HFC

Instantaneous Overcurrent

Direct trip intantaneous overcurrent relays.

Features and Benefits

- 2 electrically separated contacts per unit
- High seismic rating
- Molded drawout case

Applications

- Direct trip instantaneous overcurrent

Protection and Control

- Instantaneous overcurrent
- Detection of severe close-in faults on transmission lines
- Differential motor protection
- Sensitive ground fault protection

Description

The HFC relays consist of one or more hinged armature instantaneous overcurrent units. Each unit has two electrically separate contacts and is assembled in a single end drawout type C1 case. The units have a high-seismic rating, and include a target which is latched and raised into view when the unit operates. The targets are manually reset by a button on the front of the relay cover.

Application

The HFC relays find general application where a direct trip instantaneous overcurrent function is required. Typical applications are on transmission lines where it is desired to supplement existing distance relays, or pilot schemes with instantaneous overcurrent relays set to detect severe close-in faults.

The HFC21B can be applied with a doughnut-type CT encircling the three phase conductors (ground sensor scheme) to provide sensitive ground fault protection.

The HFC23C relay can be used to provide differential protection of a motor usually by means of one self-balanced primary current.

Design Characteristics

The HFC relay consists of a molded case, cover, support structure assembly and a connection plug to make the electrical connections. When the connection plug is withdrawn, the trip circuits are opened first and then the CT circuits are shorted. The window provides visual confirmation of CT shorting.

Ratings

The HFC relays are designed for operation in ambient air temperature from -20°C to 55°C. The contacts will carry 30 A trip current.

Burdens

The instantaneous units have a tapped coil for operation on either of two ranges (H or L). Selection of the high or low range is determined by the position of the link.

Burdens are listed on next page.

Characteristics

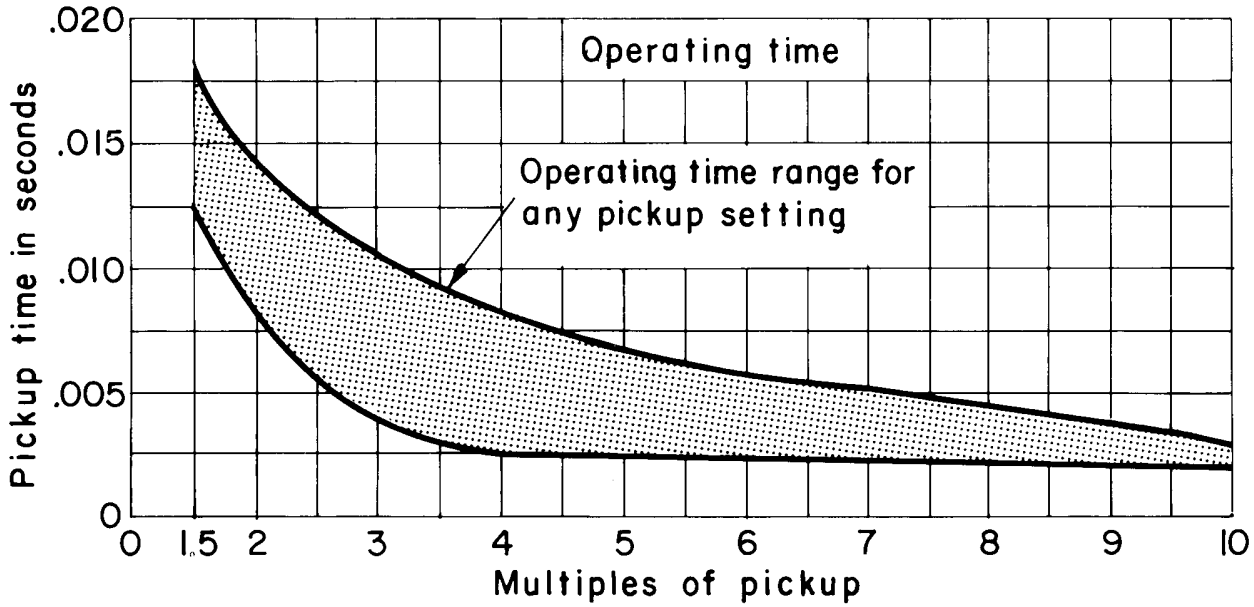
The instantaneous units have either a 25 to 1 or 8 to 1 range with a tapped coil. There are high and low ranges selected by means of links located on the top of the support structure. The time current curve for the instantaneous unit is shown in Fig. 1.

BURDENS

Hi-seismic Inst. Unit (A)	Hz	Link Position	Range (A)	Min. Pickup (A)	Continuous Rating (A)	One-Second Rating (A)	Burdens at Min. Pickup (Ω)			Burdens in Ohms (Z) Times Pickup		
							R	X	Z	3	10	20
0.5 - 4	60	L	0.5 - 2	0.5	0.75	94	10.63	9.77	14.44	9.81	8.56	7.80
		H	2 - 4	2	1.5		5.13	3.49	6.21	4.66	4.26	4.18
2 - 50		L	2 - 10	2	3.7	130	0.750	0.650	0.992	0.634	0.480	0.457
		H	10 - 50	10	7.5		0.070	0.024	0.074	0.072	0.071	0.070
0.5 - 4	50	L	0.5 - 2	0.5	0.75	94	8.86	8.14	12.03	8.18	7.13	6.50
		H	2 - 4	2	1.5		4.28	2.91	5.18	3.88	3.55	3.48
2 - 50		L	2 - 10	2	3.7	130	0.625	0.542	0.827	0.528	0.400	0.380
		H	10 - 50	10	7.5		0.058	0.020	0.062	0.060	0.059	0.058

① Higher currents may be applied for shorter periods of time in accordance with the formula: $I = \sqrt{K/T}$

Fig. 1 Time-current characteristics of the Hi-Seismic instantaneous unit



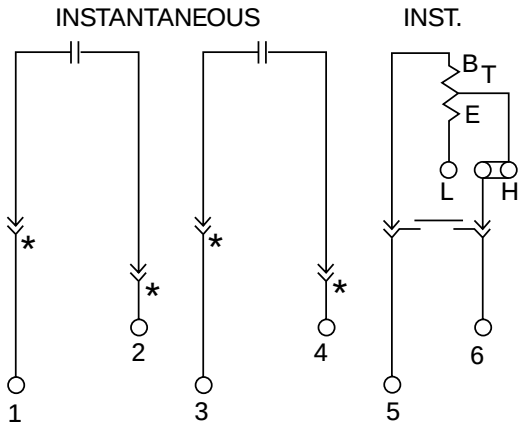
(Dwg. 0208A8695)

SELECTION GUIDE

Current Range (A)		Frequency (Hz)	Number of Units	Model Number	Case Size	Approx. Wt. in lbs (kg)	
Min	Max					Net	Ship
0.5 2.0	4.0 50	50/60	1	HFC21B1A B2A	C1	6 (2.7)	8 (3.6)
0.5 2.0	4.0 50		2	HFC22B1A B2A	C1	7 (3.2)	9 (4.0)
0.5 2.0	4.0 50		3	HFC23C1A C2A	C1	8 (3.6)	10 (4.5)

Connection Diagrams

Fig. 2. HFC21B Internal Connections Diagram



INST. SETTINGS

SET LINK TO "H" FOR HIGH RANGE AND TO "L" FOR LOW RANGE LINK SHOWN IN HIGH RANGE POSITION.

* = SHORT FINGERS

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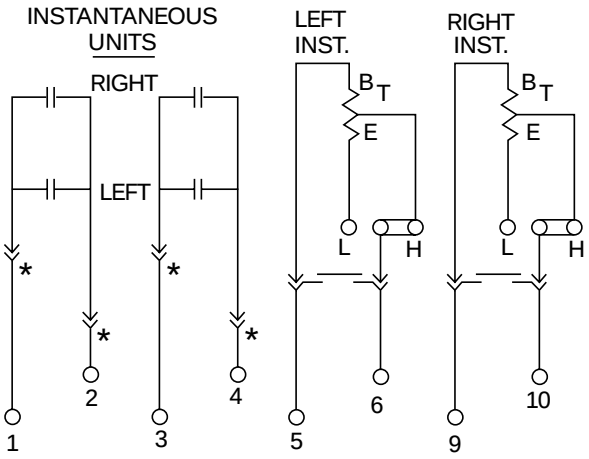
Fig. 3. HFC22B Internal Connections Diagram



INST. SETTINGS

SET LINK TO "H" FOR HIGH RANGE AND TO "L" FOR LOW RANGE. LINK SHOWN IN HIGH RANGE POSITION.

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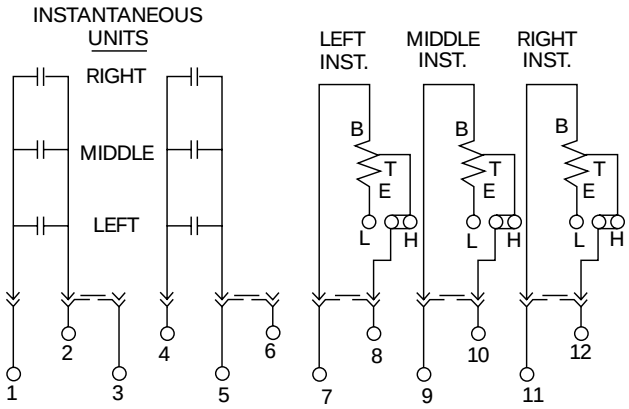
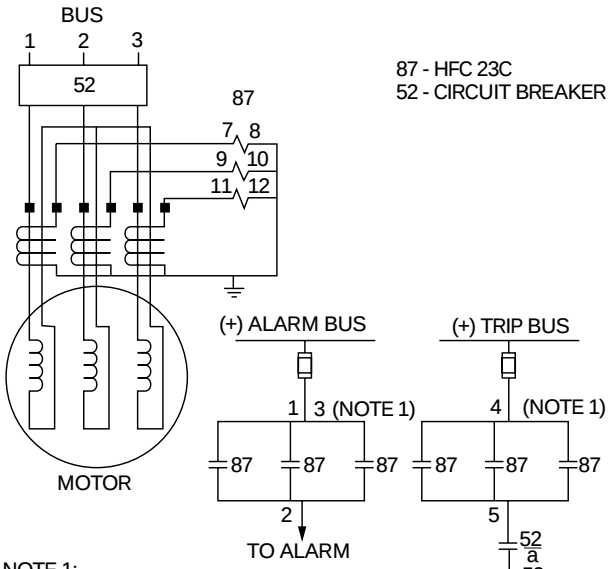
Fig. 4. HFC23C Internal Connections



INST. SETTINGS

SET LINK TO "H" FOR HIGH RANGE AND TO "L" FOR LOW RANGE. LINK SHOWN IN HIGH RANGE POSITION.

Fig. 5. External Connections for HFC23C, Self Balancing Primary Current Differential Scheme for Motor Protection



NOTE 1:
AS AN OPTION, CONNECTING STUD 3 TO (+) ALARM BUS WILL PROVIDE AN ALARM WHEN RELAY CONNECTION PLUG IS REMOVED. DO NOT USE THIS KIND OF CONNECTION ON THE TRIP CIRCUIT SINCE A FALSE TRIP WOULD OCCUR.

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