Cross Reference RA Part Number PN-D168413

F-Frame

Typical F-Frame Breaker

F-Frame Breaker with Electronic Trip Unit

Product Description

- All Eaton's Cutler-Hammer F-Frame Circuit Breakers by are HACR rated.
- All circuit breakers 10 through 30 amperes are suitable for HID (high intensity discharge) use.
- All F-Frame circuit breakers are suitable for reverse feed use

Technical Data and Specifications

Table 45-92. UL 489 Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)					
		Volts ac (50/60 Hz)				Volts dc ①	
		240	277	480	600	125	250 ②③
EDB	2, 3	22	—	—	—	10	—
EDS	2, 3	42	—	—	—	10	—
ED	2, 3	65	—	—	—	10	—
EDH	2, 3	100	—	—	—	10	—
EDC	2, 3	200	—	—	—	10	—
EHD	1	—	14	—	—	10	—
	2, 3	18	—	14	—	—	10
FDB	2, 3, 4	18	—	14	14	—	10
FD,	1	—	35	—	—	10	—
FDE ④	2, 3, 4	65	—	35	18	—	10
HFD,	1	—	65	—	—	10	—
HFDE ④	2, 3, 4	100	—	65	25	—	22
FDC ⑤,	2, 3, 4	200	—	100	35	—	22
FDCE ④⑤							

① dc ratings apply to substantially non-inductive circuits.
② 2-pole circuit breaker, or two poles of 3-pole circuit breaker.
③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.
④ Electronics available on 3-pole only.
⑤ Current limiting.

Table 45-93. IEC 157-1 (P1) Interrupting Capacity Ratings (P1)

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)					
		Volts ac (50/60 Hz)				Volts dc ⑥	
		220, 240	380, 415	440	500	125	250 ⑦⑧
EDB	2, 3	22	—	—	—	10	—
EDS	2, 3	42	—	—	—	10	—
ED	2, 3	65	—	—	—	10	—
EDH	2, 3	100	—	—	—	10	—
EDC	2, 3	200	—	—	—	10	—
FDB	2, 3, 4	18	14	14	14	—	10
FD	1	35	—	—	—	10	—
	2, 3, 4	65	35	35	18	—	10
HFD	1	65	—	—	—	10	—
	2, 3, 4	100	65	65	25	—	22
FDC	2, 3, 4	200	100	100	35	—	22

⑥ dc ratings apply to substantially non-inductive circuits.
⑦ 2-pole circuit breaker, or two poles of 3-pole circuit breaker.
⑧ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

Table 45-94. Digitrip Electronic Trip Units

Circuit Breaker Type	Frame	Ratings
FDE, HFDE, FDCE	225	100, 110, 125, 150, 160, 175, 200, 225
FDE, HFDE, FDCE	160	60, 70, 80, 90, 100, 125, 150, 160
FDE, HFDE, FDCE	80	15, 20, 30, 40, 50, 60, 70, 80

Table 45-95. F-Frame Digitrip Specifications

Trip Unit Type	Digitrip RMS 310+	
rms Sensing	Yes	
Breaker Type		
Frame Ampere Range Interrupting Rating at 480 V	FDE 15 – 225 A 35, 65, 100 (kA)	
Protection		
Ordering Options	LS LSG	LSI LSIG
Fixed Rated Plug (I_n) Overtemperature Trip	No Yes	
Long Delay Protection (L)		
Adjustable Rating Plug (I_n) Long Delay Pickup Long Delay Time I^2t	No 40 – 100% Frame 2 – 24 Seconds	
Long Delay Time I^4t Long Delay Thermal Memory High Load Alarm	No Yes Yes	
Short Delay Protection (S)		
Short Delay Pickup	200 – 1000% x (I_r)	
Short Delay Time I^2t Short Delay Time Flat	Yes No	No Inst – 300 ms
Short Delay Time Z.S.I.	No	
Instantaneous Protection (I)		
Instantaneous Pickup Discriminator Instantaneous Override	No No Yes	
Ground Fault Protection (G)		
Ground Fault Alarm Ground Fault Pickup Ground Fault Delay I^2t	No 20 – 100% Frame No	
Ground Fault Delay Flat Ground Fault Z.S.I. Ground Fault Thermal Memory	Inst – 300 ms No Yes	
System Diagnostics		
Cause of Trip LEDs Magnitude of Trip Information Remote Signal Contacts	No No No	
System Monitoring		
Digital Display Current Voltage	No No No	
Power and Energy Power Quality Harmonics Power Factor	No No No	
Communications		
PowerNet	No	
Testing		
Testing Method	Test Kit	

I_n = Rating Plug
I_r = LDPU Setting x I_n

Dimensions/Weights

Table 45-96. Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
1	1.38 (35.1)	6.00 (152.4)	3.38 (86.0)
2	2.75 (70.0)	6.00 (152.4)	3.38 (86.0)
3	4.13 (105.0)	6.00 (152.4)	3.38 (86.0)
4	5.50 (139.7)	6.00 (152.4)	3.38 (86.0)

Table 45-97. Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Number of Poles			
	1	2	3	4
ED, EDB, EDS, EDH, EDC	—	3 (1.4)	4.5 (2.0)	—
EHD, FDB, FD, HFD, FDC	2 (.9)	3 (1.4)	4.5 (2.0)	6 (2.7)
FDE, HFDE, FDCE	—	—	4.5 (2.0)	—

Product Selection

This information is presented only as an aid to understanding Catalog Numbers. It is not to be used to build Catalog Numbers for circuit breakers or trip units.

Table 45-98. Circuit Breaker Catalog Numbering System

HFD 3 050 L

Circuit Breaker Type	Number of Poles	Trip Amperes	Suffix
EHD	1 = 1 Pole	010	E = 100% Protected (4-Pole only) Neutral Pole
FDB	2 = 2 Poles	015	EH = 50% Protected (4-Pole only)
FD	3 = 3 Poles	020	K = High Magnetic Molded Case Switch
HFD	4 = 4 Poles	025	L = Line and Load Terminals
FDC		030	S = Stainless Steel Terminals
		035	V = 50°C Calibration
		040	W = Without Terminals
		045	Y = Line Terminals Only
		050	Z = Aluminum Terminals (≤ 100 Amperes)
		060	
		070	
		080	
		090	
		100	
		110	
		125	
		150	
		175 (FD, HFD, FDC, 2-, 3-, 4-Pole Only)	
		200 (FD, HFD, FDC, 2-, 3-, 4-Pole Only)	
		225 (FD, HFD, FDC, 2-, 3-, 4-Pole Only)	

EDC 3 200 L

Circuit Breaker Type	Number of Poles	Trip Amperes	Suffix
ED	2 = 2 Poles	100	L = Line and Load Terminals
EDB	3 = 3 Poles	125	W = Without Terminals
EDS		150	Y = Line Terminals Only
EDH		175	Z = Aluminum Terminals (100 Amperes)
EDC		200	
		225	

FDE 3 225 32 W

Circuit Breaker Type	Number of Poles	Trip Amperes	Trip Unit	Suffix
FDE	3 = 3 Poles	80	33 = LS	W = Without Terminals
HFDE		160	32 = LSI	
FDCE		225	35 = LSG	
			36 = LSIG	