Product Selection

Table 45-57. Types LD, HLD and LDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

Max. Cont. Ampere Rating @ 40°C ④	Standard Interrupting Capacity 600V AC Rated 35 kAIC @ 480V AC Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals		High Interrupting Capacity 600V AC Rated 65 kAIC @ 480V AC Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals		Ultra High Interrupting Capacity Current Limiting 600V AC Rated 100 kAIC @ 480V AC Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals		Thermal Magnetic Trip Unit Only For Use with Standard or High or Ultra High Interrupting Frames		Standard Terminals Only See Page 45-39 for Optional Terminals	
	Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number	Price U.S. $
2-Pole										
300	LD2300	3,940.00	HLD2300	5,890.00	LDC2300	7,610.00	LT2300T	1,275.00	TA602LD ①	29.50
350	LD2350	3,940.00	HLD2350	5,890.00	LDC2350	7,610.00	LT2350T	1,275.00	TA602LD ①	29.50
400	LD2400	3,940.00	HLD2400	5,890.00	LDC2400	7,610.00	LT2400T	1,275.00	TA602LD ①	29.50
450	LD2450	3,940.00	HLD2450	5,890.00	LDC2450	7,610.00	LT2450T	1,275.00	TA602LD ①	29.50
500	LD2500	3,940.00	HLD2500	5,890.00	LDC2500	7,610.00	LT2500T	1,275.00	TA602LD ①	29.50
600	LD2600	3,940.00	HLD2600	5,890.00	LDC2600	7,610.00	LT2600T	1,275.00	2TA603LDK ②	63.00
3-Pole										
300	LD3300	4,990.00	HLD3300	7,290.00	LDC3300	8,990.00	LT3300T	1,665.00	TA602LD ①	29.50
350	LD3350	4,990.00	HLD3350	7,290.00	LDC3350	8,990.00	LT3350T	1,665.00	TA602LD ①	29.50
400	LD3400	4,990.00	HLD3400	7,290.00	LDC3400	8,990.00	LT3400T	1,665.00	TA602LD ①	29.50
450	LD3450	4,990.00	HLD3450	7,290.00	LDC3450	8,990.00	LT3450T	1,665.00	TA602LD ①	29.50
500	LD3500	4,990.00	HLD3500	7,290.00	LDC3500	8,990.00	LT3500T	1,665.00	TA602LD ①	29.50
600	LD3600	4,990.00	HLD3600	7,290.00	LDC3600	8,990.00	LT3600T	1,665.00	3TA603LDK ②	93.00
4-Pole ③										
300	LD4300	7,485.00	HLD4300	10,835.00	LDC4300	13,840.00	LT4300T	2,660.00	TA602LD ①	29.50
350	LD4350	7,485.00	HLD4350	10,835.00	LDC4350	13,840.00	LT4350T	2,660.00	TA602LD ①	29.50
400	LD4400	7,485.00	HLD4400	10,835.00	LDC4400	13,840.00	LT4400T	2,660.00	TA602LD ①	29.50
450	LD4450	7,485.00	HLD4450	10,835.00	LDC4450	13,840.00	LT4450T	2,660.00	TA602LD ①	29.50
500	LD4500	7,485.00	HLD4500	10,835.00	LDC4500	13,840.00	LT4500T	2,660.00	TA602LD ①	29.50
600	LD4600	7,485.00	HLD4600	10,835.00	LDC4600	13,840.00	LT4600T	2,660.00	4TA603LDK ②	124.00

① Individually packed.
② Terminal kits contain one terminal for each pole and one terminal cover.
③ Neutral is in right pole.
④ Magnetic trip range 5 – 10 times continuous ampere rating.

Table 45-58. Types LD, HLD and LDC Thermal-Magnetic Circuit Breakers — Frame Only

Standard Interrupting Capacity 600V AC Rated 35 kAIC @ 480V AC		High Interrupting Capacity 600V AC Rated 65 kAIC @ 480V AC		Ultra High Interrupting Capacity Current Limiting 600V AC Rated 100 kAIC @ 480V AC	
Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number	Price U.S. $
2-Pole					
LD2600F	2,535.00	HLD2600F	4,505.00	LDC2600F	6,210.00
3-Pole					
LD3600F	3,120.00	HLD3600F	5,420.00	LDC3600F	7,150.00
4-Pole					
LD4600F	4,552.00	HLD4600F	7,904.00	LDC4600F	10,910.00

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

45

Discount Symbol CB-2

Circuit Breaker Description

Cutler-Hammer 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 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, Cutler-Hammer 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. Cutler-Hammer offers the most comprehensive family of molded case circuit breakers in the industry.

This family of circuit breakers includes:

- Thermal Magnetic Trip Breakers
- Electronic rms Trip Breakers
- Molded Case Switches
- Motor Circuit Protectors
- Current Limiting Breakers
- Special Application Breakers
- World Breakers

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. Maximum thermal calibration is limited to 135A at 400 Hz.

Suffix **H01** 400 Hz	20% Adder

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.

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.

Suffix **J01** Fungus Treated	$325. + 20% Adder

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.

Suffix **F01** Freeze Tested	20% Adder

Marine Applications

F-Frame circuit breakers can be supplied to meet the following marine specifications:

- U.S. Coast Guard CFR 46 ABS — American Bureau of Shipping IEEE 45

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

Circuit breakers can also be supplied to meet UL489 Supplement SA (Marine Use) and UL489 Supplement SB (Naval Use).

UL489 Supplement SA applies to vessels over 65 feet in length. Requirements include 40°C ambient calibration, special labeling, and no use of aluminum conductors or terminals.

Suffix **H08** "Marine"	10% Adder

UL 489 Supplement SB requires 50°C ambient calibration, vibration testings, special nameplating and no use of aluminum conductors or terminals.

Suffix **H09** "Naval"	10% Adder

Standards and Certifications

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

- Underwriters Laboratories, Inc., Standard UL489, Molded Case Circuit Breakers and Circuit Breaker Enclosures
- National Electrical Manufacturers Association 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 Standard C22.2 No. 5, Service Entrance and Branch Circuit Breakers
- International Electrotechnical Commission Recommendations IEC 157-1, 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.

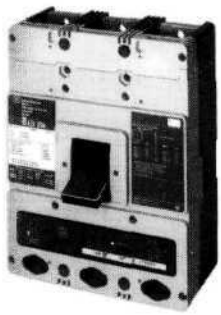
Note: For further information, see Circuit Breaker, CD-ROM SA.74A.01.T.E.

Table 45-29. Industrial Circuit Breakers (Continued)

Circuit Breaker Type	Cont. Amp Rating At 40°C	No. Poles	Volts		Type of Trip ①	Federal Spec. W-C-375b	UL Listed Interrupting Ratings rms Symmetrical Amperes									Page Number
			AC	DC			AC Ratings Volts						DC ②			
							120	120/240	240	277	480	600	125	250	125/250	
J-Frame ③																
JDB	70 – 250	2, 3	600	250	N.I.T.	22a	—	—	65,000	—	35,000	18,000	—	10,000	—	**12-34**
JD	70 – 250	2, 3, 4	600	250	I.T	22a	—	—	65,000	—	35,000	18,000	—	10,000	—	**12-33**
HJD	70 – 250	2, 3, 4	600	250	I.T	22a	—	—	100,000	—	65,000	25,000	—	22,000	—	**12-33**
JDC	70 – 250	2, 3, 4	600	250	I.T	22a	—	—	200,000	—	100,000	35,000	—	22,000	—	**12-33**
K-Frame																
DK	250 – 400	2, 3	240	250	N.I.T.	14b	—	—	65,000	—	—	—	—	10,000	—	**12-44**
KDB	100 – 400	2, 3	600	250	N.I.T.	23a	—	—	65,000	—	35,000	25,000	—	10,000	—	**12-44**
KD	100 – 400	2, 3, 4	600	250	I.T	23a	—	—	65,000	—	35,000	25,000	—	10,000	—	**45-31, 45-32, 12-46, 12-47**
CKD	100 – 400	2, 3, 4	600	250	I.T	23a	—	—	65,000	—	35,000	25,000	—	10,000	—	**12-45, 12-48, 12-49**
HKD	100 – 400	2, 3, 4	600	250	I.T	23a	—	—	100,000	—	65,000	35,000	—	22,000	—	**45-31, 45-32, 12-46, 12-47**
CHKD	100 – 400	2, 3, 4	600	250	I.T	23a	—	—	100,000	—	65,000	35,000	—	22,000	—	**12-45, 12-48, 12-49**
KDC	100 – 400	2, 3, 4	600	250	I.T	23a	—	—	200,000	—	100,000	50,000	—	22,000	—	**45-31, 45-32, 12-46, 12-47**
L-Frame																
LDB	300 – 600	2, 3	600	250	N.I.T.	23a	—	—	65,000	—	35,000	25,000	—	22,000	—	**12-59**
LD	300 – 600	2, 3, 4	600	250	I.T	23a	—	—	65,000	—	35,000	25,000	—	22,000	—	**45-37, 45-38, 12-61**
CLD	300 – 600	2, 3, 4	600	250	I.T	23a	—	—	65,000	—	35,000	25,000	—	22,000	—	**12-58, 12-64**
HLD	300 – 600	2, 3, 4	600	250	I.T	23a	—	—	100,000	—	65,000	35,000	—	25,000	—	**45-37, 45-38, 12-61**
CHLD	300 – 600	2, 3, 4	600	250	I.T	23a	—	—	100,000	—	65,000	35,000	—	25,000	—	**12-58, 12-64**
LDC	300 – 600	2, 3, 4	600	250	I.T	23a	—	—	200,000	—	100,000	50,000	—	25,000	—	**45-37, 45-38, 12-62**
CLDC	300 – 600	2, 3, 4	600	250	I.T	23a	—	—	200,000	—	100,000	50,000	—	25,000	—	**12-58, 12-65**

① N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.
② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250V DC.
③ Use the new J250 whenever possible.

Contents



Typical L-Frame Circuit Breaker

Product Description

- All 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.
- L-Frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

Technical Data

Table 45-54. UL489 Interrupting Capacity Ratings ①

Circuit Breaker Type	Number of Poles	Interrupting Capacity (rms Symmetrical Amperes) (kA)						
		Volts AC (50/60 Hz)				Volts DC		
		240	277	480	600	125	250 ②③	500
LDB	2, 3	65	—	35	25	—	22	—
LD	2, 3, 4	65	—	35	25	—	22	—
CLD	2, 3, 4	65	—	35	25	—	22	—
HLD	2, 3, 4	100	—	65	35	—	25	—
CHLD ④	2, 3, 4	100	—	65	35	—	25	—
LDC	2, 3, 4	200	—	100	50	—	30	—
CLDC ④	2, 3, 4	200	—	100	50	—	30	—

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.

Table 45-55. IEC 947-2 Interrupting Capacity Ratings ⑤

Circuit Breaker Type	Number of Poles		Interrupting Capacity (Symmetrical Amperes) (kA)			
			Volts AC (50/60 Hz)			Volts DC
			240	415	690	250 ⑥⑦
LDB	2, 3	I_{cu} I_{cs}	85 85	45 45	20 10	20 10
LD	2, 3, 4	I_{cu} I_{cs}	85 85	45 45	20 10	20 10
CLD ⑧	2, 3, 4	I_{cu} I_{cs}	85 85	45 45	20 10	20 10
HLD	2, 3, 4	I_{cu} I_{cs}	100 100	70 70	25 13	20 10
CHLD ⑧	2, 3, 4	I_{cu} I_{cs}	100 100	70 70	25 13	20 10
LDC	2, 3, 4	I_{cu} I_{cs}	200 100	100 75	35 18	20 10
CLDC ⑧	2, 3, 4	I_{cu} I_{cs}	200 100	100 75	35 18	20 10

⑤ Utilization category A circuit breakers.
⑥ L/R = 8 milliseconds minimum.
⑦ 2-pole circuit breaker or two poles of 3-pole circuit breaker. Incorporating Thermal-Magnetic trip unit only.
⑧ 100% rated breakers.

Line and Load Terminals

Line and Load Terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc., Standards UL486A and UL486B and CSA Standard C22.2 No. 65M. Unless otherwise specified, L-Frame circuit breaker line and load terminals are shipped separately for field installation.

The wire connecting terminal is secured with two pan-head, slotted screws and lockwashers which can be checked for the correct torque loading or retightened from the front of the circuit breaker before installation of the conductors. (Applies to all styles.) The circuit breaker line/load terminal conductors are positioned in the conducting holes in the wire connecting terminal and are secured with recessed socket screws which are tightened to the correct torque loading from the front of the circuit breaker.

Ordering Information

L-Frame circuit breakers use Cu/Al terminals as standard. When optional copper terminals are required, order by Catalog Number. Specify if factory installation is required.

Table 45-61. Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range/Number of Conductors	Metric Wire Range mm^2	Terminal		Terminals with Control Wire Termination	
					Catalog Number	Price U.S. $	Catalog Number	Price U.S. $
Standard Cu/Al Pressure Terminals								
400	Aluminum	Cu/Al	4/0 – 600 (1)	120 – 300	**2TA401LDK** — 2-Pole Kit ①	49.50	—	—
					3TA401LDK — 3-Pole Kit ①	76.00	—	—
					4TA401LDK — 4-Pole Kit ①	100.00	—	—
450	Aluminum	Cu/Al	4 – 4/0 (2)	25 – 95	**TA450LD** ②	47.25	—	—
500	Aluminum	Cu/Al	3/0 – 350 (2)	95 – 150	**TA602LD** ②	29.50	**TA602LDKCW**	29.50
600	Aluminum	Cu/Al	400 – 500 (2)	185 – 240	**2TA603LDK** — 2-Pole Kit ①	63.00	**2TA603LDKCW**	63.00
					3TA603LDK — 3-Pole Kit ①	93.00	**3TA603LDKCW**	93.00
					4TA603LDK — 4-Pole Kit ①	124.00	**4TA603LDKCW**	124.00
Optional Copper and Cu/Al Pressure Type Terminals								
600	Copper	Cu	250 – 350 (2)	120 – 250	**T602LD** ②	32.00	—	—

① Terminal kits contain one terminal for each pole and one terminal cover.
② Individually packed.

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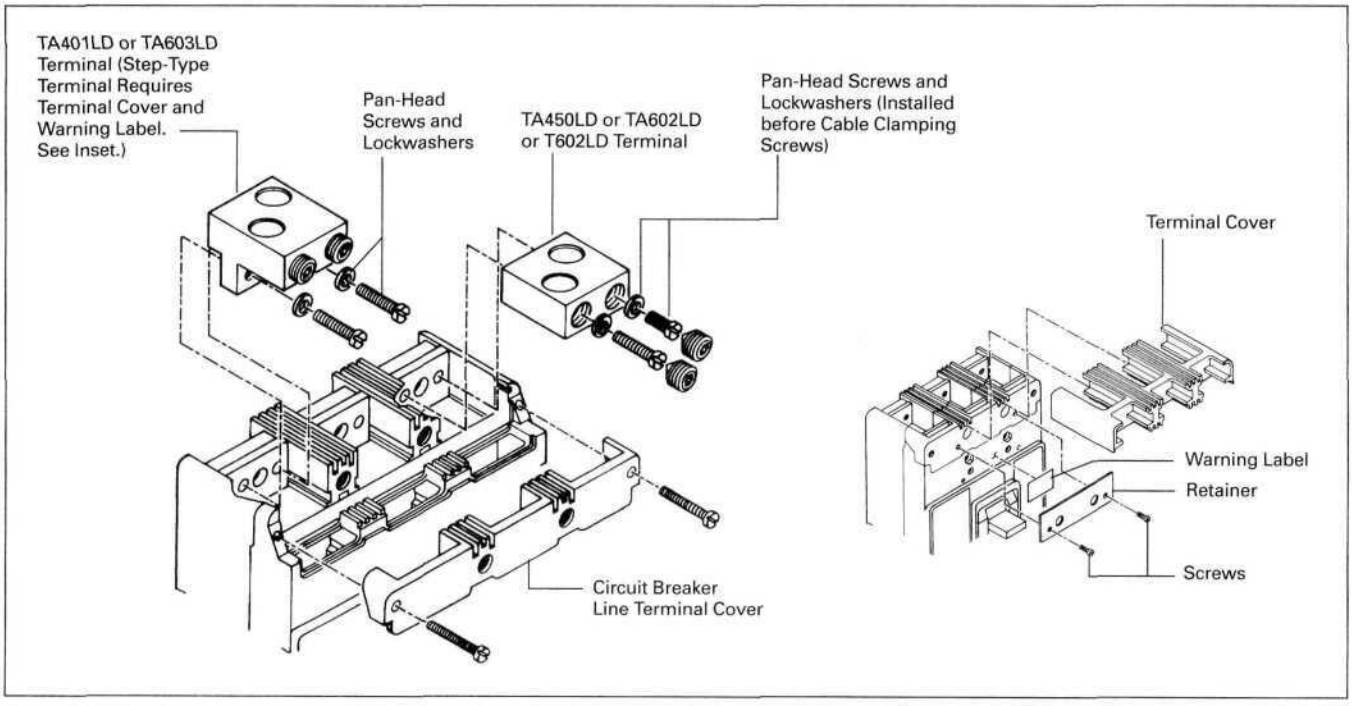

Figure 45-8. Terminals

A

MOLDED CASE CIRCUIT BREAKER REPLACEMENT GUIDE

Series C Industrial Circuit Breakers

	150A	225A, 250A		400A	400A	400A	600A
CURRENT DESIGN	FDB, FD, HFD, FDC	JD, HJD, JDC 250 Ampere	JDB 250 Ampere	DK❶	KD, HKD, KDC❶	KDB	LD, HLD, LDB
							
Dimensions – Inches Per 3-pole Breaker							
	W 4⅛ H 6 D 3⅜	W 4⅛ H 10 D 4¹⁄₁₆	W 4⅛ H 10 D 4¹⁄₁₆	W 5½ H 10⅛ D 4¹⁄₁₆	W 5½ H 10⅛ D 4¹⁄₁₆	W 5½ H 10⅛ D 4¹⁄₁₆	W 8¼ H 10¾ D 4¹⁄₁₆

Replacement Circuit Breakers

REPLACEMENT	FB, HFB W 4⅛ H 6 D 3⅜	KB, HKB (250 Amp) W 4⅛ H 10 D 4¹⁄₁₆ KA, HKA❶ (225 Amp) W 5½ H 10⅛ D 4¹⁄₁₆	JB (250 Amp) W 4⅛ H 10 D 4¹⁄₁₆ JA❶ (225 Amp) W 5½ H 10⅛ D 4¹⁄₁₆	DA❶ W 5½ H 10⅛ D 4¹⁄₁₆	LB, HLB❶ W 5½ H 10⅛ D 4¹⁄₁₆ LA, HLA W 8¼ H 10¾ D 4¹⁄₁₆	LBB❶ W 5½ H 10⅛ D 4¹⁄₁₆ LAB W 8¼ H 10¾ D 4¹⁄₁₆	LC, HLC W 8¼ H 10¾ D 4¹⁄₁₆ LA, HLA W 8¼ H 10¾ D 4¹⁄₁₆

Out-of-Production Westinghouse Circuit Breakers

OUT OF PRODUCTION	FA, HFA *1974 W 4⅛ H 6½ D 3⅜ *Indicates the last date of manufacture.	JK (225 Amp) *1967 W 8¼ H 10¾ D 4¹⁄₁₆ K, HK (225 Amp) *1967 W 8¼ H 15½ D 4¹⁄₁₆	J (225 Amp) *1967 W 8¼ H 10⅛ D 4¹⁄₁₆		JKL *1967 W 8¼ H 10¾ D 4¹⁄₁₆ KL, HKL *1967 W 8¼ H 15¾ D 4¹⁄₁₆		L, LM, HLM *1967 W 8¼ H 22 D 5½ SPCB 600A, SCB 600A *1986 Consult Cutler-Hammer W 8¼ H 10¾ D 4¹⁄₁₆

Out-of-Production Cutler-Hammer Circuit Breakers Last Manufactured by Cutler-Hammer in 1994

OUT OF PRODUCTION	FS, FH FC, HFC W 4⅛ H 6⅛ D 3⁹⁄₁₆	JS, JH, JL W 4⅛ H 12 D 3¹³⁄₁₆	JS W 4⅛ H 12 D 3¹³⁄₁₆	KS-D KS W 5½ H 10⅛ D 3¹³⁄₁₆	KS-D, KH-D KS, KH W 5½ H 12²⁹⁄₆₄ D 3¹³⁄₁₆	KS-D, KH-D KS, KH W 5½ H 12²⁹⁄₆₄ D 3¹³⁄₁₆	LS(E), LH(E) LS(A), LH(A) W 8¼ H 11¹⁷⁄₃₂ D 3¹³⁄₁₆

❶ When upgrading a DA, KA, HKA, JA, LB, HLB, LBB to a Series C k frame in a panelboard application, also order TAD3 spacer kit.