SELECTION

AND

APPLICATION

OF

K-DON CURRENT LIMITING

LOW VOLTAGE

POWER CIRCUIT BREAKERS

I-T-E CIRCUIT BREAKER COMPANY
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SELECTION OF K-DON CIRCUIT BREAKERS

The following step by step procedure is to be used as a guide for proper circuit breaker and fuse selection.

A. CIRCUIT BREAKER SELECTION

1 Determine the system short circuit capacity in symmetrical RMS amperes.

2 Determine from Table I columns 3, 4 and 5 respectively the approximate continuous current rating and the time delay and instantaneous overcurrent trip settings.

3 Select from Table II columns 1, 2, 3 and 4 respectively the proper coil rating, frame size, time delay and instantaneous settings as follows:

(a) The coil rating should be equal to or greater than the value determined in Table I column 3.

(b) When there is a choice of breaker frame size the larger will provide maximum flexibility in case of load growth.

(c) Time delay setting should be set at a value nearest to that determined in Table I column 4.

(d) Instantaneous setting should be set at a value nearest to that determined in Table I column 5. However, this value may have to be adjusted downward to coordinate with Amp-trap to be selected in step B.

TABLE I

1 type of application		2 purpose of circuit breaker	3 continuous current rating of circuit breaker	4 settings of overcurrent trip device: time delay	5 settings of overcurrent trip device: instantaneous
Service entrance (general)		(a) To protect source transformer windings from overheating, due to overload or fault current flow. (b) To protect circuit conductors from effects of overcurrent flow. (c) To provide safe and rapid means for connecting and disconnecting of load circuit.	Based upon 125% of the transformer current rating	125% of the transformer current rating	1000% of circuit breaker current rating
Service feeder (general)		(a) To protect circuit conductors from effects of overcurrent flow. (b) To protect connected electrical equipment from effects of fault current flow.	Based upon 115% of estimated load current	115% of estimated load current	1000% of circuit breaker current rating
BRANCH CIRCUITS (GENERAL)	Individual motor circuit	(a) To protect motor windings from overheating due to overcurrent or fault current flow. (b) To protect circuit conductors and other connected electrical equipment from overload or fault current flow. (c) To provide safe and rapid means of connecting and disconnecting motor circuit.	Based upon 115% of rated full load current of motor	115% of rated full load current of motor	1000% of circuit breaker current rating
	Group motor circuit	(a) To protect circuit conductors from overheating. (b) To protect circuit conductors, motor windings and other connected electrical equipment from fault current flow. (c) To provide safe and rapid means of connecting and disconnecting common motor circuit from supply source.	Based upon 115% of largest motor full load current plus sum of other motor currents	100% of circuit breaker current rating	1000% of circuit breaker current rating
	Combined motor and lighting circuit	(a) To protect circuit conductors from overheating. (b) To protect circuit conductors, motor windings and other connected electrical equipment from fault current flow. (c) To provide safe and rapid means of connecting and disconnecting common load circuit from supply source.	Based upon 115% of largest motor full load current plus sum of other motor and lighting load currents	100% of circuit breaker current rating	1000% of circuit breaker current rating
	Lighting circuit	(a) To protect circuit conductors from effects of overload or fault current flow. (b) To provide safe and rapid means of connecting and disconnecting lighting circuit from supply source.	Based upon 125% of estimated maximum lighting current	100% of circuit breaker current rating	1000% of circuit breaker current rating

B. AMP-TRAP SELECTION

1 When all equipment protected by the breaker has a short circuit withstand rating equal to or greater than the breaker selected in step A,† the maximum fuse size in Table II column 5 may be used. This assures maximum coordination and flexibility of instantaneous breaker settings with minimum fuse blowing. However, where economy over-rules maximum flexibility any lower rated fuse size down to the one directly to the right of the instantaneous trip setting selected from column 4 may be chosen. Fuse sizes below this value will not coordinate with trip setting.

2 When the equipment to be protected by the breaker has a short circuit withstand rating less than the breaker,† Figure 1 must be used to determine maximum fuse size to adequately protect this equipment. Two values must be known.

(a) System short circuit capacity—symmetrical RMS amperes (this value was determined in step A-1).

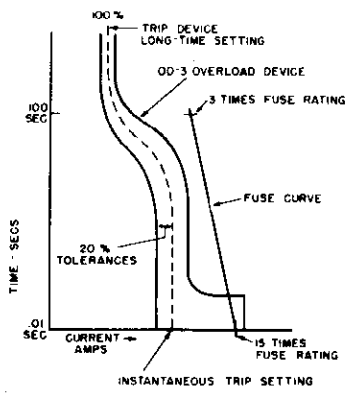
(b) Peak amperes—this value is determined by multiplying the short circuit withstand rating of the equipment in symmetrical RMS amperes by 2.3.

Select a maximum fuse size from Figure 1 which lies equal to or below the intersection of the short circuit ampere and peak ampere coordinates. Check this maximum fuse size against the instantaneous setting selected in Table II column 4. If the instantaneous setting is to high to coordinate with this fuse the instantaneous setting must be adjusted downward to insure coordination.

NOTE

Common applications such as Protection of Molded-Case Breakers and Bus Duct have been tabulated and appear in Tables III and IV.

† K-Don-600, 42,000 Amp. Sym.; K-Don-1600, 65,000 Amp. Sym.



Typical Breaker Amp-trap coordination curve

TABLE II

1 BREAKER COIL RATING	2 BREAKER FRAME SIZE	3 TRIP DEVICE LONG-TIME SETTINGS	4 TRIP DEVICE INSTANTANEOUS SETTINGS	5 COORDINATING FUSE SIZE*
40	K-Don -600	20 25 30 40 50	150 250 400 600	400 400 400 400-1200
70	K-Don -600	40 50 60 70 90	250 500 750 1100	400 400 400 400-1200
125	K-Don -600	70 90 100 125 160	450 800 1200 1900	400 400 400 600-1200
225	K-Don -600	120 150 175 200 225 285	750 1500 2400 3400	400 400 600 800-2000
400	K-Don -600	200 250 300 350 400 500	1250 2000 4000 6000	400 600 1200 1600-2000
600	K-Don -600	400 500 600 750	2500 4000 6000 9000	800 1200 1600 2000
225	K-Don -1600	120 150 175 200 225 285	750 1500 2400 3400	400 400 600 800-2000
400	K-Don -1600	200 250 300 350 400 500	1250 2000 4000 6000	400 800 1200 1600-2000
800	K-Don -1600	400 500 600 800 1000	2500 5000 7500 10,000	800 1600 2000 3000
1600	K-Don -1600	800 1000 1200 1600 2000	5000 10,000 15,000 20,000	3000 3000 a a

a. 3000 Amp. fuse will not coordinate with these instantaneous settings.

*Minimum fuse size which will coordinate with instantaneous breaker setting directly to left in column 4.

FIG 1

AMP-TRAP LET THRU CURVES

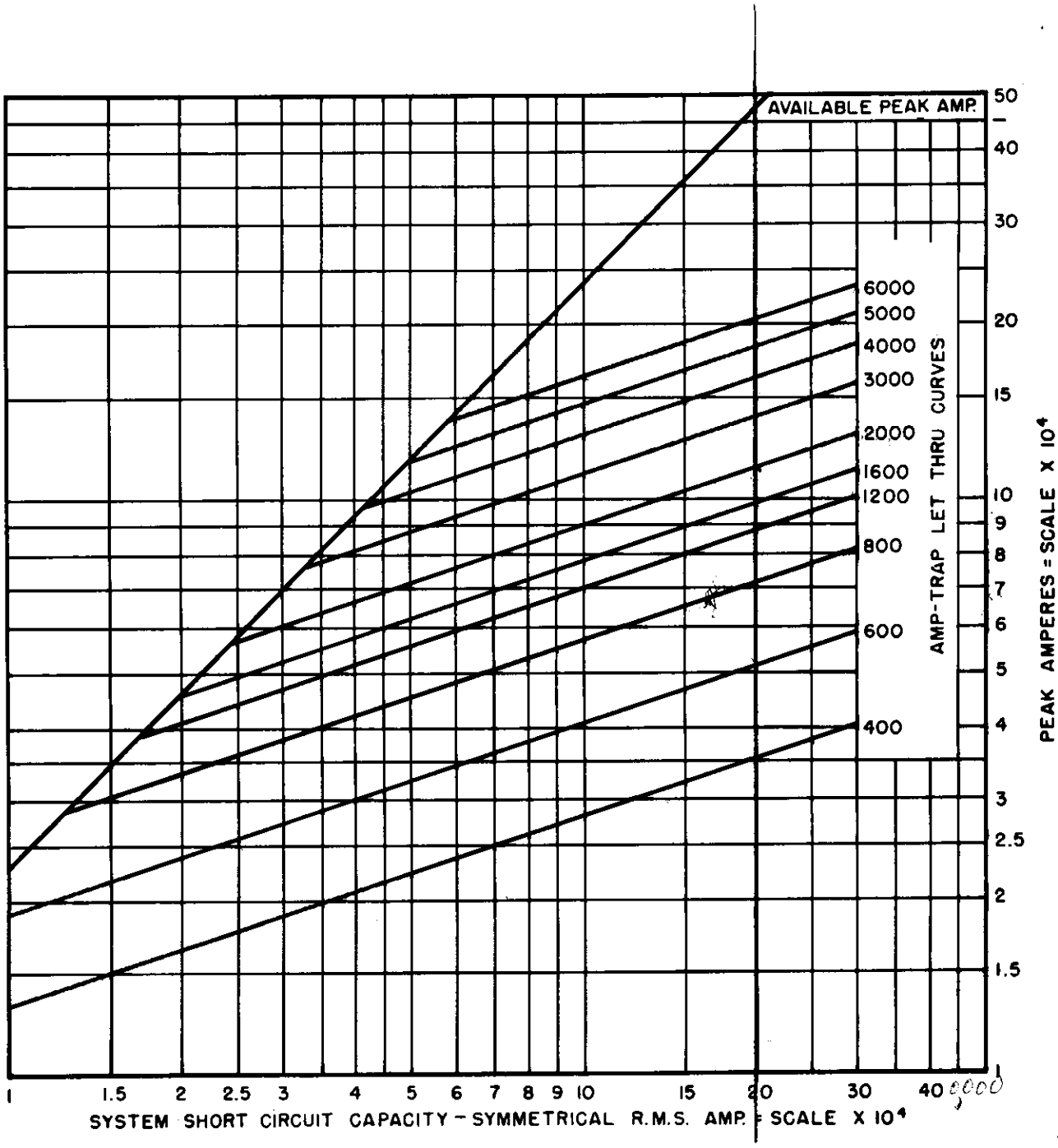


TABLE III

PROTECTION OF MOLDED CASE CIRCUIT BREAKERS IN SWITCHBOARDS, MOTOR CONTROL CENTERS AND PANELBOARDS 100,000 AMPERES *

MOLDED CASE CIRCUIT BRKR.		K-Don - 600		K-Don - 1600	
Type	Rating	Coil Rating Max.	Amp-trap Rating Max.	Coil Rating Max.	Amp-trap Rating Max.
F	15-50	400	400	——	——
F	70-100	600	600	——	——
J	70-125	600	1200	1000	1200
J	150-225	600	1600	1200	1600
JK	70-125	600	1200	1000	1200
JK	150-225	600	1600	1200	1600
JKL	125	600	1200	1000	1200
JKL	150-400	600	1600	1200	1600
LM	125	600	1200	1000	1200
LM	150-400	600	1600	1200	1600
LM	500-800	—	——	1600	2000

TABLE IV

PROTECTION OF BUS DUCT SYSTEMS 100,000 AMPERES *

BUS DUCT	K-Don - 600		K-Don - 1600	
Ampere Rating	Coil Rating Max.	Amp-trap Rating Max.	Coil Rating Max.	Amp-trap Rating Max.
Plug-In Type				
225	400	800	—	——
400	600	1200	—	——
600	600	1600	800	1600
800	—	——	1600	2000
1000	—	——	1600	3000
1250	—	——	1600	3000
1500	—	——	1600	3000
LO-X Type				
600	600	2000	800	2000
800	—	——	1600	2500
1000	—	——	1600	3000
1350	—	——	1600	3000
1600	—	——	1600	3000
2000	—	——	——	——
2500	—	——	——	——
3000	—	——	——	——
4000	—	——	——	——

* For available fault currents above 100,000 Amperes symmetrical, consult the factory.