
"	500 - 500	Contacts 1 & 8 closed in interlocked position.	.011	.011	"	A65-231
"	4 - 500	Contacts 1 & 8 closed in interlocked position.	.089	.011	"	A65-232

### SPECIFIC APPLICATION RELAYS

CONTACTS EACH SIDE	RESISTANCE EACH SIDE OHMS	FRONT CONTACT POSITION	PICKUP AND WORKING AMPERES		TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
			LEFT	RIGHT		
4FB	4 - 4	Contacts 1-2-7-8 closed in interlocked position.	.089	.089	Fig. 21	A65-240
"	500 - 500	Contacts 1-2-7-8 closed in interlocked position.	.011	.011	"	A65-241
"	4 - 500	Contacts 1-2-7-8 closed in interlocked position.	.089	.011	"	A65-242



## LAMP-CONTROL RELAY

### Type K Size 4, Direct-Current

This relay has two regular front-back contacts in spaces 2 and 3 and two lamp-control back contacts in spaces 1 and 4 especially designed to control the heavy surge current in lighting highway crossing lamps. These lamp-control contacts are rated at 15 amperes at 12 volts a.c. or d.c.

CONTACTS	RESISTANCE OHMS	NOMINAL SYSTEM VOLTAGE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB-2B	300	10 or 12	Fig. 10	A65-250

## LIGHT-OUT NEUTRAL RELAY

### Type K Sizes 2 and 4, A-C/D-C

This relay is used to detect failure of signal lamps. It operates on d.c. or a.c. Relays with low-resistance windings are used for hot filament checks. Relays with both low- and high-resistance windings are used for hot and cold filament checks.

CONTACTS	RESISTANCE OHMS	FOR USE WITH LAMP		WORKING AMPERES A.C.	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
		VOLTS	WATTS				
2FB	.102	10 12 - 16 10 11.3	5+3.5 21(C.P.) 10 13.3	.600	2	Fig. 1	A65-260
"	.069	10	13+3.5	1.00	"	"	A65-261
"	.216	"	5	.370	"	"	A65-262
"	500-.069	"	18	1.2	"	"	A65-263
"	400-.069	11	11	.650	"	"	A65-264
4FB	.045	10	40+3.5	1.7	4	Fig. 9	A65-270
"	.086	"	18	1.0	"	"	A65-271
"	500-.086	8	"	"	"	"	A65-272

## MAGNETIC-STICK RELAY

### Type K Size 4, Direct-Current

This relay operates in response to a change in the direction of current flow through the coils. The armature stays in its last-operated position when energy is cut off. Contacts (normal and reverse) are metal-impregnated-carbon-to-metal.

CONTACTS	RESISTANCE OHMS	OPERATING AMPERES	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
4NR	50	.021	Fig. 19	A65-280
"	1000	.0055	"	A65-281



## NEUTRAL RELAY, REGULAR-RELEASE

### Type K Sizes 2, 4, 6 and 8, Direct-Current, Line and Track STANDARD RELAYS

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	NOTES	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	2	.088		2	Fig. 1	A65-300
"	4	.065		"	"	A65-301
"	500	.0085		"	"	A65-305
4FB	2	.099		4	Fig. 9	A65-310
"	4	.068		"	"	A65-311
"	500	.0085		"	"	A65-315
6FB	2	.125		6	Fig. 15	A65-320
"	4	.087		"	"	A65-321
"	500	.011		"	"	A65-325
8FB	"	.012		8	Fig. 7	A65-330

### SPECIFIC APPLICATION RELAYS

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	NOTES	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	10.5	.040	Operated from decoder unit.	2	Fig. 1	A65-340
"	300	.010		"	"	A65-341
"	1000	.006		"	"	A65-342
4FB	10.8	.038	Operated from decoder unit.	4	Fig. 9	A65-350
"	50	.025	Pulse bridging.	"	"	A65-351
"	66	.017		"	"	A65-352
"	100	"		"	"	A65-353
"	300	.011		"	"	A65-354
"	500	.013	(HD) contacts .125" front contact opening.	"	"	A65-355
"	"	.0035	(EHD) contacts .125" front contact opening.	"	"	A65-356
"	1800	.004	Pulse bridging.	"	"	A65-357
"	1000	.006		"	"	A65-358
"	6	.105	Overlay track circuit.	"	"	A65-359
6FB	500	.013	(HD) contacts .125" front contact opening.	6	Fig. 15	A65-365
"	"	"	(EHD) contacts .125" front contact opening.	"	"	A65-366
"	1000	.0073		"	"	A65-367



## SLOW-ACTING RELAYS

Time of release is the time required to open front contacts after energy is removed from the relay. Time of pickup is the time required to make front contacts after energy is applied to the relay. Operating values shown are based on 70 degrees F.

### NEUTRAL RELAY, SLOW-PICKUP Type K Sizes 4 and 6, Direct-Current, Line STANDARD RELAYS

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	TIME OF PICKUP	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
4FB	580	.0122	1½ seconds at			
"	880	.010	8.8 volts	4	Fig. 9	A65-375
"	1200	.009	" " 11 "	"	"	A65-376
"			" " 13.2 "	"	"	A65-377
6FB	580	.0122	" " 8.8 "	6	Fig. 15	A65-385
"	880	.010	" " 11 "	"	"	A65-386
"	1200	.009	" " 13.2 "	"	"	A65-387

### SPECIFIC APPLICATION RELAY

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING CURRENT	TIME OF PICKUP	NOTES	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB-1B-2F	55	.026	.9 sec. at 2.2 volts	Operated from master transformer.	4	Fig. 13	A65-395

### NEUTRAL RELAY, SLOW-PICKUP AND SLOW-RELEASE Type K Sizes 4 and 6, Direct-Current, Line

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	TIME OF PICKUP AND RELEASE	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
4FB	350	.023	2.3 sec. pickup and 1.1 sec. re- lease at 10 volts.	4	Fig. 9	A65-405
6FB	350	.020	1.9 sec. pickup and 1.3 sec. re- lease at 10 volts.	6	Fig. 15	A65-409



## NEUTRAL RELAY, SLOW-RELEASE

Type K Sizes 2, 4 and 6, Direct-Current, Line

### STANDARD RELAYS

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	TIME OF RELEASE	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	400	.0138	.5 second at 8 volts. .55 " " 10 " .6 " " 12 "	2	Fig. 1	A65-415
4FB	400	.0108	.9 second at 8 volts. 1.0 seconds " 10 " 1.1 " " 12 "	4	Fig. 9	A65-420
6FB	400	.0136	.9 second at 8 volts. 1.0 seconds " 10 " 1.1 " " 12 "	6	Fig. 15	A65-425

### SPECIFIC APPLICATION RELAYS

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	TIME OF RELEASE	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	400	.011	.9 second at 8 volts. .95 " " 10 " 1.0 seconds " 12 "	2	Fig. 1	A65-430
4FB	250	.013	3.9 seconds at 8 volts. 4.0 " " 10 " 4.1 " " 12 "	4	Fig. 9	A65-435
6FB	350	.0115	2.9 seconds at 8 volts. 3.0 " " 10 " 3.1 " " 12 "	6	Fig. 15	A65-440



## POLARIZED RELAY

### Type K Sizes 6 and 8, Direct-Current

This relay has two armatures, one polar and one neutral. The polar armature operates either to the normal or reverse position, depending upon the polarity of the applied energy, and remains in the last-operated position. The neutral armature drops momentarily during pole-changing.

CONTACTS		RESISTANCE OHMS	PICKUP AND WORKING AMPERES	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
NEUTRAL	POLAR					
4FB	2NR	4	.089	6	Fig. 16	A65-460
"	"	500	.011	"	"	A65-461
"	4NR	4	.104	8	Fig. 20	A65-470
"	"	500	.013	"	"	A65-471

## POWER-TRANSFER RELAY

### Type K Sizes 2, 4 and 6

This relay is essentially a d-c neutral line relay operating on rectified a.c. If a-c energy fails, the relay armature drops and automatically transfers the circuits onto local battery. The ratio of release voltage to pickup voltage is about 75 percent to provide transfer before signal aspects are impaired. Contacts are (HD) metal-to-metal—capacity 15 amperes at 15 volts.

CONTACTS	RESISTANCE EACH SIDE OHMS	RATED VOLTAGE A-C	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	132 - 132	10	2	Fig. 1	A65-480
4FB	50 - 50	"	4	Fig. 9	A65-485
6FB	"	"	6	Fig. 15	A65-490



# PRIMARY-SECONDARY RELAY COMBINATION

## Type K Sizes 2, 4 and 6, Direct-Current

This combination of a track relay and repeater is strongly recommended where extra-high shunting sensitivity and protection against momentary loss of shunt are required. The repeater or secondary relay, when picked up, cuts out part of the winding of the track relay and inserts a corresponding amount of resistance. This, in effect, raises the value of current at which the track relay will release, yet does not affect the pickup current values. The secondary relay, in addition, is made slow in picking up to permit progressive and continuous track shunting as the train passes from one track section to another. Operating values shown are based on 70 degrees F. The secondary relay has one make-before-break contact, which is metal-to-metal front and back. This make-before-break contact is in space 4 of the Size 4 relay and space 6 of the Size 6.

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	TIME OF PICKUP	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
PRIMARY						
2FB	4	.065	—	2	Fig. 1	A65-500
SECONDARY						
1MB-3FB	580	.0122	1.5 seconds at 8.8 volts.	4	Fig. 9	A65-501
"	880	.010	" " " 11 "	"	"	A65-505
"	1200	.009	" " " 13.2 "	"	"	A65-507
1MB-5FB	580	.0122	" " " 8.8 "	6	Fig. 15	A65-515
"	880	.010	" " " 11 "	"	"	A65-519
"	1200	.009	" " " 13.2 "	"	"	A65-523



## RETAINED-NEUTRAL RELAY

Type K Sizes 4 and 6, Direct-Current

This relay is for use on any polarized line circuit requiring a neutral relay which will keep its front contacts closed during the time ordinarily required to change the line polarity.

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
2FB	320	.012	4	Fig. 11	A65-530
4FB	"	"	6	Fig. 17	A65-535

## RETAINED-NEUTRAL POLARIZED RELAY

Type K Sizes 6 and 8, Direct-Current

This polarized relay has a neutral armature which is electro-magnetically retained in its energized position when the relay current is pole-changed to effect polar contact operation.

CONTACTS		RESISTANCE OHMS	PICKUP AND WORKING AMPERES	APPLICATION	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
NEUTRAL	POLAR						
4FB	4NR	2	.130	Track	8	Fig. 8	A65-540
"	"	3.88	.090	"	"	"	A65-541
"	"	320	.0174	Line	"	"	A65-542
"	2NR	"	"	"	6	Fig. 18	A65-550



## SLOW-PICKUP, SLOW-RELEASE, QUICK CROSSOVER NEUTRAL RELAY

### Type K Sizes 4 and 6, Direct-Current

The slow-pickup and slow-release features of this relay are slightly different from usual in that the relay maintains full contact pressure for the entire time of pickup and release and then operates very rapidly. This quick-crossover feature (both pickup and release) is desirable for relays used to pole-change circuits, especially when there are relays in the pole-changed circuit that must remain in energized position during the period that the circuit is open. Operating values shown are based on 70 degrees F.

CONTACTS	RESISTANCE OHMS	PICKUP AND WORKING AMPERES	TIME OF PICKUP AND RELEASE	RELAY SIZE	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
4FB	580	.0133	1.5 seconds pickup and .75 seconds release at 10 volts.	4	Fig. 9	A65-560
"	880	.0106	1.5 seconds pickup and .75 seconds release at 12 volts.	"	"	A65-561
6FB	580	.0132	1.5 seconds pickup and .7 seconds release at 10 volts.	6	Fig. 15	A65-565
"	880	.0106	1.5 seconds pickup and .7 seconds release at 12 volts.	"	"	A65-566

## SWITCH-OVERLOAD NEUTRAL RELAY

### Type K Size 2, Direct-Current

This relay is used to cut off energy from a switch machine motor on overload because of an obstruction, and to provide for automatic resetting when polarity to the switch motor is reversed. The relay picks up on the overload current and remains stuck up as long as energy is present. The relay is made slow in picking up to prevent pickup on the heavy surges through the switch machine motor when starting. Contacts are metal-to-metal.

CONTACTS	RESISTANCE OHMS	SWITCH MACHINE OPERATING VOLTAGE	CURRENT SETTING AMPERES (Adjustable)	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
WITH MAKE-BEFORE-BREAK CONTACTS (with .050" front contact opening)					
2FB	.053-200	Low	11 to 11.5	Fig. 1	A65-570
(EHD) WITH MAGNETIC BLOWOUTS (with .090" front contact opening)					
2B	.053-250	Low	15.25 to 15.75	Fig. 2	A65-575
"	.053-1850	High	10.75 to 11.25	"	A65-576



## TIMING RELAY, MOTOR-OPERATED

### Type KB, Direct-Current

This relay has an external time adjustment which can be sealed to prevent unauthorized adjustment. The relay is factory adjusted to the maximum time and shipped unsealed. It has one check contact which is metal-to-metal and one time contact which is metal-impregnated-carbon-to-metal.

NOMINAL SYSTEM VOLTAGE	TIME RANGE		TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
	MIN.	MAX.		
8	4 seconds	64 seconds	Fig. 14	A65-580
"	1 minute	8 minutes	"	A65-585
10	4 seconds	64 seconds	"	A65-590
"	1 minute	8 minutes	"	A65-595
12	4 seconds	64 seconds	"	A65-600
"	1 minute	8 minutes	"	A65-605

## TWO-RATE CHARGE-CONTROL NEUTRAL RELAY

### Type K Size 2, Direct-Current

### FOR LEAD CELLS

This relay (operated by another relay which is actuated periodically) is used in battery charging circuits. When the battery reaches its full charge, the relay operates to transfer from a high to a continuous low charge rate to ensure a fully charged battery under varying load and temperature conditions.

CONTACTS	RESISTANCE OHMS	NUMBER CELLS LEAD BATTERY	TERMINAL DESIGNATION (See Page 12)	CATALOG NUMBER
1B	710	4 to 6	Fig. 4	A65-615
"	1110	7 to 10	"	A65-619
"	1575	10 to 14	"	A65-623
"	14215	50 to 57	"	A65-627