

## R-Frame



Typical R-Frame Circuit Breaker

## Product Description

- Cutler-Hammer R-Frame Circuit Breakers by Eaton Corporation are available as frame (which includes trip unit), rating plug and terminals.
- All R-Frame circuit breakers are suitable for reverse feed use.

## Technical Data and Specifications

Table 12-269. UL 489/CSA Interrupting Capacity Ratings <sup>①</sup>

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)			
		Volts ac (50/60 Hz)			
		240	277	480	600
RD	3, 4	125	—	65	50
CRD <sup>②</sup>	3, 4	125	—	65	50
RDC	3, 4	200	—	100	65
CRDC <sup>②</sup>	3, 4	200	—	100	65

<sup>①</sup> Utilization Category A circuit breakers.

<sup>②</sup> 100% rated breakers.

**Note:** See Page 12-165 for Trip Unit Specifications.

Table 12-270. IEC 947-2 Interrupting Capacity Ratings <sup>③</sup>

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)		
		Volts ac (50/60 Hz)		
		240	415	690
RD	3, 4			
$I_{cu}$		135	70	25
$I_{cs}$		100	50	13
RDC	3, 4			
$I_{cu}$		200	100	35
$I_{cs}$		100	50	18

<sup>③</sup> Utilization Category A circuit breakers.

**R-Frame Digitrip Specifications**

**Table 12-271. Specifications**

Trip Unit Type	Digitrip RMS 310		Digitrip RMS 510	Digitrip RMS 610	Digitrip RMS 810	Digitrip RMS 910	Digitrip OPTIM 1050
rms Sensing	Yes		Yes	Yes	Yes	Yes	Yes
<b>Breaker Type</b>							
Frame	R		R	R	R	R	R
Ampere Range	800 A – 2500 A		800 A – 2500 A	800 A – 2500 A	800 A – 2500 A	800 A – 2500 A	800 A – 2500 A
Interrupting Rating at 480 Volts	65, 100 (kA)		65, 100 (kA)	65, 100 (kA)	65, 100 (kA)	65, 100 (kA)	65, 100 (kA)
<b>Protection</b>							
Ordering Options	LS, LSG	LSI, LSIG	LI, LS, LSI, LIG, LSG, LSIG	LI, LS, LSI, LIG, LSG, LSIG	LI, LS, LSI, LIG, LSG, LSIG	LI, LS, LSI, LIG, LSG, LSIG	LSI(A), LISG
Fixed Rated Plug (I <sub>N</sub> )	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Overtemperature Trip	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Long Delay Protection (L)</b>							
Adjustable Rating Plug (I <sub>N</sub> )	Yes	Yes	No	No	No	No	No
Long Delay Pickup	0.5 – 1.0 (I <sub>N</sub> ) <sup>①</sup>	0.5 – 1.0 (I <sub>N</sub> ) <sup>①</sup>	0.5 – 1.0 x (I <sub>N</sub> )	0.5 – 1.0 x (I <sub>N</sub> )	0.5 – 1.0 x (I <sub>N</sub> )	0.5 – 1.0 x (I <sub>N</sub> )	0.4 – 1.0 x (I <sub>N</sub> )
Long Delay Time I <sup>2</sup> t	12 Seconds	12 Seconds	2 – 24 Seconds	2 – 24 Seconds	2 – 24 Seconds	2 – 24 Seconds	2 – 24 Seconds
Long Delay Time I <sup>4</sup> t	No	No	No	No	No	No	1 – 5 Seconds
Long Delay Thermal Memory	Yes	Yes	Yes	Yes	Yes	Yes	Yes
High Load Alarm	No	No	No	0.85 x I <sub>r</sub>	0.85 x I <sub>r</sub>	0.85 x I <sub>r</sub>	0.5-1.0 x I <sub>r</sub>
<b>Short Delay Protection (S)</b>							
Short Delay Pickup	200 – 800% x (I <sub>N</sub> ) <sup>②</sup>	200 – 800% x (I <sub>N</sub> ) <sup>②</sup>	200 – 600% S1&S2 x (I <sub>r</sub> )	200 – 600% S1&S2 x (I <sub>r</sub> )	200 – 600% S1&S2 x (I <sub>r</sub> )	200 – 600% S1&S2 x (I <sub>r</sub> )	150-800% x (I <sub>r</sub> ) <sup>②③</sup>
Short Delay Time I <sup>2</sup> t	100 ms	No	100 – 500 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms
Short Delay Time Flat	No	Inst – 300 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms
Short Delay Time Zone Selective Interlocking	No	No	Yes	Yes	Yes	Yes	Yes
<b>Instantaneous Protection (I)</b>							
Instantaneous Pickup	No	200 – 800% x (I <sub>N</sub> )	200 – 600% M1&M2 x (I <sub>N</sub> )	200 – 600% M1&M2 x (I <sub>N</sub> )	200 – 600% M1&M2 x (I <sub>N</sub> )	200 – 600% M1&M2 x (I <sub>N</sub> )	200 – 800% x (I <sub>N</sub> ) <sup>④</sup>
Discriminator	No	No	Yes <sup>④</sup>	Yes <sup>④</sup>	Yes <sup>④</sup>	Yes <sup>④</sup>	Yes
Instantaneous Override	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ground Fault Protection (G)</b>							
Ground Fault Alarm <sup>⑤</sup>	No	No	No	No	No	No	25 – 100% x (I <sub>N</sub> )
Ground Fault Pickup <sup>⑤</sup>	200 – 1200 A	200 – 1200 A	25 – 100% x (I <sub>S</sub> )	25-100% x (I <sub>S</sub> )	25 – 100% x (I <sub>S</sub> )	25 – 100% x (I <sub>S</sub> )	25 – 100% x (I <sub>N</sub> )
Ground Fault Delay I <sup>2</sup> t	No	No	100 – 500 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms
Ground Fault Delay Flat	Inst – 500 ms	Inst – 500 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms	100 – 500 ms
Ground Fault Zone Selective Interlocking	No	No	Yes	Yes	Yes	Yes	Yes
Ground Fault Thermal Memory	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>System Diagnostics</b>							
Status LEDs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cause of Trip LEDs	No	No	Yes	Yes	Yes	Yes	Yes
Magnitude of Trip Information	No	No	No	Yes	Yes	Yes	Yes
Remote Signal Contacts	Yes <sup>⑦</sup>	Yes <sup>⑦</sup>	No	Yes	Yes	Yes	Yes
<b>System Monitoring</b>							
Digital Display	No	No	No	Yes	Yes	Yes	Yes <sup>⑥</sup>
Current	No	No	No	Yes	Yes	Yes	Yes
Voltage	No	No	No	No	No	Yes	No
Power and Energy	No	No	No	No	Yes	Yes	Yes
Power Quality — Harmonics	No	No	No	No	No	Yes	Yes
Power Factor	No	No	No	No	Yes (Over Cutler-Hammer PowerNet Only)	Yes	Yes
<b>Communications</b>							
Cutler-Hammer PowerNet	No	No	No	No	Yes	Yes	Yes
<b>Testing</b>							
Testing Method	Test Set		Integral	Integral	Integral	Integral	OPTIMizer, BIM, Cutler-Hammer PowerNet

① Adjust by rating plug.  
 ② Except 2500 ampere frame is 200 – 600%.  
 ③ Varies by frame.  
 ④ LS/LSG only.  
 ⑤ Not to exceed 1200 amperes.  
 ⑥ By OPTIMizer/BIM.  
 ⑦ Optional. Add suffix “R” to Catalog Number.

**Legend:** BIM= Breaker Interface Module  
 (A)= GF Alarm  
 I<sub>S</sub>= Sensor Rating  
 I<sub>N</sub>= Rating Plug  
 I<sub>r</sub>= Long Delay Pickup Setting x I<sub>N</sub>

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Dimensions/Weights

Table 12-272. Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
3	15.50 (393.7)	16.00 (406.4)	9.75 (247.7)
4	20.00 (508.0)	16.00 (406.4)	9.75 (247.7)

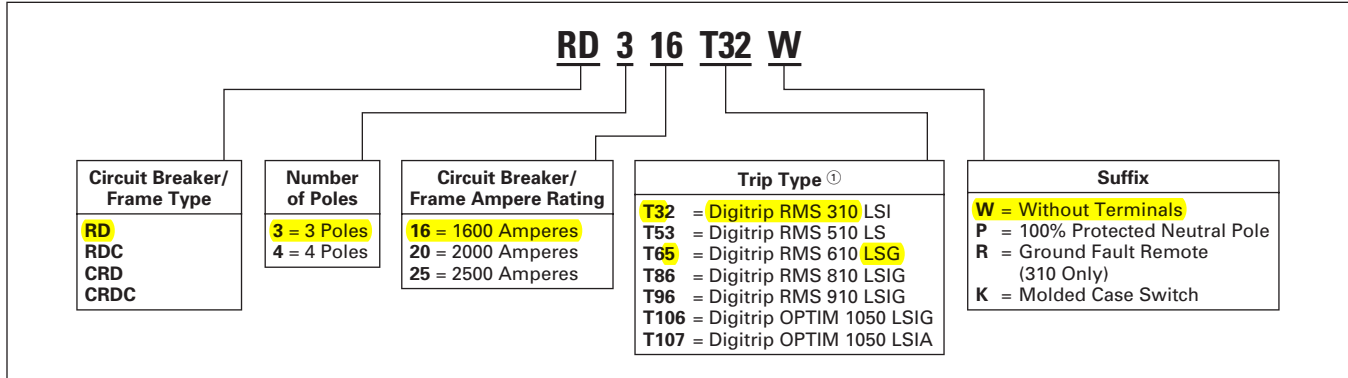
Table 12-273. Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Complete Breaker	
	Number of Poles	
	3	4
<b>1600 Amperes</b>		
RD, CRD, RDC, CRDC	102 (46.3)	135 (61.2)
<b>2000 Amperes</b>		
RD, RDC	102 (46.3)	135 (61.2)
CRD, CRDC	130 (59.0)	175 (79.4)
<b>2500 Amperes</b>		
RD, RDC	135 (61.2)	182 (82.6)

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 12-274. Circuit Breaker/Frame Catalog Numbering System



① For complete list of available trip types refer to Pages 12-167 – 12-180.

**Product Selection**

**Digitrip RMS 310 Electronic Circuit Breakers with Interchangeable Rating Plugs**

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

**Table 12-275. Digitrip RMS 310 Electronic Circuit Breakers with Interchangeable Rating Plugs ①**

Maximum Continuous Ampere Rating at 40°C	Circuit Breaker Frame Only				Digitrip RMS 310 Rating Plug Only		
	L – Adjustable Long Delay Pickup (By Adjustable Rating Plug) S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response) I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response)				Ampere Rating	Fixed Rating Plug	Adjustable Rating Plug
	LS                      LSI                      LSG ②                      LSIG ②						Adjustable Ampere Ratings
	Catalog Number				Catalog Number		

**3-Pole Standard Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac**

1600 ③	RD316T33W	RD316T32W	<b>RD316T35W</b>	RD316T36W	800 1000 1200 1250 1400 1500 1600	16RES08T 16RES10T 16RES12T 16RES125T 16RES14T 16RES15T 16RES16T	Adjustable Settings are: 800, 1000, 1200, 1600 <b>A16RES16T1</b>
2000	RD320T33W	RD320T32W	RD320T35W	RD320T36W	1000 1200 1250 1400 1600 2000	20RES10T 20RES12T 20RES125T 20RES14T 20RES16T 20RES20T	Adjustable Settings are: 1000, 1200, 1600, 2000 <b>A20RES20T1</b>
2500	RD325T33W	RD325T32W	RD325T35W	RD325T36W	1200 1250 1600 2000 2500	25RES12T 25RES125T 25RES16T 25RES20T 25RES25T	Adjustable Settings are: 1200, 1600, 2000, 2500 <b>A25RES25T1</b>

**4-Pole ④ Standard Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac**

1600 ③	RD416T33W	RD416T32W	—	—	800 1000 1200 1250 1400 1500 1600	16RES08T 16RES10T 16RES12T 16RES125T 16RES14T 16RES15T 16RES16T	Adjustable Settings are: 800, 1000, 1200, 1600 <b>A16RES16T1</b>
2000	RD420T33W	RD420T32W	—	—	1000 1200 1250 1400 1600 2000	20RES10T 20RES12T 20RES125T 20RES14T 20RES16T 20RES20T	Adjustable Settings are: 1000, 1200, 1600, 2000 <b>A20RES20T1</b>
2500	RD425T33W	RD425T32W	—	—	1200 1250 1600 2000 2500	25RES12T 25RES125T 25RES16T 25RES20T 25RES25T	Adjustable Settings are: 1200, 1600, 2000, 2500 <b>A25RES25T1</b>

① See Table 12-276 on Page 12-168 for prices.

② Add **R** to Catalog Number for ground fault remote indication compatibility, i.e., RD316T35RW.

③ For SCR application use 2000 ampere frame.

④ Unprotected right pole neutral. Add **P** to Catalog Number for 100% protected right pole neutral, i.e., RD416T33PW.