PURCHASE

Relays shall be purchased in accordance with A. R. A. Signal Section Specification, except as modified by the N. Y. C. Lines Signal Committee Instructions—*Alternating Current Relays and Indicators*—Reference being made to A. C. Relay Requirement Table, Form S. C. 20 for the Type of Relay required.

COILS

1 When in place, coils shall be fixed to prevent vibration.

TERMINAL CONNECTION

2 Relay coil terminal posts shall be marked plus (+) and minus (−), respectively, so that with energy applied and polarity as indicated, contacts will close:

(a) 2-Position relays, normal or front.

(b) 3-Position and polyphase relays, normal or upper.

(c) Vane type relays, normal or contacts nearest name plate.

FLEXIBLE CONDUCTOR

3 Flexible conductor connecting binding post and contact finger shall be formed and attached so as not to affect the Pick-up or Drop-away. The conductor shall be capable of carrying 10 Amperes continuously without injury.

NUTS AND SCREWS

4 Nuts and screws be securely locked.

CONTACTS

5 Metal contacts shall be of silver.

6 Finger contacts shall meet contact surfaces squarely and simultaneously.

7 Finger contact shall have a contact slide movement of not less than .010 in. on contact surfaces.

8 Metal support of non-fusible contact element shall be not less than $\frac{1}{16}$ in. from the contact surface.

9 Opening between finger contact and back contact surface of 2-position relays with front contact just closed shall be not less than .025 in.

10 Opening between finger contact and contact surface, with relay in de-energized position, shall be not less than .050 in.

11 Opening between de-energized finger contact and contact surface of 3-position relays with normal or reverse contacts just closed shall be not less than .015 in.

CONTACT RESISTANCE

12 Cleaned contact resistance with working current or voltage applied to coils shall not exceed the following:

(a)	Silver to silver,	0.03 Ohms.
(b)	Silver to carbon,	0.20 "
(c)	Silver gauze to carbon,	0.16 "
(d)	Carbon to carbon,	0.50 "

END PLAY

13 End play of moving elements supported by bearings shall be not less than .010 in. and not more than .020 in.

CLEARANCE

14 All moving parts except bearings and contacts, shall, under the most unfavorable conditions of end play and relative position of parts in the assembled relay, be separated by not less than the following minimum clearances:

SINGLE ELEMENT:	Rotor Type	Vane Type
(a) Radial,	.020 in.	.020 in.
(b) Longitudinal,	.025 in.	.017 in.
TWO ELEMENT:		
(c) Radial,	.020 in.	.025 in.
(d) Longitudinal,	.025 in.	.022 in.

15 Case shall be so fixed to insure a minimum clearance of $\frac{1}{8}$ in. between it and movable parts.

GASKET

16 Defective gaskets shall be replaced.

STOCK SHIPMENTS

17 Relays shall be tested and meet shop requirements immediately before shipment.

METERS

18 Shall be as specified.

19 Meters for shop use shall be calibrated by-monthly and for field use before each cycle of test or as often as necessary.

SEALING

20 Relay Case shall be sealed.

PACKING

21 Relays of the vane type must have vanes secured with mattress twine to prevent vibration of contacts during shipment.

R-1

SIGNAL (NEW YORK CENTRAL LINES) COMMITTEE

INSTRUCTIONS
A.C. RELAYS AND INDICATORS

N.Y.C.R.R.(E.), N.Y.C.R.R.(W.), N.Y.C.R.R.(OCL.), B.&A.R.R., M.C.R.R., C.C.C.&ST.L.RY., P.&L.E.R.R., RUTL.R.R.

40

JAN 31 1930

Approved by Representatives of Lines Shown.

J C Mack
Chairman

(CONT'D ON PAGE 2)

22 Each relay must be placed in separate carton or suitably wrapped before being placed in packing boxes.

METHODS OF TESTS

23 Methods for making pick-up, working, drop-away and phase angle tests of various types of relays are shown on Page 4, Figs. 1 to 8 inclusive.

24 The method of test as shown in Fig. 1 provides for a phase angle between currents in the local and track or line windings of the relay, approximately equal to the phase angle between the voltage and current of the local winding. This shall be known as the test phase angle of the relay and these values may be translated to any phase angle desired by multiplying by proper factor obtained from curves shown on Page 4, Fig. 8.

25 Pick-up and drop-away tests must also be made with relay tilted to just take up end play in each direction to determine whether there is excess friction and the values so obtained must closely check with those taken with relay in normal position.

26 Pick-up, working, and drop-away must be determined in sequence as follows:

PICK-UP

27 Apply energy to coils and slowly and gradually increase until the front or energized contacts just close. This value shall be the pick-up.

WORKING

28 After determining pick-up values, continue to slowly and gradually increase the energy until the moving element just strikes stop. This value shall be the working.

DROP-AWAY

29 After determining the working value, slowly and gradually reduce the energy until the back contacts of 2-position relays are just closed or until the de-energized contacts of 3-position relays are just closed. If there are no back or de-energized contacts the energy should be reduced until the moving element assumes its de-energized position. This value shall be the drop-away.

30 When testing for pick-up and drop-away values, Par. 27 and 29, determine that the relay operates without retardation of movement due to friction or external force.

31 Tests for pick-up, working, and drop-away values of 3-position relays must be made in normal and reverse directions.

32 Tests of 2-element relays must be made with rated voltage on local element or corrections must be made to readings taken on line or track element.

SHOP REPAIRS

33 Test relays for open circuits and short circuits in windings, resistors and condensers by impressing the working voltage on each element and observing that current is normal. Insulation resistance between windings and between all current carrying parts and case should be infinity as measured by megger. Record any irregular conditions found and give special attention to defects noted on repair tag, Form S. C. 9.

34 Make repairs and adjustments as follows:

35 Relays shall be disassembled and the bearings alternately washed in high test gasoline until clean, and dried with clean dry air, not to exceed 5 lbs. pressure. Ball bearings must then be shaken to see that the balls are free and a pointed instrument used to revolve balls in race to see that they move freely in both directions. Jewel bearings shall be inspected under magnifying glass for defects and foreign matter.

36 Stator shall be cleaned between pole pieces and coils with a suitable tool and compressed air to remove excess impregnation compound and all foreign matter to a depth of not less than .015 in. Rusty surfaces on laminations shall be cleaned until free from rust and immediately coated with "Zapon" Lacquer No. 14.

37 Rotor pinion and shaft bearing shall be washed with clean gasoline and thoroughly dried with cloth free from lint or dust.

38 The rotor shaft shall be examined for worn or pitted bearing surfaces and point. The rotor shall then be tested by revolving in rack to determine that it runs true.

39 All shafts and bearings must be cleaned and examined for worn parts.

40 All worn and defective parts shall be replaced and defective parts scrapped. Repair parts must be carefully inspected and tested before being used.

41 Pinion gear shall slip at not less than 4-inch ounces or more than 7-inch ounces.

42 The surfaces of friction discs, where the friction clutch spring presses against disc, must be examined

R-1

to determine that spring has not cut or roughened disc surface. Friction clutch springs having ends turned over to fit in the collar or disc must be scrapped and replaced with springs, having ends ground to give full bearing surface against collar or disc.

43 Sector shall be washed with clean gasoline, examined for worn teeth and the contour of teeth gauged for alignment and proper length.

44 Sectors after being tested shall be assembled in the well and checked for end play and clearance of counter-weight.

45 Rivets attaching counter-weight arm to sector shall be of steel.

46 Contacts must be cleaned, replacing any that may be pitted, burned or otherwise defective.

47 The link connecting contact bar with sector must be moved backward and forward by hand to check for friction.

SHOP TESTS

48 Relay operating requirements must be in accordance with Table, Form S. C. 20.

49 Tests, as required by Forms S. C. 19 and S. C. 22 must be made and recorded at time relay is tested. Pick-up and drop-away tests must also be made with relay tilted to just take up end play in each direction to determine whether there is excess friction and the values so obtained must closely check with those taken with relay in normal position.

50 Contacts of relays must be tested for contact resistance after case is in place and before relay is sealed and must meet contact resistance requirements.

51 Insulation tests must be made between windings and between all current carrying parts and case and the insulation should be infinity as measured by megger.

SHOP INSPECTION

52 Determine by actual operation that relay has a positive drop-away and relay contacts open without retardation of movement due to friction or external force.

53 Before case is closed, determine that each part to be enclosed is free from foreign matter, in proper position and in good condition.

FIELD TESTS

54 Tests, as required by Paragraphs 27, 28 and 29 and by form S. C. 19 must be made annually.

FIELD INSPECTION

55 It must be determined by observation that sufficient contact opening exists between front and back contacts on 2-position relays and between normal and reverse and de-energized contacts on 3-position relays.

56 Relays not meeting field requirements must be taken out of service promptly.

57 Relays shall meet shop requirements when placed in service except in emergency when relays meeting field requirements may be used.

58 Determine by observing operation of relay, that sufficient clearance exists between case and movable parts.

59 Parts enclosed shall be free from foreign matter, in proper position and in good condition.

60 Emergency repairs and adjustments to insure positive operation of relay for temporary use, may be made in the field.

RECORDING

61 Office records must be filed in groups, indexed according to location in order of mileage direction.

62 Relay records of an interlocking must be filed under index card for that location.

63 Relay records of Automatic signal territory must be indexed for the territory between points designated.

64 Relays shall be identified by serial number which shall be recorded. Manufacturer's serial number must be used if available.

65 Inspectors must re-mark indistinct serial numbers.

66 Relays that have illegible or no serial number shall be assigned serial number. The serial number shall be preceded by a letter which shall be assigned by the Signal Engineer.

67 Inspectors must immediately record field readings on Form S. C. 19 which must be forwarded to office designated by Signal Engineer.

68 Field readings must be transferred from Form S. C. 19 to Form S. C. 22. One Form S. C. 22 must be used for each relay or electrical instrument.

69 When relays are removed or installed, record shall be made on Form S. C. 21 and forwarded to office designated by Signal Engineer.

70 Normal and reverse readings on Forms S. C. 18, 19, 21 and 22 shall be recorded on separate lines.

R-7

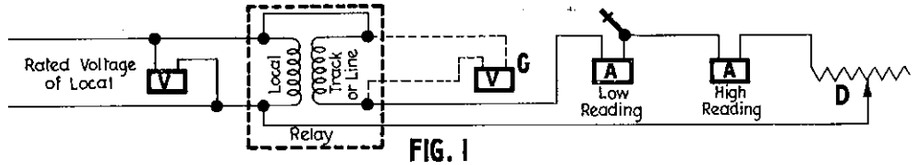

FIG. 1

SERIES RESISTANCE METHOD FOR TWO-CIRCUIT RELAYS—ROTOR TYPE AND VANE TYPE RELAYS
Notes: 1-2-3-4-5-6

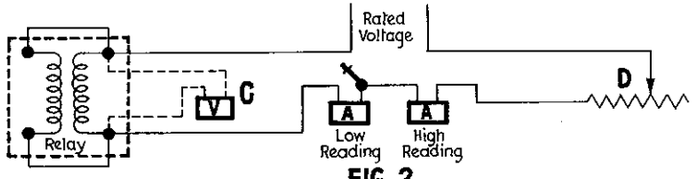

FIG. 2

SERIES RESISTANCE METHOD FOR SINGLE CIRCUIT RELAYS
Notes: 2-3-4-5-6

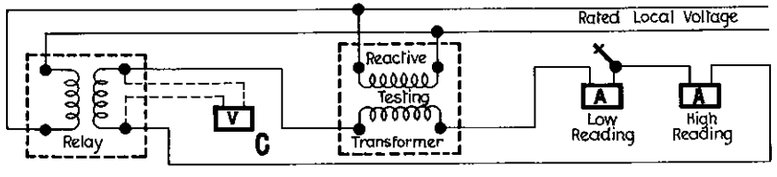

FIG. 3

REACTIVE TESTING TRANSFORMER METHOD FOR CENTRIFUGAL RELAYS AND FOR VANE TYPE TRACK RELAYS WITH CONDENSERS AND ROTOR TYPE RELAYS WITH HIGH POWER FACTOR LOCALS
Notes: 1-2-3-5-6

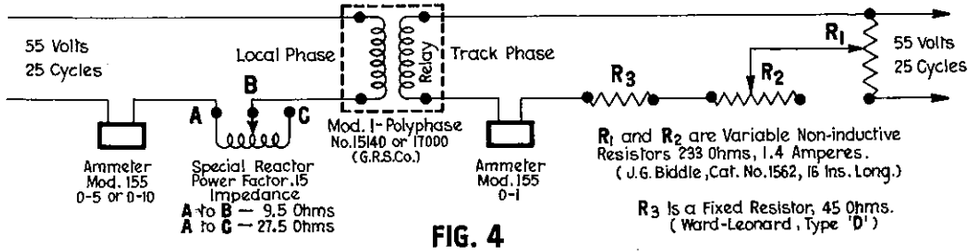

FIG. 4

METHODS OF TESTING (G.R.S.Co.) POLYPHASE RELAYS — MODELS 15140 OR 17000
Notes: 7-8

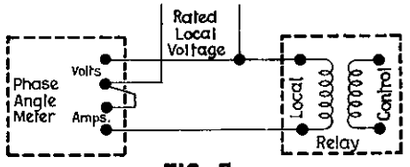

FIG. 5

PHASE ANGLE BETWEEN
LOCAL VOLTAGE AND LOCAL CURRENT
Note: 9

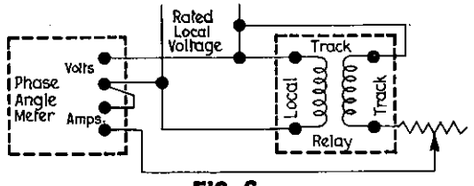

FIG. 6

PHASE ANGLE BETWEEN
LOCAL VOLTAGE AND TRACK CURRENT
Note: 9

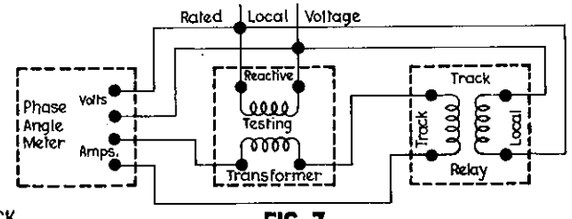

FIG. 7

PHASE ANGLE BETWEEN LOCAL VOLTAGE AND TRACK CURRENT
WHEN TESTING WITH A REACTIVE TESTING TRANSFORMER
Note: 9

PHASE ANGLE METER METHODS
(Figs. 5-6-7)

NOTES:

1 — Relay track wires to be disconnected while making tests.
2 — Volt-meter 'G' must not be in circuit when current readings are taken.
3 — Volt-meter 'G' used for taking voltage readings on line relays.
4 — Where track or line element consists of two windings arranged for individual external connections they shall be connected in series for test. Where local element consists of two windings arranged for individual external connections they shall be connected in series for test.
5 — Where rated voltage of local is less than 55, use 110 Volts (Normal) for testing track or line element.
6 — Graded resistance 'D' wound on 2.5 in. non-metalic tubing 20 ins. long. The resistance and capacity of the graded sections should be as follows:

	Length of Section.	Capacity.	Resistance of Section.	Total Resistance.
1	3 Ins.	2.3 Amps.	38 Ohms	38 Ohms
2	3 "	1.6 "	73 "	111 "
3	3 "	0.7 "	291 "	402 "
4	3 "	0.3 "	1,066 "	1,468 "
5	6 "	0.1 "	10,000 "	11,468 "

7 — When testing relays with 1.6 Volt local (Stator 21829 or 39890) connect to taps **A—B** on reactor and adjust the air gap until the current is 5.75 Amperes.
8 — When testing relays with 14 Volt local (Stator 17008) connect to taps **A—C** on reactor and adjust the air gap until the current is 1.75 Amperes.
9 — Phase angle meter used is a Weston Model No. 480 having voltage taps 0-15 V., 0-60 V. and 0-120 V. and for 25 or 60 cycle current.
10 — Curve showing relation between required and ideal operating values of Two Element Relays when phase relations differ from ideal adjustment.

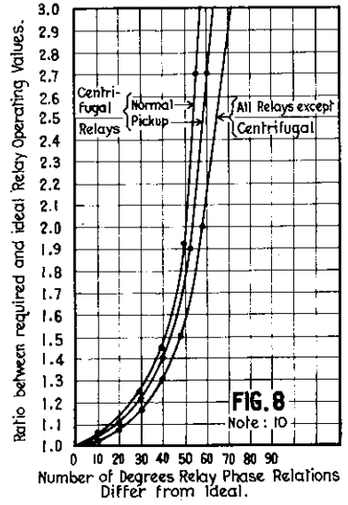

FIG. 8
Note: 10

WAK

PAGE 4
(CONT'D ON PAGE 5)

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 1

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36100 Group List 85 Spec'n. 10AB-3R Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal: Front (d) 2 (i) 2 | Reverse: Back (d) 2 (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	1.0
Amperes	.25	1.56
Volt-Amperes	27.5	1.56
Watts	18.6	.93
Power Factor	.677	.60
Impedance (Ohms)	440.	.64
Phase Angle of Element	47° 23'	53° 7'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.147		.162	
	Amps.	.230		.253	
PICK-UP (Min.)	Volts	.122		.110	
	Amps.	.190		.171	
WORKING (Max.)	Volts	.212		.233	
	Amps.	.330		.363	
WORKING (Min.)	Volts	.154		.139	
	Amps.	.240		.216	
DROP-AWAY (Min.)	Volts	.066		.059	
	Amps.	.104		.094	
% WORKING MAXIMUM W/PU x 100		150		150	
% DROP-AWAY MINIMUM DA/PU x 100		55		50	

REMARKS: Split Phase

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 2

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36100 Group List 101 Spec'n. — Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal: Front (d) 2 (i) — | Reverse: Back (d) 2 (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	1.0
Amperes	.25	1.56
Volt-Amperes	27.5	1.56
Watts	18.6	.93
Power Factor	.677	.60
Impedance (Ohms)	440.	.64
Phase Angle of Element	47° 23'	53° 7'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.147		.162	
	Amps.	.230		.253	
PICK-UP (Min.)	Volts	.122		.110	
	Amps.	.190		.171	
WORKING (Max.)	Volts	.192		.211	
	Amps.	.300		.330	
WORKING (Min.)	Volts	.140		.126	
	Amps.	.220		.198	
DROP-AWAY (Min.)	Volts	.066		.059	
	Amps.	.104		.094	
% WORKING MAXIMUM W/PU x 100		150		150	
% DROP-AWAY MINIMUM DA/PU x 100		55		50	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 3

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36100 Group List 102 Spec'n. — Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal: Front (d) — (i) 6 | Reverse: Back (d) — (i) 2; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	1.0
Amperes	.25	1.56
Volt-Amperes	27.5	1.56
Watts	18.6	.93
Power Factor	.677	.60
Impedance (Ohms)	440.	.64
Phase Angle of Element	47° 23'	53° 7'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.147		.162	
	Amps.	.230		.253	
PICK-UP (Min.)	Volts	.122		.110	
	Amps.	.190		.171	
WORKING (Max.)	Volts	.230		.253	
	Amps.	.360		.396	
WORKING (Min.)	Volts	.167		.150	
	Amps.	.262		.236	
DROP-AWAY (Min.)	Volts	.066		.059	
	Amps.	.104		.094	
% WORKING MAXIMUM W/PU x 100		150		150	
% DROP-AWAY MINIMUM DA/PU x 100		55		50	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 4

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36100 Group List 1 Spec'n. 13G-44R Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal: Front (d) 2 (i) 4 | Reverse: Back (d) 2 (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	1.0
Amperes	.25	1.56
Volt-Amperes	27.5	1.56
Watts	18.6	.93
Power Factor	.677	.60
Impedance (Ohms)	440.	.64
Phase Angle of Element	47° 23'	53° 7'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.250		.275	
	Amps.	.390		.429	
PICK-UP (Min.)	Volts	.198		.179	
	Amps.	.310		.279	
WORKING (Max.)	Volts	.330		.363	
	Amps.	.516		.567	
WORKING (Min.)	Volts	.264		.238	
	Amps.	.412		.371	
DROP-AWAY (Min.)	Volts	.132		.119	
	Amps.	.206		.186	
% WORKING MAXIMUM W/PU x 100		150		150	
% DROP-AWAY MINIMUM DA/PU x 100		62		56	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 5

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36100 Group List Spec'n. L-12 Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal: Front (d) 2 (i) 2 | Reverse: Back (d) 2 (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	130.	1.0
Amperes	.118	.80
Volt-Amperes	15.3	.80
Watts	10.25	.612
Power Factor	.67	.765
Impedance (Ohms)	1100.	1.25
Phase Angle of Element	48°	40°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.39		.40	
	Amps.	.31		.32	
PICK-UP (Min.)	Volts	.31		.30	
	Amps.	.25		.24	
WORKING (Max.)	Volts	.54		.56	
	Amps.	.43		.45	
WORKING (Min.)	Volts	.39		.375	
	Amps.	.31		.30	
DROP-AWAY (Min.)	Volts	.175		.16	
	Amps.	.14		.13	
% WORKING MAXIMUM W/PU x 100		150		150	
% DROP-AWAY MINIMUM DA/PU x 100		55		50	

REMARKS: —

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 6

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36100 Group List 1 Spec'n. 13G-8R Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal: Front (d) 4 (i) — | Reverse: Back (d) 4 (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	
Amperes	.245	
Volt-Amperes	27.	
Watts	16.9	
Power Factor	.65	
Impedance (Ohms)	450.	
Phase Angle of Element	48°	

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.	.320		.320	
PICK-UP (Min.)	Volts				
	Amps.	.280		.280	
WORKING (Max.)	Volts				
	Amps.	.370		.370	
WORKING (Min.)	Volts				
	Amps.	.275		.275	
DROP-AWAY (Min.)	Volts				
	Amps.	.160		.140	
% WORKING MAXIMUM W/PU x 100		120		120	
% DROP-AWAY MINIMUM DA/PU x 100		55		50	

REMARKS: Service - D.C. Traction - Double Rail.

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 7

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36100 Group List 1 Spec'n. 13G-177R Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal: Front (d) — (i) 4 | Reverse: Back (d) — (i) 2; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	
Amperes	.245	
Volt-Amperes	27.	
Watts	16.9	
Power Factor	.65	
Impedance (Ohms)	450.	
Phase Angle of Element	48°	

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.	.115		.115	
PICK-UP (Min.)	Volts				
	Amps.	.090		.090	
WORKING (Max.)	Volts				
	Amps.	.165		.165	
WORKING (Min.)	Volts				
	Amps.	.100		.100	
DROP-AWAY (Min.)	Volts				
	Amps.	.052		.047	
% WORKING MAXIMUM W/PU x 100		150		150	
% DROP-AWAY MINIMUM DA/PU x 100		55		50	

REMARKS: Service - Steam Road - Double Rail.

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 8

Manuf. — Style/Model — Class/Form —

Dwg. No. — Group List — Spec'n. — Cycles —

Service — Element — Position —

CONTACTS — Normal: Front (d) — (i) — | Reverse: Back (d) — (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. —

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM W/PU x 100					
% DROP-AWAY MINIMUM DA/PU x 100					

REMARKS: —

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 9

Manuf. _____ Style/Model } _____ Class/Form } _____

Dwg. No. _____ Group/List } _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM } W/PU X 100					
% DROP-AWAY MINIMUM } DA/PU X 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 10

Manuf. _____ Style/Model } _____ Class/Form } _____

Dwg. No. _____ Group/List } _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM } W/PU X 100					
% DROP-AWAY MINIMUM } DA/PU X 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 11

Manuf. _____ Style/Model } _____ Class/Form } _____

Dwg. No. _____ Group/List } _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM } W/PU X 100					
% DROP-AWAY MINIMUM } DA/PU X 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 12

Manuf. _____ Style/Model } _____ Class/Form } _____

Dwg. No. _____ Group/List } _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM } W/PU X 100					
% DROP-AWAY MINIMUM } DA/PU X 100					

REMARKS: _____

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 13

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36103 Group List 1 Spec'n. 13G-88R Cycles 60

Service Track Element 2 Position 3

CONTACTS: Normal (d) 5 (i) | Reverse (d) 5 (i)
Front (d) (i) | Back (d) (i)
De-energized 1

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	1.0
Amperes	.25	1.56
Volt-Amperes	27.5	1.56
Watts	18.6	.93
Power Factor	.677	.60
Impedance (Ohms)	440.	.64
Phase Angle of Element	47° 23'	53° 7'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.160	.160	.176	.176
	Amps.	.250	.250	.275	.275
PICK-UP (Min.)	Volts	.141	.141	.127	.127
	Amps.	.220	.220	.198	.198
WORKING (Max.)	Volts	.240	.240	.264	.264
	Amps.	.375	.375	.413	.413
WORKING (Min.)	Volts	.190	.190	.171	.171
	Amps.	.297	.297	.268	.268
DROP-AWAY (Min.)	Volts	.088	.088	.075	.075
	Amps.	.130	.130	.117	.117
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		150	150	150	150
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		55	55	50	50

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 14

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36103 Group List 1 Spec'n. 13G-79R Cycles 60

Service Track Element 2 Position 3

CONTACTS: Normal (d) 6 (i) | Reverse (d) 6 (i)
Front (d) (i) | Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	1.0
Amperes	.25	1.56
Volt-Amperes	27.5	1.56
Watts	18.6	.93
Power Factor	.677	.60
Impedance (Ohms)	440.	.64
Phase Angle of Element	47° 23'	53° 7'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.160	.160	.176	.176
	Amps.	.250	.250	.275	.275
PICK-UP (Min.)	Volts	.141	.141	.127	.127
	Amps.	.220	.220	.198	.198
WORKING (Max.)	Volts	.240	.240	.264	.264
	Amps.	.375	.375	.413	.413
WORKING (Min.)	Volts	.190	.190	.171	.171
	Amps.	.297	.297	.268	.268
DROP-AWAY (Min.)	Volts	.083	.083	.075	.075
	Amps.	.130	.130	.117	.117
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		150	150	150	150
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		55	55	50	50

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 15

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36103 Group List 1 Spec'n. 13G-101R Cycles 60

Service Track Element 2 Position 3

CONTACTS: Normal (d) 6 (i) | Reverse (d) 6 (i)
Front (d) (i) | Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	1.0
Amperes	.25	1.56
Volt-Amperes	27.5	1.56
Watts	18.6	.93
Power Factor	.677	.60
Impedance (Ohms)	440.	.64
Phase Angle of Element	47° 23'	53° 7'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.160	.160	.176	.176
	Amps.	.250	.250	.275	.275
PICK-UP (Min.)	Volts	.128	.128	.115	.115
	Amps.	.200	.200	.180	.180
WORKING (Max.)	Volts	.264	.264	.291	.291
	Amps.	.413	.413	.455	.455
WORKING (Min.)	Volts	.192	.192	.173	.173
	Amps.	.300	.300	.270	.270
DROP-AWAY (Min.)	Volts	.083	.083	.075	.075
	Amps.	.130	.130	.117	.117
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		165	165	165	165
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		60	60	55	55

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 16

Manuf. Style/Model Class/Form

Dwg. No. Group List Spec'n. Cycles

Service Element Position

CONTACTS: Normal (d) (i) | Reverse (d) (i)
Front (d) (i) | Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 17

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 18

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 19

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 20

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

R-1

NEW YORK CENTRAL LINES

SIGNAL COMMITTEE
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A.C. RELAYS AND INDICATORS

JAN. 31 1930

40

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 21

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36103 Group/List 1 Spec'n. 13G-113R Cycles 60

Service Line Element 2 Position 3

CONTACTS — Normal: Front (d) (i) 6 | De-energized | Reverse: Back (d) 6 (i)

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	110.
Amperes	.183	.055
Volt-Amperes	20.1	6.05
Watts	12.2	5.9
Power Factor	.605	.975
Impedance (Ohms)	600.	2000.
Phase Angle of Element	52° 46'	12° 50'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	32.0	32.0	35.0	35.0
	Amps.	.016	.016	.017	.017
PICK-UP (Min.)	Volts	25.	25.	22.5	22.5
	Amps.	.012	.012	.011	.011
WORKING (Max.)	Volts	48.	48.	49.5	49.5
	Amps.	.024	.024	.025	.025
WORKING (Min.)	Volts	32.	32.	29.	29.
	Amps.	.016	.016	.015	.015
DROP-AWAY (Min.)	Volts	16.	16.	14.5	14.5
	Amps.	.008	.008	.007	.007
% WORKING MAXIMUM W/PU x 100		150	150	150	150
% DROP-AWAY MINIMUM DA/PU x 100		55	55	50	50

REMARKS:

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 22

Manuf. G.R.S.Co. Style/Model 2 Class/Form A

Dwg. No. 36103 Group/List 1 Spec'n. 13G-87R Cycles 60

Service Line Element 2 Position 3

CONTACTS — Normal: Front (d) 6 (i) | De-energized | Reverse: Back (d) 6 (i)

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	110.
Amperes	.183	.055
Volt-Amperes	20.1	6.05
Watts	12.2	5.9
Power Factor	.605	.975
Impedance (Ohms)	600.	2000.
Phase Angle of Element	52° 46'	12° 50'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	32.0	32.0	35.0	35.0
	Amps.	.016	.016	.017	.017
PICK-UP (Min.)	Volts	25.	25.	22.5	22.5
	Amps.	.012	.012	.011	.011
WORKING (Max.)	Volts	48.	48.	49.5	49.5
	Amps.	.024	.024	.025	.025
WORKING (Min.)	Volts	32.	32.	29.	29.
	Amps.	.016	.016	.015	015
DROP-AWAY (Min.)	Volts	16.	16.	14.5	14.5
	Amps.	.008	.008	.007	.007
% WORKING MAXIMUM W/PU x 100		150	150	150	150
% DROP-AWAY MINIMUM DA/PU x 100		55	55	50	50

REMARKS:

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 23

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal: Front (d) (i) | De-energized | Reverse: Back (d) (i)

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM W/PU x 100					
% DROP-AWAY MINIMUM DA/PU x 100					

REMARKS:

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 24

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal: Front (d) (i) | De-energized | Reverse: Back (d) (i)

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM W/PU x 100					
% DROP-AWAY MINIMUM DA/PU x 100					

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 25

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS — Normal (d)___(i)___ | Reverse (d)___(i)___ ; Front (d)___(i)___ | Back (d)___(i)___ ; De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 26

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS — Normal (d)___(i)___ | Reverse (d)___(i)___ ; Front (d)___(i)___ | Back (d)___(i)___ ; De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 27

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS — Normal (d)___(i)___ | Reverse (d)___(i)___ ; Front (d)___(i)___ | Back (d)___(i)___ ; De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 28

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS — Normal (d)___(i)___ | Reverse (d)___(i)___ ; Front (d)___(i)___ | Back (d)___(i)___ ; De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 29

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group/List 53A/109 Spec'n. Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i) 2; De-energized. Reverse: Back (d) 2 (i)

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.110
Volt-Amperes		12.1
Watts		8.5
Power Factor		.70
Impedance (Ohms)		1000.
Phase Angle of Element		45° 34'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	69.		69.	
	Amps.	.075		.075	
PICK-UP (Min.)	Volts	55.		55.	
	Amps.	.060		.060	
WORKING (Max.)	Volts	88.		88.	
	Amps.	.096		.096	
WORKING (Min.)	Volts	64.		64.	
	Amps.	.070		.070	
DROP-AWAY (Min.)	Volts	42.		36.	
	Amps.	.045		.039	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		140		140	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		65	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 30

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group/List 70 Spec'n. Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i); De-energized. Reverse: Back (d) 2 (i)

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.11
Volt-Amperes		12.1
Watts		8.5
Power Factor		.70
Impedance (Ohms)		1000.
Phase Angle of Element		45° 34'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	65.		71.5	
	Amps.	.065		.072	
PICK-UP (Min.)	Volts	60.		54.	
	Amps.	.060		.054	
WORKING (Max.)	Volts	81.5		90.	
	Amps.	.082		.090	
WORKING (Min.)	Volts	68.		61.	
	Amps.	.068		.061	
DROP-AWAY (Min.)	Volts	45.		40.5	
	Amps.	.045		.041	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		125		125	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		65	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 31

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group/List 59-1 Spec'n. Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i) 2; De-energized. Reverse: Back (d) 2 (i)

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.12
Volt-Amperes		13.2
Watts		8.58
Power Factor		.65
Impedance (Ohms)		920.
Phase Angle of Element		48°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	69.		69.	
	Amps.	.075		.075	
PICK-UP (Min.)	Volts	55.		55.	
	Amps.	.060		.060	
WORKING (Max.)	Volts	88.		88.	
	Amps.	.096		.096	
WORKING (Min.)	Volts	64.		64.	
	Amps.	.070		.070	
DROP-AWAY (Min.)	Volts	42.		36.	
	Amps.	.045		.039	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		140		140	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		65	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 32

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group/List 6 Spec'n. Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i) 2; De-energized. Reverse: Back (d) 2 (i)

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		130.
Amperes		.087
Volt-Amperes		11.3
Watts		8.1
Power Factor		.719
Impedance (Ohms)		1493.
Phase Angle of Element		44°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	85.		90.	
	Amps.	.057		.060	
PICK-UP (Min.)	Volts	65.		60.	
	Amps.	.044		.040	
WORKING (Max.)	Volts	105.		110.	
	Amps.	.070		.074	
WORKING (Min.)	Volts	80.		75.	
	Amps.	.054		.050	
DROP-AWAY (Min.)	Volts	50.		45.	
	Amps.	.034		.030	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		150		150	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		60		55	

REMARKS:

R-1

NEW YORK CENTRAL LINES — SIGNAL COMMITTEE

INSTRUCTIONS

A.C. RELAYS AND INDICATORS

JAN. 31 1930

40

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 33

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List 92 Specn. ____ Cycles 60

Service Line Element 2 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) 2 (i) 1 | Back (d) 2 (i) 1
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	110.
Amperes	.235	.04
Volt-Amperes	25.8	4.4
Watts	11.8	4.2
Power Factor	.455	.955
Impedance (Ohms)	468.	2750.
Phase Angle of Element	62°56'	17°15'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	25.		27.5	
	Amps.	.009		.010	
PICK-UP (Min.)	Volts	18.		16.	
	Amps.	.007		.006	
WORKING (Max.)	Volts	37.5		41.	
	Amps.	.014		.015	
WORKING (Min.)	Volts	22.		20.	
	Amps.	.008		.007	
DROP-AWAY (Min.)	Volts	11.		9.5	
	Amps.	.004		.003	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		150		150	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		55		50	

REMARKS: Slow Release Relay.

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 34

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List 1 Specn. 13H-7R Cycles 25

Service Line Element 2 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) 2 (i) 2 | Back (d) 2 (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	55.	55.
Amperes	.33	.069
Volt-Amperes	18.2	3.8
Watts	9.	3.5
Power Factor	.5	.91
Impedance (Ohms)	167.	797.
Phase Angle of Element	60°	24°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	15.		16.	
	Amps.				
PICK-UP (Min.)	Volts	12.		11.5	
	Amps.				
WORKING (Max.)	Volts	26.		28.	
	Amps.				
WORKING (Min.)	Volts	21.		20.	
	Amps.				
DROP-AWAY (Min.)	Volts	8.		7.6	
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		136		136	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		55		50	

REMARKS: Slow Release Relay.

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 35

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group List ____ Specn. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 36

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group List ____ Specn. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: ____

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 37

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List 96 Spec'n. Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) 2 (i) 2 | Back (d) 2 (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	8.	6.
Amperes	4.	.371
Volt-Amperes	32.	2.23
Watts	12.8	1.96
Power Factor	.40	.88
Impedance (Ohms)	2.	16.1
Phase Angle of Element	66° 34'	28° 21'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	1.288		1.417	
	Amps.	.080		.088	
PICK-UP (Min.)	Volts	.902		.805	
	Amps.	.056		.050	
WORKING (Max.)	Volts	1.932		2.125	
	Amps.	.120		.132	
WORKING (Min.)	Volts	1.352		1.224	
	Amps.	.084		.076	
DROP-AWAY (Min.)	Volts	.724		.644	
	Amps.	.045		.040	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		150		150	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		55		50	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 38

Manuf. Style/Model Class/Form

Dwg. No. Group List Spec'n. Cycles

Service Element Position

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) (i) | Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 39

Manuf. Style/Model Class/Form

Dwg. No. Group List Spec'n. Cycles

Service Element Position

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) (i) | Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 40

Manuf. Style/Model Class/Form

Dwg. No. Group List Spec'n. Cycles

Service Element Position

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) (i) | Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

NEW YORK CENTRAL LINES

SIGNAL COMMITTEE

INSTRUCTIONS

A.C. RELAYS AND INDICATORS

JAN. 31 1930

40

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 41

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List Spec'n. 48 Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) 2 (i) 2 | Back (d) 2 (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.375
Volt-Amperes		11.45
Watts		10.5
Power Factor		.2
Impedance (Ohms)		134.
Phase Angle of Element		53°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	21.5		22.5	
	Amps.	.16		.168	
PICK-UP (Min.)	Volts	17.2		16.5	
	Amps.	.129		.123	
WORKING (Max.)	Volts	30.		32.	
	Amps.	.22		.23	
WORKING (Min.)	Volts	21.		20.	
	Amps.	.16		.157	
DROP-AWAY (Min.)	Volts	12.		11.5	
	Amps.	.09		.089	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		136		136	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		65	

REMARKS: To be used for Serial Nos. 01 to 0102 used on N.Y.C.R.R. (Electric Zone)

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 42

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List Spec'n. 48 Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) 2 (i) 2 | Back (d) 2 (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.375
Volt-Amperes		11.45
Watts		10.5
Power Factor		.20
Impedance (Ohms)		134.
Phase Angle of Element		53°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	26.		28.	
	Amps.	.19		.2	
PICK-UP (Min.)	Volts	18.5		17.6	
	Amps.	.138		.131	
WORKING (Max.)	Volts	36.		38.	
	Amps.	.26		.28	
WORKING (Min.)	Volts	26.		25.	
	Amps.	.192		.19	
DROP-AWAY (Min.)	Volts	12.		11.5	
	Amps.	.09		.087	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		136		136	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		65	

REMARKS: To be used for Serial Nos. 366 to 3000—N.Y.C.R.R. (Electric Zone)

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 43

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List Spec'n. 48 Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) 2 (i) 2 | Back (d) 2 (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.375
Volt-Amperes		11.45
Watts		10.5
Power Factor		.2
Impedance (Ohms)		134.
Phase Angle of Element		53°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	23.		24.	
	Amps.	.169		.18	
PICK-UP (Min.)	Volts	20.		19.	
	Amps.	.146		.14	
WORKING (Max.)	Volts	32.		34.	
	Amps.	.23		.245	
WORKING (Min.)	Volts	26.		25.	
	Amps.	.195		.185	
DROP-AWAY (Min.)	Volts	13.		12.5	
	Amps.	.098		.094	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		136		136	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		65	

REMARKS: To be used for Serial Nos. 3001 to 4000—N.Y.C.R.R. (Electric Zone)

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 44

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List Spec'n. 48 Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) 2 (i) 2 | Back (d) 2 (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.375
Volt-Amperes		11.45
Watts		10.5
Power Factor		.2
Impedance (Ohms)		134.
Phase Angle of Element		53°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	24.		25.	
	Amps.	.17		.18	
PICK-UP (Min.)	Volts	22.		21.	
	Amps.	.153		.145	
WORKING (Max.)	Volts	34.		36.	
	Amps.	.24		.25	
WORKING (Min.)	Volts	29.		28.	
	Amps.	.21		.2	
DROP-AWAY (Min.)	Volts	14.		13.	
	Amps.	.105		.1	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		136		136	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		65	

REMARKS: To be used for Serial Nos. 4029 to 4522—N.Y.C.R.R. (Electric Zone)

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 45

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List Specn. 48 Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i) 2 | Reverse: Back (d) 2 (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.375
Volt-Amperes		11.45
Watts		10.5
Power Factor		.2
Impedance (Ohms)		134.
Phase Angle of Element		53°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	28.		30.	
	Amps.	.205		.22	
PICK-UP (Min.)	Volts	21.		20.	
	Amps.	.159		.15	
WORKING (Max.)	Volts	38.		40.	
	Amps.	.28		.3	
WORKING (Min.)	Volts	29.		28.	
	Amps.	.205		.2	
DROP-AWAY (Min.)	Volts	15.		14.5	
	Amps.	.112		.105	
% WORKING MAXIMUM W/PU x 100		136		136	
% DROP-AWAY MINIMUM DA/PU x 100		70		65	

REMARKS: To be used for Serial Nos. 6451 to 7236 - N.Y.C.R.R. (Electric Zone)

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 46

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List Specn. 48 Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i) 2 | Reverse: Back (d) 2 (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.372
Volt-Amperes		11.43
Watts		10.5
Power Factor		.2
Impedance (Ohms)		133.
Phase Angle of Element		53°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	29.		31.	
	Amps.	.215		.22	
PICK-UP (Min.)	Volts	22.		21.	
	Amps.	.162		.155	
WORKING (Max.)	Volts	40.		42.	
	Amps.	.3		.32	
WORKING (Min.)	Volts	30.		29.	
	Amps.	.22		.215	
DROP-AWAY (Min.)	Volts	20.		19.	
	Amps.	.15		.142	
% WORKING MAXIMUM W/PU x 100		130		136	
% DROP-AWAY MINIMUM DA/PU x 100		70		65	

REMARKS: To be used for Serial Nos. 8102 to 8283 - N.Y.C.R.R. (Electric Zone)

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 47

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List Specn. 48 Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i) 2 | Reverse: Back (d) 2 (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.375
Volt-Amperes		11.45
Watts		10.5
Power Factor		.2
Impedance (Ohms)		134.
Phase Angle of Element		53°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	30.		32.	
	Amps.	.218		.23	
PICK-UP (Min.)	Volts	26.		25.	
	Amps.	.194		.185	
WORKING (Max.)	Volts	40.		42.	
	Amps.	.3		.32	
WORKING (Min.)	Volts	28.		26.	
	Amps.	.196		.194	
DROP-AWAY (Min.)	Volts	18.		17.	
	Amps.	.135		.128	
% WORKING MAXIMUM W/PU x 100		136		136	
% DROP-AWAY MINIMUM DA/PU x 100		70		65	

REMARKS: To be used for Serial Nos. 9055 to 9728 - N.Y.C.R.R. (Electric Zone)

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 48

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37310 Group List Specn. 48 Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i) 2 | Reverse: Back (d) 2 (i) —; De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.375
Volt-Amperes		11.45
Watts		10.5
Power Factor		.2
Impedance (Ohms)		134.
Phase Angle of Element		53°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	30.		32.	
	Amps.	.225		.234	
PICK-UP (Min.)	Volts	25.		24.	
	Amps.	.152		.144	
WORKING (Max.)	Volts	42.		44.	
	Amps.	.31		.326	
WORKING (Min.)	Volts	29.		27.	
	Amps.	.21		.2	
DROP-AWAY (Min.)	Volts	15.		14.	
	Amps.	.11		.105	
% WORKING MAXIMUM W/PU x 100		136		136	
% DROP-AWAY MINIMUM DA/PU x 100		70		70	

REMARKS: To be used for Serial Nos. 11154 to 22166 - N.Y.C.R.R. (Electric Zone)

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 49

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 43300-I Group List ____ Spec'n. ____ Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) 2 (i) ___ | Back (d) 2 (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.69
Volt-Amperes		37.95
Watts		29.25
Power Factor		.77
Impedance (Ohms)		79.7
Phase Angle of Element		40°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 3		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts			42.	
	Amps.	.535			
PICK-UP (Min.)	Volts			32.	
	Amps.	.40			
WORKING (Max.)	Volts			54.	
	Amps.	.69			
WORKING (Min.)	Volts			43.	
	Amps.	.535			
DROP-AWAY (Min.)	Volts			20.	
	Amps.	.22			
% WORKING MAXIMUM W/PU x 100		136		136	
% DROP-AWAY MINIMUM DA/PU x 100		*55		*50	

REMARKS: Slow Pick-up Relay, *55% Contacts just open, 25% Contacts full open 90 Sec - N.Y.C. (Elec. Zone)

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 50

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 34780 Group List ____ Spec'n. ____ Cycles 25

Service Line Indicator Element 1 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		55.0
Amperes		.26
Volt-Amperes		13.52
Watts		8.7
Power Factor		.64
Impedance (Ohms)		134.
Phase Angle of Element		52°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 3		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.	.182		.192	
PICK-UP (Min.)	Volts				
	Amps.	.145		.138	
WORKING (Max.)	Volts				
	Amps.	.182		.192	
WORKING (Min.)	Volts				
	Amps.	.145		.138	
DROP-AWAY (Min.)	Volts				
	Amps.	.120		.115	
% WORKING MAXIMUM W/PU x 100					
% DROP-AWAY MINIMUM DA/PU x 100		70		65	

REMARKS: N.Y.C.R.R. (Electric Zone)

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 51

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM W/PU x 100					
% DROP-AWAY MINIMUM DA/PU x 100					

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 52

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM W/PU x 100					
% DROP-AWAY MINIMUM DA/PU x 100					

REMARKS: ____

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 53

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37312 Group List 28 Spec'n. Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i) 4; Back (d) 2 (i) —; De-energized —; Reverse: Front (d) — (i) —; Back (d) — (i) —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.11
Volt-Amperes		12.1
Watts		8.5
Power Factor		.70
Impedance (Ohms)		1000.
Phase Angle of Element		45°34'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	68.		73.	
	Amps.	.068		.073	
PICK-UP (Min.)	Volts	63.		57.	
	Amps.	.063		.057	
WORKING (Max.)	Volts	85.		93.5	
	Amps.	.085		.093	
WORKING (Min.)	Volts	71.		64.	
	Amps.	.071		.064	
DROP-AWAY (Min.)	Volts	48.		43.	
	Amps.	.048		.043	
% WORKING MAXIMUM (W/PU x 100)		125		125	
% DROP-AWAY MINIMUM (DA/PU x 100)		70		65	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 54

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37312 Group List 19-1 Spec'n. Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 4 (i) —; Back (d) 4 (i) —; De-energized —; Reverse: Front (d) — (i) —; Back (d) — (i) —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.135
Volt-Amperes		14.9
Watts		9.7
Power Factor		.65
Impedance (Ohms)		815.
Phase Angle of Element		49°27'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	65.		71.5	
	Amps.	.080		.088	
PICK-UP (Min.)	Volts	60.		54.	
	Amps.	.073		.066	
WORKING (Max.)	Volts	81.5		90.	
	Amps.	.1		.11	
WORKING (Min.)	Volts	68.		61.	
	Amps.	.083		.075	
DROP-AWAY (Min.)	Volts	45.		40.5	
	Amps.	.055		.050	
% WORKING MAXIMUM (W/PU x 100)		125		125	
% DROP-AWAY MINIMUM (DA/PU x 100)		70		65	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 55

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37312 Group List 60 Spec'n. Cycles 60

Service Line Element 2 Position 2

CONTACTS — Normal: Front (d) 2 (i) 4; Back (d) 2 (i) —; De-energized —; Reverse: Front (d) — (i) —; Back (d) — (i) —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	110.
Amperes	.17	.04
Volt-Amperes	18.7	4.4
Watts	8.8	4.2
Power Factor	.47	.955
Impedance (Ohms)	650.	2750.
Phase Angle of Element	61°57'	17°15'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	30.		33.	
	Amps.	.011		.012	
PICK-UP (Min.)	Volts	23.		20.5	
	Amps.	.008		.007	
WORKING (Max.)	Volts	45.		49.5	
	Amps.	.016		.018	
WORKING (Min.)	Volts	27.		24.	
	Amps.	.01		.009	
DROP-AWAY (Min.)	Volts	14.		12.5	
	Amps.	.005		.004	
% WORKING MAXIMUM (W/PU x 100)		150		150	
% DROP-AWAY MINIMUM (DA/PU x 100)		55		50	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 56

Manuf. Style/Model Class/Form

Dwg. No. Group List Spec'n. Cycles

Service Element Position

CONTACTS — Normal: Front (d) (i); Back (d) (i); De-energized —; Reverse: Front (d) (i); Back (d) (i)

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM (W/PU x 100)					
% DROP-AWAY MINIMUM (DA/PU x 100)					

REMARKS:

R-1

NEW YORK CENTRAL LINES — SIGNAL COMMITTEE
INSTRUCTIONS
A.C. RELAYS AND INDICATORS
JAN. 31 1930
40

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 57

Manuf. G.R.S.Co. Style/Model 2 Class/Form B

Dwg. No. 37314 Group/List 12 Spec'n. ____ Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 2 (i) 1 | Reverse: Back (d) 2 (i) 1 | De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.135
Volt-Amperes		14.9
Watts		9.7
Power Factor		.65
Impedance (Ohms)		815.
Phase Angle of Element		49°27'

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	60.		66.	
	Amps.	.073		.081	
PICK-UP (Min.)	Volts	50.		45.	
	Amps.	.061		.055	
WORKING (Max.)	Volts	66.		72.	
	Amps.	.081		.088	
WORKING (Min.)	Volts	55.		50.	
	Amps.	.067		.061	
DROP-AWAY (Min.)	Volts	38.		34.	
	Amps.	.047		.042	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		110		110	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		65	

REMARKS: ____

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 58

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal: Front (d) ____ (i) ____ | Reverse: Back (d) ____ (i) ____ | De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: ____

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 59

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal: Front (d) ____ (i) ____ | Reverse: Back (d) ____ (i) ____ | De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: ____

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 60

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal: Front (d) ____ (i) ____ | Reverse: Back (d) ____ (i) ____ | De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: ____

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 61

Manuf. G.R.S.Co. Style/Model P10 Class/Form L

Dwg. No. 51500-2 Group/List 1 Specn. 13K-28R Cycles 25

Service Line Element 2 Position 3

CONTACTS — Normal (d) 6 (i) — Reverse (d) 6 (i)
Front (d) — (i) — Back (d) — (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	55.	55.
Amperes	.458	.115
Volt-Amperes	25.	6.32
Watts	6.25	5.84
Power Factor	.25	.925
Impedance (Ohms)	120.	480.
Phase Angle of Element	75°	22°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. L

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	20.	20.	21.	21.
	Amps.				
PICK-UP (Min.)	Volts	16.	16.	14.	14.
	Amps.				
WORKING (Max.)	Volts	40.	40.	42.	42.
	Amps.				
WORKING (Min.)	Volts	30.	30.	28.	28.
	Amps.				
DROP-AWAY (Min.)	Volts	8.5	8.5	8.	8.
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		136	136	136	136
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70	70	65	65

REMARKS: Vane Type Relay.

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 62

Manuf. G.R.S.Co. Style/Model D-10 Class/Form T-2-R

Dwg. No. 51500-2 Group/List 3 Specn. 13K-22R Cycles 25

Service Track Element 2 Position 2

CONTACTS — Normal (d) — (i) — Reverse (d) — (i)
Front (d) 2 (i) 2 — Back (d) 2 (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	50.	1.
Amperes	.70	5.32
Volt-Amperes	35.	5.32
Watts	7.7	2.39
Power Factor	.22	.45
Impedance (Ohms)	75.	.188
Phase Angle of Element	77°	63°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. I

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.	1.02		1.07	
PICK-UP (Min.)	Volts				
	Amps.	.78		.74	
WORKING (Max.)	Volts				
	Amps.	2.		2.1	
WORKING (Min.)	Volts				
	Amps.	1.2		1.14	
DROP-AWAY (Min.)	Volts				
	Amps.	.66		.62	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		136		136	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		55		50	

REMARKS: Vane Type Relay.

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 63

Manuf. Style/Model Class/Form

Dwg. No. Group/List Specn. Cycles

Service Element Position

CONTACTS — Normal (d) (i) — Reverse (d) (i)
Front (d) (i) — Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 64

Manuf. Style/Model Class/Form

Dwg. No. Group/List Specn. Cycles

Service Element Position

CONTACTS — Normal (d) (i) — Reverse (d) (i)
Front (d) (i) — Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 65

Manuf. G.R.S.Co. Style/Model ____ Class/Form ____

Dwg. No. 15140 Group/List ____ Spec'n. ____ Cycles 25

Service Track Element 2 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) 2 | Back (d) ___ (i) ___
De-energized ___

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	1.72	1.02
Amperes	5.75	2.
Volt-Amperes	9.9	2.04
Watts	9.06	1.96
Power Factor	.95	.96
Impedance (Ohms)	.30	.50
Phase Angle of Element	18°	16°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 4

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.	.83		.87	
PICK-UP (Min.)	Volts				
	Amps.	.50		.475	
WORKING (Max.)	Volts				
	Amps.	1.13		1.17	
WORKING (Min.)	Volts				
	Amps.	.60		.57	
DROP-AWAY (Min.)	Volts				
	Amps.	.275		.26	
% WORKING MAXIMUM W/PU x 100		136		136	
% DROP-AWAY MINIMUM DA/PU x 100		55		50	

REMARKS: Iron Rotor Relay.

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 66

Manuf. G.R.S.Co. Style/Model ____ Class/Form ____

Dwg. No. 17000 Group/List ____ Spec'n. ____ Cycles 25

Service Track Element 2 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) 4 | Back (d) ___ (i) ___
De-energized ___

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	1.6	.70
Amperes	5.5	2.1
Volt-Amperes	8.7	1.47
Watts	8.2	1.325
Power Factor	.94	.9025
Impedance (Ohms)	.291	.33
Phase Angle of Element	20°	25°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 4

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.	.90		.95	
PICK-UP (Min.)	Volts				
	Amps.	.56		.53	
WORKING (Max.)	Volts				
	Amps.	1.24		1.30	
WORKING (Min.)	Volts				
	Amps.	.76		.72	
DROP-AWAY (Min.)	Volts				
	Amps.	.31		.30	
% WORKING MAXIMUM W/PU x 100		136		136	
% DROP-AWAY MINIMUM DA/PU x 100		55		50	

REMARKS: Iron Rotor Relay.

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 67

Manuf. G.R.S.Co. Style/Model ____ Class/Form ____

Dwg. No. 17008 Group/List ____ Spec'n. ____ Cycles 25

Service Track Element 2 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) 4 | Back (d) ___ (i) ___
De-energized ___

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	14.6	.68
Amperes	1.75	2.
Volt-Amperes	25.5	1.36
Watts	24.7	1.27
Power Factor	.97	.94
Impedance (Ohms)	8.35	.34
Phase Angle of Element	15°	21°

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 4

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.	.87		.915	
PICK-UP (Min.)	Volts				
	Amps.	.38		.36	
WORKING (Max.)	Volts				
	Amps.	1.18		1.24	
WORKING (Min.)	Volts				
	Amps.	.50		.47	
DROP-AWAY (Min.)	Volts				
	Amps.	.21		.20	
% WORKING MAXIMUM W/PU x 100		136		136	
% DROP-AWAY MINIMUM DA/PU x 100		55		50	

REMARKS: Iron Rotor Relay.

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 68

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized ___

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM W/PU x 100					
% DROP-AWAY MINIMUM DA/PU x 100					

REMARKS: ____

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 69

Manuf. _____ Style/Model _____ Class/Form _____

Dwg. No. _____ Group/List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST		FIELD TEST	
		Normal	Reverse	Normal	Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 70

Manuf. _____ Style/Model _____ Class/Form _____

Dwg. No. _____ Group/List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST		FIELD TEST	
		Normal	Reverse	Normal	Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 71

Manuf. _____ Style/Model _____ Class/Form _____

Dwg. No. _____ Group/List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST		FIELD TEST	
		Normal	Reverse	Normal	Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 72

Manuf. _____ Style/Model _____ Class/Form _____

Dwg. No. _____ Group/List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) ___ | Back (d) ___ (i) ___
De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST		FIELD TEST	
		Normal	Reverse	Normal	Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

R-1

NEW YORK CENTRAL LINES — SIGNAL COMMITTEE
INSTRUCTIONS
A.C. RELAYS AND INDICATORS

JAN. 31 1930

40

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE № 73

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group List ____ Spec'n. 9 Cycles 60

Service Track Element 1 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) ___ (i) 2 | Back (d) ___ (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		7.4
Amperes		2.4
Volt-Amperes		17.7
Watts		8.9
Power Factor		.5
Impedance (Ohms)		3.08
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	3.15		3.3	
	Amps.	1.05		1.1	
PICK-UP (Min.)	Volts	2.85		2.7	
	Amps.	.95		.9	
WORKING (Max.)	Volts	7.76		8.15	
	Amps.	2.52		2.64	
WORKING (Min.)	Volts	7.02		6.65	
	Amps.	2.28		2.16	
DROP-AWAY (Min.)	Volts	2.56		2.16	
	Amps.	.85		.72	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		258		271	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		90		80	

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE № 74

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group List ____ Spec'n. 101 Cycles 60

Service Track Element 1 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) 2 (i) ___ | Back (d) 2 (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		6.
Amperes		4.5
Volt-Amperes		27.
Watts		
Power Factor		
Impedance (Ohms)		1.33
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	2.73		2.86	
	Amps.	2.1		2.2	
PICK-UP (Min.)	Volts	2.47		2.34	
	Amps.	1.9		1.8	
WORKING (Max.)	Volts	6.3		6.6	
	Amps.	4.72		4.95	
WORKING (Min.)	Volts	5.7		5.4	
	Amps.	4.27		4.05	
DROP-AWAY (Min.)	Volts	2.22		1.87	
	Amps.	1.71		1.44	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		242		254	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		90		80	

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE № 75

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group List ____ Spec'n. 1031 Cycles 25

Service Track Element 1 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) 2 (i) ___ | Back (d) 2 (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		2.7
Amperes		1.6
Volt-Amperes		4.31
Watts		2.4
Power Factor		.55
Impedance (Ohms)		1.69
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	2.2		2.31	
	Amps.	1.36		1.43	
PICK-UP (Min.)	Volts	1.99		1.89	
	Amps.	1.24		1.17	
WORKING (Max.)	Volts	2.84		2.97	
	Amps.	1.68		1.76	
WORKING (Min.)	Volts	2.56		2.43	
	Amps.	1.52		1.44	
DROP-AWAY (Min.)	Volts	1.89		1.60	
	Amps.	1.18		.99	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		135		141	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		95		85	

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE № 76

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group List ____ Spec'n. 1031 Cycles 60

Service Track Element 1 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___
Front (d) 4 (i) ___ | Back (d) 2 (i) ___
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		4.9
Amperes		1.7
Volt-Amperes		8.34
Watts		5.2
Power Factor		.62
Impedance (Ohms)		2.88
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	3.67		3.85	
	Amps.	1.31		1.37	
PICK-UP (Min.)	Volts	3.32		3.14	
	Amps.	1.18		1.12	
WORKING (Max.)	Volts	5.14		5.39	
	Amps.	1.78		1.87	
WORKING (Min.)	Volts	4.65		4.4	
	Amps.	1.61		1.53	
DROP-AWAY (Min.)	Volts	3.15		2.67	
	Amps.	1.12		.95	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		147		154	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		95		85	

REMARKS: ____

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 77

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group/List ____ Spec'n. 1031 Cycles 60

Service Track Element 1 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___ ; Front (d) 4 (i) ___ | Back (d) 4 (i) ___ ; De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		5.02
Amperes		1.79
Volt-Amperes		9.
Watts		5.75
Power Factor		.64
Impedance (Ohms)		2.8
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	4.04		4.22	
	Amps.	1.42		1.48	
PICK-UP (Min.)	Volts	3.65		3.46	
	Amps.	1.28		1.21	
WORKING (Max.)	Volts	5.27		5.52	
	Amps.	1.88		1.97	
WORKING (Min.)	Volts	4.76		4.52	
	Amps.	1.7		1.61	
DROP-AWAY (Min.)	Volts	3.46		2.94	
	Amps.	1.21		1.03	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		137		143	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		95		85	

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 78

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___ ; Front (d) ___ (i) ___ | Back (d) ___ (i) ___ ; De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 79

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___ ; Front (d) ___ (i) ___ | Back (d) ___ (i) ___ ; De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 80

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group/List ____ Spec'n. 1259 Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal (d) ___ (i) ___ | Reverse (d) ___ (i) ___ ; Front (d) ___ (i) 8 | Back (d) ___ (i) ___ ; De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		220.
Amperes		.095
Volt-Amperes		20.9
Watts		13.
Power Factor		.62
Impedance (Ohms)		2320.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	173.		181.	
	Amps.	.073		.076	
PICK-UP (Min.)	Volts	156.		143.	
	Amps.	.066		.063	
WORKING (Max.)	Volts	231.		242.	
	Amps.	.100		.104	
WORKING (Min.)	Volts	208.		198.	
	Amps.	.090		.085	
DROP-AWAY (Min.)	Volts	140.		114.	
	Amps.	.059		.050	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		140		147	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		90		80	

REMARKS: ____

NEW YORK CENTRAL LINES

SIGNAL COMMITTEE
INSTRUCTIONS
A.C. RELAYS AND INDICATORS

JAN. 31' 1930

40

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 81

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group/List ____ Spec'n. 1008 Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) ___ (i) 6; Back (d) ___ (i) 2; De-energized ____ — Reverse: (d) ___ (i) ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.18
Volt-Amperes		19.8
Watts		12.5
Power Factor		.63
Impedance (Ohms)		610.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	60.		62.5	
	Amps.	.105		.110	
PICK-UP (Min.)	Volts	54.		51.3	
	Amps.	.095		.090	
WORKING (Max.)	Volts	94.5		99.	
	Amps.	.157		.165	
WORKING (Min.)	Volts	85.5		81.	
	Amps.	.142		.135	
DROP-AWAY (Min.)	Volts	51.3		43.5	
	Amps.	.090		.076	
% WORKING MAXIMUM W/PU x 100		166		173	
% DROP-AWAY MINIMUM DA/PU x 100		95		85	

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 82

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group/List ____ Spec'n. 1008 Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 4 (i) ___; Back (d) 2 (i) ___; De-energized ____ — Reverse: (d) ___ (i) ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.125
Volt-Amperes		13.75
Watts		8.5
Power Factor		.62
Impedance (Ohms)		880.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	73.5		77.	
	Amps.	.084		.088	
PICK-UP (Min.)	Volts	66.5		62.9	
	Amps.	.076		.071	
WORKING (Max.)	Volts	99.8		104.5	
	Amps.	.110		.115	
WORKING (Min.)	Volts	90.3		85.5	
	Amps.	.1		.095	
DROP-AWAY (Min.)	Volts	63.1		53.4	
	Amps.	.072		.060	
% WORKING MAXIMUM W/PU x 100		142		149	
% DROP-AWAY MINIMUM DA/PU x 100		95		85	

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 83

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group/List ____ Spec'n. 1008 Cycles ____

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) 4 (i) ___; Back (d) 4 (i) ___; De-energized ____ — Reverse: (d) ___ (i) ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.125
Volt-Amperes		13.75
Watts		8.5
Power Factor		.62
Impedance (Ohms)		880.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	73.5		77.	
	Amps.	.084		.088	
PICK-UP (Min.)	Volts	66.5		62.9	
	Amps.	.076		.071	
WORKING (Max.)	Volts	99.8		104.5	
	Amps.	.110		.115	
WORKING (Min.)	Volts	90.3		85.5	
	Amps.	.100		.095	
DROP-AWAY (Min.)	Volts	63.1		53.4	
	Amps.	.072		.060	
% WORKING MAXIMUM W/PU x 100		142		149	
% DROP-AWAY MINIMUM DA/PU x 100		95		85	

REMARKS: ____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 84

Manuf. U.S.&S.Co. Style/Model SLV-13 Class/Form ____

Dwg. No. C4194 Group/List ____ Spec'n. 1259 Cycles 25

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) ___ (i) 8; Back (d) ___ (i) ____; De-energized ____ — Reverse: (d) ___ (i) ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		220.
Amperes		.075
Volt-Amperes		16.5
Watts		7.
Power Factor		.42
Impedance (Ohms)		2930.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	173.		181.	
	Amps.	.057		.061	
PICK-UP (Min.)	Volts	156.		143.	
	Amps.	.052		.050	
WORKING (Max.)	Volts	231.		242.	
	Amps.	.079		.082	
WORKING (Min.)	Volts	208.		198.	
	Amps.	.071		.067	
DROP-AWAY (Min.)	Volts	140.		114.	
	Amps.	.046		.039	
% WORKING MAXIMUM W/PU x 100		140		147	
% DROP-AWAY MINIMUM DA/PU x 100		90		80	

REMARKS: ____

R-1

NEW YORK CENTRAL LINES — SIGNAL COMMITTEE INSTRUCTIONS A.C. RELAYS AND INDICATORS — JAN. 31' 1930 — 40

S.G.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 85

Manuf. U.S.&S.Co. Style/Model 15 Class/Form
Dwg. No. C8813 Group/List Spec'n. 725A Cycles 60
Service Track Element 2 Position 2
CONTACTS Normal (d)___(i)___ Reverse (d)___(i)___
Front (d)4(i)___ Back (d)2(i)___
De-energized ___

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.45
Amperes	.40	.35
Volt-Amperes	44.	.157
Watts	11.	
Power Factor	.44	.40
Impedance (Ohms)	275.	1.28
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.29		.31	
	Amps.	.21		.22	
PICK-UP (Min.)	Volts	.26		.25	
	Amps.	.19		.18	
WORKING (Max.)	Volts	.47		.495	
	Amps.	.37		.385	
WORKING (Min.)	Volts	.42		.405	
	Amps.	.33		.315	
DROP-AWAY (Min.)	Volts	.23		.20	
	Amps.	.17		.14	
% WORKING MAXIMUM (W/PU x 100)		168		177	
% DROP-AWAY MINIMUM (DA/PU x 100)		90		80	

REMARKS: ___

S.G.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 86

Manuf. U.S.&S.Co. Style/Model 15 Class/Form
Dwg. No. C8813 Group/List Spec'n. 762 Cycles 60
Service Track Element 2 Position 3
CONTACTS Normal (d)4(i)___ Reverse (d)4(i)___
Front (d)___(i)___ Back (d)___(i)___
De-energized 1

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.62
Amperes	.40	.62
Volt-Amperes	44.	.385
Watts	11.	
Power Factor	.25	1.
Impedance (Ohms)	275.	1.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.294	.294	.308	.308
	Amps.	.294	.294	.308	.308
PICK-UP (Min.)	Volts	.266	.266	.250	.250
	Amps.	.266	.266	.250	.250
WORKING (Max.)	Volts	.650	.650	.680	.680
	Amps.	.650	.650	.680	.680
WORKING (Min.)	Volts	.580	.580	.557	.557
	Amps.	.580	.580	.557	.557
DROP-AWAY (Min.)	Volts	.210	.210	.175	.175
	Amps.	.210	.210	.175	.175
% WORKING MAXIMUM (W/PU x 100)		232	232	243	243
% DROP-AWAY MINIMUM (DA/PU x 100)		80	80	70	70

REMARKS: ___

S.G.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 87

Manuf. U.S.&S.Co. Style/Model 15 Class/Form
Dwg. No. C8813 Group/List Spec'n. 762 Cycles 60
Service Track Element 2 Position 3
CONTACTS Normal (d)4(i)___ Reverse (d)4(i)___
Front (d)___(i)___ Back (d)___(i)___
De-energized ___

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.54
Amperes	.40	.54
Volt-Amperes	44.	.29
Watts	11.	
Power Factor	.25	1.
Impedance (Ohms)	275.	1.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.262	.262	.275	.275
	Amps.	.262	.262	.275	.275
PICK-UP (Min.)	Volts	.238	.238	.225	.225
	Amps.	.238	.238	.225	.225
WORKING (Max.)	Volts	.566	.566	.595	.595
	Amps.	.566	.566	.595	.595
WORKING (Min.)	Volts	.510	.510	.485	.485
	Amps.	.510	.510	.485	.485
DROP-AWAY (Min.)	Volts	.190	.190	.150	.150
	Amps.	.190	.190	.150	.150
% WORKING MAXIMUM (W/PU x 100)		226	226	238	238
% DROP-AWAY MINIMUM (DA/PU x 100)		80	80	70	70

REMARKS: ___

S.G.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 88

Manuf. U.S.&S.Co. Style/Model 15 Class/Form
Dwg. No. C8813 Group/List Spec'n. 1057 Cycles 60
Service Track Element 2 Position 2
CONTACTS Normal (d)___(i)___ Reverse (d)___(i)___
Front (d)4(i)___ Back (d)2(i)___
De-energized ___

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	130.	.45
Amperes	.34	.35
Volt-Amperes	44.1	.157
Watts	11.	
Power Factor	.25	.40
Impedance (Ohms)	382.	1.28
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.294		.308	
	Amps.	.210		.220	
PICK-UP (Min.)	Volts	.266		.252	
	Amps.	.190		.180	
WORKING (Max.)	Volts	.472		.495	
	Amps.	.368		.385	
WORKING (Min.)	Volts	.426		.405	
	Amps.	.332		.315	
DROP-AWAY (Min.)	Volts	.239		.202	
	Amps.	.171		.144	
% WORKING MAXIMUM (W/PU x 100)		168		177	
% DROP-AWAY MINIMUM (DA/PU x 100)		90		80	

REMARKS: ___

R-1

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 89

Manuf. U.S.&S.Co. Style Model 15 Class Form

Dwg. No. C8813 Group List Spec'n. 1195 Cycles 60

Service Track Element 2 Position 3

CONTACTS — Normal (d) 4 (i) | Reverse (d) 4 (i)
Front (d) (i) | Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.50
Amperes	.44	.50
Volt-Amperes	48.4	.25
Watts	23.	
Power Factor	.47	.91
Impedance (Ohms)	250.	1.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.23	.23	.24	.24
	Amps.	.23	.23	.24	.24
PICK-UP (Min.)	Volts	.21	.21	.19	.19
	Amps.	.21	.21	.19	.19
WORKING (Max.)	Volts	.53	.53	.55	.55
	Amps.	.53	.53	.55	.55
WORKING (Min.)	Volts	.47	.47	.42	.42
	Amps.	.47	.47	.42	.42
DROP-AWAY (Min.)	Volts	.16	.16	.13	.13
	Amps.	.16	.16	.13	.13
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		241	241	250	250
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		80	80	70	70

REMARKS:

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 90

Manuf. U.S.&S.Co. Style Model 15 Class Form

Dwg. No. C8813 Group List Spec'n. 1195 Cycles 60

Service Track Element 2 Position 3

CONTACTS — Normal (d) 6 (i) | Reverse (d) 6 (i)
Front (d) (i) | Back (d) (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.65
Amperes	.44	.65
Volt-Amperes	48.4	.42
Watts	23.	
Power Factor	.47	.91
Impedance (Ohms)	250.	1.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.23	.23	.24	.24
	Amps.	.23	.23	.24	.24
PICK-UP (Min.)	Volts	.21	.21	.19	.19
	Amps.	.21	.21	.19	.19
WORKING (Max.)	Volts	.68	.68	.72	.72
	Amps.	.68	.68	.72	.72
WORKING (Min.)	Volts	.62	.62	.58	.58
	Amps.	.62	.62	.58	.58
DROP-AWAY (Min.)	Volts	.16	.16	.13	.13
	Amps.	.16	.16	.13	.13
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		309	309	327	327
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		80	80	70	70

REMARKS:

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 91

Manuf. U.S.&S.Co. Style Model 15 Class Form

Dwg. No. C8813 Group List Spec'n. 1195A Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) 6 (i) | Back (d) 2 (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.5
Amperes	.44	.5
Volt-Amperes	48.4	.25
Watts	23.	
Power Factor	.47	.91
Impedance (Ohms)	250.	1.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.37		.385	
	Amps.	.37		.385	
PICK-UP (Min.)	Volts	.33		.31	
	Amps.	.33		.31	
WORKING (Max.)	Volts	.525		.55	
	Amps.	.525		.55	
WORKING (Min.)	Volts	.475		.45	
	Amps.	.475		.45	
DROP-AWAY (Min.)	Volts	.297		.248	
	Amps.	.297		.248	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		150		157	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		90		80	

REMARKS:

S.C. 20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 92

Manuf. U.S.&S.Co. Style Model 15 Class Form

Dwg. No. C8813 Group List Spec'n. 1195A Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) (i) 8 | Back (d) (i) 4
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.55
Amperes	.44	.55
Volt-Amperes	48.4	.30
Watts	23.	
Power Factor	.47	.91
Impedance (Ohms)	250.	1.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.37		.385	
	Amps.	.37		.385	
PICK-UP (Min.)	Volts	.33		.31	
	Amps.	.33		.31	
WORKING (Max.)	Volts	.577		.605	
	Amps.	.577		.605	
WORKING (Min.)	Volts	.52		.495	
	Amps.	.52		.495	
DROP-AWAY (Min.)	Volts	.297		.248	
	Amps.	.297		.248	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		165		173	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		90		80	

REMARKS:

R-1

NEW YORK CENTRAL LINES — SIGNAL COMMITTEE
INSTRUCTIONS
A.C. RELAYS AND INDICATORS

JAN. 31st 1930

40

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 93

Manuf. U.S.&S.Co. Style/Model 15 Class/Form

Dwg. No. C8813 Group/List Spec'n. 1195A Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) 6 (i) | Back (d) 4 (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.5
Amperes	.44	.5
Volt-Amperes	48.4	.25
Watts	23.	
Power Factor	.47	.91
Impedance (Ohms)	250.	1.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.37		.385	
	Amps.	.37		.385	
PICK-UP (Min.)	Volts	.33		.31	
	Amps.	.33		.31	
WORKING (Max.)	Volts	.525		.55	
	Amps.	.525		.55	
WORKING (Min.)	Volts	.475		.45	
	Amps.	.475		.45	
DROP-AWAY (Min.)	Volts	.297		.248	
	Amps.	.297		.248	
% WORKING MAXIMUM W/PU x 100		150		157	
% DROP-AWAY MINIMUM DA/PU x 100		90		80	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 94

Manuf. U.S.&S.Co. Style/Model 15 Class/Form

Dwg. No. C8813 Group/List Spec'n. 1263 Cycles 60

Service Track Element 2 Position 3

CONTACTS — Normal (d) 5 (i) | Reverse (d) 5 (i)
Front (d) (i) | Back (d) (i)
De-energized 1

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.73
Amperes	.44	1.04
Volt-Amperes	48.4	.76
Watts	23.	
Power Factor	.47	.91
Impedance (Ohms)	250.	.70
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.38	.38	.39	.39
	Amps.	.53	.53	.56	.56
PICK-UP (Min.)	Volts	.34	.34	.32	.32
	Amps.	.48	.48	.46	.46
WORKING (Max.)	Volts	.76	.76	.80	.80
	Amps.	1.09	1.09	1.14	1.14
WORKING (Min.)	Volts	.69	.69	.65	.65
	Amps.	.99	.99	.94	.94
DROP-AWAY (Min.)	Volts	.27	.27	.22	.22
	Amps.	.39	.39	.32	.32
% WORKING MAXIMUM W/PU x 100		212	212	222	222
% DROP-AWAY MINIMUM DA/PU x 100		80	80	70	70

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 95

Manuf. U.S.&S.Co. Style/Model 15 Class/Form

Dwg. No. C8813 Group/List Spec'n. 1263 Cycles 60

Service Track Element 2 Position 3

CONTACTS — Normal (d) 4 (i) | Reverse (d) 4 (i)
Front (d) (i) | Back (d) (i)
De-energized 2

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.83
Amperes	.44	1.18
Volt-Amperes	48.4	.98
Watts	23.	
Power Factor	.47	.91
Impedance (Ohms)	250.	.70
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.44	.44	.46	.46
	Amps.	.63	.63	.66	.66
PICK-UP (Min.)	Volts	.39	.39	.37	.37
	Amps.	.57	.57	.54	.54
WORKING (Max.)	Volts	.87	.87	.92	.92
	Amps.	1.24	1.24	1.30	1.30
WORKING (Min.)	Volts	.78	.78	.74	.74
	Amps.	1.12	1.12	1.06	1.06
DROP-AWAY (Min.)	Volts	.32	.32	.25	.25
	Amps.	.45	.45	.37	.37
% WORKING MAXIMUM W/PU x 100		206	206	218	218
% DROP-AWAY MINIMUM DA/PU x 100		80	80	70	70

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 96

Manuf. U.S.&S.Co. Style/Model 15 Class/Form

Dwg. No. C8813 Group/List Spec'n. 1408 Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal (d) (i) | Reverse (d) (i)
Front (d) 4 (i) | Back (d) 2 (i)
De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.58
Amperes	.44	1.55
Volt-Amperes	48.5	.90
Watts	23.	
Power Factor	.47	.70 Lead
Impedance (Ohms)	250.	.37
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.26		.28	
	Amps.	.71		.74	
PICK-UP (Min.)	Volts	.23		.22	
	Amps.	.63		.60	
WORKING (Max.)	Volts	.61		.64	
	Amps.	1.63		1.71	
WORKING (Min.)	Volts	.55		.52	
	Amps.	1.47		1.39	
DROP-AWAY (Min.)	Volts	.21		.18	
	Amps.	.57		.48	
% WORKING MAXIMUM W/PU x 100		244		256	
% DROP-AWAY MINIMUM DA/PU x 100		90		80	

REMARKS:

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 97

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d)___(i)___ | Reverse (d)___(i)___ ; Front (d)___(i)___ | Back (d)___(i)___ ; De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 98

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d)___(i)___ | Reverse (d)___(i)___ ; Front (d)___(i)___ | Back (d)___(i)___ ; De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 99

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d)___(i)___ | Reverse (d)___(i)___ ; Front (d)___(i)___ | Back (d)___(i)___ ; De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 100

Manuf. _____ Style / Model _____ Class / Form _____

Dwg. No. _____ Group / List _____ Spec'n. _____ Cycles _____

Service _____ Element _____ Position _____

CONTACTS { Normal (d)___(i)___ | Reverse (d)___(i)___ ; Front (d)___(i)___ | Back (d)___(i)___ ; De-energized _____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ___		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: _____

NEW YORK CENTRAL LINES

SIGNAL COMMITTEE

INSTRUCTIONS

A.C. RELAYS AND INDICATORS

JAN. 31 1930

40

S.C.20

(See Instructions No. 40)

A. C. RELAY REQUIREMENTS—TABLE № 101

Manuf. U.S. & S.Co. Style/Model 15 Class/Form ____

Dwg. No. C8813 Group/List ____ Spec'n. 1207 Cycles 60

Service Line Element 2 Position 3

CONTACTS — Normal (d) 4 (i) ____ | Reverse (d) 4 (i) ____
Front (d) ____ (i) ____ | Back (d) ____ (i) ____
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	110.
Amperes	.4	.046
Volt-Amperes	44.	5.06
Watts	11.	
Power Factor	.764	.4
Impedance (Ohms)	275.	2390.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	37.8	37.8	39.6	39.6
	Amps.	.016	.016	.017	.017
PICK-UP (Min.)	Volts	34.2	34.2	32.4	32.4
	Amps.	.014	.014	.013	.013
WORKING (Max.)	Volts	105.	105.	110.	110.
	Amps.	.044	.044	.046	.046
WORKING (Min.)	Volts	95.	95.	90.	90.
	Amps.	.039	.039	.037	.037
DROP-AWAY (Min.)	Volts	27.4	27.4	23.4	23.4
	Amps.	.011	.011	.009	.009
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		291	291	305	305
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		80	80	70	70

REMARKS: ____

S.C.20

(See Instructions No. 40)

A. C. RELAY REQUIREMENTS—TABLE № 102

Manuf. U.S. & S.Co. Style/Model 15 Class/Form ____

Dwg. No. C8813 Group/List ____ Spec'n. 749 Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal (d) ____ (i) ____ | Reverse (d) ____ (i) ____
Front (d) 6 (i) ____ | Back (d) 6 (i) ____
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.19
Volt-Amperes		20.9
Watts		
Power Factor		.60
Impedance (Ohms)		579.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	84.		88.	
	Amps.	.158		.165	
PICK-UP (Min.)	Volts	76.		72.	
	Amps	.142		.135	
WORKING (Max.)	Volts	110.		115.	
	Amps.	.189		.198	
WORKING (Min.)	Volts	99.7		94.6	
	Amps.	.170		.160	
DROP-AWAY (Min.)	Volts	72.1		61.1	
	Amps.	.135		.114	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		138		144	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		95		85	

REMARKS: ____

S.C.20

(See Instructions No. 40)

A. C. RELAY REQUIREMENTS—TABLE № 103

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal (d) ____ (i) ____ | Reverse (d) ____ (i) ____
Front (d) ____ (i) ____ | Back (d) ____ (i) ____
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: ____

S.C.20

(See Instructions No. 40)

A. C. RELAY REQUIREMENTS—TABLE № 104

Manuf. ____ Style/Model ____ Class/Form ____

Dwg. No. ____ Group/List ____ Spec'n. ____ Cycles ____

Service ____ Element ____ Position ____

CONTACTS — Normal (d) ____ (i) ____ | Reverse (d) ____ (i) ____
Front (d) ____ (i) ____ | Back (d) ____ (i) ____
De-energized ____

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. ____

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: ____

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 105

Manuf. U.S.&S.Co. Style/Model 15 Class/Form —

Dwg. No. C8813 Group/List — Specn. 737 Cycles 60

Service Indicator Element 2 Position 3

CONTACTS — Normal (d) 5 (i) — | Reverse (d) 5 (i) —
Front (d) — (i) — | Back (d) — (i) —
De-energized 1-Buffer

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	110.
Amperes	.61	.05
Volt-Amperes	67.	5.5
Watts	14.	
Power Factor	.21	
Impedance (Ohms)	180.	2200.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	57.8	57.8	60.5	60.5
	Amps.	.026	.026	.027	.027
PICK-UP (Min.)	Volts	52.2	52.2	49.5	49.5
	Amps.	.023	.023	.022	.022
WORKING (Max.)	Volts	115.	115.	121.	121.
	Amps.	.052	.052	.055	.055
WORKING (Min.)	Volts	104.	104.	99.1	99.1
	Amps.	.047	.047	.045	.045
DROP-AWAY (Min.)	Volts	41.7	41.7	34.6	34.6
	Amps.	.018	.018	.015	.015
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		209	209	220	220
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		80	80	70	70

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 106

Manuf. U.S.&S.Co. Style/Model 15 Class/Form —

Dwg. No. C8813 Group/List — Specn. 1122 Cycles 25

Service Indicator Element 2 Position 3

CONTACTS — Normal (d) 6 (i) — | Reverse (d) 6 (i) —
Front (d) — (i) — | Back (d) — (i) —
De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	50.	50.
Amperes	.95	.085
Volt-Amperes	47.5	4.25
Watts	10.	
Power Factor	.21	
Impedance (Ohms)	52.5	588.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	18.9	18.9	19.8	19.8
	Amps.	.031	.031	.033	.033
PICK-UP (Min.)	Volts	17.1	17.1	16.2	16.2
	Amps.	.028	.028	.027	.027
WORKING (Max.)	Volts	52.5	52.5	55.	55.
	Amps.	.089	.089	.093	.093
WORKING (Min.)	Volts	47.5	47.5	45.	45.
	Amps.	.080	.080	.076	.076
DROP-AWAY (Min.)	Volts	15.4	15.4	13.	13.
	Amps.	.025	.025	.021	.021
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		292	292	306	306
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		90	90	80	80

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 107

Manuf. — Style/Model — Class/Form —

Dwg. No. — Group/List — Specn. — Cycles —

Service — Element — Position —

CONTACTS — Normal (d) — (i) — | Reverse (d) — (i) —
Front (d) — (i) — | Back (d) — (i) —
De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. —

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 108

Manuf. U.S.&S.Co. Style/Model 15 Class/Form —

Dwg. No. C8813 Group/List — Specn. 1332 Cycles 60

Service L.O. Element 2 Position 2

CONTACTS — Normal (d) — (i) — | Reverse (d) — (i) —
Front (d) 4 (i) — | Back (d) 2 (i) —
De-energized —

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	5.4
Amperes	.40	.154
Volt-Amperes	44.	.831
Watts	11.	
Power Factor	.25	
Impedance (Ohms)	275.	35.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	1.4		1.46	
	Amps.	.040		.042	
PICK-UP (Min.)	Volts	1.26		1.20	
	Amps.	.036		.034	
WORKING (Max.)	Volts	5.66		5.95	
	Amps.	.162		.170	
WORKING (Min.)	Volts	5.12		4.85	
	Amps.	.146		.138	
DROP-AWAY (Min.)	Volts	1.13		.96	
	Amps.	.032		.027	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		425		447	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		.90		80	

REMARKS:

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 109

Manuf. U.S. & S.Co. Style/Model: Iron Galv. Class/Form:

Dwg. No. G6372 Group/List: Spec'n. 63 Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) (i) 2 | Back (d) (i) | Reverse: Back (d) (i) | Front (d) (i) | De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.16
Volt-Amperes		17.6
Watts		
Power Factor		
Impedance (Ohms)		687.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	69.3		72.5	
	Amps.	.136		.143	
PICK-UP (Min.)	Volts	62.5		59.4	
	Amps.	.123		.112	
WORKING (Max.)	Volts	115.		121.	
	Amps.	.168		.176	
WORKING (Min.)	Volts	104.		99.	
	Amps.	.152		.144	
DROP-AWAY (Min.)	Volts	50.		41.5	
	Amps.	.098		.078	
% WORKING MAXIMUM W/PU x 100		174		183	
% DROP-AWAY MINIMUM DA/PU x 100		80		70	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 110

Manuf. U.S. & S.Co. Style/Model: Galv. Class/Form:

Dwg. No. G7361 Group/List: Spec'n. 249 Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal: Front (d) 4 (i) | Back (d) 2 (i) | Reverse: Back | Front | De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.5
Amperes	.45	2.5
Volt-Amperes	49.5	1.25
Watts		
Power Factor		
Impedance (Ohms)	244.	.20
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.178		.187	
	Amps.	1.05		1.1	
PICK-UP (Min.)	Volts	.161		.153	
	Amps.	.95		.90	
WORKING (Max.)	Volts	.525		.55	
	Amps.	2.62		2.75	
WORKING (Min.)	Volts	.474		.45	
	Amps.	2.37		2.25	
DROP-AWAY (Min.)	Volts	.129		.107	
	Amps.	.76		.63	
% WORKING MAXIMUM W/PU x 100		308		324	
% DROP-AWAY MINIMUM DA/PU x 100		80		70	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 111

Manuf. U.S. & S.Co. Style/Model: Rad. Poly. Class/Form:

Dwg. No. G7967 Group/List: Spec'n. 438 Cycles 60

Service Track Element 2 Position 3

CONTACTS — Normal: Front (d) 4 (i) | Back (d) | Reverse: Back (d) 4 (i) | Front (d) (i) | De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.55
Amperes	.145	.60
Volt-Amperes	15.9	.33
Watts	14.	
Power Factor	.88	
Impedance (Ohms)	760.	.916
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.345	.345	.360	.360
	Amps.	.379	.379	.396	.396
PICK-UP (Min.)	Volts	.255	.255	.240	.240
	Amps.	.280	.280	.264	.264
WORKING (Max.)	Volts	.632	.632	.660	.660
	Amps.	.690	.690	.720	.720
WORKING (Min.)	Volts	.466	.466	.440	.440
	Amps.	.510	.510	.480	.480
DROP-AWAY (Min.)	Volts	.153	.153	.120	.120
	Amps.	.168	.168	.132	.132
% WORKING MAXIMUM W/PU x 100		210	210	220	220
% DROP-AWAY MINIMUM DA/PU x 100		60	60	50	50

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No 112

Manuf. U.S. & S.Co. Style/Model: Radial Class/Form:

Dwg. No. G7967 Group/List: Spec'n. 548 Cycles 60

Service Track Element 2 Position 3

CONTACTS — Normal: Front (d) 4 (i) | Back (d) | Reverse: Back (d) 4 (i) | Front (d) (i) | De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	15.	.60
Amperes	.73	.63
Volt-Amperes	10.95	.378
Watts	9.5	
Power Factor	.866	
Impedance (Ohms)	20.5	.95
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 1

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.380	.380	.396	.396
	Amps.	.400	.400	.420	.420
PICK-UP (Min.)	Volts	.280	.280	.264	.264
	Amps.	.297	.297	.280	.280
WORKING (Max.)	Volts	.690	.690	.720	.720
	Amps.	.725	.725	.755	.755
WORKING (Min.)	Volts	.510	.510	.480	.480
	Amps.	.544	.544	.504	.504
DROP-AWAY (Min.)	Volts	.168	.168	.132	.132
	Amps.	.178	.178	.140	.140
% WORKING MAXIMUM W/PU x 100		209	209	218	218
% DROP-AWAY MINIMUM DA/PU x 100		60	60	50	50

REMARKS:

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 113

Manuf. U.S. & S.Co. Style/Model SLV-13 Class/Form

Dwg. No. C3707 Group List Spec'n. 467 Cycles 60

Service Line Element 1 Position 2

CONTACTS — Normal: Front (d) (i) 2 | Back (d) (i) | Reverse: Front (d) (i) | Back (d) (i) | De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		110.
Amperes		.25
Volt-Amperes		27.5
Watts		14.
Power Factor		.51
Impedance (Ohms)		440.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	80.9		84.7	
	Amps.	.184		.192	
PICK-UP (Min.)	Volts	73.		69.2	
	Amps.	.166		.157	
WORKING (Max.)	Volts	94.5		99.	
	Amps.	.214		.224	
WORKING (Min.)	Volts	85.5		81.	
	Amps.	.194		.183	
DROP-AWAY (Min.)	Volts	65.5		55.4	
	Amps.	.149		.125	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		122		128	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		90		80	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 114

Manuf. U.S. & S.Co. Style/Model Centrif'l. Class/Form

Dwg. No. C8104 Group List Spec'n. 1405 Cycles 60

Service Track Element 2 Position 2

CONTACTS — Normal: Front (d) 4 (i) | Back (d) 4 (i) | Reverse: Front (d) (i) | Back (d) (i) | De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts	110.	.47
Amperes	.30	1.88
Volt-Amperes	33.	.885
Watts	32.	
Power Factor	.97	.47
Impedance (Ohms)	366.	.25
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 3

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	.40		.42	
	Amps.	1.57		1.65	
PICK-UP (Min.)	Volts	.36		.34	
	Amps.	1.42		1.35	
WORKING (Max.)	Volts	.49		.52	
	Amps.	1.97		2.07	
WORKING (Min.)	Volts	.44		.42	
	Amps.	1.78		1.69	
DROP-AWAY (Min.)	Volts	.32		.27	
	Amps.	1.27		1.08	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		129		137	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		90		80	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 115

Manuf. Style/Model Class/Form

Dwg. No. Group List Spec'n. Cycles

Service Element Position

CONTACTS — Normal: Front (d) (i) | Back (d) (i) | Reverse: Front (d) (i) | Back (d) (i) | De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 116

Manuf. Style/Model Class/Form

Dwg. No. Group List Spec'n. Cycles

Service Element Position

CONTACTS — Normal: Front (d) (i) | Back (d) (i) | Reverse: Front (d) (i) | Back (d) (i) | De-energized

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

R-1

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 117

Manuf. U.S. & S.Co. Style/Model ANL-30 Class/Form

Dwg. No. B12635 Group List Spec'n. 1717 Cycles 60

Service Power Off Element 1 Position 2

CONTACTS — Normal: (d) (i) | Reverse: (d) (i)
Front: (d) 2 (i) | Back: (d) 2 (i)
De-energized:

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		8.
Amperes		.22
Volt-Amperes		1.76
Watts		
Power Factor		.43
Impedance (Ohms)		36.3
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	7.15		7.47	
	Amps.	.197		.206	
PICK-UP (Min.)	Volts	5.85		5.51	
	Amps.	.161		.152	
WORKING (Max.)	Volts	8.8		9.2	
	Amps.	.264		.275	
WORKING (Min.)	Volts	7.2		6.8	
	Amps.	.176		.165	
DROP-AWAY (Min.)	Volts	4.1		3.3	
	Amps.	.113		.091	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		135		141	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		60	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 118

Manuf. U.S. & S.Co. Style/Model ANL-30 Class/Form

Dwg. No. B12635 Group List Spec'n. 1805 Cycles 60

Service Power Off Element 1 Position 2

CONTACTS — Normal: (d) (i) | Reverse: (d) (i)
Front: (d) 2 (i) | Back: (d) 2 (i)
De-energized:

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		12.
Amperes		.15
Volt-Amperes		1.8
Watts		
Power Factor		.43
Impedance (Ohms)		80.
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig. 2

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts	10.7		11.2	
	Amps.	.133		.140	
PICK-UP (Min.)	Volts	8.77		8.29	
	Amps.	.110		.104	
WORKING (Max.)	Volts	13.2		13.8	
	Amps.	.180		.187	
WORKING (Min.)	Volts	10.8		10.2	
	Amps.	.120		.112	
DROP-AWAY (Min.)	Volts	6.15		4.97	
	Amps.	.077		.062	
% WORKING MAXIMUM $\frac{W}{PU}$ x 100		135		141	
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100		70		60	

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 119

Manuf. Style/Model Class/Form

Dwg. No. Group List Spec'n. Cycles

Service Element Position

CONTACTS — Normal: (d) (i) | Reverse: (d) (i)
Front: (d) (i) | Back: (d) (i)
De-energized:

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS:

S.C.20

(See Instructions No. 40)

A.C. RELAY REQUIREMENTS—TABLE No. 120

Manuf. Style/Model Class/Form

Dwg. No. Group List Spec'n. Cycles

Service Element Position

CONTACTS — Normal: (d) (i) | Reverse: (d) (i)
Front: (d) (i) | Back: (d) (i)
De-energized:

NOMINAL OR RATED	LOCAL ELEMENT	CONTROLLED ELEMENT
Volts		
Amperes		
Volt-Amperes		
Watts		
Power Factor		
Impedance (Ohms)		
Phase Angle of Element		

OPERATING CHARACTERISTICS

Tests made in accordance with Dwg. 40 (Pg. 4) Fig.

		SHOP TEST Normal	SHOP TEST Reverse	FIELD TEST Normal	FIELD TEST Reverse
PICK-UP (Max.)	Volts				
	Amps.				
PICK-UP (Min.)	Volts				
	Amps.				
WORKING (Max.)	Volts				
	Amps.				
WORKING (Min.)	Volts				
	Amps.				
DROP-AWAY (Min.)	Volts				
	Amps.				
% WORKING MAXIMUM $\frac{W}{PU}$ x 100					
% DROP-AWAY MINIMUM $\frac{DA}{PU}$ x 100					

REMARKS: