

Heater Selection

General Information on Heater Coil Selection

For maximum motor protection and compliance with Article 430-32 of the National Electrical Code, select heater coils from the tables in this section on the basis of motor nameplate full load current.

When the full load current is unknown, selection may be made on the basis of average full load currents as shown on **Pages V5-T2-155 and V5-T2-156. Caution—The average ratings could be high or low for a specific**

motor and therefore selection on this basis always involves risk. For fully reliable motor protection, select heater coils on the basis of full load current rating as shown on the motor nameplate.

Heater coils are rated to protect 40°C rise motors, and open and drip-proof motors having a **service factor of 1.15** where the motor and the controller are at the same ambient temperature.

For other conditions:

- For 50°C, 55°C, 75°C rise motors and **enclosed motors having a service factor of 1.0, select one size smaller coil.**
- Ambient temperature of controller lower than motor by 26°C (47°F), use one size smaller coil.
- Ambient temperature of controller higher than motor by 26°C (47°F), use one size larger coil.

Ultimate tripping current of heater coils is approximately 1.25 times the minimum current rating listed in the tables.

Type A and B Overload Relays, Sizes 3 and 4

Size Starter	Ambient Compensated Enclosed Starters	Non-Compensating Enclosed Starters	Heater (One Heater per Catalog Number) Catalog Number
	All Applications Full Load Current of Motor Amps		
↑ For Size 4 Starters ↓	12.8–14.1	11.9–13.0	FH68
	14.2–15.5	13.1–14.3	FH69
	15.6–17.1	14.4–15.9	FH70
	17.2–18.9	16.0–17.4	FH71
	19.0–20.8	17.5–19.1	FH72
	20.9–22.9	19.2–21.1	FH73
	23.0–25.2	21.2–23.2	FH74
	25.3–27.8	23.3–25.6	FH75
	27.9–30.6	25.7–28.1	FH76
	30.7–33.5	28.2–30.8	FH77
	33.6–37.5	30.9–34.5	FH78
	37.6–41.5	34.6–38.2	FH79
	41.6–56.3	38.3–42.6	FH80
	46.4–50	42.7–46	FH81
	51–55	47–51	FH82
	56–61	52–56	FH83
	62–66	57–61	FH84
	67–73	62–67	FH85
	74–78	68–72	FH86
	79–84	73–77	FH87
85–92	78–84	FH88	
↑ For Size 3 Starters ↓	93–101	85–91	FH89
	102–110	92–99	FH90
	111–122	100–110	FH91
	123–129	111–122	FH92
	130–133	123–128	FH93
	—	129–133	FH94

Type A and B Overload Relays, Sizes 5 and 6

Compensated Overload Relay		Heater (One Heater per Catalog Number) Catalog Number
Open Starter Full Load Current of Motor (Amps)	Enclosed Starter Full Load Current of Motor (Amps)	
Size 5 (with 300/5 Current Transformers)		
—	—	FH23
118–129	118–129	FH24
130–141	130–141	FH25
142–155	142–155	FH26
156–170	156–170	FH27
171–187	171–187	FH28
188–205	188–205	FH29
206–224	206–224	FH30
225–244	225–244	FH31
245–263	245–263	FH32
264–292	264–292	FH33
293–300	—	FH34
Size 6 (with 600/5 Current Transformers)		
—	—	FH23
236–259	236–259	FH24
260–283	260–283	FH25
284–310	284–310	FH26
311–340	311–340	FH27
341–374	341–374	FH28
375–411	375–411	FH29
412–448	412–448	FH30
449–489	449–489	FH31
490–527	490–527	FH32
528–585	528–540	FH33
586–600	—	FH34

Note

① Size 7 and larger—advise full load current.

2.3

NEMA Contactors and Starters

A200 Series

Type A and B Overload Relays, Sizes 0, 1 and 2

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Size Starter	Non-Compensated Open Starters and Ambient Comp. Open and Enclosed Starters Block Type Overload sing Three Heaters	Single-Pole Type Overload	Heater (One Heater per Catalog Number) Catalog Number	Non-Compensating Enclosed Starters Block Type Overload Using Three Heaters	Single-Pole Type Overload	Heater Catalog Number
Full Load Current of Motor (Amps)						
	0.25–0.27	0.29–0.31	FH03	0.24–0.25	0.28–0.30	FH03
	0.28–0.31	0.32–0.35	FH04	0.26–0.28	0.31–0.34	FH04
	0.32–0.34	0.36–0.39	FH05	0.29–0.31	0.35–0.37	FH05
	0.35–0.38	0.40–0.43	FH06	0.32–0.35	0.38–0.42	FH06
	0.39–0.42	0.44–0.48	FH07	0.36–0.39	0.43–0.47	FH07
	0.43–0.46	0.49–0.53	FH08	0.40–0.43	0.48–0.52	FH08
	0.47–0.50	0.54–0.58	FH09	0.44–0.47	0.53–0.56	FH09
	0.51–0.55	0.59–0.64	FH10	0.48–0.51	0.57–0.63	FH10
	0.56–0.62	0.65–0.71	FH11	0.52–0.57	0.64–0.70	FH11
	0.63–0.68	0.72–0.79	FH12	0.58–0.63	0.71–0.77	FH12
	0.69–0.75	0.80–0.87	FH13	0.64–0.70	0.78–0.85	FH13
	0.76–0.83	0.88–0.96	FH14	0.71–0.77	0.86–0.94	FH14
	0.84–0.91	0.97–1.06	FH15	0.78–0.85	0.95–1.03	FH15
	0.92–1.00	1.07–1.16	FH16	0.86–0.93	1.04–1.13	FH16
	1.01–1.11	1.17–1.28	FH17	0.94–1.03	1.14–1.25	FH17
	1.12–1.22	1.29–1.41	FH18	1.04–1.13	1.26–1.38	FH18
	1.23–1.34	1.42–1.55	FH19	1.14–1.25	1.39–1.52	FH19
	1.35–1.47	1.56–1.71	FH20	1.26–1.37	1.53–1.67	FH20
	1.48–1.62	1.72–1.87	FH21	1.38–1.51	1.68–1.83	FH21
	1.63–1.78	1.88–2.06	FH22	1.52–1.65	1.84–2.01	FH22
	1.79–1.95	2.07–2.26	FH23	1.66–1.81	2.02–2.21	FH23
	1.96–2.15	2.27–2.48	FH24	1.82–1.99	2.22–2.43	FH24
	2.16–2.35	2.49–2.72	FH25	2.00–2.19	2.44–2.66	FH25
	2.36–2.58	2.73–2.99	FH26	2.20–2.39	2.67–2.92	FH26
	2.59–2.83	3.00–3.28	FH27	2.40–2.63	2.93–3.21	FH27
	2.84–3.11	3.29–3.60	FH28	2.64–2.89	3.22–3.53	FH28
	3.12–3.42	3.61–3.95	FH29	2.90–3.17	3.54–3.87	FH29
	3.43–3.73	3.96–4.31	FH30	3.18–3.47	3.88–4.22	FH30
	3.74–4.07	4.32–4.71	FH31	3.48–3.79	4.23–4.61	FH31
	4.08–4.39	4.72–5.14	FH32	3.80–4.11	4.62–4.9	FH32
	4.40–4.87	5.15–5.6	FH33	4.12–4.55	5.0–5.5	FH33
	4.88–5.3	5.7–6.2	FH34	4.56–5.0	5.6–6.0	FH34
	5.4–5.9	6.3–6.8	FH35	5.1–5.5	6.1–6.6	FH35
	6.0–6.4	6.9–7.5	FH36	5.6–5.9	6.7–7.3	FH36
	6.5–7.1	7.6–8.2	FH37	6.0–6.6	7.4–8.0	FH37
	7.2–7.8	8.3–9.0	FH38	6.7–7.2	8.1–8.7	FH38
	7.9–8.5	9.1–9.9	FH39	7.3–7.9	8.8–9.7	FH39
	8.6–9.4	10.0–10.8	FH40	8.0–8.7	9.8–10.5	FH40
	9.5–10.3	10.9–11.9	FH41	8.8–9.5	10.6–11.7	FH41
	10.4–11.3	12.0–13.1	FH42	9.6–10.5	11.8–12.7	FH42
	11.4–12.4	13.2–14.3	FH43	10.6–11.5	12.8–14.0	FH43
	12.5–13.5	14.4–15.7	FH44	11.6–12.6	14.1–15.3	FH44
	13.6–14.9	15.8–17.2	FH45	12.7–13.8	15.4–16.6	FH45
	15.0–16.3	17.3–18.9	FH46	13.9–15.1	16.7–18.3	FH46
	16.4–18.0	19.0–20.8	FH47	15.2–16.7	18.4–20.0	FH47
	18.1–19.8	20.9–22.9	FH48	16.8–18.3	20.1–21.9	FH48
	19.9–21.7	23.0–25.2	FH49	18.4–20.2	22.0–23.9	FH49
	21.8–23.9	25.3–27.6	FH50	20.3–22.2	24.0–26.2	FH50
	24.0–26.2	27.7–30.3	FH51	22.3–24.3	26.3–28.8	FH51
	26.3–28.7	30.4–33.3	FH52	24.4–26.6	28.9–31.4	FH52
	28.8–31.4	33.4–36.4	FH53	26.7–29.1	31.5–34.5	FH53
	31.5–34.5	36.5–39.9	FH54	29.2–32.0	34.6–37.9	FH54
	34.6–37.9	40.0–43.9	FH55	32.1–35.2	38.0–41.9	FH55
	38.0–41.5		FH56	35.3–38.5	42.0–45.0	FH56
	41.6–45.0		FH57	38.6–42.3		FH57