

## Molded Case Circuit Breaker Product Family



## Product Overview

Eaton's molded case circuit breakers are designed to provide circuit protection for low voltage distribution systems. They are described by NEMA as, "... a device for closing and interrupting a circuit between separable contacts under both normal and abnormal conditions," and furthermore as, "... a breaker assembled as an integral unit in a supporting and enclosing housing of insulating material." The National Electrical Code (NEC) describes them as, "A device designed to open and close a circuit by non-automatic means, and to open the circuit automatically on a predetermined overload of current, without injury to itself when properly applied within its rating."

So designed, Eaton circuit breakers protect conductors against overloads and conductors and connected apparatus, such as motors and motor starters, against short circuits.

In low voltage distribution systems, there are many varied applications of molded case circuit breakers.

Eaton offers the most comprehensive family of molded case circuit breakers in the industry.

This section of circuit breakers includes:

- Thermal-magnetic trip breakers
- Electronic rms trip breakers
- Molded case switches
- Motor circuit protectors
- Current limiting breakers
- Special application breakers

## Modified Breakers

Eaton breakers can be ordered with internal accessories installed. These modified breakers will be subject to an addition charge.

## Special Calibration

Special non-UL-listed calibrations are available for certain ambient temperatures other than 40 °C and for frequencies other than 50/60 Hz or DC. Reduced interrupting ratings will apply for 400 Hz applications.

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## 50 °C Calibration

Add suffix **V** to catalog Number for complete breaker, listed above, when ordering listed ampere ratings for breakers to be used in 50 °C ambients. (No UL label.)

## Moisture-Fungus Treatment

All circuit breaker cases are molded from glass-polyester which does not support the growth of fungus. Any parts which are susceptible to the growth of fungus will require special treatment.

## Freeze-Tested Circuit Breakers

The circuit breakers may be ordered with freeze testing. This option uses special lubrication and mechanical operation is verified at –40 °C.

## Marine Applications

E- to R-Framed circuit breakers can be supplied to meet the following marine specifications:

- U.S. Coast Guard CFR 46; ABS—American Bureau of Shipping; IEEE 45; DNV; Lloyds; and ABS/NVR

These specifications generally require molded case circuit breakers to be supplied with 50 °C ambient, and plug-in adapter kits. When plug-in adapter kits are used, no terminals need be supplied (switchboard applications).

Circuit breakers can also be supplied to meet UL 489 Supplement SA (Marine use) and UL 489 Supplement SB (Naval Use).

UL 489 Supplement SA applies to vessels over 65 feet (19.8 m) in length. Requirements include 40 °C ambient calibration, special labeling, and no use of aluminum conductors or terminals. (No 50 °C.)

- Suffix H08

Or you can choose to add 50 °C ambient but then there is no "UL" mark.

- Suffix VH08

UL 489 Supplement SB requires partial 50 °C ambient calibration, vibration testing, special nameplating and no use of aluminum conductors or terminals. Eaton chooses to always fully calibrate to 50 °C ambient. ("Naval" labeled per UL, and UL now allows 50 °C label here.)

- Suffix VH09

### Certified Test Reports

Eaton breakers can be ordered with certified test reports at the time of order entry. Test report documents the thermal and magnetic or electronic tripping characteristics of the individual breaker. Breaker and test report must be ordered together. Add suffix 12 to breaker catalog number and enter separate line item on order for certified test report.

### Standards and Certifications

Molded case circuit breakers are designed to conform with the following standards:

- Underwriters Laboratories Inc., Standard UL 489, molded case circuit breakers and circuit breaker enclosures
- National Electrical Manufacturers Association (NEMA) Standards Publication No. AB1-1993, molded case circuit breakers
- Australian Standard AS 2184, molded case circuit breakers
- British Standards Institution Standard BS 4752: Part 1, switchgear and control gear Part 1: circuit breakers
- Canadian Standards Association (CSA) Standard C22.2 No. 5, service entrance and branch circuit breakers
- International Electrotechnical Commission Recommendations IEC 60947-2, circuit breakers
- Japanese T-Mark Standard molded case circuit breakers
- South African Bureau of Standards, Standard SABS 156, Standard Specification for molded case circuit breakers
- Swiss Electro-Technical Association Standard SEV 157-1, safety regulations for circuit breakers
- Union Technique de l'Electricite Standard NF C 63-120, low voltage switchgear and control gear circuit breaker requirements
- Verband Deutscher Elektrotechniker (Association of German Electrical Engineers) Standard VDE 0660, low voltage switchgear and control gear, circuit breakers

Conformance with these standards satisfies most local and international codes, assuming user acceptability and simplified application.

Molded case circuit breakers equal or exceed Federal Specification Classification W-C-375b requirements for the particular class associated with the circuit breaker frame being considered.

Open breakers do not have service entrance ratings. Service entrance rating is part of the enclosure.



Typical K-Frame Circuit Breaker



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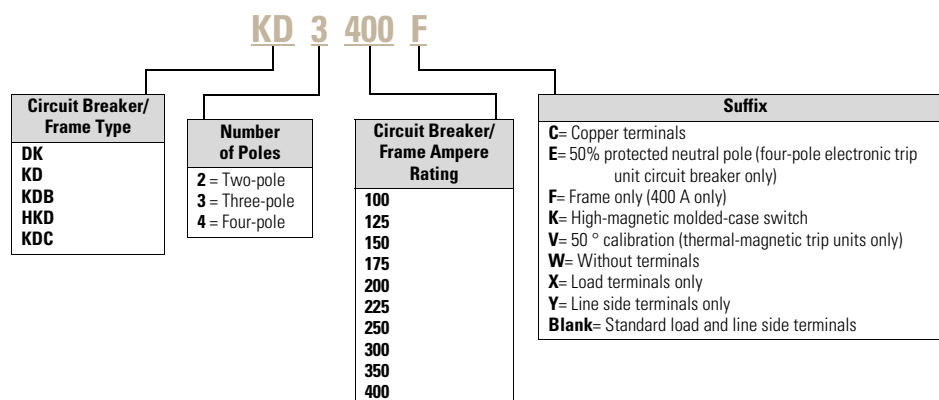
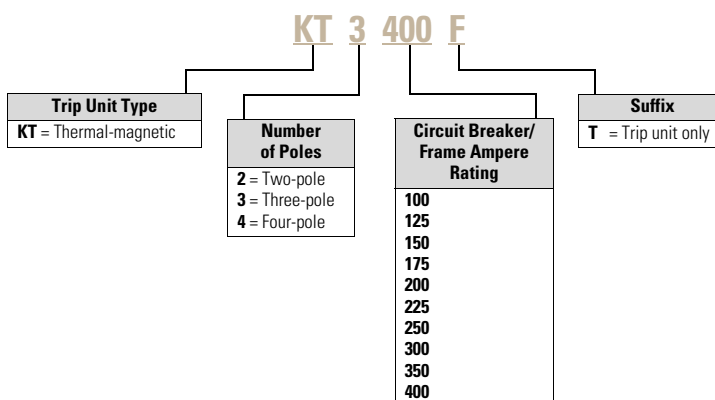
K-Frame (70–400 Amperes)

Product Description

- All Eaton K-Frame circuit breakers are HACR rated
- K-Frame circuit breakers are available as individual components (frame, trip unit, terminals), or factory assembled complete breakers
- K-Frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use

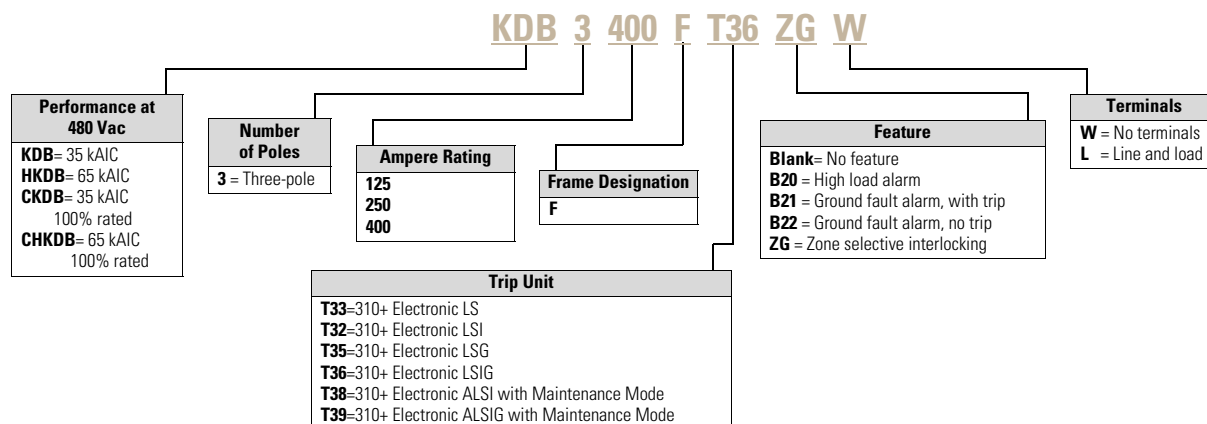
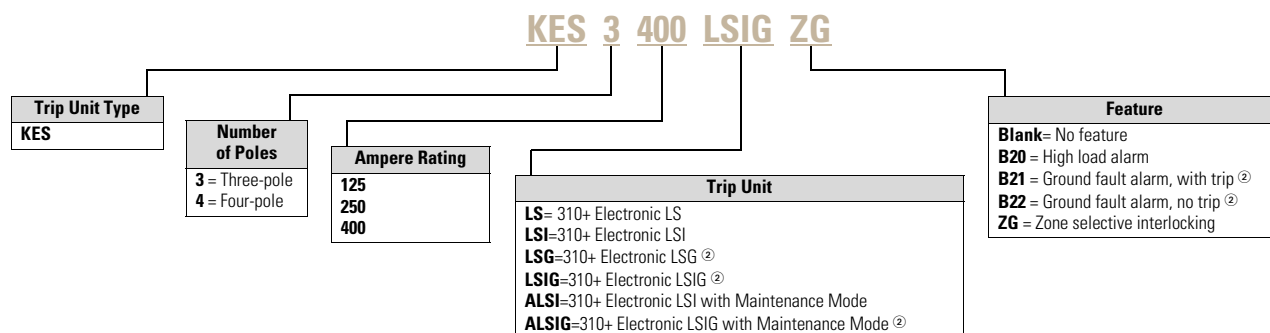
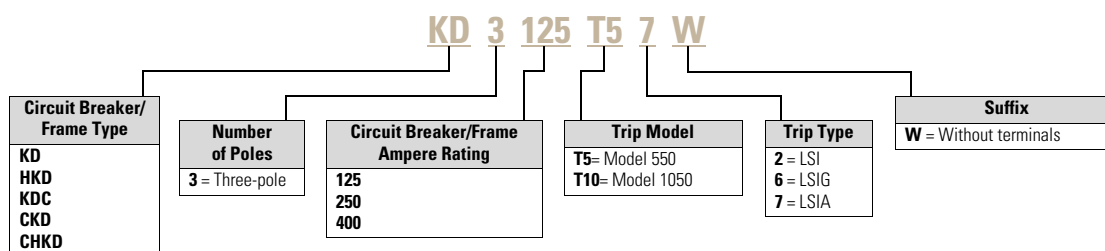
**Catalog Number Selection**

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.

**K-Frame with Thermal-Magnetic Trip Unit Technology****Thermal-Magnetic Breakers and Frames** ①**Thermal-Magnetic Trip Unit** ①**Notes**

① Frames are the same for thermal-magnetic or 310+ electronic trip units, e.g., **KD3400F** or **HKD3400F**.

Ampere rating available with electronic trip unit only.

**K-Frame with 310+ Electronic Trip Unit Technology**<sup>①</sup>**310+ Circuit Breakers**<sup>②</sup>**310+ Electronic Trip Units**<sup>③</sup>**K-Frame with OPTIM Trip Unit Technology****OPTIM Circuit Breakers****Notes**

- ① Cannot combine 'B2X' suffixes with 'B2X' suffixes.  
 ② Not available in four-pole configurations.  
 ③ Frames are the same for thermal-magnetic or 310+ electronic trip units, e.g., **KD3400F**, **HKD3400F**, etc.

## Product Selection

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## Types KD, HKD and KDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

Maximum Continuous Ampere Rating at 40 °C	Standard Interrupting Capacity 600 Vac Rated 35 kAIC at 480 Vac Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals <sup>①</sup> Catalog Number	High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals <sup>①</sup> Catalog Number	Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC at 480 Vac Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals <sup>①</sup> Catalog Number	Thermal-Magnetic Trip Unit Only <sup>①</sup>  For Use with Standard or High or Ultra High Interrupting Frames Catalog Number	Standard Terminals Only  See Page V4-T2-317 for Optional Terminals Catalog Number
<b>Two-Pole</b>					
100	KD2100	HKD2100	KDC2100	KT2100T	TA300K <sup>②</sup>
125	KD2125	HKD2125	KDC2125	KT2125T	TA300K <sup>②</sup>
150	KD2150	HKD2150	KDC2150	KT2150T	TA300K <sup>②</sup>
175	KD2175	HKD2175	KDC2175	KT2175T	TA300K <sup>②</sup>
200	KD2200	HKD2200	KDC2200	KT2200T	TA300K <sup>②</sup>
225	KD2225	HKD2225	KDC2225	KT2225T	TA300K <sup>②</sup>
250	KD2250	HKD2250	KDC2250	KT2250T	TA350K <sup>②</sup>
300	KD2300	HKD2300	KDC2300	KT2300T	TA350K <sup>②</sup>
350	KD2350	HKD2350	KDC2350	KT2350T	TA350K <sup>②</sup>
400	KD2400	HKD2400	KDC2400	KT2400T	2TA400K <sup>③</sup>
<b>Three-Pole</b>					
100	KD3100	HKD3100	KDC3100	KT3100T	TA300K <sup>②</sup>
125	KD3125	HKD3125	KDC3125	KT3125T	TA300K <sup>②</sup>
150	KD3150	HKD3150	KDC3150	KT3150T	TA300K <sup>②</sup>
175	KD3175	HKD3175	KDC3175	KT3175T	TA300K <sup>②</sup>
200	KD3200	HKD3200	KDC3200	KT3200T	TA300K <sup>②</sup>
225	KD3225	HKD3225	KDC3225	KT3225T	TA300K <sup>②</sup>
250	KD3250	HKD3250	KDC3250	KT3250T	TA350K <sup>②</sup>
300	KD3300	HKD3300	KDC3300	KT3300T	TA350K <sup>②</sup>
350	KD3350	HKD3350	KDC3350	KT3350T	TA350K <sup>②</sup>
400	KD3400	HKD3400	KDC3400	KT3400T	3TA400K <sup>③</sup>
<b>Four-Pole</b>					
100	KD4100	HKD4100	KDC4100	KT3100T	TA300K <sup>②</sup>
125	KD4125	HKD4125	KDC4125	KT3125T	TA300K <sup>②</sup>
175	KD4175	HKD4175	KDC4175	KT3175T	TA300K <sup>②</sup>
200	KD4200	HKD4200	KDC4200	KT3200T	TA300K <sup>②</sup>
225	KD4225	HKD4225	KDC4225	KT3225T	TA300K <sup>②</sup>
250	KD4250	HKD4250	KDC4250	KT3250T	TA350K <sup>②</sup>
300	KD4300	HKD4300	KDC4300	KT3300T	TA350K <sup>②</sup>
350	KD4350	HKD4350	KDC4350	KT3350T	TA350K <sup>②</sup>
400	KD4400	HKD4400	KDC4400	KT3400T	4TA400K <sup>③</sup>

**Notes**

- <sup>①</sup> Magnetic trip adjustable 5–10 times continuous ampere rating.  
<sup>②</sup> Individually packed.  
<sup>③</sup> 2TA400K, 3TA400K and 4TA400K terminal kits contain one terminal for each pole and one terminal cover.

## Types KD, HKD and KDC Thermal-Magnetic Circuit Breakers—Frame Only

Standard Interrupting Capacity 600 Vac Rated 35 kAIC at 480 Vac Catalog Number	High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac Catalog Number	Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC at 480 Vac Catalog Number
<b>Two-Pole</b>		
KD2400F	HKD2400F	KDC2400F
<b>Three-Pole</b>		
KD3400F	HKD3400F	KDC3400F
<b>Four-Pole</b>		
KD4400F	HKD4400F	KDC4400F

## Types KD, HKD and KDC Electronic Circuit Breakers with Interchangeable 310+ Trip Units

Order as individual components: breaker frame, trip unit and terminals. See 310+ adjustability specifications on **Page V4-T2-320**.

## Types KD, HKD and KDC Electronic Circuit Breakers with Interchangeable 310+ Trip Units—Three-Pole

Max. Cont. Ampere Rating at 40 °C	Circuit Breaker Frame Only			Digitrip RMS 310+ Trip Unit Only <sup>①</sup>				Neutral CT for LSG and LSIG <sup>②③</sup> Catalog Number	Terminal Information
	Standard Interrupting Capacity 600 Vac Rated 35 kAIC at 480 Vac Catalog Number	High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac	Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC at 480 Vac	Standard LS	Options LSI	LSG	LSIG		
				Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay Ramp	Independently Adjustable Short Time Pickup and Delay	Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection	Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection		
125	KD3400F	HKD3400F	KDC3400F	KES3125LS	KES3125LSI	KES3125LSG	KES3125LSIG	LGFC125	See <b>Page V4-T2-317</b>
250	KD3400F	HKD3400F	KDC3400F	KES3250LS	KES3250LSI	KES3250LSG	KES3250LSIG	LGFC250	
400	KD3400F	HKD3400F	KDC3400F	KES3400LS	KES3400LSI	KES3400LSG	KES3400LSIG	LGFC400	

Types KD, HKD and KDC Electronic Circuit Breakers with Interchangeable 310+ Trip Units—Four-Pole <sup>④⑤</sup>

Max. Cont. Ampere Rating at 40 °C	Circuit Breaker Frame Only			Digitrip RMS 310+ Trip Unit Only <sup>①</sup>				Neutral CT for LSG and LSIG <sup>②③</sup> Catalog Number	Terminal Information
	Standard Interrupting Capacity 600 Vac Rated 35 kAIC at 480 Vac Catalog Number	High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac	Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC at 480 Vac	Standard LS	Options LSI	LSG	LSIG		
				Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay Ramp	Independently Adjustable Short Time Pickup and Delay	Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection	Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection		
125	KD4400F	HKD4400F	KDC4400F	KES4125LS	KES4125LSI	—	—	—	See <b>Page V4-T2-317</b>
250	KD4400F	HKD4400F	KDC4400F	KES4250LS	KES4250LSI	—	—	—	
400	KD4400F	HKD4400F	KDC4400F	KES4400LS	KES4400LSI	—	—	—	

## Notes

- ① For AC use only.  
 ② Required for four-wire systems if neutral protection is desired.  
 ③ Included with LSG and LSIG trip units.  
 ④ Trip unit includes protected neutral pole. Use corresponding three-pole trip unit if protected neutral pole is not required.  
 ⑤ Fully rated neutral pole protection is standard. For 50% rated protection on neutral pole, add Suffix **E** to four-pole trip unit catalog number.

**Type KDB with Digitrip 310+ Non-Interchangeable Trip Unit Suitable for Reverse Feed**See 310+ adjustability specifications on **Page V4-T2-320**.

2

Factory Assembled Circuit Breaker Consisting of Frame and Trip Unit Less Terminals <sup>①</sup>							
Maximum Continuous Ampere Rating at 40 °C	Number of Poles	Standard LS	Optional LSI	LSG	LSIG	Neutral CT for LSG and LSIG <sup>②③</sup>	Terminal Information
		Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay Ramp	Independently Adjustable Short Time Pickup and Delay	Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection	Independently Adjustable Short Time Pickup and Ground Fault Protection		
		Catalog Number				Catalog Number	
125	3	KDB3125FT33W	KDB3125FT32W	KDB3125FT35W	KDB3125FT36W	LGFC125	See Page V4-T2-318
250	3	KDB3250FT33W	KDB3250FT32W	KDB3250FT35W	KDB3250FT36W	LGFC250	
400	3	KDB3400FT33W	KDB3400FT32W	KDB3400FT35W	KDB3400FT36W	LGFC400	

**Type HKDB with Digitrip 310+ Non-Interchangeable Trip Unit Suitable for Reverse Feed**See 310+ adjustability specifications on **Page V4-T2-320**.

Factory Assembled Circuit Breaker Consisting of Frame and Trip Unit Less Terminals <sup>①</sup>							
Maximum Continuous Ampere Rating at 40 °C	Number of Poles	Standard LS	Optional LSI	LSG	LSIG	Neutral CT for LSG and LSIG <sup>②③</sup>	Terminal Information
		Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay Ramp	Independently Adjustable Short Time Pickup and Delay	Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection	Independently Adjustable Short Time Pickup and Ground Fault Protection		
		Catalog Number				Catalog Number	
125	3	HKDB3125FT33W	HKDB3125FT32W	HKDB3125FT35W	HKDB3125FT36W	LGFC125	See Page V4-T2-318
250	3	HKDB3250FT33W	HKDB3250FT32W	HKDB3250FT35W	HKDB3250FT36W	LGFC250	
400	3	HKDB3400FT33W	HKDB3400FT32W	HKDB3400FT35W	HKDB3400FT36W	LGFC400	

**100% Rated Types CKD and CHKD Electronic Circuit Breakers**

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. All 100% rated circuit breakers have electronic trip units.

**100% Rated Types CKD and CHKD Electronic Circuit Breakers—Three-Pole**See 310+ adjustability specifications on **Page V4-T2-320**.

Maximum Continuous Ampere Rating at 40 °C	Circuit Breaker Frame Only		Digitrip RMS 310+ Trip Unit Only		Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection	Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection	Neutral CT for LSG and LSIG <sup>②③</sup>	Terminal Information
	Standard Interrupting Capacity	High Interrupting Capacity	Standard	Options				
	35 kAIC at 480 Vac	65 kAIC at 480 Vac	Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay Ramp	Independently Adjustable Short Time Pickup and Delay				
	Catalog Number						Catalog Number	
125	CKD3400F	CHKD3400F	KES3125LS	KES3125LSI	KES3125LSG	KES3125LSIG	LGFC125	See Page V4-T2-317
250	CKD3400F	CHKD3400F	KES3250LS	KES3250LSI	KES3250LSG	KES3250LSIG	LGFC250	
400	CKD3400F	CHKD3400F	KES3400LS	KES3400LSI	KES3400LSG	KES3400LSIG	LGFC400	

**Notes**

- ① For AC use only.
- ② Required for four-wire systems if neutral protection is desired.
- ③ Included with LSG and LSIG trip units.



**Types DK and KDB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units**

Suitable for reverse feed application.

**Types DK and KDB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units**

Maximum Continuous Ampere Rating at 40 °C	240 Vac Rated, 250 Vdc			600 Vac Rated, 250 Vdc	
	Complete Circuit Breaker Without Line and Load Terminals Catalog Number	With Line Terminals Only Catalog Number	With Standard Line and Load Terminals Only Catalog Number	Complete Circuit Breaker Without Line and Load Terminals Catalog Number	With Standard Line and Load Terminals Catalog Number
<b>Two-Pole</b>					
100	—	—	—	KDB2100W	KDB2100
125	—	—	—	KDB2125W	KDB2125
150	—	—	—	KDB2150W	KDB2150
175	—	—	—	KDB2175W	KDB2175
200	—	—	—	KDB2200W	KDB2200
225	—	—	—	KDB2225W	KDB2225
250	DK2250W	DK2250Y	DK2250	KDB2250W	KDB2250
300	DK2300W	DK2300Y	DK2300	KDB2300W	KDB2300
350	DK2350W	DK2350Y	DK2350	KDB2350W	KDB2350
400	DK2400W	DK2400Y	DK2400	KDB2400W	KDB2400
<b>Three-Pole</b>					
100	—	—	—	KDB3100W	KDB3100
125	—	—	—	KDB3125W	KDB3125
150	—	—	—	KDB3150W	KDB3150
175	—	—	—	KDB3175W	KDB3175
200	—	—	—	KDB3200W	KDB3200
225	—	—	—	KDB3225W	KDB3225
250	DK3250W	DK3250Y	DK3250	KDB3250W	KDB3250
300	DK3300W	DK3300Y	DK3300	KDB3300W	KDB3300
350	DK3350W	DK3350Y	DK3350	KDB3350W	KDB3350
400	DK3400W	DK3400Y	DK3400	KDB3400W	KDB3400