

April 1998  
 Mailed to: E, D, C/29-100A, 31-400A,  
 31-500A

# Mining Service Molded Case Circuit Breakers E<sup>2</sup>

## DESCRIPTION

State of the art E<sup>2</sup> Mining Service Breakers incorporate the rigid specifications and testing procedures developed by a focus group led by engineers from several large coal companies and Cutler-Hammer design engineers. Additionally, the performance of these breakers was proven and verified during hundreds of hours of field testing in harsh mine environments.

E<sup>2</sup> Mining Breakers are available in 600 V Ac and 1000Y/577 V Ac. Interchangeable trip units can be used on either 600 or 1000 V Ac frames.

The E<sup>2</sup> mining breaker family is designed especially for trailing cable application per MSHA 30 CFR 75. Field interchangeable electronic rms sensing trip units are available from 150 to 2000 amperes with instantaneous pickup settings conforming to the code of Federal Regulations 30 CFR 75.601-2. Electro-mechanical trip units are also available with a wide range of magnetic pickup ranges.

E<sup>2</sup> electronic trip units are the first to provide the mining industry with true rms sensing, made possible by the patented SuRE™ chip microprocessor in each electronic trip unit.

E<sup>2</sup> breakers are designed to be physically and electrically interchangeable with Classic Mining Service Breakers and supersedes Series C Mining Service Breakers. The table below outlines direct replacements.

## MINING BREAKER REPLACEMENT CHART (COMPLETE STYLE NUMBER/ CATALOG NUMBER LISTING ON PAGE 25)

600 V Ac			1000 V Ac		
Classic	Series C	E <sup>2</sup>	Classic	Series C	E <sup>2</sup> M
FBM HFBS	FDBM FDM HFDM (Mag. Only)	E <sup>2</sup> F	HFM		E <sup>2</sup> FM
	JDM	E <sup>2</sup> J		JDCM	E <sup>2</sup> JM
KAM KAMH	KDM	E <sup>2</sup> K	HKAM	KDCM	E <sup>2</sup> KM
LAM LAMH LCM LCMH	LDM	E <sup>2</sup> L	HLAM HLCM	LDCM	E <sup>2</sup> LM
MAM MAMH MCM MCMH NBM NBMH NCM NCMH		E <sup>2</sup> N <sup>①</sup>	HMAM HMCM HNBH HNBMH HNCM HLCLM		E <sup>2</sup> NM <sup>①</sup>
		E <sup>2</sup> R <sup>②</sup>	HPBM		E <sup>2</sup> RM <sup>②</sup>

① E<sup>2</sup>N/E<sup>2</sup>NM is physically different than the MAM/MCM/HMAM/HMCM/HLCLM see DS29-170MS.  
 ② E<sup>2</sup>R/E<sup>2</sup>RM is a new frame physically different than the HPBM see DS29-170MS.



## Mining Service Molded Case Circuit Breakers E<sup>2</sup>

### INTERRUPTING CAPACITY RATINGS

Circuit Breaker Type	Interrupting Capacity (Symmetrical kA)				
	Volts Ac (50/60 Hz)				Volts Dc <sup>②</sup>
	240	480	600	1000Y/577	
E <sup>2</sup> F	65	25	18	..	10
E <sup>2</sup> J	65	35	18	..	10
E <sup>2</sup> K	65	35	25	..	10
E <sup>2</sup> L	65	35	25	..	22
E <sup>2</sup> N	65	50	25	..	..
E <sup>2</sup> R	125	65	50	..	..
E <sup>2</sup> FM	...	25	18	10	10
E <sup>2</sup> JM	...	35	18	10	10
E <sup>2</sup> KM	...	35	25	14	10
E <sup>2</sup> LM	...	35	25	14	22
E <sup>2</sup> NM <sup>①</sup>	...	50	25	25	..
E <sup>2</sup> RM	...	65	50	25	..

Cutler-Hammer Mining Service Circuit Breakers provide short circuit protection as specified in the code of Federal Regulations 30 CFR 75.601-2. E<sup>2</sup> 225/400 ampere K frame and 400/600 ampere L frame electronic trip units feature specifically designed instantaneous pickup settings to conform exactly with the code of Federal Regulations 30 CFR 75.601-2. Electromechanical trip units are also available with a wide range of magnetic pickup ranges.

The table below lists the conductor size maximum allowable circuit breaker instantaneous setting and the E<sup>2</sup> breaker that meets that setting.

### TRAILING CABLE SETTING PER 30 CFR 75

Conductor Size	Maximum Breaker Instantaneous Setting	Maximum Ampere 75° C Insulated Conductor	E <sup>2</sup> /E <sup>2</sup> M Instantaneous Only	Setting
14	50	15	E <sup>2</sup> K 150A	A
12	75	20	E <sup>2</sup> K 150A	B
10	150	30	E <sup>2</sup> K 150A	C
8	200	50	E <sup>2</sup> K 225A	A
6	300	65	E <sup>2</sup> K 225A	B
4	500	85	E <sup>2</sup> K 225A/E2L 400A	C/A
3	600	100	E <sup>2</sup> K 225A/E2L 400A	D/B
2	800	115	E <sup>2</sup> K 225A/E2L 400A	E/C
1	1,000	130	E <sup>2</sup> K 225A/E2L 400A	F/D
1/0	1,250	150	E <sup>2</sup> K 225A/E2L 400A	G/E
2/0	1,500	175	E <sup>2</sup> K 225A/E2L 400A	H/F
3/0	2,000	200	E <sup>2</sup> L 400A	G
4/0	2,500	230	E <sup>2</sup> L 400A	H
250	2,500	255	E <sup>2</sup> L 400A	H
300	2,500	285	E <sup>2</sup> L 400A	H
350	2,500	310	E <sup>2</sup> L 400A	H
400	2,500	335	E <sup>2</sup> L 400A	H
500	2,500	380	E <sup>2</sup> L 400A	H

① Series rated for application with Cutler-Hammer E<sup>2</sup>M Breakers.

② Two poles in series. Breakers with electronic trip units are not Dc rated.

## Cutler-Hammer

Five Parkway Center  
 Pittsburgh, Pennsylvania, U.S.A. 15220

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 31-500A

# Mining Service Molded Case Circuit Breakers E<sup>2</sup>F/E<sup>2</sup>FM

## INTERRUPTING CAPACITY RATINGS

Circuit Breaker Type	Interrupting Capacity (Symmetrical Amperes)				
	Volts Ac (50/60 Hz)				Volts Dc
	240	480	600	1000Y/577	250
E <sup>2</sup> F	65,000	25,000	18,000	.....	10,000
E <sup>2</sup> FM	.....	25,000	18,000	10,000	10,000

## THERMAL-MAGNETIC CIRCUIT BREAKERS SEALED BREAKERS WITH NON-INTERCHANGEABLE TRIP UNIT

Maximum Continuous Ampere Rating at 40°C	600 V Ac Maximum, 250 V Dc 25 kA at 480 V Ac 3-Pole <sup>①</sup>	1000Y/577 V Ac Maximum, 250 V Dc 10 kA at 1000 V Ac 3-Pole
	CATALOG NUMBERS	
15	E2F3015	.....
20	E2F3020	.....
25	E2F3025	.....
30	E2F3030	.....
35	E2F3035	.....
40	E2F3040	.....
45	E2F3045	.....
50	E2F3050	E2FM3050
60	E2F3060	E2FM3060
70	E2F3070	E2FM3070
80	E2F3080	E2FM3080
90	E2F3090	E2FM3090
100	E2F3100	E2FM3100
125	E2F3125	E2FM3125
150	E2F3150	E2FM3150

## MAGNETIC ONLY CIRCUIT BREAKERS SEALED BREAKERS WITH NON-INTERCHANGEABLE TRIP UNIT

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum, 250 V Dc 25 kA at 480 V Ac 3-Pole	1000Y/577 V Ac Maximum, 250 V Dc 10 kA at 1000 V Ac 3-Pole
		CATALOG NUMBERS	
3	9- 30	E2F003AM	.....
7	21- 70	E2F007CM	.....
15	45- 150	E2F015EM	.....
30	90- 300	E2F030HM	.....
30	50- 150	E2F030EM	.....
50	150- 500	E2F050KM	E2FM050KM
50	66- 190	E2F050YM	E2FM050YM
70	210- 700	E2F070MM	E2FM070MM
100	150- 500	E2F100KM	E2FM100KM
100	300-1000	E2F100RM	E2FM100RM
150	450-1500	E2F150TM	E2FM150TM
150	750-2500	E2F150UM	E2FM150UM

① For 2-pole application use outer poles.

<b>Further Information</b> List Prices..... Price and Availability Digest Dimensions.... DS 29-170MS
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## Mining Service Molded Case Circuit Breakers E<sup>2</sup>J/E<sup>2</sup>JM

### INTERRUPTING CAPACITY RATINGS

Circuit Breaker Type	Interrupting Capacity (Symmetrical Amperes)				
	Volts Ac (50/60 Hz)				Volts Dc
	240	480	600	1000Y/577	250
E <sup>2</sup> J	65,000	35,000	18,000	.....	10,000
E <sup>2</sup> JM	.....	35,000	18,000	10,000	10,000

### CIRCUIT BREAKERS WITH INTERCHANGEABLE THERMAL-MAGNETIC TRIP UNIT

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum, 250 V Dc 35 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum, 250 V Dc 10 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
70	350- 700	E2J3070W	E2J3250F	E2JM3070W	E2JM3250F	E2J3070T
90	450- 900	E2J3090W	.....	E2JM3090W	.....	E2J3090T
100	500-1000	E2J3100W	.....	E2JM3100W	.....	E2J3100T
125	625-1250	E2J3125W	.....	E2JM3125W	.....	E2J3125T
150	750-1500	E2J3150W	.....	E2JM3150W	.....	E2J3150T
175	875-1750	E2J3175W	.....	E2JM3175W	.....	E2J3175T
200	1000-2000	E2J3200W	.....	E2JM3200W	.....	E2J3200T
225	350- 700	E2J3225AW	.....	E2JM3225AW	.....	E2J3225TA
225	500-1000	E2J3225DW	.....	E2JM3225DW	.....	E2J3225TD
225	1125-2250	E2J3225W	.....	E2JM3225W	.....	E2J3225T
250	1250-2500	E2J3250W	.....	E2JM3250W	.....	E2J3250T

### CIRCUIT BREAKERS WITH INTERCHANGEABLE MAGNETIC ONLY TRIP UNIT

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum, 250 V Dc 25 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum, 250 V Dc 10 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
250	350- 700	E2J3250MAW	E2J3250F	E2JM3250MAW	E2JM3250F	E2J3250TMA
250	450- 900	E2J3250MCW	.....	E2JM250MCW	.....	E2J3250TMC
250	500-1000	E2J3250MDW	.....	E2JM3250MDW	.....	E2J3250TMD
250	625-1250	E2J3250MFW	.....	E2JM3250MFW	.....	E2J3250TMF
250	750-1500	E2J3250MGW	.....	E2JM3250MGW	.....	E2J3250TMG
250	875-1750	E2J3250MJW	.....	E2JM3250MJW	.....	E2J3250TMJ
250	1000-2000	E2J3250MKW	.....	E2JM3250MKW	.....	E2J3250TMK
250	1125-2250	E2J3250MLW	.....	E2JM3250MLW	.....	E2J3250TML
250	1250-2500	E2J3250MW	.....	E2JM3250MW	.....	E2J3250TM

**Further Information**  
 List Prices..... Price and Availability Digest  
 Dimensions..... DS 29-170MS

## Cutler-Hammer

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# Mining Service Molded Case Circuit Breakers E<sup>2</sup>K/E<sup>2</sup>KM

## INTERRUPTING CAPACITY RATINGS

Circuit Breaker Type	Interrupting Capacity (Symmetrical Amperes)				
	Volts Ac (50/60 Hz)				Volts Dc
	240	480	600	1000Y/577	250 <sup>①</sup>
E <sup>2</sup> K	65,000	35,000	25,000	.....	10,000
E <sup>2</sup> KM	.....	35,000	25,000	14,000	10,000

## CIRCUIT BREAKERS WITH INTERCHANGEABLE THERMAL-MAGNETIC TRIP UNIT

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum, 250 V Dc 35 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum, 250 V Dc 14 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
100	500-1000	E2K3100W	E2K3400F	E2KM3100W	E2KM3400F	E2K3100T
125	625-1250	E2K3125W	.....	E2KM3125W	.....	E2K3125T
150	750-1500	E2K3150W	.....	E2KM3150W	.....	E2K3150T
175	875-1750	E2K3175W	.....	E2KM3175W	.....	E2K3175T
200	1000-2000	E2K3200W	.....	E2KM3200W	.....	E2K3200T
225	350- 700	E2K3225AW	.....	E2KM3225AW	.....	E2K3225TA
225	500-1000	E2K3225DW	.....	E2KM3225DW	.....	E2K3225TD
225	1125-2250	E2K3225W	.....	E2KM3225W	.....	E2K3225T
250	1250-2500	E2K3250W	.....	E2KM3250W	.....	E2K3250T
300	1500-3000	E2K3300W	.....	E2KM3300W	.....	E2K3300T
350	1750-3500	E2K3500W	.....	E2KM3500W	.....	E2K3500T
400	2000-4000	E2K3400W	.....	E2KM3400W	.....	E2K3400T

## CIRCUIT BREAKERS WITH INTERCHANGEABLE MAGNETIC ONLY TRIP UNIT

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum, 250 V Dc 35 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum, 250 V Dc 14 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
400	350- 700	E2K3400MAW	E2K3400F	E2KM3250MAW	E2KM3400F	E2K3400TMA
400	500-1000	E2K3400MDW	.....	E2KM3400MDW	.....	E2K3400TMD
400	625-1250	E2K3400MFW	.....	E2KM3400MFW	.....	E2K3400TMF
400	750-1500	E2K3400MGW	.....	E2KM3400MGW	.....	E2K3400TMG
400	875-1750	E2K3400MJW	.....	E2KM3400MJW	.....	E2K3400TMJ
400	1000-2000	E2K3400MKW	.....	E2KM3400MKW	.....	E2K3400TMK
400	1125-2250	E2K3400MLW	.....	E2KM3400MLW	.....	E2K3400TML
400	1250-2500	E2K3400MWW	.....	E2KM3400MWW	.....	E2K3400TMW
400	1500-3000	E2K3400MNW	.....	E2KM3400MNW	.....	E2K3400TMN
400	1750-3500	E2K3400MRW	.....	E2KM3400MRW	.....	E2K3400TMR
400	2000-4000	E2K3400MW	.....	E2KM3400MW	.....	E2K3400TM

<sup>①</sup> Dc rating applies to breakers with thermal-magnetic trip unit, breakers with electronic trip unit are not Dc rated.



**Mining Service Molded Case Circuit Breakers E<sup>2</sup>K/E<sup>2</sup>KM**

**CIRCUIT BREAKERS WITH INTERCHANGEABLE ELECTRONIC TRIP UNIT,  
 LONG/INSTANTANEOUS**

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum 35 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum 14 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
100	50- 800	E2KE3100W	E2K3400F	E2KEM3100W	E2KM3400F	KEM3100T
125	50- 800	E2KE3125W	.....	E2KEM3125W	.....	KEM3125T
150	50- 800	E2KE3150W	.....	E2KEM3150W	.....	KEM3150T
200	200-1500	E2KE3200W	.....	E2KEM3200W	.....	KEM3200T
225	200-1500	E2KE3225W	.....	E2KEM3225W	.....	KEM3225T
225	500-2500	E2KE32252W	.....	E2KEM32252W	.....	KEM3225T2
400	200-1500	E2KE3400W	.....	E2KEM3400W	.....	KEM3400T
400	500-2500	E2KE34002W	.....	E2KEM34002W	.....	KEM3400T2

**CIRCUIT BREAKERS WITH INTERCHANGEABLE ELECTRONIC TRIP UNIT,  
 INSTANTANEOUS ONLY**

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum 35 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum 14 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
150	50- 800	E2KE3150MW	E2K3400F	E2KEM3150MW	E2KM3400F	KEM3150TM
225	200-1500	E2KE3225MW	.....	E2KEM3225MW	.....	KEM3225TM
225	500-2500	E2KE3225M2W	.....	E2KEM3225M2W	.....	KEM3225TM2
400	200-1500	E2KE3400MW	.....	E2KEM3400MW	.....	KEM3400TM
400	500-2500	E2KE3400M2W	.....	E2KEM3400M2W	.....	KEM3400TM2

**Further Information**  
 List Prices..... Price and Availability Digest  
 Dimensions..... DS 29-170MS

**Cutler-Hammer**

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 31-500A

# Mining Service Molded Case Circuit Breakers E<sup>2</sup>L/E<sup>2</sup>LM

## INTERRUPTING CAPACITY RATINGS

Circuit Breaker Type	Interrupting Capacity (Symmetrical Amperes)				
	Volts Ac (50/60 Hz)				Volts Dc
	240	480	600	1000Y/577	250②
E <sup>2</sup> L	65,000	35,000	25,000	.....	22,000
E <sup>2</sup> LM	.....	35,000	25,000	14,000	22,000

## CIRCUIT BREAKERS WITH INTERCHANGEABLE THERMAL-MAGNETIC TRIP UNIT

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum, 250 V Dc 35 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum, 250 V Dc 18 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
300	1500-3000	E2L3300W	E2L3600F	E2LM3300W	E2LM3600F	E2L3300T
350	1750-3500	E2L3500W	.....	E2LM3500W	.....	E2L3500T
400	2000-4000	E2L3400W	.....	E2LM3400W	.....	E2L3400T
450	2250-4500	E2L3450W	.....	E2LM3450W	.....	E2L3450T
500	2500-5000	E2L3500W	.....	E2LM3500W	.....	E2L3500T
600	3000-6000	E2L3600W	.....	E2LM3600W	.....	E2L3600T

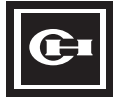
## CIRCUIT BREAKERS WITH INTERCHANGEABLE MAGNETIC ONLY TRIP UNIT

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum, 250 V Dc 35 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum, 250 V Dc 18 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
600	1125-2250	E2L3600MLW	E2L3600F	E2LM3600MLW	E2LM3600F	E2L3600TML
600	1500-3000	E2L3600MNW	.....	E2LM3600MNW	.....	E2L3600TMN
600	1750-3500	E2L3600MRW	.....	E2LM3600MRW	.....	E2L3600TMR
600	2000-4000	E2L3600MXW	.....	E2LM3600MXW	.....	E2L3600TMX
600	2250-4500	E2L3650MYW	.....	E2LM3600MYW	.....	E2L3600TMY
600	2500-5000	E2L3600MPW	.....	E2LM3600MPW	.....	E2L3600TMP
600	3000-6000	E2L3600MW	.....	E2LM3600MW	.....	E2L3600TM

## CIRCUIT BREAKERS WITH INTERCHANGEABLE ELECTRONIC TRIP UNIT, LONG/INSTANTANEOUS

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum 35 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum 18 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
300	500-2500	E2LE3300W	E2L3600F	E2LEM3300W	E2LM3600F	LEM3300T
350	500-2500	E2LE3350W	.....	E2LEM3350W	.....	LEM3350T
400	500-2500	E2LE3400W	.....	E2LEM3400W	.....	LEM3400T
400	1000-4000	E2LE34002W	.....	E2LEM34002W	.....	LEM3400T2
600	500-2500	E2LE3600W	.....	E2LEM3600W	.....	LEM3600T
600	1000-4000	E2LE36002W	.....	E2LEM36002W	.....	1483D53G49

① Dc rating applies to breakers with thermal-magnetic trip unit, breakers with electronic trip unit are not Dc rated.



**Mining Service Molded Case Circuit Breakers E<sup>2</sup>L/E<sup>2</sup>LM**

**CIRCUIT BREAKERS WITH INTERCHANGEABLE ELECTRONIC TRIP UNIT, INSTANTANEOUS ONLY**

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum 35 kA at 480 V Ac 3-Pole		1000Y/577 V Ac Maximum 18 kA at 1000 V Ac 3-Pole		
		Complete Breaker	Frame Only	Complete Breaker	Frame Only	Trip Unit Only
		CATALOG NUMBERS				
400	500-2500	E2LE3400MW	E2L3600F	E2LEM3400MW	E2LM3600F	LEM3400TM
400	1000-4000	E2LE3400M2W	.....	E2LEM3400M2W	.....	LEM3400TM2
600	500-2500	E2LE3600MW	.....	E2LEM3600MW	.....	LEM3600TM
600	1000-4000	E2LE3600M2W	.....	E2LEM3600M2W	.....	1483D53G50

**Further Information**  
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 Dimensions..... DS 29-170MS

**Cutler-Hammer**

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 31-500A

# Mining Service Molded Case Circuit Breakers E<sup>2</sup>N/E<sup>2</sup>NM

## INTERRUPTING CAPACITY RATINGS

Circuit Breaker Type	Interrupting Capacity (Symmetrical Amperes)			
	Volts Ac (50/60 Hz)			
	240	480	600	1000Y/577
E <sup>2</sup> N	65,000	50,000	25,000	.....
E <sup>2</sup> NM	.....	50,000	25,000	25,000

The E<sup>2</sup>NM is series rated with E<sup>2</sup>KM and E<sup>2</sup>LM for application where 25 kA I.C. is required at 1000Y/577 V Ac.

## CIRCUIT BREAKERS WITH ELECTRONIC TRIP UNIT, LONG/INSTANTANEOUS

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum	1000Y/577 V Ac Maximum
		50 kA at 480 V Ac 3-Pole Frame	25 kA at 1000 V Ac 3-Pole Frame
CATALOG NUMBERS			
500	500-2500	E2N3500W	E2NM3500W
600	500-2500	E2N3600W	E2NM3600W
700	500-2500	E2N3700W	E2NM3700W
800	500-2500	E2N3800W	E2NM3800W
900	1250-5000	E2N3900W	E2NM3900W
1000	1250-5000	E2N310W	E2NM310W
1200	1250-5000	E2N312W	E2NM312W

## CIRCUIT BREAKERS WITH ELECTRONIC TRIP UNIT, INSTANTANEOUS ONLY

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum	1000Y/577 V Ac Maximum
		50 kA at 480 V Ac 3-Pole Frame	25 kA at 1000 V Ac 3-Pole Frame
CATALOG NUMBERS			
800	500-2500	E2N3800MW	E2NM3800MW
1200	1250-5000	E2N312MW	E2NM312MW

**Further Information**  
 List Prices..... Price and Availability Digest  
 Dimensions.... DS 29-170MS



## Mining Service Molded Case Circuit Breakers E<sup>2</sup>R/E<sup>2</sup>RM

### INTERRUPTING CAPACITY RATINGS

Circuit Breaker Type	Interrupting Capacity (Symmetrical Amperes)			
	Volts Ac (50/60 Hz)			
	240	480	600	1000Y/577
E <sup>2</sup> R	125,000	65,000	50,000	.....
E <sup>2</sup> RM	.....	65,000	50,000	25,000

### CIRCUIT BREAKERS WITH ELECTRONIC TRIP UNIT, LONG/INSTANTANEOUS

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	600 V Ac Maximum 50 kA at 480 V Ac 3-Pole Frame	1000Y/577 V Ac Maximum 25 kA at 1000 V Ac 3-Pole Frame
		CATALOG NUMBERS	
LS			
1600 2000	2-8 x I <sub>N</sub> 2-8 x I <sub>N</sub>	E2R316T33W E2R320T33W	E2RM316T33W E2RM320T33W
LSI			
1600 2000	2-8 x I <sub>N</sub> 2-8 x I <sub>N</sub>	E2R316T32W E2R320T32W	E2RM316T32W E2RM320T32W

**Further Information**  
 List Prices ..... Price and Availability Digest  
 Dimensions .... DS 29-170MS

## Cutler-Hammer

Five Parkway Center  
 Pittsburgh, Pennsylvania, U.S.A. 15220

April 1998

# Mining Service Molded Case Circuit Breakers Accessories

## LINE AND LOAD TERMINALS

Breaker Type	Maximum Breaker Amps	Wire Type	AWG Wire Range (No. Conductors)	CATALOG NUMBERS
E <sup>2</sup> F/E <sup>2</sup> FM	100 150 250	Cu/Al Cu	#14-1/0 (1) #4-4/0 (1)	3T100FB Package of 3 3T150FB Package of 3
E <sup>2</sup> J/E <sup>2</sup> JM	250	Cu	#4-350 (1)	T250KB
E <sup>2</sup> K/E <sup>2</sup> KM	225 350 400	Cu Cu Cu	#3-350 (1) 250-500 (1) 2/0-250 (2)	T300K T350K 3T400K (3-Pole Kit)
E <sup>2</sup> L/E <sup>2</sup> LM	400 600	Cu/Al Cu	4/0-600 (1) 250-350 (2)	3TA401LDK (3-pole kit) T603LD
E <sup>2</sup> N/E <sup>2</sup> NM	700 1000 1200 1600 2000	Cu Cu Cu Cu/Al Cu/Al	2/0-500 (2) 3/0-500 (3) 3/0-400 (4) 500-1000 (4) 2-600 (6)	T700NB1 T1000NB1 T1200NB3 TA1600RD TA2000RD

## EXTERNAL ACCESSORIES

### Padlockable Handle Lock Hasp

Breaker Type	CATALOG NUMBERS
E <sup>2</sup> F/E <sup>2</sup> FM	PLK1
E <sup>2</sup> J/E <sup>2</sup> JM	PLK2
E <sup>2</sup> K/E <sup>2</sup> KM	PLK3
E <sup>2</sup> L/E <sup>2</sup> LM	PLK4
E <sup>2</sup> N/E <sup>2</sup> NM	PLK5
E <sup>2</sup> R/E <sup>2</sup> RM	PLK6 Factory modification only.

### End Cap Terminals - for use with ring type terminals

Breaker Type	Maximum Breaker Amps	CATALOG NUMBERS
E <sup>2</sup> F/E <sup>2</sup> FM	150	KPEK1
E <sup>2</sup> J/E <sup>2</sup> JM	250	Mid 1997 availability use PLN2
E <sup>2</sup> K/E <sup>2</sup> KM	400	KPEK3
E <sup>2</sup> L/E <sup>2</sup> LM	600	KPEK4

## INTERNAL ACCESSORIES<sup>①</sup>

### Undervoltage Release

Breaker Type	UVR Type	Voltage Rating	Mounting Location	CATALOG NUMBERS
E <sup>2</sup> F/E <sup>2</sup> FM	Handle Reset	208-240 Vac 110-127 Vdc 110-127 Vac 208-240 Vac 110-127 Vdc	Left Pole Left Pole Left Pole Left Pole Left Pole	UVH1LP11K (Thermal/Magnetic Only) UVH 1LP26K (Thermal/Magnetic Only) MUVH1LP08K (Magnetic Only) MUVH1LP11K (Magnetic Only) MUVH1LP26K (Magnetic Only)
E <sup>2</sup> J/E <sup>2</sup> JM	Handle Reset	110-127 Vac 208-240 Vac 110-125 Vdc	Left Pole Left Pole Left Pole	UVH2LP08K UVH2LP11K UVH2LP26K
E <sup>2</sup> K/E <sup>2</sup> KM	120V Handle Reset with LED 120V Handle Reset with LED Handle Reset Handle Reset Handle Reset	120 Vac 120 Vac 110-127 Vac 208-240 Vac 110-125 Vdc	Left Pole Left Pole Left Pole Left Pole Left Pole	UVM3LP08K <sup>②</sup> UVM3LP08KT <sup>③</sup> UVH3LP08K UVH3LP11K UVH3LP26K
E <sup>2</sup> L/E <sup>2</sup> LM	120V Handle Reset with LED 120V Handle Reset with LED Handle Reset Handle Reset Handle Reset	120 Vac 120 Vac 110-127 Vac 208-240 Vac 110-125 Vdc	Left Pole Left Pole Left Pole Left Pole Left Pole	UVM4LP08K <sup>②</sup> UVM4LP08KT <sup>③</sup> UVH4LP08K UVH4LP11K UVH4LP26K
E <sup>2</sup> N/E <sup>2</sup> NM	Electric Reset Handle Reset Handle Reset Handle Reset	120 Vac 110-127 Vac 208-240 Vac 110-125 Vdc	Left Pole Left Pole Left Pole Left Pole	UVE5LP08K UVH5LP08K UVH5LP11K UVH5LP26K
E <sup>2</sup> R/E <sup>2</sup> RM	Electric Reset Handle Reset Handle Reset Handle Reset	120 Vac 110-127 Vac 208-240 Vac 110-125 Vdc	Right Pole Right Pole Right Pole Right Pole	UVE6RP08K UVH6RP08K UVH6RP11K UVH6RP26K

<sup>①</sup> Contact Cutler-Hammer for internal accessory voltage ratings not listed.

<sup>②</sup> Pig tail leads

<sup>③</sup> Terminal block



## Mining Service Molded Case Circuit Breakers Accessories

### INTERNAL ACCESSORIES<sup>①</sup>, Continued

#### Shunt Trip

Breaker Type	Voltage Rating	Mounting Location	CATALOG NUMBERS
E <sup>2</sup> F/E <sup>2</sup> FM	48-127 Vac or 48-60 Vdc 208-230 Vac or 110-127 Vdc	Left Pole Left Pole	SNT1LP08K SNT1LP12K
E <sup>2</sup> J/E <sup>2</sup> JM	110-240 Vac or 110-125 Vdc	Left Pole	SNT2LP11K
E <sup>2</sup> K/E <sup>2</sup> KM	110-240 Vac or 110-125 Vdc	Left Pole	SNT3LP11K
E <sup>2</sup> L/E <sup>2</sup> LM	48-60 Vac 48-60 Vdc 110-240 Vac 110-125 Vdc	Left Pole Left Pole Left Pole Left Pole	SNT4LP05K SNT4LP23K SNT4LP11K SNT4LP26K
E <sup>2</sup> N/E <sup>2</sup> NM	110-240 Vac 110-125 Vdc	Left Pole Left Pole	SNT5LP11K SNT5LP26K
E <sup>2</sup> R/E <sup>2</sup> RM	110-240 Vac 110-125 Vdc	Right Pole Right Pole	SNT6RP11K SNT6RP26K

#### Auxiliary Switch

Electrical Rating Data			
Maximum Voltage	Frequency	Maximum Current Amps	
600 125 250	50/60 Hz Dc Dc	6.0 0.5 (non-inductive load) 0.25 (non-inductive load)	
Breaker Type	Number of Sets of Contacts (1A and 1B)	Mounting Location	CATALOG NUMBERS
E <sup>2</sup> F/E <sup>2</sup> FM	1 2	Left or Right Left or Right	A1X1PK A2X1PK
E <sup>2</sup> J/E <sup>2</sup> JM	1 2	Left or Right Left or Right	A1X2PK A2X2PK
E <sup>2</sup> K/E <sup>2</sup> KM	1 2	Left or Right Left or Right	A1X3PK A2X3PK
E <sup>2</sup> L/E <sup>2</sup> LM	1 2 3	Left or Right Left or Right Left or Right	A1X4PK A2X4PK A3X4PK
E <sup>2</sup> N/E <sup>2</sup> NM	1 1 2 2 3 3	Left Right Left Right Left Right	A1X5LPK A1X5RPK A2X5LPK A2X5RPK A3X5LPK A3X5RPK
E <sup>2</sup> R/E <sup>2</sup> RM	2 4	Right Right	A2X6RPK A4X6RPK

#### Alarm (Signal/Lockout Switch)

Electrical Rating Data			
Maximum Voltage	Frequency	Maximum Current Amps	
600 125 250	50/60 Hz Dc Dc	6.0 0.5 (non-inductive load) 0.25 (non-inductive load)	
Breaker Type	Number of Sets of Contacts (Make and Break)	Mounting Location	CATALOG NUMBERS
E <sup>2</sup> F/E <sup>2</sup> FM	1 2	Left/Right Left/Right	A1L1PK/A1R1PK A2L1PK/A2R1PK
E <sup>2</sup> J/E <sup>2</sup> JM	1 2	Left/Right Left/Right	A1L2PK/A1R2PK A2L2PK/A2R2PK
E <sup>2</sup> K/E <sup>2</sup> KM	1 2	Left/Right Left/Right	A1L3PK/A1R3PK A2L3PK/A2R3PK
E <sup>2</sup> L/E <sup>2</sup> LM	1 2	Left/Right Left/Right	A1L4PK/A1R4PK A2L4PK/A2R4PK
E <sup>2</sup> N/E <sup>2</sup> NM	1 2	Left/Right Left/Right	A1L5PK/A1R5PK A2L5PK/A2R5PK
E <sup>2</sup> R/E <sup>2</sup> RM	1 2	Right Right	A1L6RPK A2L6RPK

① Contact Cutler-Hammer for internal accessory voltage ratings not listed.

## Cutler-Hammer

Five Parkway Center  
 Pittsburgh, Pennsylvania, U.S.A. 15220

October 1997  
 Mailed to: E, D, C/29-100A, 31-400A,  
 31-500A

## Replacement Mining Service Circuit Breakers

### MARK 75 SELTRONIC™ MINING SERVICE CIRCUIT BREAKERS<sup>①②③</sup>

#### High Interrupting Capacity — 3-Poles Only

Developed especially for mining applications, SELTRONIC is the world's first molded case circuit breaker with a solid-state trip. They feature a small, easily changed rating plug which establishes a continuous rating or is used to convert to magnetic only operation. The instantaneous trip is independently adjustable to meet federal requirements for trailing cable protection. Rated at 50/60 Hz, Ac only, 600 volts maximum. (See page 19 for rating plug selection.)

Breaker Type	Frame	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>④</sup>
	STYLE NUMBERS		
LCMH-150	1284C80G01	None	150-1000
LCMH-150	1284C80G02	120V Shunt Trip	150-1000
LCMH-150	1284C80G03	120V Undervoltage Release	150-1000
LCMH-150	1284C80G04	120V UVR with Remote Tripping Leads <sup>⑤</sup>	150-1000
LCMH-300	1284C80G05	None	300-1500
LCMH-300	1284C80G06	120V Shunt Trip	300-1500
LCMH-300	1284C80G07	120V Undervoltage Release	300-1500
LCMH-300	1284C80G08	120V UVR with Remote Tripping Leads <sup>⑤</sup>	600-1500
LCMH-600	1284C80G09	None	600-2500
LCMH-600	1284C80G10	120V Shunt Trip	600-2500
LCMH-600	1284C80G11	120V Undervoltage Release	600-2500
LCMH-600	1284C80G12	120V UVR with Remote Tripping Leads <sup>⑤</sup>	600-2500
MCMH-800	1284C82G01	None	800-2500
MCMH-800	1284C82G02	120V Shunt Trip	800-2500
MCMH-800	1284C82G03	120V Undervoltage Release	800-2500
MCMH-800	1284C82G04	120V UVR with Remote Tripping Leads <sup>⑤</sup>	800-2500
NCMH-1200	1373D88G13	None	1600-5000
NCMH-1200	1373D88G14	120V Shunt Trip	1600-5000
NCMH-1200	1373D88G15	120V Undervoltage Release	1600-5000
NCMH-1200	1373D88G16	120V UVR with Remote Tripping Leads <sup>⑤</sup>	1600-5000

① Where required for replacement purposes or Dc applications, standard thermal magnetic MARK 75 Mining Service Circuit Breakers are available and listed in Technical Data 29-128. Consult Cutler-Hammer for assistance.

② Rating plugs are not interchangeable with standard SELTRONIC™ Breakers.

③ The MARK 75 thermal magnetic FBM equivalent is designated HFBM and is listed under Standard Mining Service Circuit Breakers.

④ The magnetic trip range does not change when rating plug is changed.

⑤ Remote tripping requires a Normally Open circuit not supplied with the breaker.



## Replacement Mining Service Circuit Breakers

### MARK 75 SELTRONIC™ MINING SERVICE CIRCUIT BREAKERS, *Continued*

#### High Interrupting Capacity Thermal Magnetic and Magnetic Only Types

Breaker Type	Frame	Poles	Amps	Trip Type	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>①</sup>
	STYLE NUMBERS					
HFBM <sup>②</sup>	1366D21G06	2	50	M	Terminal Shield	66- 190
HFBM <sup>②</sup>	1366D21G07	2	100	M	UVR <sup>①</sup> , Terminal Shield	150- 480
HFBM <sup>②</sup>	1366D21G42	3	30	M	UVR <sup>①</sup> , Terminal Shield	50- 150
HFBM <sup>②</sup>	1366D21G38	3	50	M	UVR <sup>①</sup>	66- 190
HFBM <sup>②</sup>	1366D21G39	3	50	M	Terminal Shield	66- 190
HFBM <sup>②</sup>	1366D21G40	3	50	M	UVR <sup>①</sup> , Terminal Shield	66- 190
HFBM <sup>②</sup>	1366D21G41	3	50	M	Standard Shunt Trip <sup>①</sup>	66- 190
HFBM <sup>②</sup>	1366D21G30	3	100	M	None	150- 480
HFBM <sup>②</sup>	1366D21G23	3	100	M	Terminal Shield	150- 480
HFBM <sup>②</sup>	1366D21G31	3	100	M	UVR <sup>①</sup>	150- 480
HFBM <sup>②</sup>	1366D21G24	3	100	M	UVR <sup>①</sup> , Terminal Shield	150- 480
HFBM <sup>②</sup>	1366D21G32	3	100	M	Standard Shunt Trip <sup>①</sup>	150- 480
HFBM <sup>②</sup>	1366D21G44	3	100	M	Shunt Trip <sup>①</sup> , Terminal Shield	150- 480
KAMH	1291C26G17	2	225	TM	UVR <sup>③</sup>	300- 700
KAMH	1291C26G18	2	225	TM	UVR <sup>③</sup>	500-1000
KAMH	1278C71G03	3	225	TM	None	300- 700
KAMH	1278C71G04	3	225	TM	None	500-1000
KAMH	1291C26G19	3	225	TM	UVR <sup>③</sup>	300- 700
KAMH	1291C26G20	3	225	TM	UVR <sup>③</sup>	500-1000
KAMH	1278C71G07	3	225	TM	Standard Shunt Trip <sup>①</sup>	300- 700
KAMH	1278C71G08	3	225	TM	Standard Shunt Trip <sup>①</sup>	500-1000
KAMH	1278C71G11	3	225	M	None	300- 700
KAMH	1278C71G12	3	225	M	None	500-1000
KAMH	1291C26G21	3	225	M	UVR <sup>③</sup>	300- 700
KAMH	1291C26G22	3	225	M	UVR <sup>③</sup>	500-1000
LAMH	1291C32G05	2	400	TM	UVR <sup>③</sup>	500-1000
LAMH	1278C72G02	3	400	TM	None	800-1600
LAMH	1291C32G06	3	400	TM	UVR <sup>③</sup>	800-1600
LAMH	1278C72G04	3	400	TM	Standard Shunt Trip <sup>①</sup>	800-1600
LAMH	1278C72G06	3	400	M	None	800-1600
LAMH	1291C32G08	3	400	M	UVR <sup>③</sup>	800-1600
MAMH	1278C73G01	2	600	TM	UVR <sup>①</sup>	750-1500
MAMH	1278C73G02	2	800	TM	UVR <sup>①</sup>	1000-2000
MAMH	1278C73G03	3	600	TM	None	1500-3000
MAMH	1278C73G04	3	600	TM	UVR <sup>①</sup>	1500-3000
MAMH	1278C73G05	3	600	TM	Standard Shunt Trip <sup>①</sup>	1500-3000
MAMH	1278C73G07	3	800	TM	Standard Shunt Trip <sup>①</sup>	2000-4000
MAMH	1278C73G08	3	800	TM	None	2000-4000
MAMH	1278C73G09	3	800	TM	UVR <sup>①</sup>	2000-4000
MAMH	1278C73G11	3	800	M	None	1500-3000
MAMH	1278C73G12	3	800	M	UVR <sup>①</sup>	1500-3000
MAMH	1278C73G13	3	800	M	None	2000-4000
MAMH	1278C73G14	3	800	M	UVR <sup>①</sup>	2000-4000
NBMH	1227C37G15	2	1000	TM	UVR <sup>④</sup>	1500-3000
NBMH	1227C37G16	2	1200	TM	UVR <sup>④</sup>	2000-4000
NBMH	1227C37G17	3	1000	TM	None	2500-5000
NBMH	1227C37G18	3	1000	TM	UVR <sup>④</sup>	2500-5000
NBMH	1227C37G19	3	1000	TM	Standard Shunt Trip <sup>①</sup>	2500-5000
NBMH	1227C37G21	3	1200	TM	Standard Shunt Trip <sup>①</sup>	2500-5000
NBMH	1227C37G22	3	1200	TM	None	2500-5000
NBMH	1227C37G23	3	1200	TM	UVR <sup>④</sup>	2500-5000
NBMH	1227C37G27	3	1200	M	None	2500-5000
NBMH	1227C37G28	3	1200	M	UVR <sup>④</sup>	2500-5000

- ① Rated 120 volts/60 Hz: undervoltage release is handle reset type.
- ② Types FBM and HFBM Magnetic Only breakers for Dc applications should be ordered as "similar to listed style number" and calibration for Dc specified.
- ③ UVR is auto-reset type, 120 volts Ac.
- ④ HFD030HM magnetic range 90-300 amperes; HFD030ZM magnetic range 49-72 amperes.

## Cutler-Hammer

Five Parkway Center  
 Pittsburgh, Pennsylvania, U.S.A. 15220



October 1997  
 Mailed to: E, D, C/29-100A, 31-400A,  
 31-500A

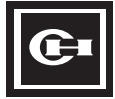
# Replacement Mining Service Circuit Breakers

## STANDARD MINING SERVICE CIRCUIT BREAKERS

These mining service circuit breakers have been specially developed to meet the trailing cable protection requirements of the Federal Register Ruling For Underground Coal Mines. The FBM through NBM breakers are rated at 600 volts Ac maximum. All breakers listed are complete with accessories indicated. Trip elements are as indicated: M-Magnetic Only; TM-Thermal Magnetic. TERMINALS NOT INCLUDED IN STYLE NUMBER.

Breaker Type	Frame	Poles	Amps	Trip Type	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>①</sup>
	STYLE NUMBERS					
FBM	1366D21G01	2	30	M <sup>②</sup>	None	50- 150
FBM	1366D21G02	2	50	M <sup>②</sup>	None	66- 190
FBM	1366D21G03	2	50	M <sup>②</sup>	Terminal Shield	66- 190
FBM	1366D21G04	2	100	M <sup>②</sup>	None	150- 480
FBM	1366D21G05	2	100	M <sup>②</sup>	UVR <sup>①</sup> , Terminal Shield	150- 480
FBM	1366D21G08	3	30	M <sup>②</sup>	None	50- 150
FBM	1366D21G14	3	30	TM	None	.....
FBM	1366D21G09	3	30	M <sup>②</sup>	Terminal Shield	50- 150
FBM	1366D21G12	3	30	M <sup>②</sup>	UVR <sup>①</sup>	50- 150
FBM	1366D21G10	3	30	M <sup>②</sup>	UVR <sup>①</sup> , Terminal Shield	50- 150
FBM	1366D21G15	3	30	TM	UVR <sup>①</sup>	.....
FBM	1366D21G13	3	30	M <sup>②</sup>	Standard Shunt Trip <sup>①</sup>	50- 150
FBM	1366D21G11	3	30	M <sup>②</sup>	Shunt Trip <sup>①</sup> , Terminal Shield	50- 150
FBM	1366D21G16	3	30	TM	Standard Shunt Trip <sup>①</sup>	.....
FBM	1366D21G17	3	50	M <sup>②</sup>	None	66- 190
FBM	1366D21G34	3	50	M <sup>②</sup>	UVR <sup>①</sup>	66- 190
FBM	1366D21G35	3	50	M <sup>②</sup>	Terminal Shield	66- 190
FBM	1366D21G36	3	50	M <sup>②</sup>	UVR <sup>①</sup> , Terminal Shield	66- 190
FBM	1366D21G37	3	50	M <sup>②</sup>	Standard Shunt Trip <sup>①</sup>	66- 190
FBM	1366D21G18	3	100	M <sup>②</sup>	None	150- 480
FBM	1366D21G28	3	100	TM	None	.....
FBM	1366D21G19	3	100	M <sup>②</sup>	Terminal Shield	150- 480
FBM	1366D21G27	3	100	M <sup>②</sup>	UVR <sup>①</sup>	150- 480
FBM	1366D21G20	3	100	M <sup>②</sup>	UVR <sup>①</sup> , Terminal Shield	150- 480
FBM	1366D21G29	3	100	TM	UVR <sup>①</sup>	.....
FBM	1366D21G22	3	100	M <sup>②</sup>	Shunt Trip <sup>③</sup> , Terminal Shield	150- 480
FBM	1366D21G33	3	100	TM	Standard Shunt Trip <sup>①</sup>	.....
FBM	1366D21G43	3	100	M <sup>②</sup>	Shunt Trip <sup>①</sup> , Terminal Shield	150- 480
FBM	1366D21G45	3	100	M <sup>②</sup>	Shunt Trip <sup>①</sup>	450-1550
FBM	1366D21G46	3	15	TM	UVR <sup>①</sup>	.....
KAM	2609D60G64	2	180	M	None	200- 400
KAM	1291C26G07	2	180	M	UVR <sup>④</sup>	200- 400
KAM	2609D60G66	2	180	M	Standard Shunt Trip <sup>①</sup>	200- 400
KAM	1291C26G01	2	225	TM	UVR <sup>④</sup>	300- 700
KAM	1291C26G02	2	225	TM	UVR <sup>④</sup>	500-1000
KAM	2609D60G67	3	180	M	None	200- 400
KAM	1291C26G08	3	180	M	UVR <sup>④</sup>	200- 400
KAM	2609D60G69	3	180	M	Standard Shunt Trip <sup>①</sup>	200- 400
KAM	5685D48G75	3	225	TM	None	300- 700
KAM	5685D48G74	3	225	TM	None	500-1000
KAM	1291C26G03	3	225	TM	UVR <sup>④</sup>	300- 700
KAM	1291C26G04	3	225	TM	UVR <sup>④</sup>	500-1000
KAM	2609D60G01	3	225	TM	Standard Shunt Trip <sup>①</sup>	300- 700
KAM	2609D60G02	3	225	TM	Standard Shunt Trip <sup>①</sup>	500-1000
KAM	2609D60G40	3	225	M	None	300- 700
KAM	2609D60G41	3	225	M	None	500- 700
KAM	1291C26G05	3	225	M	UVR <sup>④</sup>	300- 700
KAM	1291C26G06	3	225	M	UVR <sup>④</sup>	500-1000

- ① Rated 120 volts/60 Hz: undervoltage release is handle reset type.
- ② Types FBM and HFBM Magnetic Only breakers for Dc applications should be ordered as "similar to listed style number" and calibration for Dc specified.
- ③ Shunt trip does not contain cutoff switch; rated 480 volts/60 Hz. Where these shunt trips are used, auxiliary protection is required to prevent burn-out of shunt trip coil.
- ④ UVR is auto-reset type, 120 volts Ac.



## Replacement Mining Service Circuit Breakers

### STANDARD MINING SERVICE CIRCUIT BREAKERS, *Continued*

Breaker Type	Frame	Poles	Amps	Trip Type	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>①</sup>
	STYLE NUMBERS					
LAM	1291C32G01	2	400	TM	UVR <sup>②</sup>	500-1000
LAM	2609D60G61	2	400	M	Shunt Trip (48 VDC)	750-1500
LAM	1291C32G03	3	400	TM	UVR <sup>②</sup>	500-1000
LAM	5685D48G73	3	400	TM	None	800-1600
LAM	1291C32G02	3	400	TM	UVR <sup>②</sup>	800-1600
LAM	2609D60G03	3	400	TM	Standard Shunt Trip <sup>①</sup>	800-1600
LAM	2609D60G44	3	400	M	None	800-1600
LAM	1291C32G04	3	400	M	UVR <sup>②</sup>	800-1600
MAM	2609D60G17	2	600	TM	UVR <sup>①</sup>	750-1500
MAM	2609D60G18	2	800	TM	UVR <sup>①</sup>	1000-2000
MAM	2609D60G63	3	400	TM	UVR <sup>①</sup>	2000-4000
MAM	5685D48G72	3	600	TM	None	1500-3000
MAM	2609D60G19	3	600	TM	UVR <sup>①</sup>	1500-3000
MAM	2609D60G04	3	600	TM	Standard Shunt Trip <sup>①</sup>	1500-3000
MAM	2609D60G05	3	800	TM	Standard Shunt Trip <sup>①</sup>	2000-4000
MAM	5685D48G71	3	800	TM	None	2000-4000
MAM	2609D60G20	3	800	TM	UVR <sup>①</sup>	2000-4000
MAM	2609D60G46	3	800	M	None	1500-3000
MAM	2609D60G47	3	800	M	UVR <sup>①</sup>	1500-3000
MAM	2609D60G48	3	800	M	None	2000-4000
MAM	2609D60G49	3	800	M	UVR <sup>①</sup>	2000-4000
NBM	1229C37G13	2	1000	TM	UVR <sup>②</sup>	1500-3000
NBM	1229C37G14	2	1200	TM	UVR <sup>②</sup>	2000-4000
NBM	1227C36G10	3	1000	TM	None	2500-5000
NBM	1229C37G15	3	1000	TM	UVR <sup>②</sup>	2500-5000
NBM	1227C36G13	3	1000	TM	Standard Shunt Trip <sup>①</sup>	2500-5000
NBM	1227C36G14	3	1200	TM	Standard Shunt Trip <sup>①</sup>	2500-5000
NBM	1227C36G09	3	1200	TM	None	2500-5000
NBM	1229C37G16	3	1200	TM	UVR <sup>②</sup>	2500-5000
NBM	1227C36G19	3	1200	M	None	2500-5000
NBM	1229C37G17	3	1200	M	UVR <sup>②</sup>	2500-5000

① Rated 120 volts/60 Hz: undervoltage release is handle reset type.

② UVR is auto-reset type, 102 volts Ac.

## Cutler-Hammer

Five Parkway Center  
 Pittsburgh, Pennsylvania, U.S.A. 15220

October 1997  
 Mailed to: E, D, C/29-100A, 31-400A,  
 31-500A

## Replacement Mining Service Circuit Breakers

### 1000 VOLT STANDARD MINING SERVICE CIRCUIT BREAKERS

These are specially designed and treated three-pole breakers, with accessories indicated for application on 1000 volts Ac, 60 Hz, and are the same physical size as standard mining service 100 to 1200 amp circuit breaker frames.① Terminals are not included, except for Type HFM.

Breaker Type	Frame	Poles	Amps	Trip Type	Accessories (Included in Frame)	Magnetic Trip Range, Amperes②
	STYLE NUMBERS					
HFM	2609D60G10	3	30	M	None	50- 150
HFM	5685D48G89	3	30	M	Terminal Shield	50- 150
HFM	5685D48G90	3	30	M	UVR③, Terminal Shield	50- 150
HFM	2609D60G08	3	100	M	None	150- 480
HFM	2609D60G09	3	100	M	UVR③	150- 480
HFM	5685D48G88	3	100	M	Terminal Shield	150- 480
HFM	5685D48G45	3	100	M	UVR③, Terminal Shield	150- 480
HKAM	2609D60G70	3	180	M	None	200- 400
HKAM	1291C26G16	3	180	M	UVR④	200- 400
HKAM	5685D48G87	3	225	TM	None	300- 700
HKAM	1291C26G12	3	225	TM	UVR④	300- 700
HKAM	5685D48G86	3	225	TM	None	500-1000
HKAM	1291C26G13	3	225	TM	UVR④	500-1000
HKAM	1291C26G14	3	225	M	UVR④	300- 700
HKAM	1291C26G15	3	225	M	UVR④	500-1000
HLAM	5685D48G85	3	400	TM	None	800-1600
HLAM	1291C32G07	3	400	TM	UVR④	800-1600
HLAM	1291C32G09	3	400	M	UVR④	800-1600
HMAM	5685D48G84	3	600	TM	None	1500-3000
HMAM	2609D60G28	3	600	TM	UVR⑤	1500-3000
HMAM	5685D48G83	3	800	TM	None	2000-4000
HMAM	2609D60G29	3	800	TM	UVR⑤	2000-4000
HMAM	2609D60G57	3	800	M	UVR⑤	1500-3000
HMAM	2609D60G58	3	800	M	UVR⑤	2000-4000
HNBM	1227C36G12	3	1000	TM	None	2500-5000
HNBM	1229C37G19	3	1000	TM	UVR④	2500-5000
HNBM	1227C36G11	3	1200	TM	None	2500-5000
HNBM	1229C37G20	3	1200	TM	UVR④	2500-5000
HNBM	1229C37G18	3	1200	M	UVR④	2500-5000
HPBM	1229C37G09	3	600	TM	UVR④⑥	1500-5000
HPBM	1229C37G10	3	800	TM	UVR④⑥	1500-5000
HPBM	1229C37G11	3	1000	TM	UVR④⑥	1500-5000
HPBM	1229C37G12	3	1200	TM	UVR④⑥	2000-6000
HPBM	1290C94G05	3	600	TM	None⑥	1500-5000
HPBM	1290C94G06	3	800	TM	None⑥	1500-5000
HPBM	1290C94G07	3	1000	TM	None⑥	1500-5000
HPBM	1290C94G08	3	1200	TM	None⑥	2000-6000

- ① Except that HFM is slightly longer than FBM.
- ② The magnetic trip range does not change when rating plug is changed.
- ③ UVR is auto-reset type, 120 V Ac.
- ④ 120 volt, 60 Hz electrical reset type.
- ⑤ Rated 120 volts, 60 Hz; undervoltage release is handle reset type.
- ⑥ Breaker includes rear bus connectors.

**Ordering Information**  
 Order by style number from appropriate table. For SELTRONIC™ Breakers, order rating plugs from page 19.



## Replacement Mining Service Circuit Breakers

1000 VOLT STANDARD MINING SERVICE CIRCUIT BREAKERS, *Continued*

### 1000 Volt SELTRONIC™ Mining Frames

Breaker Type	Frame	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>①</sup>
	STYLE NUMBERS		
HLCM-150	1284C68G01	None	150-1000
HLCM-150	1284C68G02	120V Shunt Trip	150-1000
HLCM-150	1284C68G03	120V UVR	150-1000
HLCM-150	1284C68G04	120V UVR with Remote Tripping Leads <sup>②</sup>	150-1000
HLCM-300	1284C68G05	None	300-1500
HLCM-300	1284C68G06	120V Shunt Trip	300-1500
HLCM-300	1284C68G07	120V UVR	300-1500
HLCM-300	1284C68G08	120V UVR with Remote Tripping Leads <sup>②</sup>	300-1500
HLCM-600	1284C68G09	None	600-2500
HLCM-600	1284C68G10	120V Shunt Trip	600-2500
HLCM-600	1284C68G11	120V UVR	600-2500
HLCM-600	1284C68G12	120V UVR with Remote Tripping Leads <sup>②</sup>	600-2500
HMCM-800	1284C83G01	None	800-2500
HMCM-800	1284C83G02	120V Shunt Trip	800-2500
HMCM-800	1284C83G03	120V UVR	800-2500
HMCM-800	1284C83G04	120V UVR with Remote Tripping Leads <sup>②</sup>	800-2500
HNCM-1200	1373D89G09	None	1600-5000
HNCM-1200	1373D89G10	120V Shunt Trip	1600-5000
HNCM-1200	1373D89G11	120V UVR	1600-5000
HNCM-1200	1373D89G12	120V UVR with Remote Tripping Leads <sup>②</sup>	1600-5000

### Current Limit-R Breakers — Order Rating Plugs Below

Breaker Type	Frame	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>①</sup>
	STYLE NUMBERS		
HLCLM-250	1228C81G01	None	600-1500
HLCLM-250	1228C81G02	120V Shunt Trip	600-1500
HLCLM-250	1228C81G03	120V UVR	600-1500
HLCLM-250	1228C81G04	120V UVR with Remote Tripping Leads <sup>③</sup>	600-1500
HLCLM-400	1228C82G01	None	800-2500
HLCLM-400	1228C82G02	120V Shunt Trip	800-2500
HLCLM-400	1228C82G03	120V UVR	800-2500
HLCLM-400	1228C82G04	120V UVR with Remote Tripping Leads <sup>②</sup>	800-2500

### Rating Plugs for HLCLM Current Limiting Mining Breakers

Ampere Rating	Type	STYLE NUMBERS	Ampere Rating	Type	STYLE NUMBERS
<b>Rating Plugs For Type HLCLM-250 Breakers</b>			<b>Rating Plugs For Type HLCLM-400 Breakers</b>		
125	Thermal Magnetic	1228C78G01	200	Thermal Magnetic	1228C79G01
150	Thermal Magnetic	1228C78G02	225	Thermal Magnetic	1228C79G02
175	Thermal Magnetic	1228C78G03	250	Thermal Magnetic	1228C79G03
200	Thermal Magnetic	1228C78G04	300	Thermal Magnetic	1228C79G04
225	Thermal Magnetic	1228C78G05	350	Thermal Magnetic	1228C79G05
250	Thermal Magnetic	1228C78G06	400	Thermal Magnetic	1228C79G06
250	Magnetic Only	1228C78G07	400	Magnetic Only	1228C79G07

#### Ordering Information:

Order by style number from appropriate table. For SELTRONIC™ Breakers, order rating plugs from page 19.

- ① The magnetic trip range does not change when rating plug is changed.
- ② Remote tripping requires a Normally Open contact not supplied with the breaker.
- ③ Except that HFM is slightly longer than FBM.

## Cutler-Hammer

Five Parkway Center  
 Pittsburgh, Pennsylvania, U.S.A. 15220



October 1997  
 Mailed to: E, D, C/29-100A, 31-400A,  
 31-500A

## Replacement Mining Service Circuit Breakers

### SELTRONIC™ MINING SERVICE CIRCUIT BREAKERS

The Mining SELTRONICS™ are the world's first molded case mining circuit breakers with a solid-state trip. They have been developed especially for mining applications, and feature a small, easily changed rating plug which establishes continuous current rating or is used to convert to magnetic only operation. The instantaneous trip is independently adjustable to meet federal requirements for trailing cable protection. Rated 50/60 Hz. Ac only. 600 volts maximum. TERMINALS NOT INCLUDED IN STYLE NUMBER.

Breaker Type	Frame	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>①</sup>
	STYLE NUMBERS		
LCM-150	1284C67G01	None	150-1000
LCM-150	1284C67G02	120V Shunt Trip	150-1000
LCM-150	1284C67G03	120V UVR	150-1000
LCM-150	1284C67G04	120V UVR with Remote Tripping Leads <sup>②</sup>	150-1000
LCM-300	1284C67G05	None	300-1500
LCM-300	1284C67G06	120V Shunt Trip	300-1500
LCM-300	1284C67G07	120V UVR	300-1500
LCM-300	1284C67G08	120V UVR with Remote Tripping Leads <sup>②</sup>	300-1500
LCM-600	1284C67G09	None	600-2500
LCM-600	1284C67G10	120V Shunt Trip	600-2500
LCM-600	1284C67G11	120V UVR	600-2500
LCM-600	1284C67G12	120V UVR with Remote Tripping Leads <sup>②</sup>	600-2500
MCM-800	1284C81G01	None	800-2500
MCM-800	1284C81G02	120V Shunt Trip	800-2500
MCM-800	1284C81G03	120V UVR	800-2500
MCM-800	1284C81G04	120V UVR with Remote Tripping Leads <sup>②</sup>	800-2500
NCM-1200	1373D88G17	None	1600-5000
NCM-1200	1373D88G18	120V Shunt Trip	1600-5000
NCM-1200	1373D88G19	120V UVR	1600-5000
NCM-1200	1373D88G20	120V UVR with Remote Tripping Leads <sup>②</sup>	1600-5000

#### Ordering Information

Order frame and rating plug by style number from table.

Additional information on the following mining breakers can be found in Technical Data 29-128:

- SELTRONIC™ Mining Service Breakers
- Standard Mining Service Breakers
- 1000 Volt Mining Service Breakers
- Terminals for Mining Service Breakers
- Trip Units for Mining Service Breakers
- Rear Connected Studs for Mining Service Breakers
- Standard Undervoltage Releases for Mining Service Breakers
- Standard Shunt Trips for Mining Service Breakers
- Terminal Shields for Mining Service Breakers

#### Rating Plugs for SELTRONIC Mining Circuit Breakers<sup>③</sup>

Ampere Rating	Type	STYLE NUMBERS	Ampere Rating	Type	STYLE NUMBERS
<b>Rating Plugs For Type LCM-150 Breakers<sup>③</sup></b>			<b>Rating Plugs For Type LCM-600 Breakers<sup>③</sup></b>		
75	Thermal Magnetic	2608D90G01	300	Thermal Magnetic	2608D90G15
90	Thermal Magnetic	2608D90G02	350	Thermal Magnetic	2608D90G16
100	Thermal Magnetic	2608D90G03	400	Thermal Magnetic	2608D90G17
125	Thermal Magnetic	2608D90G04	450	Thermal Magnetic	2608D90G18
150	Thermal Magnetic	2608D90G05	500	Thermal Magnetic	2608D90G19
150	Magnetic Only	2608D90G06	600	Thermal Magnetic	2608D90G20
			600	Magnetic Only	2608D90G21
<b>Rating Plugs For Type LCM-300 Breakers<sup>③</sup></b>			<b>Rating Plugs For Type MCM Breakers<sup>③</sup></b>		
150	Thermal Magnetic	2608D90G07	400	Thermal Magnetic	2606D86G01
175	Thermal Magnetic	2608D90G08	500	Thermal Magnetic	2606D86G02
200	Thermal Magnetic	2608D90G09	600	Thermal Magnetic	2606D86G03
225	Thermal Magnetic	2608D90G10	700	Thermal Magnetic	2606D86G04
250	Thermal Magnetic	2608D90G11	800	Thermal Magnetic	2606D86G05
275	Thermal Magnetic	2608D90G12	800	Magnetic Only	2606D86G06
300	Thermal Magnetic	2608D90G13			
300	Magnetic Only	2608D90G14	<b>Rating Plugs For Type NCM Breakers<sup>③</sup></b>		
			900	Thermal Magnetic	2606D86G07
			1000	Thermal Magnetic	2606D86G08
			1200	Thermal Magnetic	2606D86G09
			1200	Magnetic Only	2606D86G10

<sup>①</sup> The magnetic trip range does not change when rating plug is changed.

<sup>②</sup> Remote tripping requires a Normally Open contact not supplied with the breaker.

<sup>③</sup> Rating plugs are not interchangeable with standard SELTRONIC™ Breakers.



## Replacement Mining Service Circuit Breakers

### AB CIRCUIT BREAKERS FOR MINING SERVICE

#### Undervoltage Release Data

Undervoltage releases are calibrated to pick-up at 72 to 85% of rated voltage dropout between 35 to 70% of rated voltage.

Volts	Breaker Type														
	FBM, HFBM <sup>①</sup>			KAM, HKAM, <sup>①</sup> KAMH			LAM, HLAM, MAM, HMAM, NBM, HNBM, <sup>①</sup> LAMH, MAMH, NBMH			HFM <sup>①</sup>			LCM, MCM, NCM, HLCM, HMCM, HNCM, LCMH, MCMH, NCMH <sup>①</sup>		
	Line Amperes	Series Resistors <sup>③</sup>	Total VA	Line Amperes	Series Resistors <sup>③</sup>	Total VA	Line Amperes	Series Resistors <sup>③</sup>	Total VA	Line Amperes	Series Resistors <sup>③</sup>	Total VA	Line Amperes	Total VA	
480/60	.016	25,000	7.7	.021	10,000	10.1	.033	12,000 <sup>④</sup>	15.9	.013	30,000	6.3	...	...	
240/60	.021	6,000	5.1	.019	.....	4.6	.028	6,000	6.7	.013	.....	3.2	...	...	
120/60	.023	.....	2.8	.021	.....	2.5	.029	.....	3.5	.023	.....	2.8	.05	6	
120/60 <sup>②</sup>	....	.....	...	.13	.....	15.6	.13	.....	15.6	....	.....	...	...	...	

#### Shunt Trip Coil Data

Volts	Breaker Type								
	All Except Those Listed at Right			HFM		SELTRONIC™ Breakers Standard, MARK 75 and 1000 Volt			
	Amperes		VA	Amperes		VA	Amperes		VA
480/60	.085		40.8	.35		168	..		..
240/60	1.7		408	1.3		312	..		..
120/60	.88		105.6	4.5		540	15		18
48 DC	8.0		384	2.2		105.6	..		..

#### Ac Interrupting Capacity, Symmetrical Amps

60 Hz Ac Volts	Breaker Type										
	FBM <sup>⑥</sup>	HFBM	KAM	KAMH, LAMH, MAMH, NBMH, LCMH	LAM, LCM, MAM, MCM, NBM, NCM	MCMH, NCMH	HFM, HKAM	HLAM <sup>⑦</sup>	HPBM	HLCLM	All Other 1000 Volt Breakers <sup>⑦</sup>
240	18,000	65,000	25,000	65,000	42,000	65,000	.....	.....	.....	.....	.....
480	14,000	25,000	22,000	35,000	30,000	50,000	.....	.....	.....	.....	.....
600	14,000	18,000	22,000	25,000	22,000	25,000	.....	.....	.....	.....	.....
1000 <sup>⑤</sup>	.....	.....	.....	.....	.....	.....	10,000	12,000	24,000	25,000 <sup>⑧</sup>	14,000

#### Special Dc Interrupting Capacity

Breaker Type	Interrupting Capacity (Amperes)			
	at 300-330 V Dc			
	Single-Pole		Two Poles in Series <sup>⑩</sup>	
	.0-.15mH Inductance <sup>⑨</sup>	.15-.5mH Inductance	.5-.9mH Inductance	2.4mH Inductance
FBM <sup>⑨</sup>	10,000	7,500	10,000	5,000
KAM	15,000	10,000	15,000	5,000
LAM	15,000	10,000	15,000	5,000
MAM	15,000	10,000	15,000	5,000
NBM	15,000	10,000	15,000	5,000

- ① These attachments field mountable except on FBM, HFBM, HFM, and all SELTRONIC™ Breakers.
- ② New design electrical reset UVR.
- ③ Supplied for external customer mounting.
- ④ 16,000 for Type MAM, MAMH and HMAM.
- ⑤ Based on circuit power factor of 50% or greater.
- ⑥ Thermal Magnetic or Magnetic Only.
- ⑦ HLAM and HLCM must be rear stud connected. If front connected, I.C. rating is 10,000 amperes.
- ⑧ Series rated for application with Cutler-Hammer 1000 Volt Breakers.
- ⑨ FBM or HFBM Magnetic Only breakers require special calibration for Dc application.
- ⑩ Resistive circuit.
- ⑪ Two poles in electrical series in ungrounded leg of circuit.

## Cutler-Hammer

Five Parkway Center  
Pittsburgh, Pennsylvania, U.S.A. 15220



October 1997  
 Mailed to: E, D, C/29-100A, 31-400A,  
 31-500A

# Replacement Mining Service Circuit Breakers

## AB CIRCUIT BREAKERS FOR MINING SERVICE

### Accessories

#### Rear Connected Studs<sup>①</sup>

For complete stud assembly, order a stud and tube based on thickness of customer's mounting panel. A short stud must be assembled adjacent to a long stud to maintain clearances required by Underwriters' Laboratories, Inc.<sup>②</sup> Two studs required per pole. For List Prices, see Price and Availability Digest.

Mounting Panel Thickness Inches	Stud		Tube	
	Length	STYLE NUMBERS	Length Inches	STYLE NUMBERS
<b>FBM, HFBM, FDBM, FDM, HFDM Breakers</b>				
1	Short	451D874G01	1 <sup>1</sup> / <sub>16</sub>	32B9446H20
	Long	451D874G02	3 <sup>7</sup> / <sub>16</sub>	32B9446H24
1 <sup>1</sup> / <sub>16</sub> -1 <sup>5</sup> / <sub>16</sub>	Short	451D874G01	1 <sup>3</sup> / <sub>8</sub>	32B9446H21
	Long	451D874G02	3 <sup>3</sup> / <sub>4</sub>	32B9446H25
3 <sup>8</sup> / <sub>8</sub> -5 <sup>8</sup> / <sub>8</sub>	Short	451D874G01	1 <sup>1</sup> / <sub>16</sub>	32B9446H22
	Long	451D874G02	4 <sup>1</sup> / <sub>16</sub>	32B9446H26
1 <sup>4</sup> / <sub>4</sub> -5 <sup>16</sup> / <sub>16</sub>	Short	451D874G01	2	32B9446H23
	Long	451D874G02	4 <sup>3</sup> / <sub>8</sub>	32B9446H27
<b>KAM, HKAM, KAMH, KDM, HKDM, KDCM Breakers</b>				
3 <sup>4</sup> / <sub>4</sub> -1	Short	656D565G01	2 <sup>7</sup> / <sub>32</sub>	456D983H05
	Long	656D565G02	3 <sup>25</sup> / <sub>32</sub>	456D983H08
1 <sup>2</sup> / <sub>2</sub> -3 <sup>4</sup> / <sub>4</sub>	Short	656D565G01	1 <sup>3</sup> / <sub>32</sub>	456D983H06
	Long	656D565G02	4 <sup>1</sup> / <sub>32</sub>	456D983H09
1 <sup>4</sup> / <sub>4</sub> -1 <sup>2</sup> / <sub>2</sub>	Short	656D565G01	1 <sup>11</sup> / <sub>32</sub>	456D983H07
	Long	656D565G02	4 <sup>9</sup> / <sub>32</sub>	456D983H10

For insulated panels only: 2 per pole.

Stud Ampere Number	Diameter, Inches and Thread	Extension Back of Breaker Inches	Stud STYLE NUMBERS
<b>LAM, LCM, HLAM, LAMH, LCMH, HLCM Breakers</b>			
225 <sup>③</sup>	1 <sup>1</sup> / <sub>2</sub> -13	3 <sup>7</sup> / <sub>32</sub>	1241 345
225 <sup>③</sup>	1 <sup>1</sup> / <sub>2</sub> -13	6 <sup>9</sup> / <sub>32</sub>	1241 346
225 <sup>③④</sup>	1 <sup>1</sup> / <sub>2</sub> -13	4 <sup>31</sup> / <sub>32</sub>	1241 392
400 <sup>③</sup>	3 <sup>4</sup> / <sub>4</sub> -16	5 <sup>19</sup> / <sub>32</sub>	05B7383G22
400 <sup>③</sup>	3 <sup>4</sup> / <sub>4</sub> -16	7 <sup>31</sup> / <sub>32</sub>	05B7383G23
400 <sup>③</sup>	3 <sup>4</sup> / <sub>4</sub> -16	10 <sup>15</sup> / <sub>32</sub>	05B7383G24
600	1-12	5 <sup>29</sup> / <sub>32</sub>	314C960G16
600	1-12	8 <sup>13</sup> / <sub>32</sub>	314C960G17
600	1-12	10 <sup>29</sup> / <sub>32</sub>	314C960G18
<b>MAM, MCM, HMAM, MAMH, MCMH, HMCM Breakers</b>			
225	1 <sup>1</sup> / <sub>2</sub> -13	3 <sup>21</sup> / <sub>32</sub>	314C960G01
400	3 <sup>4</sup> / <sub>4</sub> -16	5 <sup>29</sup> / <sub>32</sub>	314C960G04
400	3 <sup>4</sup> / <sub>4</sub> -16	8 <sup>13</sup> / <sub>32</sub>	314C960G05
400	3 <sup>4</sup> / <sub>4</sub> -16	10 <sup>29</sup> / <sub>32</sub>	314C960G06
600	1-12	5 <sup>29</sup> / <sub>32</sub>	314C960G07
600	1-12	8 <sup>13</sup> / <sub>32</sub>	314C960G08
600	1-12	10 <sup>29</sup> / <sub>32</sub>	314C960G09
800	1 <sup>1</sup> / <sub>8</sub> -12	4 <sup>29</sup> / <sub>32</sub>	314C960G10
800	1 <sup>1</sup> / <sub>8</sub> -12	8 <sup>13</sup> / <sub>32</sub>	314C960G11
800	1 <sup>1</sup> / <sub>8</sub> -12	10 <sup>29</sup> / <sub>32</sub>	314C960G12
<b>NBM, NCM, HNBM, NBMH, NCMH, HNCM Breakers</b>			
800	1 <sup>1</sup> / <sub>8</sub> -12	5 <sup>1</sup> / <sub>2</sub>	623B222G01
800	1 <sup>1</sup> / <sub>8</sub> -12	8	623B222G02
800	1 <sup>1</sup> / <sub>8</sub> -12	10 <sup>1</sup> / <sub>2</sub>	623B222G03
1200	1 <sup>1</sup> / <sub>4</sub> -12	5 <sup>1</sup> / <sub>2</sub>	373B375G04
1200	1 <sup>1</sup> / <sub>4</sub> -12	10 <sup>1</sup> / <sub>2</sub>	373B375G03

### Line and Load Terminal Shields<sup>⑤</sup>

Breaker Type	STYLE NUMBERS	Description
KAM	1261C93G01	Line Terminals
KAM	1262C46G01	Load Terminals
LAM-400	1261C95G01	Line Terminals
LAM-400	1262C48G01	Load Terminals
MAM	1261C97G01	Line Terminals
MAM	1261C97G02	Load Terminals

- ① Not Underwriters' Laboratories, Inc. listed.
- ② 400 ampere LA studs of the same length have sufficient clearance; however, customer connections may make it necessary to use a short stud adjacent to a long stud.
- ③ 150, 300 and 400 ampere frames only.
- ④ This is a special stud which includes six contact nuts for use where bus contact nuts must be used.
- ⑤ For breakers used with terminals and cable connections. Sold in packages of 10.



## Replacement Mining Service Circuit Breakers

### AB CIRCUIT BREAKERS FOR MINING SERVICE

#### Accessories, Continued

#### Standard Handle Reset Undervoltage Release

For Standard and MARK 75 Breakers field mountable on special frames listed on page 25, or replacement on breakers originally equipped with this type UVR.

For undervoltage protection. A solenoid device mounts within breaker case. Coil must be energized before closing breaker. Trips breaker when voltage drops below 35 to 70% of coil rating. Picks up and seals in at 72 to 85% of coil rating. For line voltages up to 250 V Dc or 600 V Ac. Externally mounted resistors are supplied for certain ratings. Standard leads extend 18 inch outside of breaker. Longer leads may be specified.

Attachment Volts	For Right Hand Mounting				For Left Hand Mounting
	Breaker Type				Breaker Type
	LAM, LAMH, HLAM	MAM, HMAM, MAMH	NBM, HNBM, NBMH	HPBM	KAM, KAMH, HKAM
	STYLE NUMBERS				
120/60	4995D12G11	5672D69G11	4995D11G11	1290C94G13 <sup>②</sup>	4995D10G01
120/60 <sup>①</sup>	1228C76G03	.....	1229C35G03	1229C35G05	1228C76G03
240/60	4995D12G13	5672D69G13	4995D11G13	.....	4995D10G03
480/60	4995D12G14	5672D69G14	4995D11G14	.....	4995D10G04

#### Shunt Trips

For tripping breaker from a remote point. A solenoid device mounts within breaker case. Breaker trips when coil is energized. A cutoff switch breaks the circuit to the momentary rated coil when breaker opens. Available for control voltages up to 250 V Dc or 600 V Ac. Voltage and frequency must be specified. Standard leads extend 18 inch outside of breaker. Longer leads may be specified.

Volts (Ac for 50-60 Hz)	Breaker Type				
	FBM, HFBM (Thermal Magnetic Only)	KAM, HKAM, KAMH	LAM, HLAM, LAMH	MAM, HMAM, MAMH	NBM, HNBM, NBMH
	STYLE NUMBERS				
<b>Right Hand Mounting</b>					
480 Ac	2609D39G16	2605D15G16	2606D56G16	2606D57G16	2606D58G16
240 Ac	2609D39G17	2605D15G17	2606D56G17	2606D57G17	2606D58G17
120 Ac	2609D39G19	2605D15G19	2606D56G19	2606D57G19	2606D58G19
<b>Left Hand Mounting</b>					
480 Ac	2609D39G02	2605D15G02	2606D56G02	2606D57G02	2606D58G02
240 Ac	2609D39G03	2605D15G03	2606D56G03	2606D57G03	2606D58G03
120 Ac	2609D39G05	2605D15G05	2606D56G05	2606D57G05	2606D58G05

① New design electrical reset UVR.  
 ② Auto reset type.

## Cutler-Hammer

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October 1997  
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 31-500A

# Replacement Mining Service Circuit Breakers

## MINING SERVICE BREAKER FRAMES ONLY

These frames are modified to accept handle reset undervoltage releases or standard shunt trips. Frames are identified as special mining service breaker frames by the orange nameplates. The only modification necessary by the user is to file exit holes for attachment leads. Use trip units and terminals listed below.

Breaker Type	Frame Size, Amperes	Poles	STYLE NUMBERS	Breaker Type	Frame Size, Amperes	Poles	STYLE NUMBERS
KAM①	225	2	2602D86G11	MAM②	800	2	2600D43G11
KAM①	225	3	2602D86G12	MAM②	800	3	2600D43G12
KAMH①	225	2	2602D86G13	MAMH②	800	2	2600D43G13
KAMH①	225	3	2602D86G14	MAMH②	800	3	2600D43G14
HKAM①	225	3	1264C99G05	HMAM②	800	3	1264C99G03
LAM②	400	2	2602D99G05	NBM②	1200	2	2610D64G07
LAM②	400	3	2602D99G06	NBM②	1200	3	2610D64G08
LAMH②	400	2	2602D99G07	NBMH②	1200	2	2610D64G09
LAMH②	400	3	2602D99G08	NBMH②	1200	3	2610D64G10
HLAM②	400	3	1264C99G02	HNBM②	1200	3	2610D64G13
LAM3600F	600	3	2603D48G07				
LAMH3600F	600	3	2603D48G08				
HLAM3600F	600	3	2603D48G09				

## Trip Units for Standard MARK 75 and 1000 Volt Mining Service Circuit Breakers (See MARK 75 Frames Pages 13 and 14)

Conductor Size	Magnetic Trip Range, Amperes	Maximum Continuous Amperes	Breaker Type	Style Numbers		
				Thermal Magnetic		Magnetic Only 3 Poles
				2 Poles	3 Poles③	
STYLE NUMBERS						
#6	200- 400	180	KAM	2609D99G06④	.....	2609D99G07
#4-#3	300- 700	225	KAM	5685D48G42	5685D48G40	2611D75G01
#4-#1	500-1000	225	KAM	5685D48G36	5685D48G34	2611D75G02
#4-#1	500-1000	400	LAM	5685D48G30	5685D48G97	.....
#2-#2/0	800-1600	400	LAM	.....	5685D48G28	2611D75G03
#2-2/0	750-1500	600	LAM600	.....	2609D99G20	.....
2/0-500MCM	1500-3000	600	LAM600	.....	2609D99G19	.....
#2-#2/0	750-1500	600	MAM	5685D48G24	.....	.....
2/0-500MCM	1500-3000	600	MAM	.....	5685D48G22	2611D75G04⑥
#1-3/0	1000-2000	800	MAM	5685D48G18	.....	.....
3/0-500MCM	2000-4000	800	MAM	.....	5685D48G16	2611D75G05
2/0-500MCM	1500-3000	1000	NBM	5685D48G12	.....	.....
4/0-500MCM	2500-5000	1000	NBM	.....	5685D48G10	.....
3/0-500MCM	2000-4000	1200	NBM	5685D48G06	.....	.....
4/0-500MCM	2500-5000	1200	NBM	.....	5685D48G04	2611D75G07
⑤	1500-5000	600	HPBM	.....	1290C94G09	.....
⑤	1500-5000	800	HPBM	.....	1290C94G10	.....
⑤	1500-5000	1000	HPBM	.....	1290C94G11	.....
⑤	2000-6000	1200	HPBM	.....	1290C94G12	.....

- ① Frame modified for left hand mounting of UVR attachment.
- ② Frame modified for right hand mounting of UVR attachment.
- ③ Three-pole trip units only are suitable for replacement in 1000 Volt Mining Service Circuit Breakers.
- ④ Except KAM,180 amperes is Magnetic Only.
- ⑤ Bus connected.
- ⑥ 800 amperes.



## Replacement Mining Service Circuit Breakers

### TERMINALS FOR MINING SERVICE BREAKERS

Terminals are Underwriters' Laboratories, Inc. listed for wire type and range listed below. When used with aluminum conductors, use joint compound.

Maximum Amperes	Package of 3 Line Terminals Style Number	Wire Range, Type
<b>FBM, HFBM</b>		
<b>Style Pressure Type Terminals</b>		
100	624B100G02	#14-1/0 Al/Cu
<b>Optional Al/Cu Pressure Terminals</b>		
50	624B100G10	#14-#4 Al/Cu
100	624B100G17	# 4-4/0 Al/Cu

Maximum Amperes	Terminal Catalog Number	Wire Range, Type Number of Cables
<b>KAM, HKAM, KAMH</b>		
<b>Standard Pressure Terminals (Copper Only)</b>		
225	T225LA	1 #6-350 MCM
225	T225LBF	1 #6-250 MCM
<b>Optional Al/Cu Pressure Terminals</b>		
225	TA225LA1	1 #6-350 MCM Cu, or 1 #4-350 MCM Al
<b>LAM, LCM-150, LCM-300, HLAM, LAMH, LCMH-150, LCMH-300, HLCM-150, HLCM-300, HLCLM-250, HLCLM-400</b>		
<b>Standard Copper Pressure Terminals</b>		
225	T225LA	1 #6-350 MCM Cu
225	T225LBF	1 #6-250 MCM Cu
400	T401LA	1 #4-250 MCM Cu plus 1 3/0-600 MCM Cu
<b>Optional Al/Cu Pressure Terminals</b>		
225	TA225LA1	1 #6-350 MCM Cu, or 1 #4-350 MCM Al
400	TA400LA1	1 #4-250 MCM Al/Cu, plus 1 3/0-600 MCM Al/Cu
400	TA401LA	1 600-750 MCM Al
<b>LAM-600, LAMH-600, HLAM-600, LCM-600, LCMH-600, HLCM-600</b>		
<b>Standard Copper Pressure Terminals</b>		
600	T600LA	2 250-500 MCM Cu
<b>Optional Al/Cu Pressure Terminals</b>		
600	TA600LA	2 250-500 MCM Al/Cu

Maximum Amperes	Terminal Catalog Number	Wire Range, Type Number of Cables
<b>MAM, MCM, HMAM, MAMH, MCMH, HMC</b>		
<b>Standard Copper Pressure Terminals</b>		
350	T350MA	1 #1-600 MCM Cu
600	T600MA1	2 2/0-500 MCM Cu
800	T800MA1	3 3/0-300 MCM Cu
<b>Optional Al/Cu Pressure Terminals</b>		
600	TA700MA1	2 #1-500 MCM Al/Cu
800	TA800MA2	3 3/0-400 MCM Al/Cu
800	TA801MA	2 500-750 MCM Al/Cu
<b>NBM, NCM, HNB, NBH, NCMH, HNCM</b>		
<b>Standard Copper Pressure Terminals</b>		
1000	T1000NB1	3 3/0-500 MCM Cu
1200	T1200NB1	4 3/0-400 MCM Cu
<b>Optional Al/Cu Pressure Terminals</b>		
1000	TA1000NB1	3 3/0-400 MCM Al/Cu
1200	TA1200NB1	4 4/0-500 MCM Al/Cu
1200	TA1201NB1	3 500-750 MCM Al/Cu

## Cutler-Hammer

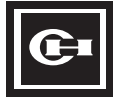
Five Parkway Center  
 Pittsburgh, Pennsylvania, U.S.A. 15220



October 1997  
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 31-500A

## E<sup>2</sup> Cross Reference

Series C Mining	Superseded by E <sup>2</sup> Mining	Series C Mining	Superseded by E <sup>2</sup> Mining
1491D72G31	E2J3070T	FDBM3100	E2F3100
1491D72G32	E2J3090T	FDBM3100LM04U62	E2F3100M04U62
1491D72G33	E2J3100T	FDBM3125	E2F3125
1491D72G37	E2J3200T	FDBM3150	E2F3150
6622C87G27	E2K3225AWU66	FDBM3150L	E2F3150L
6622C87G28	E2K3225DWU66	FDM3015	E2F3015
6622C87G32	E2K3400GWU66	FDM3015L	E2F3015L
E2KM3100	E2KEM3100W	FDM3015LU62	E2F3015LU62
E2KM3100U66	E2KEM3100WU66	FDM3020	E2F3020
E2KM3125	E2KEM3125W	FDM3020LU62	E2F3020LU62
E2KM3125U66	E2KEM3125WU66	FDM3025	E2F3025
E2KM3150	E2KEM3150W	FDM3025L	E2F3025L
E2KM3150MU66	E2KEM3150WU66	FDM3025LS22	E2F3025LS22
E2KM3150TM	E2KEM3150MW	FDM3025LU62	E2F3025LU62
E2KM3150U66	E2KEM3150MWU66	FDM3030	E2F3030
E2KM3200	E2KEM3200W	FDM3030LS22	E2F3030LS22
E2KM3200U66	E2KEM3200WU66	FDM3040	E2F3040
E2KM3225	E2KEM3225W	FDM3040L	E2F3040L
E2KM3225F	E2KM3400F	FDM3040LU62	E2F3040LU62
E2KM3225FUV	E2KM3400F	FDM3050	E2F3050
E2KM3225MU66	E2KEM3225MWU66	FDM3050LU62	E2F3050LU62
E2KM3225TM	E2KEM3225TM	FDM3050U62	E2F3050U62
E2KM3225U66	E2KEM3225WU66	FDM3060	E2F3060
E2LM3300U66	E2LEM3300WU66	FDM3060LU62	E2F3060LU62
E2LM3350U66	E2LEM3350WU66	FDM3070	E2F3070
E2LM34002U66	E2LEM34002WU66	FDM3070A02U62	E2F3070A02U62
E2LM3400F	E2LM3600F	FDM3080	E2F3080
E2LM3400FUV	E2LM3600F	FDM3090	E2F3090
E2LM3400M2U66	E2LEM3400M2WU66	FDM3100	E2F3100
E2LM3400MU66	E2LEM3400MWU66	FDM3100LS22	E2F3100LS22
E2LM3400U66	E2LEM3400WU66	FDM3100LU62	E2FLU62
FDBM3015	E2F3015	FDM3125	E2F3125
FDBM3015WU62	E2F3015WU62	FDM3125LU62	E2F3125LU62
FDBM3020	E2F3020	FDM3150	E2F3150
FDBM3025	E2F3025	HFDMM003AM	E2F003AM
FDBM3025U62	E2F3025U62	HFDMM003AMLU62	E2F003AMLU62
FDBM3030	E2F3030	HFDMM007CM	E2F007CM
FDBM3030U62	E2F3030WU62	HFDMM007CMU62	E2F007CMU62
FDBM3030WU62	E2F3030WU62	HFDMM015EM	E2F015EM
FDBM3035	E2F3035	HFDMM015EMA02	E2F015EMA02
FDBM3040	E2F3040	HFDMM015EMLU62	E2F015EMLU62
FDBM3045	E2F3045	HFDMM015EMU62	E2F015EMU62
FDBM3050	E2F3050	HFDMM030HM	E2F030HM
FDBM3050U62	E2F3050U62	HFDMM030HMLU62	E2F030HMLU62
FDBM3050WU62	E2F3050WU62	HFDMM030HMU62	E2F030HMU62
FDBM3060	E2F3060	HFDMM050KM	E2F050KM
FDBM3070	E2F3070	HFDMM050KML	E2F050KML
FDBM3070WU62	E2F3070WU62	HFDMM050KMLU62	E2F050KMLU62
FDBM3080	E2F3080	HFDMM050KMU62	E2F050KMU62
FDBM3090	E2F3090	HFDMM070MM	E2F070MM



**E<sup>2</sup> Cross Reference**

Series C Mining	Superseded by E <sup>2</sup> Mining	Series C Mining	Superseded by E <sup>2</sup> Mining
HFD070MMU62	E2F070MMU62	JDCMGA02D1	E2JM3250MGA02D01
HFD01001M	E2F1001M	JDCMJA2D1	E2JM3250MJA02D01
HFD01001MS22	E2F1001MS22	JDCMJD01	E2JM3250MJD01
HFD0100LM	E2F100LM	JDM2250F	E2JM3250F
HFD0100LMA02	E2F100LMA02	JDM3070W	E2J3070W
HFD0100LMU62	E2F100LMU62	JDM3090W	E2J3090W
HFD0100RM	E2F100RM	JDM3100W	E2J3100W
HFD0100RML	E2F100RML	JDM3125W	E2J3125W
HFD0100RMS22	E2F100RMS22	JDM3150W	E2J3150W
HFD0100RMU62	E2F100RMU62	JDM3150WU18	E2J3150WU18
HFD0150TM	E2F150TM	JDM3175W	E2J3175W
HFD0150TML	E2F150TML	JDM3200W	E2J3200W
HFD0150TMU62	E2F150TMU62	JDM3200WA06	E2J3200WA06
HFD0150UM	E2F150UM	JDM3225A5W	E2J3225AW
JCDA2D1S30	E2JM250MDA2D1S30	JDM3225D5W	E2J3225DW
JCMA2D1S30	E2JM250MFA2D1S30	JDM3225W	E2J3225W
JDCM3070W	E2JM3070W	JDM3250A5MW	E2J3250MAW
JDCM3090W	E2JM3090W	JDM3250A5W	E2J3250AW
JDCM3100W	E2JM3100W	JDM3250C5MW	E2J3250CW
JDCM3125W	E2JM3125W	JDM3250D5MW	E2J3250MDW
JDCM3150W	E2JM3150W	JDM3250F	E2J3250F
JDCM3175W	E2JM3175W	JDM3250F5MW	E2J3250MFW
JDCM3200W	E2JM3200W	JDM3250G5MW	E2J3250MGW
JDCM3225A5W	E2JM3225AW	JDM3250J5MW	E2J3250MJW
JDCM3225D5W	E2JM3225D5W	JDM3250K5MW	E2J3250MKW
JDCM3225W	E2JM3225W	JDM3250L5MW	E2J3250MLW
JDCM3250A5MW	E2JM3250MAW	JDM3250MW	E2J3250MW
JDCM3250A5MWU18	E2JM3250MAWU18	JDM3250W	E2J3250W
JDCM3250A5W	E2JM3250AW	JDM3250WS10	E2J3250WS10
JDCM3250C5MW	E2JM3250MCW	JM2225T1125-2250	E2J3225T
JDCM3250D5MW	E2JM3250MDW	JM3070T	E2J3070T
JDCM3250D5MWA06	E2JM3250MDWA06	JM3090T	E2J3090T
JDCM3250D5W	E2JM3250D5W	JM3100T	E2J3100T
JDCM3250D5WS10	E2JM3250D5WS10	JM3125T	E2J3125T
JDCM3250F	E2JM3250F	JM3150T	E2J3150T
JDCM3250F5MD01	E2JM3250MFD01	JM3175T	E2J3175T
JDCM3250F5MW	E2JM3250MFW	JM3200T	E2J3200T
JDCM3250G5MW	E2JM3250MGW	JM3225T	E2J3225T
JDCM3250G5WA02D01	E2JM3250MGA02D01	JM3225TA5	E2J3225TA
JDCM3250J5MW	E2JM3250MJW	JM3225TD5	E2J3225TD
JDCM3250J5MWA02	E2JM3250MJA02	JM3250T	E2J3250T
JDCM3250J5WA02D01	E2JM3250MJA02D01	JM3250TA5	E2J3250TA
JDCM3250J5WD01	E2JM3250MJD01	JM3250TA5M_350-700	E2J3250TMA
JDCM3250K5MW	E2JM3250MKW	JM3250TC5M	E2J3250TMC
JDCM3250L5MW	E2JM3250MLW	JM3250TD5_500-1000	E2J3250TMD
JDCM3250MW	E2JM3250MW	JM3250TF5M_625-1250	E2J3250TMF
JDCM3250W	E2JM3250W	JM3250TG5M_750-1500	E2J3250TMG
JDCMAA2D1	E2JM3250MM02D01	JM3250TJ5M_875-1750	E2J3250TMJ
JDCMDD1S30	E2JM3250MDS30D01	JM3250TK5M_1000-2000	E2J3250TMK
JDCMFD01	E2JM3250MFD01		

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October 1997  
 Mailed to: E, D, C/29-100A, 31-400A,  
 31-500A

## E<sup>2</sup> Cross Reference

Series C Mining	Superseded by E <sup>2</sup> Mining	Series C Mining	Superseded by E <sup>2</sup> Mining
JM3250TL5M_1125-2250	E2J3250TML	KDCMNA2D7	E2KM3400MNA02D07
JM3250TM	E2J3250TM	KDM2400F	E2K2400F
KDCM3100W	E2KM3100W	KDM2400G5MS50	E2K2400MGWS50
KDCM3125W	E2KM3125W	KDM2400G5MW	E2K2400MGW
KDCM3150W	E2KM3150W	KDM2400W5MW	E2K2400MWW
KDCM3175W	E2KM3175W	KDM2400W5MWA06D07S10	E2K2400MWA06D07S10
KDCM3200W	E2KM3200W	KDM2400W5MWA06D10S10	E2K2400MWA06D10S10
KDCM3225A5MW	E2KM3200MAW	KDM2400W5MWD07	E2K2400MWD07
KDCM3225D5MW	E2KM3200MDW	KDM2400W5MWD07S10	E2K2400MWD07S10
KDCM3225W	E2KM3225W	KDM2400W5MWD10	E2K2400MWD10
KDCM3250W	E2KM3250W	KDM2400W5MWD10S10	E2K2400MWD10S10
KDCM3250WU18	E2KM3250WU18	KDM2400W5MWS10	E2K2400MWWWS10
KDCM3300W	E2KM3300W	KDM3100W	E2K3100W
KDCM3350W	E2KM3350W	KDM3125W	E2K3125W
KDCM3400D5MA02D09H04	E2KM3400MDA02D09H04	KDM3150W	E2K3150W
KDCM3400D5MW	E2KM3400MDW	KDM3150WA06	E2K3150WA06
KDCM3400D5MWA02D07	E2KM3400MDA02D07	KDM3175W	E2K3175W
KDCM3400D5W	E2KM3400DW	KDM3200W	E2K3200W
KDCM3400D5WD09	E2KM3400DD09	KDM3225A5W	E2K3225AW
KDCM3400F	E2KM3400F	KDM3225D5A13D09U18	E2K3225DA13D09U18
KDCM3400F5MW	E2KM3400MFW	KDM3225D5MW	E2K3400MDW
KDCM3400FD09G04	E2KM3400MFD09G04	KDM3225D5W	E2K3225DW
KDCM3400G5MW	E2KM3400MGD09G05	KDM3225F	E2K3400F
KDCM3400G5MWD09H04	E2KM3400MGD09H04	KDM3225W	E2K3225W
KDCM3400G5W	E2KM3400MGW	KDM3225WK37	E2KE3225W
KDCM3400G5WD07	E2KM3400MGD07	KDM3225WK37U18	E2KE3225WU18
KDCM3400J5MA02D09	E2KM3400MJA02D09	KDM3225WK38	E2KE3225MW
KDCM3400J5MA2D9G4S30	E2KM3400MJA2D9G4S30	KDM3250W	E2K3250W
KDCM3400J5MD09	E2KM3400MJD09	KDM3300W	E2K3300W
KDCM3400J5MD09H04S30	E2KM3400MJD09H04S30	KDM3300WA06U18	E2K3300WA06U18
KDCM3400J5MW	E2KM3400MJW	KDM3300WS10	E2K3300WS10
KDCM3400J5MWA02D07	E2KM3400MJA02D07	KDM3350W	E2K3350W
KDCM3400J5MWA06	E2KM3400MJA06	KDM3400D5MW	E2K3400MDW
KDCM3400J5MWD07S30	E2KM3400MJD07S30	KDM3400D5W	E2K3400DW
KDCM3400J5WD07	E2KM3400MJD07	KDM3400D5WU18	E2K3400DWU18
KDCM3400K5MW	E2KM3400MKW	KDM3400F	E2K3400F
KDCM3400K5MWS10	E2KM3400MKWS10	KDM3400F5MW	E2K3400MFW
KDCM3400K5MWU18	E2KM3400MKWU18	KDM3400FK37A06D09D18	E2KE3400A06D09D18
KDCM3400L5MW	E2KM3400MLW	KDM3400G5A06D09U18	E2K3400GA06D09U18
KDCM3400L5MWD09H04	E2KM3400MLD09H04	KDM3400G5A13D09U18	E2K3400GA13D09U18
KDCM3400L5MWS10	E2KM3400MLWS10	KDM3400G5MW	E2K3400MGW
KDCM3400L5WD07	E2KM3400MLD07	KDM3400G5W	E2K3400GW
KDCM3400MW	E2KM3400MW	KDM3400G5WA06	E2K3400GWS10
KDCM3400N5MW	E2KM3400MNW	KDM3400G5WS10	E2K3400GWS10
KDCM3400N5MWA06	E2KM3400MNWA06	KDM3400G5WU18	E2K3400GWU18
KDCM3400N5WA02D07	E2KM3400MNA02D07	KDM3400J5MW	E2K3400MJW
KDCM3400R5MW	E2KM3400MRW	KDM3400K5MS54	E2K3400MKWS54
KDCM3400W	E2KM3400W	KDM3400K5MW	E2K3400MKW
KDCM3400W5MW	E2KM3400MWW	KDM3400L5MW	E2K3400MLW
KDCMDMD07	E2KM3400MDD07	KDM3400MW	E2K3400MW



**E<sup>2</sup> Cross Reference**

Series C Mining	Superseded by E <sup>2</sup> Mining	Series C Mining	Superseded by E <sup>2</sup> Mining
KDM3400MWA06U18	E2K3400MWA06U18	KM3225TD5M	E2K3400TMD
KDM3400N5MW	E2K3400MNW	KM3250T	E2K3250T
KDM3400R5MW	E2K3400MRW	KM3300T	E2K3300T
KDM3400W	E2K3400W	KM3350T	E2K3350T
KDM3400W5MW	E2K3400MWW	KM3400T	E2K3400T
KEM3100T	KEM3100T	KM3400TD5	E2K3400TD
KEM3100T	KEM3100T	KM3400TF5M	E2K3400TMF
KEM3125T	KEM3125T	KM3400TG5M	E2K3400TMG
KEM3125T	KEM3125T	KM3400TJ5M	E2K3400TMJ
KEM3150T	KEM3150T	KM3400TK5M	E2K3400TMK
KEM3150T	KEM3150T	KM3400TL5M	E2K3400TML
KEM3150TM	KEM3150TM	KM3400TM	E2K3400TM
KEM3150TM	KEM3150TM	KM3400TN5M	E2K3400TMN
KEM3200T	KEM3200T	KM3400TR5M	E2K3400TMR
KEM3200T	KEM3200T	KM3400TW5M	E2K3400TMW
KEM3225T	KEM3225T	LDCM3600EMA05W	E2LEM3600MA05W
KEM3225T	KEM3225T	LDCM3600F	E2LM3600F
KEM3225T	KEM3225T	LDM3600F	E2L3600F
KEM3225T2	KEM3225T2	LEM3300T	LEM3300T
KEM3225TM	KEM3225TM	LEM3350T	LEM3350T
KEM3225TM	KEM3225TM	LEM3400T	LEM3400T
KEM3225TM2	KEM3225TM2	LEM3400T2	LEM3400T2
KM2225TA5	E2K2225TA	LEM3400TM	LEM3400TM
KM2225TA5M	E2K2400TMA	LEM3400TM2	LEM3400TM2
KM2225TD5	E2K2225TD	LEM3600T	LEM3600T
KM2225TD5M	E2K2400TMD	LEM3600TM	LEM3600TM
KM2400TD5	E2K2400TD	LM3600TL6M	E2L3600TML
KM2400TD5M	E2K2400TMD	LM3600TN6M	E2L3600TMN
KM2400TG5M	E2K2400TMG	LM3600TP6M	E2L3600TMP
KM2400TN5M	E2K2400TMN	LM3600TR6M	E2L3600TMR
KM2400TW5M	E2K2400TMW	LM3600TS6M	E2L3600TM
KM3100T	E2K3100T	LM3600TX6M	E2L3600TMX
KM3125T	E2K3125T	UVE3LP08K	UVE3LP08K
KM3150T	E2K3150T	UVE4LP08K	UVE4LP08K
KM3175T	E2K3175T		
KM3200T	E2K3200T		
KM3225T	E2K3225T		
KM3225TA5	E2K3225TA		
KM3225TA5M	E2K3400TMA		
KM3225TD5	E2K3225TD		

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