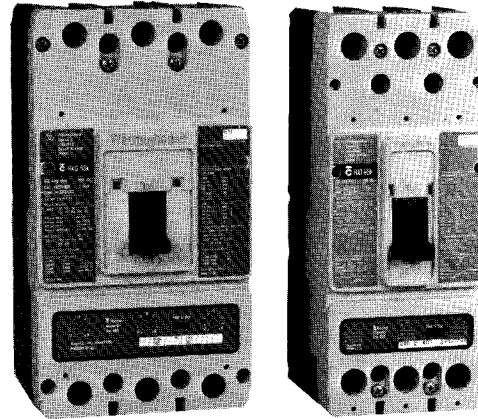


CENTERLINE[®] Motor Control Centers

Cutler-Hammer/Westinghouse Inverse Time Circuit Breakers In Application-Rated Combination Starter Units

Product Data



Cutler-Hammer/Westinghouse HKD and HJD frame thermal magnetic circuit breakers.

Application

Circuit breaker application is valid for the following Bulletin 2400 products:

- Bulletin 2407 Full Voltage Reversing Combination Staters
- Bulletin 2413 Full Voltage Non-Reversing Combination Starters

The information in this publication applies to Cutler-Hammer/Westinghouse inverse time, thermal magnetic or solid-state circuit breakers, when they are used in application-rated combination starter units (16A through 304A).

IMPORTANT: The information in this publication does not apply to instantaneous trip circuit breakers (motor circuit protectors). For combination starter units with instantaneous trip circuit breakers, refer to Publication 2400-TD001A-EN-P, Cutler-Hammer/Westinghouse Instantaneous Trip Motor Circuit Protectors (HMCP) In Application-Rated Combination Starter Units.

Circuit Breaker Operation

Inverse time circuit breakers are designed to trip at 100% to 125% of their continuous current rating. They are also designed to trip, on an inverse-time basis, at overcurrents up to the magnetic or electronic trip current setting of the circuit breaker. The circuit breaker manufacturer sets the continuous current ratings for the thermal magnetic circuit breakers. The continuous current rating of circuit breakers with solid-state trip mechanisms depends on the installed rating plug.

Cutler–Hammer/Westinghouse F-frame circuit breakers have a non-adjustable instantaneous magnetic trip mechanism, which is set by the circuit breaker manufacturer. All other frame sizes have an adjustable instantaneous trip mechanism, which can be set to a desired current value. Refer to Tables 1-3 (pages 4-7) for the instantaneous (magnetic or electronic) trip ranges and settings.

Circuit Breaker Size and Adjustment

Packaged Control Products has made engineering evaluations for the protective device (circuit breaker) selection, sizing, and setting range based on the protection rules/requirements and motor criteria as stipulated in NEC, CEC, NEMA, and UL Standards, e.g. motor full load currents (FLC), X/R ratios, lock rotor currents, nominal utilization voltages, etc. Should the motor application have criteria that deviates from those stated in the aforementioned standards, higher FLC and/or motor inrush currents (greater than 1300% of the nominal FLC) may be experienced, e.g. special motors, non-standard NEMA motors, energy efficient motors, Design B energy efficient, etc.

Determine the desired trip current, using the National Electrical Code (NEC) or Canadian Electrical Code (CEC), and the instructions provided with the combination starter unit. Refer to the tables on pages 4-7 and choose the trip setting which has the desired trip current value. Make certain that the circuit breaker operating handle is in the **OFF/O** position. Depress each trip setting dial with a screwdriver, and turn clockwise to the determined setting. If there is more than one dial on the circuit breaker, all should be set to the same value.

Push-To-Trip Mechanism

The push-to-trip mechanism provides a manual means for tripping the circuit breaker. Use a small screwdriver to depress the red button on the circuit breaker cover. When the button is pushed, a plunger rotates the trip bar and causes the breaker to trip.

Horsepower and Kilowatt Ratings

The horsepower and kilowatt ratings for application-rated combination starter units listed in the tables on pages 4-7 were determined from full load currents as specified in the NEC/CEC.

Acceptable performance should occur when the motor full load current is within 15% of the value which corresponds to the horsepower or kilowatt ratings and voltages listed in the NEC/CEC. Consult your local Rockwell Automation sales office or Allen-Bradley distributor if the motor full load current is not within these limits.



ATTENTION: The horsepower and kilowatt ratings and corresponding trip settings in Tables 1-3 are only valid when the combination starter units are equipped with an Allen-Bradley Bulletin 193 overload relay (motor running overcurrent protective device).

When correctly selected, this combination of equipment protects against short circuit and ground fault damage, and provides coordinated overcurrent protection in the motor branch circuit for continuous-duty rated motors, as defined in the NEC and CEC.

The circuit breaker tripping may indicate the interruption of a high fault current. To ensure protection against fire and/or shock hazard, examine the current carrying parts of the combination starter units and replace if damaged. (Refer to NEMA Standards Publication Number ICS 2.2, Maintenance of Motor Controllers After a Fault Condition, and NEMA Standard Publication Number ICS 2, Parts ICS 2-302.

Table 1
Combination 2407 and 2413 Starter Units - FD, FDB, and HFD Thermal Magnetic Circuit Breakers
(Non-Adjustable Magnetic Trip)

Continuous Current Rating (Amperes)	Contactor Rating (Amperes)	Horsepower (Kilowatt) Range					Magnetic Trip Range (Amperes)	
		220-230V	240V	380-415V	480V	600V	Min.	Max.
15A	16-23A	(0.12-1.5)	0.125-2	(0.12-2.2)	0.125-3	0.125-5	500	800
20A	16-23A	(2.2)	3	(3.7)	5	7.5		1000
30A	16-23A	(3.7)	5	(5.5-7.5)	7.5-10	10		
40A	23-43A	--	--	--	--	15		
50A	16A	(5.5)	--	--	--	--	600	1200
	23A	(5.5)	7.5	(11)	15	--		
	30A	(5.5)	7.5-10	(11)	15-20	20		
	37-43A	(5.5)	7.5-10	(11)	15-20	20-25		
	60-85A	--	10	--	20	25		
60A	23A	(7.5)	--	--	--	--		
	30A	(7.5)	--	(15)	--	--		
	37A	(7.5)	--	(15)	25	--		
	43-85A	(7.5)	--	(15)	25	30		
70A	37A	(11)	--	(18.5)	--	--		
	43A	(11)	15	(18.5-22)	30	--		
	60-85A	(11)	15	(18.5-22)	30	40		
100A	60A	(15)	--	--	40	--	700	1400
	72-85A	(15)	--	--	40	50		
125A	60A	(18.5)	20	(30)	--	--	800	1600
	72-85A	(18.5)	20	(30)	50	--		
150A	72-85A	(22)	25	(37)	--	--		

	Standard Interrupting Capacity Suffix Letter "CT"		Medium Interrupting Capacity Suffix Letter "CB"		High Interrupting Capacity Suffix Letter "CM"	
	C-H/Westinghouse Catalog Number	Allen-Bradley Part Number	C-H/Westinghouse Catalog Number	Allen-Bradley Part Number	C-H/Westinghouse Catalog Number	Allen-Bradley Part Number
	FDB3015	25105-265-01	FD3015	25105-264-01	HFD3015	25105-263-01
	FDB3020	25105-265-02	FD3020	25105-264-02	HFD3020	25105-263-02
	FDB3030	25105-265-04	FD3030	25105-264-04	HFD3030	25105-263-04
	FDB3040	25105-265-06	FD3040	25105-264-06	HFD3040	25105-263-06
	FDB3050	25105-265-07	FD3050	25105-264-07	HFD3050	25105-263-07
	FDB3050	25105-265-07	FD3050	25105-264-07	HFD3050	25105-263-07
	FDB3050	25105-265-07	FD3050	25105-264-07	HFD3050	25105-263-07
	FDB3050	25105-265-07	FD3050	25105-264-07	HFD3050	25105-263-07
	FDB3050	25105-265-07	FD3050	25105-264-07	HFD3050	25105-263-07
	FDB3060	25105-265-08	FD3060	25105-264-08	HFD3060	25105-263-08
	FDB3060	25105-265-08	FD3060	25105-264-08	HFD3060	25105-263-08
	FDB3060	25105-265-08	FD3060	25105-264-08	HFD3060	25105-263-08
	FDB3060	25105-265-08	FD3060	25105-264-08	HFD3060	25105-263-08
	FDB3070	25105-265-09	FD3070	25105-264-09	HFD3070	25105-263-09
	FDB3070	25105-265-09	FD3070	25105-264-09	HFD3070	25105-263-09
	FDB3070	25105-265-09	FD3070	25105-264-09	HFD3070	25105-263-09
	FDB3100	25105-265-11	FD3100	25105-264-11	HFD3100	25105-263-11
	FDB3100	25105-265-11	FD3100	25105-264-11	HFD3100	25105-263-11
	FDB3125	25105-265-12	FD3125	25105-264-12	HFD3125	25105-263-12
	FDB3125	25105-265-12	FD3125	25105-264-12	HFD3125	25105-263-12
	FDB3150	25105-265-13	FD3150	25105-264-13	HFD3150	25105-263-13

Table 2 Combination 2407 and 2413 Starter Units - JDB, HJD, KDB and HKD Thermal Magnetic Circuit Breakers (Adjustable Magnetic Trip)

Continuous Current Rating (Amperes)	Contactor Rating (Amperes)	Horsepower (Kilowatt) Range					Magnetic Trip Setting (Amperes)								
		220-230V	240V	380-415V	480V	600V	5X	--	--	--	7.5X	--	--	--	10X
125A	85A	--	30	--	60	60	625	700	780	860	940	1020	1050	1170	1250
	110A	--	30	--	60	60-75	625	700	780	860	940	1020	1050	1170	1250
150A	85A	--	--	(45)	--	--	750	840	935	1030	1125	1220	1315	1410	1500
	110A	--	40	(45)	75	100	750	840	935	1030	1125	1220	1315	1410	1500
175A	110A	--	--	--	--	--	875	980	1090	1200	1310	1420	1530	1640	1750
	180A	--	50	--	100	125	875	980	1090	1200	1310	1420	1530	1640	1750
250A	110A	(30)	--	(55)	--	--	1250	1405	1565	1720	1875	2030	2185	2340	2500
	180A	(37)	60	(75)	125-150	150	1250	1405	1565	1720	1875	2030	2185	2340	2500
	250A	--	75	--	--	200	1250	1405	1565	1720	1875	2030	2185	2340	2500
300A	180A	(45)	--	(90)	--	--	1500	1690	1875	2065	2250	2440	2630	2815	3000
400A	250A	(55)	100	(110)	200	250	2000	2250	2500	2750	3000	3250	3500	3750	4000

Table 3 Combination 2407 and 2413 Starter Units - LD and HLD Solid-State Circuit Breakers (Adjustable Electronic Trip)

Continuous Current Rating (Amperes)	Contactor Rating (Amperes)	Horsepower (Kilowatt) Range					Electronic Trip Setting (Amperes)							
		220-230V	240V	380-415V	480V	600V	2X	3X	4X	5X	6X	7X	8X	
--	250A	(75) ❶	--	(132) ❶	--	--	--	--	--	--	--	--	--	
500	304A	(90)	--	(150-160)	--	300	1000	1500	2000	2500	3000	3500	4000	
600	304A	--	--	--	250	--	1200	1800	2400	3000	3600	4200	4800	

❶ Thermal magnetic circuit breakers are not available for 75 and 132 kilowatt applications. See Publication 2400-TD001A-EN-P, Cutler-Hammer/Westing

	Standard Interrupting Capacity Suffix Letter "CT"		High Interrupting Capacity Suffix Letter "CM"	
	C-H/Westinghouse Catalog Number	Allen-Bradley Part Number	C-H/Westinghouse Catalog Number	Allen-Bradley Part Number
	JDB3125	25104-348-04	HJD3125	25104-346-04
	JDB3125	25104-348-04	HJD3125	25104-346-04
	JDB3150	25104-348-05	HJD3150	25104-346-05
	JDB3150	25104-348-05	HJD3150	25104-346-05
	JDB3175	25104-348-06	HJD3175	25104-346-06
	JDB3175	25104-348-06	HJD3175	25104-346-06
	JDB3250	25104-348-09	HJD3250	25104-346-09
	JDB3250	25104-348-09	HJD3250	25104-346-09
	JDB3250	25104-348-09	HJD3250	25104-346-09
	KDB3300	25104-369-10	HKD3300	25104-367-10
	KDB3400	25104-369-12	HKD3400	25104-367-12

	Standard Interrupting Capacity Suffix Letter "CT"		High Interrupting Capacity Suffix Letter "CM"	
	C-H/Westinghouse Catalog Number	Allen-Bradley Part Number	C-H/Westinghouse Catalog Number	Allen-Bradley Part Number
	--	--	--	--
	--	--	--	--
	LDB3600FT35W 6LES500T	25103-406-01 25107-447-04	HLDB3600FT35W 6LES500T	25103-406-02 25107-447-04
	LDB3600FT35W 6LES600T	25103-406-01 25107-447-05	HLDB3600FT35W 6LES600T	24103-406-02 25107-447-05

Trip Motor Circuit Protectors (HMCP) In Application-Rated Combination Starter Units.

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