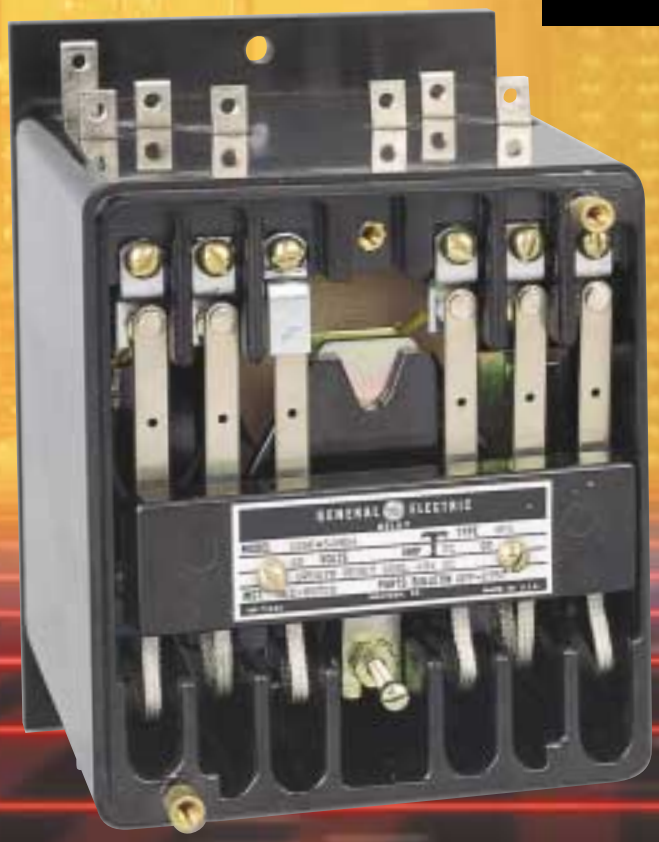
HFA

Multicontact Auxiliary



Multicontact auxiliary relays for AC and DC circuit applications.

Features and Benefits

- Electrically separate contact circuits
- Molded case with 3 mounting options
- Drawout case available

Applications

- Contact multiplication

Protection and Control

- Standard, high-speed or variable time tripping available
- Manual, self or electric reset available

Application

The HFA relay is designed for applications where a number of auxiliary functions must be performed simultaneously. Six contacts are provided. If more than six circuits are to be controlled, the coils of two or more relays may be connected in series (DC only) or in parallel.

All HFA relays have six electrically separate contact circuits adaptable for either circuit-opening or circuit-closing applications.

The HFA relays are available for front or back connection. The front connected relays are suitable for surface mounting only.

The back connected relays are suitable for either surface mounting or semi-flush mounting: a steel flange is provided for the latter.

The HFA relay is also available in an S2 draw-out case.

Selection of DC relays for tripping duty where operating coil circuit is opened by an auxiliary switch.

The operating time of the standard HFA relay is approximately 5 cycles for the DC models (60 Hz basis). If used on DC for tripping a circuit breaker, the operating time should be reduced to approximately 1 cycle in order that no appreciable time delay will be added to the operating time of the protective relay. This can be accomplished by selecting a relay which has a lower voltage rating than the control circuit. Recommended voltage ratings for one minute tripping duty are listed below.

Supply Voltage (VDC)	Use Relay with Coil Rated (VDC)	Operating Coil Current (A)	Target Coil Tap Value in Prot. Relay (A)	Time to Close N.O. Contacts at Pickup (60 Hz Basis)
24	6	5.3	2.0	Approx. one cycle
32	6	7.1	2.0	
48	12	2.7	2.0	
125	24	1.7	0.2	
250	48	0.9	0.2	

When so applied, the HFA operating coil must be opened by the breaker auxiliary switch to prevent overheating. The increased current through the HFA operating coil will assure operation of the target on the protective relay.

Contact Rating

Contacts are electrically separate and easily reversible from normally open to normally closed or vice versa. The current-closing rating of the contacts is 30 A. The current-carrying rating is 12 A continuously or 30 A for 1 min.

Contact interrupting ratings

VDC	1 Contact (A)	2 Contacts in Series (A)	VAC	1 Contact (A)	2 Contacts in Series (A)
NON-INDUCTIVE					
6 to 24	15	30	115	30	30
48	8	16	230	20	30
125	3	6	460	8	12
250	1	2	—	—	—
INDUCTIVE					
24	6.0	12	115	20	20
48	3.5	6	230	10	10
125	1.0	1.5	460	5	5
250	0.3	0.35	—	—	—

Standard Speed

The HFA51 and 71 relays are instantaneous, hinged armature, six contact auxiliary relays supplied in either a drawout or non-drawout case for panel mounting.

TABLE 4	CODE NUMBER						
	60	51	42	33	24	15	06
Position No.	Contact Arrangement						
1	⫫	⫫	⫫	⫫	⫫	⫫	⫽
2	⫫	⫫	⫫	⫫	⫽	⫽	⫽
3	⫫	⫫	⫽	⫽	⫽	⫽	⫽
4	⫫	⫽	⫽	⫽	⫽	⫽	⫽
5	⫫	⫫	⫫	⫽	⫽	⫽	⫽
6	⫫	⫫	⫫	⫫	⫫	⫽	⫽

NOTES:

⫫ = Normally open contact, open when relay is de-energized.

⫽ = Normally closed contact, closed when relay is de-energized.

If contact code is not specified on the order Code 60 will be furnished. Relays stocked in the warehouse are stocked with contact Code 60. Conversion from normally open to normally closed or vice-versa, can be easily accomplished in the field.

Order Code Breakdown

HFA51 * * *

A	Self reset
B	Hand reset
XX	Electrical data (see Group column under Selection guide)
F	Semi-flush mounted, back connected
H	Surface mounted, front connected
*	Surface mounted, back connected

Selection Guide

NON-DRAWOUT CASE

Group	DC Volt.	VAC 50 Hz	VAC 60 Hz	Contacts	Pickup Time (Cycles)	DC Res. Ohms at 25°C	Impedance at 25°C	Approx. Wt. in lbs (kg)	
								Net	Ship
41	250			Table 4	Approx. 5	8000		5 (2.2)	7 (3.1)
42	125					2000			
43	62.5					510			
44	48					336			
45	32					140			
46	24					82			
47	12					21			
48	6					5.2			
49			115			13	415		
50			208			45	1350		
51			230			52	1650		
52			460			212	6600		
54		115				20	575		
55		230				80	2300		
56		460				325	9200		
86		208				52	1880		

Order Code Breakdown

HFA71 * * *

A	Self reset
B	Hand reset
XX	Electrical data (see Group column under Selection guide)
H	Surface mounted, front connected
*	Surface mounted, back connected

Selection Guide

DRAWOUT CASE

Group	DC Volt.	VAC 50 Hz	VAC 60 Hz	Contacts	Operating Time (ms)	DC Res. Ohms at 25°C	Impedance at 25°C	Approx. Wt. in lbs (kg)		Case
								Net	Ship	
41A	250			Table 4	84	8000		12 (5.4)	18 (8.1)	S2
42A	125				84	2000				
44	48				84	336				
46	24				84	82				
47	12				84	21				
48	6				84	5.2				
49			115		34	13	415			
50			208		34	45	1350			
51			230		34	52	1650			
52			460		34	212	6600			
54		115			34	20	575			
55		230			34	80	2300			
56		460			34	325	9200			
86		208			34	52	1880			

Time-Delay Applications

The HFA65D relays are similar to the HFA51 relays except they have adjustable time-delay dropout.

Although the HFA65D relay has a time delay dropout adjustable from 0.25 sec to 2.0 sec, it is normally set for 2 sec at the factory unless otherwise specified.

The HFA65E relays have an adjustable time-delay pickup with a fixed time dropout of 0.25 sec. Pickup is normally set for 0.083 sec unless otherwise specified.

Order Code Breakdown

HFA65 * * *

D	Adjustable time delay dropout
E	Adjustable time delay pickup
XX	Electrical data (see Group column under Selection guide)
F	Semi-flush mounted, back connected
H	Surface mounted, front connected
*****	Surface mounted, back connected

HFA65D Selection Guide

Group	DC Volt.	VAC① 25/5000 Hz	Contacts	Time Delay Dropout	Time (sec)	DC Res. Ohms at 25°C	Approx. Wt. in lbs (kg) Net	Ship
61	250					4950		
62	125					1230		
63	62.5					308		
64	48					187	7 (3.1)	10 (4.5)
65	32		Table 5	0.25 - 2.0	0.067 - 0.10	77		
66	24					48		
67	12					11.7		
76		208				3580		
77		230				3580	8 (3.6)	12 (5.4)
84		120				790		

① Necessary rectifier included.

TABLE 5	CODE NUMBER						
	60	51	42	33	24	15	06
Position No.	Contact Arrangement						
1	⫫	⫫	⫫	⫫	⫫	⫫	⫽
2	⫫	⫫	⫫	⫫	⫽	⫽	⫽
3	⫫	⫫	⫽	⫽	⫽	⫽	⫽
4	⫫	⫽	⫽	⫽	⫽	⫽	⫽
5	⫫	⫫	⫫	⫽	⫽	⫽	⫽
6	⫫	⫫	⫫	⫫	⫫	⫽	⫽

NOTES:

⫫ = Normally open contact, open when relay is de-energized.

⫽ = Normally closed contact, closed when relay is de-energized.

If contact code is not specified on the order **Code 60 will be furnished.** Relays stocked in the warehouse are stocked with contact Code 60. Conversion from normally open to normally closed or vice-versa can be easily accomplished in the field.

High-Speed Tripping

The HFA53K relays are designed to have a pickup time of 9 ms (one-half cycle—60 Hz basis). The required external resistor is included in the basic model number. Since one contact is used for the operating coil transfer circuit, only five contacts are available for external circuits.

The HFA73K is a high-speed tripping relay with a pickup time of not more than 9 ms. The required series resistor is built into the relay. Since one contact is used for the operating coil transfer circuit, only five contacts are available for external circuits.

Order Code Breakdown

HFA** ***** ***** *****

53	Non-drawout case
73	Drawout case
D	Adjustable time delay dropout
E	Adjustable time delay pickup
XX	Electrical data (see Group column under Selection guide)
F	Semi-flush mounted, back connected
H	Surface mounted, front connected
*****	Surface mounted, back connected

HFA53K Selection Guide

Group ③	Rating VDC	Coil Resistance (Ω) 25°C ①	Resistor Ω	Operating Time (Cycles) ②	Contacts	Approx. Wt. in lbs (kg) Net	Ship
NON-DRAWOUT CASE							
95	48	2	30	0.5	Table 6	6 (2.7)	9 (4)
91	125	21	200				
92	250	82	800				
93	125 ④	13.5	10				
94	250 ④	13.5	30				

Group	Continuous Rating VDC	DC Coil Resistance (Ω) 25°C ①	Internal Series Resistance (Ω)	Operating Time	Contacts	Case Size	Approx. Wt. in lbs (kg) Net	Ship
DRAWOUT CASE								
3A	48	2.9	75	9 ms	Table 7	S2	12 (5.4)	18 (8.1)
1A	125	21.0	500					
2A	250	82.0	2000					

①Within plus or minus 10 percent.
②On 60 Hz basis (time from energizing operating coil to closing of the normally open contacts).
③Model numbers shown are for **back connected, surface mounted.** If **back connected, semiflush mounting** is desired, add letter "F" to listed model number, for example: HFA51A42F. If **front connected, surface mounting** is desired, add letter "H" to listed model number, for example: HFA51A42H.
④Intermittent rating.

TABLE 6	CODE NUMBER			
	1	2	3	5
Position No.	Contact Arrangement			
1				
2				
3				
4				
5				
6				

NOTES:
= Long-wipe closed contact, closed when relay is de-energized and opens after the standard NC contact. This contact is used to insert the dropping resistor into the coil circuit.

TABLE 7	CODE NUMBER
	1
Position No.	Contact Arrangement
1	
2	
3	
4	
5	
6	

NOTES:
= Long-wipe closed contact, used to insert the dropping resistor into the coil circuits.

If contact code is not specified on the order **Code 60 will be furnished.** Relays stocked in the warehouse are stocked with contact Code 60. Conversion from normally open to normally closed or vice-versa can be easily accomplished in the field.

Electric Reset Relays

Table D lists the combination of reset and mounting available.

Table E Lists the voltage and frequencies of the operating and reset coils.

Table F and G (below) show the various contact configurations available.

To obtain a complete catalog number, select the **basic number** from Table D; insert the **form number** from Table E; specify the **contact code** from either Table F or Table G.

EXAMPLE:

Electric reset only Front connected Surface mounting Reset coil cutoff contact	Select HFA54E-H from Table D
48 VDC operate coil 115V 60 Hz reset coil	Select form number 245 from Table E
3 N.O. and 2 N.C. contacts	Select contact code 42 from Table F

Thus, HFA54E245H code 42 is the complete relay number.

Selection Guide

TABLE D. BASIC NUMBER

Type of Reset	Mounting	Basic Number	Contact	Basic Number	Contact	Approx. Wt. in lbs (kg)	
						Net	Ship
Hand and electric reset	Back-connected surface mounting	HFA54B-	Table F	HFA54H-	Table G	5 (2.2)	7 (3.1)
	Back-connected semi-flush mounting	HFA54B-F		HFA54H-F			
	Front-connected surface mounting	HFA54B-H		HFA54H-H			
	Back-connected drawout case	HFA74B-A		HFA74H-A			
Hand and electric reset with mechanical target	Back-connected surface mounting	HFA54C-		HFA54J-		12 (5.4)	18 (8.1)
	Back-connected semi-flush mounting	HFA54C-F		HFA54J-F		5 (2.2)	7 (3.1)
	Front-connected surface mounting	HFA54C-H		HFA54J-H			
Electric reset only	Back-connected surface mounting	HFA54E-		HFA54L-			
	Back-connected semi-flush mounting	HFA54E-F		HFA54L-F			
	Front-connected surface mounting	HFA54E-H		HFA54L-H			
	Back-connected drawout case	HFA74E-A		HFA74L-A		12 (5.4)	12 (8.1)

TABLE F	CODE NUMBER					
	60	51	42	33	24	15
Position No.	Contact Arrangement					
1	⫩	⫩	⫩	⫩	⫩	⫫
2	⫩	⫩	⫩	⫩	⫫	⫫
3	⫩	⫩	⫫	⫫	⫫	⫫
4	⫩	⫫	⫫	⫫	⫫	⫫
5	⫩	⫩	⫩	⫫	⫫	⫫
6 ③	⫩	⫩	⫩	⫩	⫩	⫩

③This contact is reserved for opening the reset coil circuit to protect the intermittently rated reset coil.

NOTES:

⫩ = Normally open contact, open when relay is de-energized.

⫫ = Normally closed contact, closed when relay is de-energized.

TABLE G	CODE NUMBER						
	60	51	42	33	24	15	06
Position No.	Contact Arrangement						
1	⫩	⫩	⫩	⫩	⫩	⫩	⫫
2	⫩	⫩	⫩	⫩	⫫	⫫	⫫
3	⫩	⫩	⫫	⫫	⫫	⫫	⫫
4	⫩	⫫	⫫	⫫	⫫	⫫	⫫
5	⫩	⫩	⫩	⫫	⫫	⫫	⫫
6	⫩	⫩	⫩	⫩	⫩	⫫	⫫

NOTES:

⫩ = Normally open contact, open when relay is de-energized.

⫫ = Normally closed contact, closed when relay is de-energized.

If contact code is not specified on the order. Code 60 will be furnished. Relays stocked in the warehouse are stocked with contact Code 60. Conversion from normally open to normally closed, or vice-versa, can be easily accomplished in the field.

TABLE E. FORM NUMBERS

	Voltage and Frequency	Reset Coil Rating				
		48 VDC	125 VDC	250 VDC	115 V 60 Hz	230 V 60 Hz
		Form Numbers				
Operating Coil Rating	12 VDC	122	182	212	242	272
	24 VDC	123	183	213	243	273
	48VDC	125	185	215	245	275
	125 VDC	127	187	217	247	277
	250 VDC	128	188	218	248	278
	115 V 60 Hz	129	189	219	249	279
	230 V 60 Hz	130	190	220	250	280

Operating Characteristics

Model Number	Pickup Voltage in Percent of Rating		Dropout Voltage in Percent of Rating		Operating Time at Rated Voltage to Close a N.O. Contact		Operating Time to Open a N.O. Contact When Voltage Reduced from Rated to Zero	
	Hot	Cold	AC	DC	AC	DC	AC	DC
HFA51A, -B HFA54B, -C, -E, -H, -J, -L HFA71A, -B HFA74B, -E, -H, -L	80 or less, AC or DC	60 or less, DC	30-60	2-10	33 ms or less	84 ms or less	14 ms or less	28 ms or less
HFA53K HFA73K	80 or less, DC only	60 or less, DC only	—	2-10	9 ms or less for tripping duty			9 ms or less
HFA65D	①	35-80 AC 30-60 DC	①	①			Adjustable 250 to 2000 ms factory set at 2000 ms	
HFA65E	①	①	①	①	Adjustable 67-100 ms factory set at 83 ms		250 ms	

① These relays are adjusted to give the proper time delays at rated voltage. Since these adjustments affect the pickup voltage point, it is not possible to accurately predict the pickup voltage.