

N-Frame

N-Frame



Typical N-Frame Circuit Breaker

Product Description

- All Cutler-Hammer N-Frame Circuit Breakers by Eaton Corporation are suitable for reverse feed use.
- All N-Frame circuit breakers are HACR rated.

Technical Data and Specifications

Table 12-242. UL 489 Interrupting Capacity Ratings ^①

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)			
		Volts ac (50/60 Hz)			
		240	277	480	600
ND	2, 3, 4	65	—	50	25
CND ^②	2, 3, 4	65	—	50	25
HND	2, 3, 4	100	—	65	35
CHND ^②	2, 3, 4	100	—	65	35
NDC	2, 3, 4	200	—	100	65
CNDC ^②	2, 3, 4	200	—	100	65
NDU ^③	3	300 ^④	—	150	75 ^⑤

^① Utilization Category A circuit breakers.

^② 100% rated breakers.

^③ 800 amperes maximum rating.

^④ Successfully tested at 300 kAIC, although UL recognizes maximum of 200 kAIC at 240 Vac.

^⑤ Successfully tested at 75 kAIC, although UL recognizes maximum of 65 kAIC at 600 Vac.

Table 12-243. IEC 947-2 Interrupting Capacity Ratings ^⑥

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)		
		Volts ac (50/60 Hz)		
		240	415	690
ND	2, 3, 4			
I_{cu}		85	50	20
I_{cs}		85	50	10
CND ^⑦	2, 3, 4			
I_{cu}		85	50	20
I_{cs}		85	50	10
HND	2, 3, 4			
I_{cu}		100	70	25
I_{cs}		100	50	13
CHND ^⑦	2, 3, 4			
I_{cu}		100	70	25
I_{cs}		100	50	13
NDC	2, 3, 4			
I_{cu}		200	100	35
I_{cs}		100	50	18
CNDC ^⑦	2, 3, 4			
I_{cu}		200	100	35
I_{cs}		100	50	18

^⑥ Utilization Category A circuit breakers.

^⑦ 100% rated breakers.

N-Frame

N-Frame Digitrip Specifications

Table 12-244. Specifications

Trip Unit Type	Digitrip RMS 310	Digitrip OPTIM 550	Digitrip OPTIM 1050	
rms Sensing	Yes	Yes	Yes	
Breaker Type				
Frame	N	N	N	
Ampere Range	400 A – 1200 A	400 A – 1200 A	400 A – 1200 A	
Interrupting Rating at 480 Volts	50, 65, 100 (kA)	50, 65, 100 (kA)	50, 65, 100 (kA)	
Protection				
Ordering Options	LS, LSG	LSI, LSIG	LSI, LSIG, LSI(A)	LSI(A), LISG
Fixed Rated Plug (I_N)	Yes	Yes	Yes	Yes
Overtemperature Trip	Yes	Yes	Yes	Yes
Long Delay Protection (L)				
Adjustable Rating Plug (I_N)	Yes	Yes	No	No
Long Delay Pickup	0.5 – 1.0 (I_N) ^①	0.5 – 1.0 (I_N) ^①	0.4 – 1.0 x (I_N)	0.4 – 1.0 x (I_N)
Long Delay Time I^2t	12 Seconds	12 Seconds	2 – 24 Seconds	2 – 24 Seconds
Long Delay Time I^4t	No	No	1 – 5 Seconds	1 – 5 Seconds
Long Delay Thermal Memory	Yes	Yes	Yes	Yes
High Load Alarm	No	No	No	0.5 – 1.0 x I_T
Short Delay Protection (S)				
Short Delay Pickup	200 – 800% x (I_N)	200 – 800% x (I_N)	150 – 800% x (I_T)	150 – 800% x (I_T)
Short Delay Time I^2t	100 ms	No	100 – 500 ms	100 – 500 ms
Short Delay Time Flat	No	Inst – 300 ms	100 – 500 ms	100 – 500 ms
Short Delay Time Zone Selective Interlocking	No	No	Yes	Yes
Instantaneous Protection (I)				
Instantaneous Pickup	No	200 – 800% x (I_N)	200 – 800% x (I_N)	200 – 800% x (I_N)
Discriminator	No	No	Yes	Yes
Instantaneous Override	Yes	Yes	Yes	Yes
Ground Fault Protection (G)				
Ground Fault Alarm	No	No	20 – 100% x (I_G)	20 – 100% x (I_G)
Ground Fault Pickup	Varies by Frame ^②	Varies by Frame ^②	20 – 100% x (I_G)	20 – 100% x (I_G)
Ground Fault Delay I^2t	No	No	100 – 500 ms	100 – 500 ms
Ground Fault Delay Flat	Inst – 500 ms	Inst – 500 ms	100 – 500 ms	100 – 500 ms
Ground Fault Zone Selective Interlocking	No	No	Yes ^③	Yes
Ground Fault Thermal Memory	Yes	Yes	Yes	Yes
System Diagnostics				
Status LEDs	Yes	Yes	Yes	Yes
Cause of Trip LEDs	No	No	Yes	Yes
Magnitude of Trip Information	No	No	Yes	Yes
Remote Signal Contact — Ground Alarm	Yes ^④	Yes ^④	Yes ^③	Yes
Local Auxiliary and Bell Alarm Contact	Optional	Optional	Optional	Included
System Monitoring				
Digital Display	No	No	Yes ^②	Yes ^②
Current	No	No	Yes	Yes
Power and Energy	No	No	No	Yes
Power Quality — Harmonics	No	No	No	Yes
Power Factor	No	No	No	Yes
Communications				
Cutler-Hammer PowerNet	No	No	No ^⑤	Yes
Testing				
Testing Method	Test Set	OPTIMizer, BIM, Cutler-Hammer PowerNet	OPTIMizer, BIM, Cutler-Hammer PowerNet	

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Zone interlock kit.

④ With separate ground fault alarm unit (GFAU).

⑤ Eaton's Cutler-Hammer PowerNet kit.

Legend: BIM = Breaker Interface Module
 (A) = GF Alarm
 I_S = Sensor Rating
 I_N = Rating Plug
 I_T = Long Delay Pickup Setting

N-Frame

Dimensions/Weights

Table 12-245. Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
2, 3	8.25 (209.6)	16.00 (406.4)	5.50 (139.7)
4	11.13 (282.6)	16.00 (406.4)	5.50 (139.7)

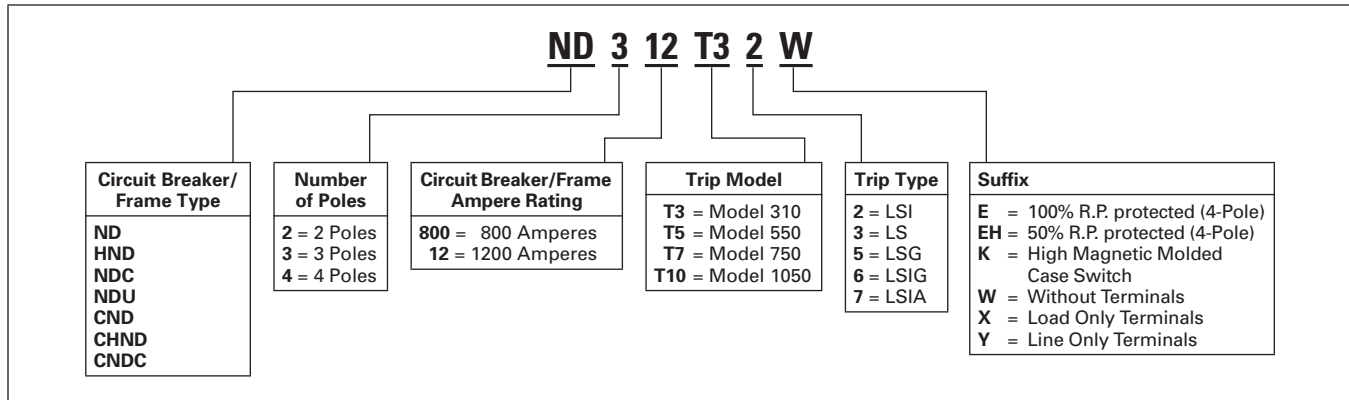
Table 12-246. Approximate Shipping Weight in Lbs. (kg)

Breaker Type	Complete Breaker		
	Number of Poles		
	2	3	4
ND, HND, NDC, NDU	37 (16.8)	45 (20.4)	58 (26.3)

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 12-247. Circuit Breaker/Frame Catalog Numbering System



N-Frame

100% Rated Type CND Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals.

Table 12-255. 100% Rated Type CND Electronic Circuit Breakers with Non-Interchangeable Trip Units ①

Maximum Continuous Ampere Rating at 40°C	Digitrip RMS 310 Circuit Breaker Frame Only				Digitrip RMS 310 Rating Plug Only			Standard Terminals Only ② See Page 12-162 for Optional Terminals
	Standard Interrupting Capacity 600 Vac Rated 50 kAIC at 480 Vac				Ampere Rating	Fixed Rating Plugs	Adjustable Rating Plug	
	Standard	Options						
	Adjustable Short Time Pickup with I ² t Short Delay Ramp	Independently Adjustable Short Time Pickup and Delay	Adjustable Short Time Pickup with I ² t Short Delay and Ground Fault Protection	Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection				
Catalog Number				Catalog Number				
2-Pole								
800	CND2800T33W	CND2800T32W	CND2800T35W	CND2800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA1000NB1
					450	8NES450T		
					500	8NES500T		
					600	8NES600T		
					700	8NES700T		
					800	8NES800T		
3-Pole								
800	CND3800T33W	CND3800T32W	CND3800T35W	CND3800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA1000NB1
					450	8NES450T		
					500	8NES500T		
					600	8NES600T		
					700	8NES700T		
					800	8NES800T		
4-Pole ③								
800	CND4800T33W	CND4800T32W	—	—	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA1000NB1
					450	8NES450T		
					500	8NES500T		
					600	8NES600T		
					700	8NES700T		
					800	8NES800T		
2-Pole ④								
1200	CND212T33W	CND212T32W	CND212T35W	CND212T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1 TA700NB1 TA1000NB1 TA1000NB1 TA1000NB1 TA1200NB1
					700	12NES700T		
					800	12NES800T		
					900	12NES900T		
					1000	12NES1000T		
					1200	12NES1200T		
3-Pole ④								
1200	CND312T33W	CND312T32W	CND312T35W	CND312T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1 TA700NB1 TA1000NB1 TA1000NB1 TA1000NB1 TA1200NB1
					700	12NES700T		
					800	12NES800T		
					900	12NES900T		
					1000	12NES1000T		
					1200	12NES1200T		
4-Pole ③④								
1200	CND412T33W	CND412T32W	—	—	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1 TA700NB1 TA1000NB1 TA1000NB1 TA1000NB1 TA1200NB1
					700	12NES700T		
					800	12NES800T		
					900	12NES900T		
					1000	12NES1000T		
					1200	12NES1200T		

① See Table 12-256 on Page 12-153 for prices.

② Two terminals are required per pole.

③ Neutral is in right pole.

④ Includes conductor extension kit which increase breaker length 3.75 on each end. Terminal ordered separate.