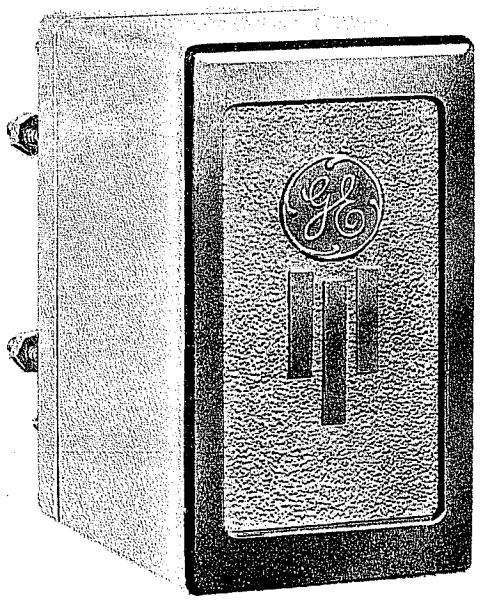
GET-7290

TYPE HGA
AUXILIARY

SWITCHGEAR
PROTECTIVE RELAYS

Type HGA auxiliary relays are used in the protective relaying of industrial and utility power systems

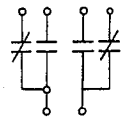
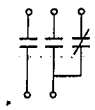
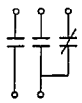
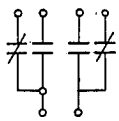
for: multiplying contacts
increasing contact rating
isolating circuits
introducing time delay
tripping

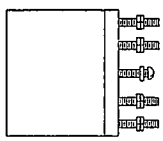


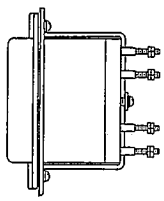
Low Voltage Switchgear Department—6901 Elmwood Avenue, Philadelphia, Pennsylvania

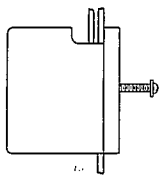
GENERAL ELECTRIC

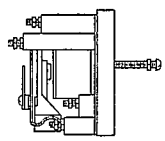
SELECTION DATA

Relay	Mounting	Available Operating Coils	Contact Arrangements	Installation and Maintenance Manual	Remarks
HGA11A 11H 11J	BC, cover FC, no cover FC, cover	Volts D-c: 6, 12, 24, 32, 48, 62.5, 125, 250 Volts A-c: 115, 208, 230, 460, 575 Amps D-c: 1, 2, 3, 4, 5		GEH-1793	General auxiliary use Operating time—approximately 2 cycles
HGA14A 14AD 14AF	BC, cover FC, no cover FC, cover	Same as HGA11		GEI-30912	Low pickup Operating time—approximately 1 cycle
HGA14AL 14AM	FC, cover BC, cover	D-c only: 48, 125, 250		GEI-38980	High-speed tripping Coils rated for intermittent duty only Operating time—approximately ½ cycle
HGA17A 17B 17C	BC, cover FC, no cover FC, cover	Same as HGA11		GEI-10190	Fixed time delay on dropout—approximately 15 cycles
HGA17D 17H	FC, cover BC, cover	Same as HGA11			Fixed time delay on pickup—approximately 3½ cycles


BC with cover


BC semi-flush with cover


FC with cover


FC without cover

NOTES:
1. BC = back-connected; FC = front-connected.
2. These relays are in molded cases, with or without covers. Glass window covers can be supplied. Any back-connected relay can be furnished in a molded case for semiflush mounting.
3. Operating times are given on a 60-cycle basis.
4. For detailed model listings, see the Model List section at the end of this bulletin.

CONSTRUCTION

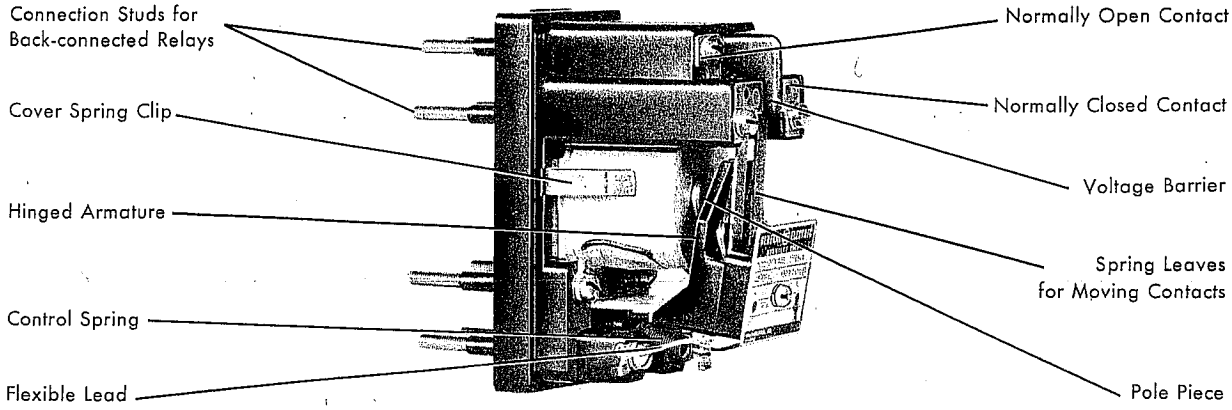


Fig. 1. Typical Type HGA relay removed from the case

APPLICATION

For general auxiliary purposes, choose a suitable model by speed, voltage, and contact arrangement. Also, select the mounting arrangement, whether back-connected or front-connected, whether the cover is to be provided with a glass window or solid front. Specific model numbers are given in the Model List, page 6. Ratings and burdens are given in the tables of this bulletin.

For high-speed tripping duty with Type GCX distance relays and for carrier applications with Type GCX or GCY relays, use models HGA14AL or HGA14AM with external resistors (Table 3). For these applications, select the HGA relay by the voltage rating of its coil.

The relay is used in these applications for tripping two breakers. The resistor is placed in series with the HGA relay coil, and it acts to limit the current as required by the circuit. The GCX and GCY circuits are given in the bulletins on those relays.

For high-speed tripping duty in general, use HGA14AL or HGA14AM relays without external resistors (Table 4). Note that the coils are rated for intermittent duty only, and they must be removed from the tripping circuit by *"a"* contacts on the circuit-breaker auxiliary switches.

Models are specified for this duty on the basis of coil resistance, to assure that sufficient current flows to drop the required number of protective-relay target units and to give the required speed of operation of the auxiliary.

For applications not covered by Table 4, consult the nearest General Electric sales office.

TABLE 1 COIL DATA

Relay Model	Coil Ratings			Coil Burdens				
	D-c		A-c	①	②			D-c
	Volts	Amps	60 Cps	Resistance in Ohms	Impedance in Ohms	V-A	PF	Coil Watts
HGA11A, -H, -J	6			9.9				3.6
HGA14A, -AD,	12			41				3.5
-AF	24			160				3.6
	32			250				4.1
	48			512				4.5
	62.5			830				4.7
	125			3650				4.3
	250			15500				4.0
		1		4.42				4.4
		2		0.84				3.4
		3		0.36				3.2
		4		0.195				3.1
		5		0.124				3.1
			115	90.5	825	16.1	0.4	
			208	312	2560	16.6	0.4	
			230	376	3340	15.8	0.4	
			460	1640	14650	14.5	0.4	
			575	2200	18550	17.8	0.4	
HGA17A, -B,	6			6.1				5.9
-C, -D, -H	12			24.5				5.8
	24			98				5.9
	32			153				6.7
	48			375				6.1
	62.5			585				6.7
	125			2280				6.8
	250			10300				6.1
		1		5.6				5.6
		2		1.4				5.6
		3		0.62				5.6
		4		0.35				5.6
		5		0.21				5.2

NOTES:
1. Resistance and impedance values have a tolerance of ±10% at 25 C.
2. A-c impedance values apply when armature is picked up. With armature dropped out, the impedance is ½ the value shown ±10%, for the HGA11; and ¾ the value shown ±10%, for the HGA14.

TABLE 2

CONTACT DATA

Relay Model	Coil Ratings		Contact Ratings (amperes)			
	D-c Volts	A-c Volts	Non-inductive Interrupt	Inductive Interrupt	Carry	
			1 Contact	1 Contact	Continuous	One Minute
HGA11	24		30	15	12	30
	48		30	15	12	30
	125		2.0	1.0	12	30
	250		0.55	0.25	12	30
		115	30	10	12	30
		230	30	5	12	30
HGA14A, -AD, -AF	24		30	12	12	30
	48		13	6	12	30
	125		0.7	0.35	12	30
	250		0.3	0.15	12	30
		115	30	10	12	30
		230	30	5	12	30
HGA17A, -B, -C	24		30	12	12	30
	48		13	6	12	30
	125		0.7	0.35	12	30
	250		0.3	0.15	12	30
		115	30	10	12	30
		230	30	5	12	30
HGA17D, -H	24		30	15	12	30
	48		30	15	12	30
	125		2.0	1.0	12	30
	250		0.55	0.25	12	30
		115	30	10	12	30
		230	30	5	12	30

TABLE 3

Type HGA14AL and HGA-14AM Coil Ratings used in GCX and GCY Distance and Carrier Relaying Applications for tripping two breakers

Coil Ratings (volts d-c)	Relay Model No.	Resistance (ohms)		Current (amps)	Coil Rating (seconds)
		Coil	External		
48	12HGA14AL28 12HGA14AM28	0.124	3	16	295
125	12HGA14AL26 12HGA14AM26	0.843	20	6	40
250	12HGA14AL25 12HGA14AM25	0.843	40	6	20

Resistances ±10% at 25 C.

TABLE 4

Type HGA14AL and HGA-14AM relays for Tripping Applications. For intermittent duty only, in series with the indicated combinations of targets connected in parallel

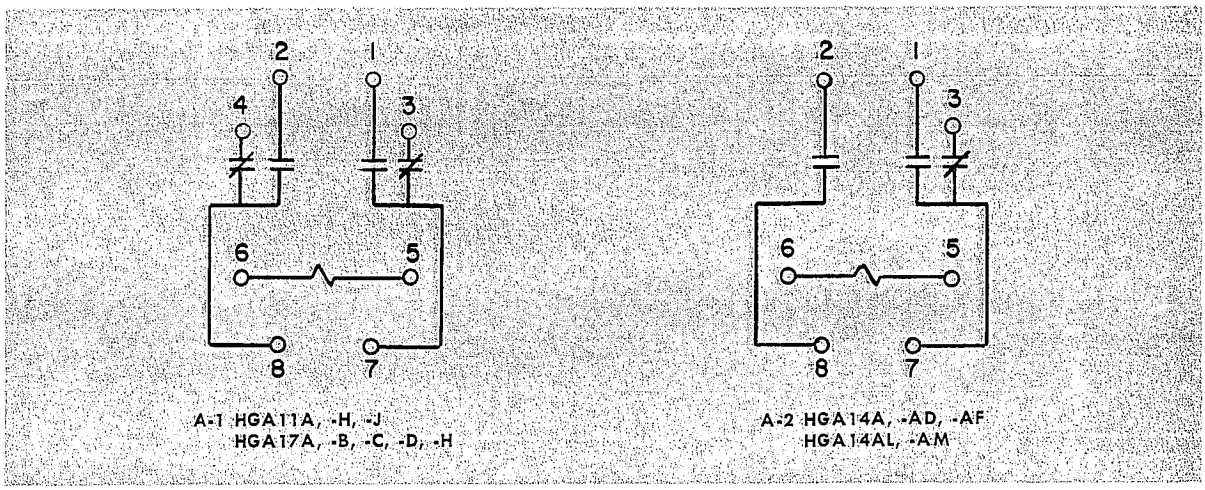
D-c Supply Volts	1 to 3 2-ampere Targets	1 to 3 1-ampere Targets	1 2-ampere Target (Note 2)	1 1-ampere Target (Note 3)
Front-connected, with Cover				
48	12HGA14AL3	12HGA14AL8	12HGA14AL13	12HGA14AL18
125	12HGA14AL2	12HGA14AL7	12HGA14AL12	12HGA14AL17
250	12HGA14AL1	12HGA14AL6	12HGA14AL11	12HGA14AL16
Back-connected, with Cover				
48	12HGA14AM3	12HGA14AM8	12HGA14AM13	12HGA14AM18
125	12HGA14AM2	12HGA14AM7	12HGA14AM12	12HGA14AM17
250	12HGA14AM1	12HGA14AM6	12HGA14AM11	12HGA14AM16

NOTES:
1. For applications not covered by this table, consult the nearest General Electric sales office.
2. May also be used in series with three 0.6-amp or three 0.6-amp plus two 0.2-amp targets.
3. May also be used in series with three 0.2-amp or one 0.2-amp target.

TABLE V Operating Characteristics, Type HGA Relays

Model	Pickup in Percent of Rating			Dropout in Percent of Rating		Operating Times in Cycles (60 cycle basis)			
						At Pickup		At Dropout	
	Voltage		Current	Voltage	Current	To Close a NO contact	To Open a NC contact	To Open a NO contact	To Close a NC contact
	Hot	Cold							
HGA11A, -H, -J	a-c 80 d-c 80	d-c 60	80	a-c 40-55 d-c 2-10	2-10	2	—	—	—
HGA14A, -AD, -AF	a-c 40 d-c 40	d-c 30	40	a-c 20-30 d-c 2-10	2-10	1	—	—	—
HGA14AL, -AM	—	—	—			½ or less	½ or less	½ or less	½ or less
HGA17A, -B, -C	a-c 40 d-c 40	d-c 30	40	a-c 20-30 d-c 2-10	2-10	—	—	15 or more	15 or more
HGA17D, -H	a-c 80 d-c 80	d-c 80	80	a-c 40-55 d-c 2-10	2-10	3½	—	15 or more	15 or more

INTERNAL CONNECTIONS (FRONT VIEWS)

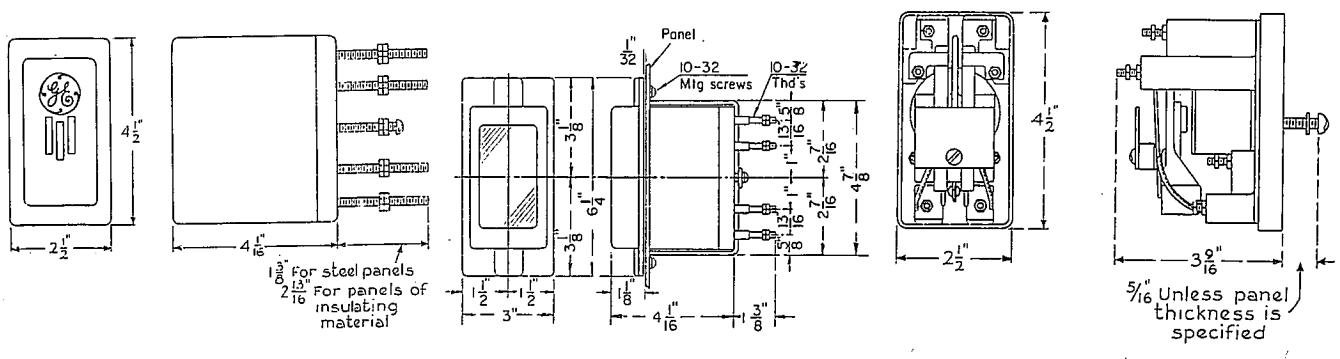


A-1 HGA11A, -H, -J
HGA17A, -B, -C, -D, -H

A-2 HGA14A, -AD, -AF
HGA14AL, -AM

DIMENSIONS

Dimensions are subject to change and should not be used for construction without approval.



Type HGA back-connected relays

Type HGA back-connected semiflush relays

Type HGA front-connected relays

MODEL LIST

RATINGS—MOLDED CASE RELAYS

Coil Rating			D-c Res	A-c Ohms	Contact Forms	Pickup Time Cycles	Model Number				Approx Wt in Lb	
Volts D-c	Volts A-c 60 Cycle	Amps D-c	Ohms at 25 C	at 60 Cycles			†Surface Back Connected with Cover and Studs	Semi-flush Back Connected with Cover	†Front Connected with Cover (No Studs)	Front Connected without Cover or Studs	Net	Ship.
GENERAL-PURPOSE RELAYS												
TYPE HGA (HEAVIER DUTY—LARGER) STANDARD PICKUP												
6			9.9				12HGA11A58	12HGA11A58F	12HGA11J58	12HGA11H58		
12			41				57	57F	57	57		
24			160				56	56F	56	56		
32			250				55	55F	55	55		
48			512				54	54F	54	54		
62.5			830				53	53F	53	53		
125			3650				52	52F	52	52		
250			15500				51	51F	51	51		
	115			825	2 N.O.	Approx	70	70F	70	70	2	3
	208			2560	2 N.C.	2	105	105F	105	105		
	230			3340			71	71F	71	71		
	460			14650			72	72F	72	72		
	575			18550			73	73F	73	73		
		1	4.42				65	65F	65	65		
		2	0.84				66	66F	66	66		
		3	0.36				67	67F	67	67		
		4	0.195				68	68F	68	68		
		5	0.124				69	69F	69	69		
TYPE HGA LOW PICKUP												
6			9.9				12HGA14A58	12HGA14A58F	12HGA14AF58	12HGA14AD58		
12			41				57	57F	57	57		
24			160				56	56F	56	56		
32			250				55	55F	55	55		
48			512				54	54F	54	54		
62.5			830				53	53F	53	53		
125			3650				52	52F	52	52		
250			15500				51	51F	51	51		
	115			825	2 N.O.	Approx	70	70F	70	70	2	3
	208			2560	1 N.C.	1	105	105F	105	105		
	230			3340			71	71F	71	71		
	460			14650			72	72F	72	72		
	575			18550			73	73F	73	73		
		1	4.42				65	65F	65	65		
		2	0.84				66	66F	66	66		
		3	0.36				67	67F	67	67		
		4	0.195				68	68F	68	68		
		5	0.124				69	69F	69	69		
TIME DELAY												
FIXED TIME DELAY ON DROPOUT (APPROX. 15 CYCLES)												
12			24.5				12HGA17A57	12HGA17A57F	12HGA17C57	12HGA17B57		
24			98				56	56F	56	56		
32			153				55	55F	55	55		
48			375				54	54F	54	54		
62.5			585				53	53F	53	53		
125			2280				52	52F	52	52		
250			10300		2 N.O. 2 N.C.		51	51F	51	51	2	3
	115						§63	§63F	§63	§63		
	230						§64	§64F	§64	§64		
		1	5.6				65	65F	65	65		
		2	1.4				61	61F	61	61		
		5	0.21				62	62F	62	62		

RATINGS—MOLDED CASE RELAYS (Cont'd)

FIXED TIME DELAY ON PICKUP (APPROX. 3½ CYCLES)

Coil Rating			Pickup Volts	Contact Forms	Pickup Time Cycles Min.	Model Number				Approx Wt in Lb	
Volts D-c	Volts A-c 60 Cycle	Amps D-c				†Surface Back Connected with Cover and Studs	Semi-flush Back Connected with Cover	†Front Connected with Cover (No Studs)	Front Connected without Cover or Studs	Net	Ship.
12			60%	2 N.O. 2 N.C.	3.5	12HGA17H57	12HGA17H57F	12HGA17D57	.....	2	3
24						56	56F	56	.....		
32						55	55F	55	.....		
48						54	54F	54	.....		
62.5						53	53F	53	.....		
125						52	52F	52	.....		
250						51	51F	51	.....		
	115		80%			§63	§63F	§63	.....		
	230					§64	§64F	§64	.....		
		1				65	65F	65	.....		
		2				61	61F	61	.....		
		5				62	62F	62	.....		

RATINGS—MOLDED CASE TRIPPING RELAYS ½ CYCLE OR LESS (For tripping two breakers)

Volts D-c Intermittent	Pickup Volts	Contact Forms	Back Connected with Cover				
			For 3—2-amp Targets	For 3—1-amp Targets	For 3—0.6-amp Targets	For 3—0.2-amp Targets	For Carrier GCX or GCY
		2 N.O. 1 N.C.	Model No.	Model No.	Model No.	Model No.	Model No.
250	80% or Less		12HGA14AM1	12HGA14AM6	12HGA14AM11	12HGA14AM16	12HGA14AM25
125			2	7	12	17	26
48			3	8	13	18	28
32							
24							
		2 N.O. 1 N.C.	Front Connected with Cover				
250	80% or Less		12HGA14AL1	12HGA14AL6	12HGA14AL11	12HGA14AL16	12HGA14AL25
125			2	7	12	17	26
48			3	8	13	18	28
32							
24							

FOOTNOTES FOR MOLDED CASE RELAYS

† To obtain glass in cover of HGA relays add suffix "G" to Model Example: Model 12HGA17H57G.

§ External rectifier and resistor included as required.

Note: Any back-connected HGA Relay with molded case can be furnished for semi-flush mounting. Add "F" to regular model number when ordering. Example: **12HGA11A52F.** Cover will have glass windows.

Only 60-cycle relays are listed, but similar models are available for 25- and 50-cycle applications. To order, select the appropriate 60-cycle model number and specify desired frequency (*e.g.*, "Similar to 12HGA11A70 except for 50-cycle duty").

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