

Series C® L-Frame



Typical Series C L-Frame Circuit Breaker

- All Series C L-frame circuit breakers are HACR rated.
- L-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers. OPTIM circuit breakers are available as factory assembled only.
- L-frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

Interrupting Capacity Ratings

UL489 Interrupting Capacity Ratings<sup>①</sup>

Circuit Breaker Type	Number of Poles	Interrupting Capacity (RMS Symmetrical Amperes) (kA)							Page Number
		Volts Ac (50/60 Hz)					Volts Dc		
		240	277	480	600	125	250 <sup>②③</sup>	500	
LDB	2, 3	65	—	35	25	—	22	—	58
LD	2, 3, 4	65	—	35	25	—	22	—	57, 59
CLD	2, 3, 4	65	—	35	25	—	22	—	58, 61
HLD	2, 3, 4	100	—	65	35	—	25	—	57, 59
CHLD <sup>④</sup>	2, 3, 4	100	—	65	35	—	25	—	61
LDC	2, 3, 4	200	—	100	50	—	30	—	57, 60
CLDC <sup>④</sup>	2, 3, 4	200	—	100	50	—	30	—	62

IEC 947-2 Interrupting Capacity Ratings<sup>①</sup>

Circuit Breaker Type	Number of Poles		Interrupting Capacity (Symmetrical Amperes) (kA)				Page Number
			Volts Ac (50/60 Hz)			Volts Dc	
			240	415	690	250 <sup>②③</sup>	
LDB	2, 3	$I_{CU}$ $I_{CS}$	85 85	45 45	20 10	20 10	58
LD	2, 3, 4	$I_{CU}$ $I_{CS}$	85 85	45 45	20 10	20 10	57, 59
CLD <sup>④</sup>	2, 3, 4	$I_{CU}$ $I_{CS}$	85 85	45 45	20 10	20 10	58, 61
HLD	2, 3, 4	$I_{CU}$ $I_{CS}$	100 100	70 70	25 13	20 10	57, 59
CHLD <sup>④</sup>	2, 3, 4	$I_{CU}$ $I_{CS}$	100 100	70 70	25 13	20 10	61
LDC	2, 3, 4	$I_{CU}$ $I_{CS}$	200 100	100 75	35 18	20 10	57, 60
CLDC <sup>④</sup>	2, 3, 4	$I_{CU}$ $I_{CS}$	200 100	100 75	35 18	20 10	62

① Utilization category A circuit breakers.  
 ② L/R = 8 milliseconds minimum.  
 ③ 2-pole circuit breaker or two poles of 3-pole circuit breaker. Incorporating Thermal-Magnetic trip unit only.  
 ④ 100% rated breakers

## Series C® L-Frame

## L-Frame Digitrip Selection Guide

Trip Unit Type	Digitrip RMS 310	Digitrip OPTIM 550	Digitrip OPTIM 750	Digitrip OPTIM 1050	
RMS Sensing	Yes	Yes	Yes	Yes	
<b>Breaker Type</b>					
Frame	L	L	L	L	
Ampere Range	300-600A	200-600A	200-600A	200-600A	
Interrupting Rating @ 480V	35, 65, 100 (kA)	35, 65, 100 (kA)	35, 65, 100 (kA)	35, 65, 100 (kA)	
<b>Protection</b>					
Ordering Options	LS, LSG	LSI, LSIG	LSI, LSI(A), LSIG	LSI(A), LSIG	LSI(A), LSIG
Fixed Rated Plug (I <sub>n</sub> )	Yes	Yes	Yes	Yes	Yes
Overtemperature Trip	Yes	Yes	Yes	Yes	Yes
<b>Long Delay Protection (L)</b>					
Adjustable Rating Plug (I <sub>n</sub> )	Yes	Yes	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>	0.4-1.0 x (I <sub>n</sub> )	0.4-1.0 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
Long Delay Time I <sup>4</sup> T	No	No	1-5 Seconds	1-5 Seconds	1-5 Seconds
Long Delay Thermal Memory	Yes	Yes	Yes	Yes	Yes
High Load Alarm	No	No	0.5-1.0 x I <sub>r</sub>	0.5-1.0 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> )	200-800% x (I <sub>n</sub> )	150-800% x (I <sub>r</sub> )	150-800% x (I <sub>r</sub> )	150-800% x (I <sub>r</sub> )
Short Delay Time I <sup>2</sup> T	100 ms	No	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
Short Delay Time Zone Selective Interlocking	No	No	No	Yes	Yes
<b>Instantaneous Protection (I)</b>					
Instantaneous Pickup	No	200-800% x (I <sub>n</sub> )	200-800% x (I <sub>n</sub> )	200-800% x (I <sub>n</sub> )	200-800% x (I <sub>n</sub> )
Discriminator	No	No	Yes	Yes	Yes
Instantaneous Override	Yes	Yes	Yes	Yes	Yes
<b>Ground Fault Protection (G)</b>					
Ground Fault Alarm	No	No	20-100% x (I <sub>s</sub> )	20-100% x (I <sub>s</sub> )	20-100% x (I <sub>s</sub> )
Ground Fault Pickup	Varies by Frame	Varies by Frame	20-100% x (I <sub>s</sub> )	20-100% x (I <sub>s</sub> )	20-100% x (I <sub>s</sub> )
Ground Fault Delay I <sup>2</sup> T	No	No	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
Ground Fault Zone Selective Interlocking	No	No	No	Yes	Yes
Ground Fault Thermal Memory	Yes	Yes	Yes	Yes	Yes
<b>System Diagnostics</b>					
Status LEDs	Yes	Yes	Yes	Yes	Yes
Cause of Trip LEDs	No	No	Yes	Yes	Yes
Magnitude of Trip Information	No	No	Yes	Yes	Yes
Remote Signal Contact – Ground Alarm	Yes	Yes	No	Yes	Yes
Local Auxiliary and Bell Alarm Contact	Optional	Optional	Optional	Included	Included
<b>System Monitoring</b>					
Digital Display	No	No	Yes <sup>②</sup>	Yes <sup>②</sup>	Yes <sup>②</sup>
Current	No	No	Yes	Yes	Yes
Power and Energy	No	No	No	No	Yes
Power Quality-Harmonics	No	No	No	No	Yes
Power Factor	No	No	No	No	Yes
<b>Communications</b>					
Cutler-Hammer PowerNet	No	No	No <sup>③</sup>	Yes	Yes
<b>Testing</b>					
Testing Method	Test Set		OPTIMizer, BIM, Cutler-Hammer PowerNet		

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Cutler-Hammer PowerNet kit for field upgrade.

BIM = Breaker Interface Module

(A) = GF Alarm

I<sub>s</sub> = Sensor RatingI<sub>n</sub> = Rating PlugI<sub>r</sub> = Long Delay Pickup Setting

## Series C® L-Frame

## Types LD, HLD, and LDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C	Standard Interrupting Capacity 600 Vac Rated 35 kAIC @ 480 Vac		High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac		Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC @ 480 Vac		Thermal Magnetic Trip Unit Only  For Use With: Standard or High or Ultra High Interrupting Frames  Magnetic Trip Range is 5-10 x Continuous Ampere Rating	Standard Terminals Only  See Page 63 for Optional Terminals
	Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals	Frame Only	Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals	Frame Only	Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals	Frame Only		

## 2-Pole

300	LD2300	LD2600F	HLD2300	HLD2600F	LDC2300	LDC2600F	LT2300T	TA602LD①
350	LD2350		HLD2350		LDC2350		LT2350T	TA602LD①
400	LD2400		HLD2400		LDC2400		LT2400T	TA602LD①
450	LD2450		HLD2450		LDC2450		LT2450T	TA602LD①
500	LD2500		HLD2500		LDC2500		LT2500T	TA602LD①
600	LD2600		HLD2600		LDC2600		LT2600T	2TA603LDK②

## 3-Pole

300	LD3300	LD3600F	HLD3300	HLD3600F	LDC3300	LDC3600F	LT3300T	TA602LD①
350	LD3350		HLD3350		LDC3350		LT3350T	TA602LD①
400	LD3400		HLD3400		LDC3400		LT3400T	TA602LD①
450	LD3450		HLD3450		LDC3450		LT3450T	TA602LD①
500	LD3500		HLD3500		LDC3500		LT3500T	TA602LD①
600	LD3600		HLD3600		LDC3600		LT3600T	3TA603LDK②

## 4-Pole③

300	LD4300	LD4600F	HLD4300	HLD4600F	LDC4300	LDC4600F	LT4300T	TA602LD①
350	LD4350		HLD4350		LDC4350		LT4350T	TA602LD①
400	LD4400		HLD4400		LDC4400		LT4400T	TA602LD①
450	LD4450		HLD4450		LDC4450		LT4450T	TA602LD①
500	LD4500		HLD4500		LDC4500		LT4500T	TA602LD①
600	LD4600		HLD4600		LDC4600		LT4600T	4TA603LDK②

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C607 for Thermal Magnetic Trip Unit

## Types LD, HLD, and LDC Electronic Circuit Breakers with Interchangeable Trip Units

Order as individual components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

Maximum Continuous Ampere Rating @ 40°C①	Circuit Breaker Frame Only			Digitrip RMS 310 Trip Unit Only④				Digitrip RMS 310 Rating Plug Only			Standard Terminals Only  See Page 63 for Optional Terminals
	Standard Interrupting Capacity 600 Vac Rated 35 kAIC @ 480 Vac	High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac	Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC @ 480 Vac	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 Delay (Flat Response)	Ampere Rating	Fixed Rating Plug	Adjustable Rating Plug	
Catalog Number											

## 3-Pole③

600	LD3600F	HLD3600F	LDC3600F	LES3600LS	LES3600LSI	LES3600LSG	LES3600LSIG	300 350 400 500 600	6LES300T 6LES350T 6LES400T 6LES500T 6LES600T	300/400/500/600 A6LES600T1	TA602LD① TA602LD① TA602LD① TA602LD① 3TA603LDK②
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## 4-Pole③

600	LD4600F	HLD4600F	LDC4600F	LES4600LS	LES4600LSI	–	–	300 350 400 500 600	6LES300T 6LES350T 6LES400T 6LES500T 6LES600T	300/400/500/600 A6LES600T1	TA602LD④ TA602LD④ TA602LD④ TA602LD④ 4TA603LDK②
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Instruction Leaflet/FRED Number 29C105 for Breaker; 29C615 for LES Trip Unit

① Individually packed.

② Terminal kits contain one terminal for each pole and one terminal cover.

③ Neutral is in right pole.

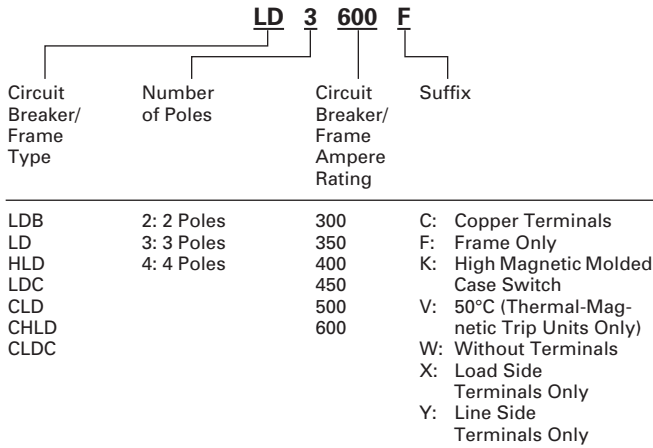
④ For AC use only.

**Series C® L-Frame**

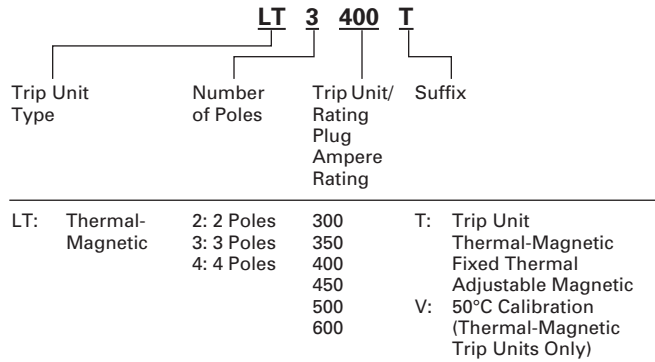
**Catalog Numbering System**

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.

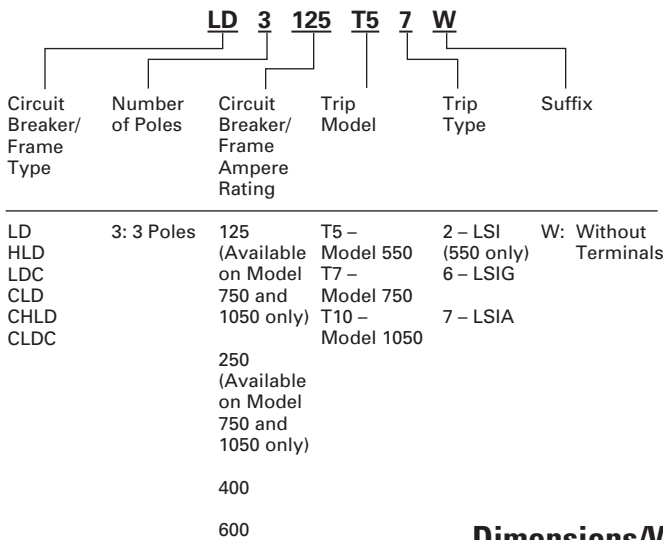
**Circuit Breaker/Frame Catalog Number**



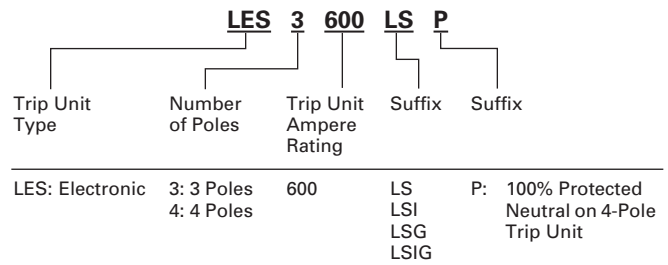
**Thermal-Magnetic Trip Unit Catalog Number**



**OPTIM Circuit Breaker/Frame Catalog Number**



**Digitrip RMS 310 Trip Unit Catalog Number**



**Dimensions/Weights**

**Dimensions, Inches (mm)**

Number of Poles	Width	Height	Depth
2, 3	8.25 (210)	10.75 (274)	4.062 (103)
4	11 (279)	10.75 (274)	4.062 (103)

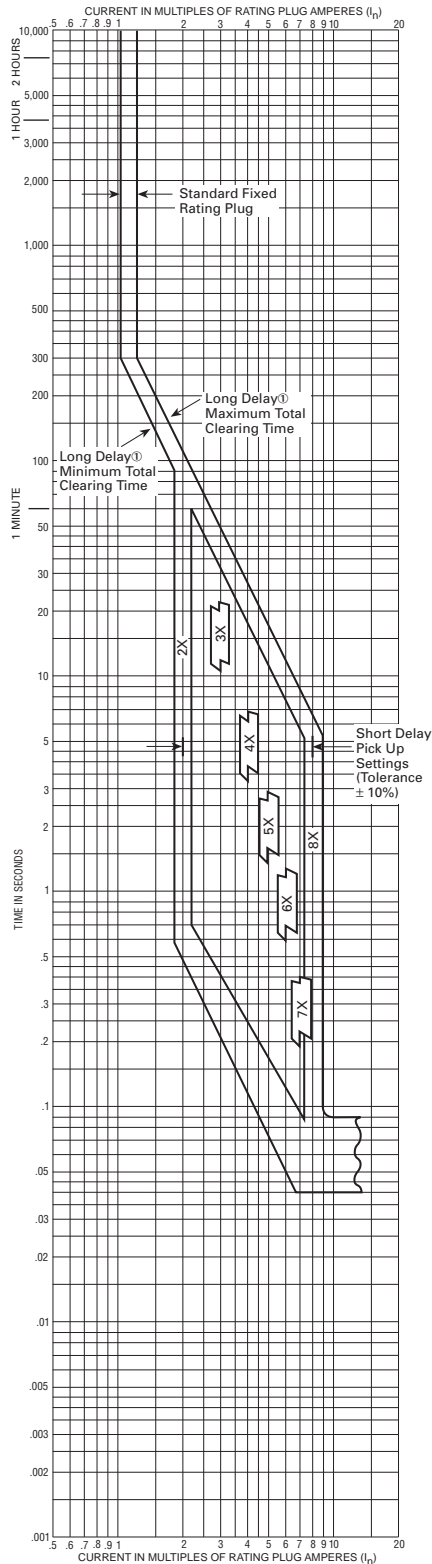
**Approximate Shipping Weight, Lbs. (kg)**

Breaker Type	Complete Breaker			Frame Only			Trip Unit		
	Number of Poles			Number of Poles			Number of Poles		
	2	3	4	2	3	4	2	3	4
LD, HLD, LDC	18 (8.172)	20 (9.080)	25 (11.340)	14 (6.356)	15 (6.810)	20 (9.072)	3 (1.361)	4 (1.814)	5 (2.268)
LDB	18 (8.172)	20 (9.080)	25 (11.340)	–	–	–	–	–	–



## AB DE-ION Circuit Breakers

Types LD, HLD, CLD, and CHLD Equipped With Type LES Digitrip RMS 310 Trip Units,  
 Types LES3600LS, LES3600LSG, LES4600LS, LES4600LSE, LES4600LSP



**Circuit Breaker Time/Current Curves (Phase Current) ④**

**Series C® L-Frame Circuit Breakers**  
 Equipped With Type LES Digitrip RMS 310 Trip Units

Catalog Types LES3600LS, LES3600LSG, LES4600LS, LES4600LSE, and LES4600LSP  
 Digitrip RMS 310 Trip Units for use with Circuit Breaker Types LD, HLD, CLD, and CHLD  
 3 and 4 Poles

**Fixed Short Delay Time**                      **Typical Trip Unit Nameplate**

**Available Rating Plugs**

Ampere Rating (I <sub>n</sub> )	Type	Rating Plug Catalog Number	Short Delay Pickup Range Amperes
600	Fixed	6LES600T	1200-4800
500	Fixed	6LES500T	1000-4000
400	Fixed	6LES400T	800-3200
350	Fixed	6LES350T	700-2800
300	Fixed	6LES300T	600-2400
300, 400, 500, 600	Adjustable	A6LES600T1	600-4800

**Interrupting Ratings @ 50/60 Hz RMS Sym. Amperes (kA)**

Breaker Type	UL/CSA Volts	240		380		415	
		I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>	I <sub>cu</sub>	I <sub>cs</sub>
LD, CLD	kA	65	33	40	20	40	20
HLD, CHLD		100	50	65	33	65	33

Utilization Category A  
 U<sub>imp</sub> = 8kV

**Notes**

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA AB4-1991 publications.

Calibration response in short delay pick-up range is same for 1, 2 or 3 poles in series.

There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick-up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

① Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.

② For high fault current levels a fixed instantaneous override is provided at 5500A. (Tolerance ±15%).

③ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

④ For ground fault time/current curves see SC-5661-93.

