Reference Material for Timers: Inrush Current

"---" indicates a constant current and therefore omitted from the table. All the values are approximate values and should therefore be used as a guide.

■ Timers

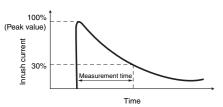
H3CA-A series 24 to 240 VAC/ 12 to 240 VDC 264 VAC 1.6 A 0.6 ms H3CA-8/-8-306 200/220/240 VAC 264 VAC 1.5 A 0.6 ms 24 VDC H3CA-8H/-8H-306 200/220/240 VAC 264 VAC 1.5 A 0.6 ms 100/110/120 VAC 132 VAC 1.6 A 0.6 ms 100/110/120 VAC 132 VAC 1.5 A 5 ms 24 VDC H3CR-A/-A8/-AP 100 to 240 VAC/ 264 VAC 1.6 A 0.6 ms 100 to 125 VDC 264 VDC 1.2 A 2 ms 100 to 240 VAC/ 264 VDC 1.76A 0.1ms 100 to 125 VDC 100 to 240 VAC/ 264 VAC 1.76A 0.1ms 100 to 240 VAC/ 264 VAC 1.76A 0.1ms 0.2ms 264 VAC 1.76A 0.1ms 137.5 VDC 550 mA 0.2 ms 264 VAC 1.75 mA 3.1 ms H3CR-AS/-A8S 24 to 48 VAC/ 26.4 VAC 1.75 mA	Model		Voltage	Applied voltage	Inrush current (peak value)	Time (see note)
12 to 240 VDC 100 120 VAC 264 VAC 180 5 ms 14 24 VDC 264 VAC 1.6 A 0.6 ms 5 ms 24 VDC 264 VAC 1.5 A 5 ms 130 100 to 240 VAC/ 264 VAC 1.8 M 3.2 ms 780 mA 1.8 ms 100 to 125 VDC 264 VAC 780 mA 1.8 ms 3.2 ms 780 mA 3.2 ms 12 to 48 VAC/ 264 VAC 1.5 A 0.5 mA 0.3 ms 3.2 ms 12 to 48 VAC/ 12 to 48 VAC/ 264 VAC 17.6 A 0.1 ms 3.1 ms 13CR-F 100 to 240 VAC/ 264 VAC 37.5 VDC 550 mA 0.2 ms 2.6 VAC 17.6 A 1.1 ms 13CR-F 100 to 240 VAC/ 264 VAC 37.5 VDC 0.5 A 9.1 ms	H3AM-NS/	-NSR	100 to 240 VAC	264 VAC	2.74 A	1.7 ms
100/110/120 VAC 132 VAC 780 mA 5 ms 24 VDC H3CA-8H/-8H-306 200/220/240 VAC 264 VAC 1.6 A 0.6 ms 100/110/120 VAC 132 VAC 1.5 A 5 ms 24 VDC 264 VDC 1.2 A 2 ms 24 VDC 264 VAC 780 mA 1.8 ms 100 to 240 VAC/ 12 to 48 VAC/ 12 to 48 VAC 264 VAC 780 mA 1.8 ms H3CR-A/-A8/-AP 100 to 240 VAC/ 12 to 48 VAC 264 VAC 1.76A 0.1 ms 100 to 125 VDC 264 VAC 1.76A 0.1 ms 0.3 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VAC 264 VAC 370 mA 2.2 ms 13CR-F 100 to 240 VAC/ 12 to 48 VDC 264 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 264 VAC 0.57 A 9.4 ms 13C VDC 132 VAC 1.05 A 11 ms 137.5 VDC 0.5 A 11 ms 13CR-F 100 to 125 VDC 132 VAC 1.05 A 111 ms				264 VAC	1.6 A	0.6 ms
24 VDC H3CA-8H/-8H-306 200/220/240 VAC 264 VAC 1.6 A 0.6 ms 100/110/120 VAC 132 VAC 1.5 A 5 ms 24 VDC 264 VAC 1.6 A 0.6 ms 100 to 240 VAC/ 100 to 240 VAC/ 264 VAC 760 mA 1.8 ms 100 to 125 VDC 264 VAC 830 mA 2.4 ms 2.6 VAC 570 mA 6.3 ms H3CR-A8E 100 to 240 VAC/ 264 VAC 1.76A 0.1 ms 3.2 ms H3CR-A8E 100 to 240 VAC/ 264 VAC 270 mA 35 ms 24 to 48 VAC/ 264 VAC 270 mA 31 ms H3CR-AS/-A8S 24 to 48 VAC/ 264 VAC 370 mA 3.2 ms 12 to 48 VDC 264 VAC 370 mA 3.2 ms 264 VAC 370 mA 3.2 ms H3CR-F 100 to 240 VAC/ 264 VAC 370 mA 1.0 ms 3.2 ms 2.0 ms 3.2 ms H3CR-F 100 to 125 VDC 137.5 VDC 0.5 A 9.1 ms 2.0 ms <td< td=""><td>H3CA-8/-</td><td>8-306</td><td>200/220/240 VAC</td><td>264 VAC</td><td>1.5 A</td><td>0.6 ms</td></td<>	H3CA-8/-	8-306	200/220/240 VAC	264 VAC	1.5 A	0.6 ms
H3CA-8H/-8H-306 200/220/240 VAC 264 VAC 1.6 A 0.6 ms 100/110/120 VAC 132 VAC 1.5 A 5 ms 24 VDC 26.4 VDC 1.2 A 2 ms H3CR-A/-A8/-AP 100 to 240 VAC/ 100 to 125 VDC 264 VAC 780 mA 1.8 ms H3CR-A/-A8/-AP 100 to 240 VAC/ 12 to 48 VAC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 364 ms 3.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 364 ms 3.1 ms H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 1.1 ms 100 to 125 VDC 137.5 VDC 0.57 A 9.4 ms 200/220/240 VAC 264 VAC 1.06 A 1.13 ms 200/220/240 VAC 264 VAC 1.0			100/110/120 VAC	132 VAC	780 mA	5 ms
100/110/120 VAC 132 VAC 1.5 A 5 ms 24 VDC 26.4 VDC 1.2 A 2 ms H3CR-A/-A8/-AP 100 to 240 VAC/ 100 to 125 VDC 264 VAC 780 mA 1.8 ms H3CR-A/-A8/-AP 100 to 240 VAC/ 12 to 48 VDC 264 VAC 830 mA 2.4 ms H3CR-A-A8 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 830 mA 2.4 ms H3CR-A8E 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 1.76A 0.1ms H3CR-A8 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 270 mA 31 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VAC/ 12 to 48 VDC 26.4 VDC 250 mA 3.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VDC 250 mA 3.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VDC 3.0 mA 2.4 ms H3CR-F 100 to 1260 VAC/ 100 to 125 VDC 26.4 VDC 0.57 A 9.4 ms H3CR-F 100 to 125 VDC 137.5 VDC 0.57 A 9.4 ms H3CR-H S series 100/110/120 VAC 264 VAC 1.05 A			24 VDC			
24 VDC 26.4 VDC 1.2 A 2 ms H3CR-A/-A8/-AP 100 to 240 VAC/ 100 to 125 VDC 264 VAC 780 mA 1.8 ms H3CR-A/-A8/-AP 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 830 mA 2.4 ms H3CR-A8E 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 830 mA 2.4 ms H3CR-A8E 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 17.6A 0.1 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 270 mA 31 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 125 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 750 mA 1.8 ms H3CR-F 100 to 125 VDC 132 VAC 0.5 A 9.1 ms 100 to 125 VDC 132 VAC 0.5 A 111 ms 24 to 48 VAC/ 12 to 48 VDC 26.4 VDC 0.5 A 111 ms 200/220/240 VAC 26.4 VDC 0.5 A 111 ms 200/220/240 VAC 26.4 VDC 0.62	H3CA-8H/-	8H-306	200/220/240 VAC	264 VAC	1.6 A	0.6 ms
H3CR-A/-A8/-AP 100 to 240 VAC/ 100 to 125 VDC 264 VAC 780 mA 1.8 ms H3CR-A/-A8/-AP 100 to 125 VDC 26.4 VAC 830 mA 2.4 ms H3CR-A8E 100 to 240 VAC/ 12 to 48 VDC 26.4 VDC 570 mA 6.3 ms H3CR-A8E 100 to 240 VAC/ 100 to 125 VDC 26.4 VDC 570 mA 0.1 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VDC 270 mA 35 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VDC 270 mA 31 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VDC 250 mA 0.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VDC 0.5 A 9.1 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VDC 0.5 A 9.4 ms H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 111 ms 200/220/240 VAC 26.4 VAC 1.26 A 1.37 ms 26.4 VDC 0.62 A 109 ms 100 to 125 VDC 137.5 VDC 0.62 A 109 ms 26.4 VDC 0.64 ms 26	H3CR-A/-A8/-AP		100/110/120 VAC	132 VAC	1.5 A	5 ms
100 to 125 VDC 137.5 VDC 310 mA 3.2 ms 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 830 mA 2.4 ms H3CR-A8E 100 to 240 VAC/ 100 to 125 VDC 264 VAC 1.76A 0.1 ms 24 to 48 VAC/ 100 to 125 VDC 264 VAC 270 mA 35 ms 24 to 48 VAC/ 100 to 125 VDC 264 VAC 270 mA 31 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 264 VAC 270 mA 31 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 264 VAC 270 mA 3.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 264 VAC 0.5 A 9.1 ms 137.5 VDC 0.5 A 9.1 ms 3.2 ms H3CR-F 100 to 125 VDC 137.5 VDC 0.5 A 9.1 ms 24 to 48 VAC/ 12 to 48 VDC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC			24 VDC	26.4 VDC	1.2 A	2 ms
H3CR-ABE 137.5 24 to 48 VDC 310 mA 3.2 ms H3CR-ABE 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 830 mA 2.4 ms H3CR-ABE 100 to 240 VAC/ 100 to 125 VDC 264 VAC 1.76A 0.1 ms 24 to 48 VAC/VDC 26.4 VAC 270 mA 35 ms 26.4 VAC 270 mA 31 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 270 mA 32 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 370 mA 2.2 ms H3CR-H Series 100/110/120 VAC 26.4 VAC 0.5 A 9.1 ms 200/220/240 VAC 26.4 VAC 1.05 A 111 ms 200/220/240 VAC 26.4 VAC 1.02 A 364 ms 200/220/240 VAC 26.4 VAC 1.03 A	H3CR-A/-A	8/-AP		264 VAC	780 mA	1.8 ms
12 to 48 VDC 26.4 VDC 570 mA 6.3 ms H3CR-A8E 100 to 240 VAC/ 100 to 125 VDC 264 VAC 1.76A 0.1ms 24 to 48 VAC/VDC 26.4 VAC 270 mA 35 ms PACR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 270 mA 31 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 0.33 A 10 ms PACR-F 100/110/120 VAC 137.5 VDC 0.57 A 9.4 ms H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.07 A 119 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 26.4 VDC 0.87A 560 m				VDC		3.2 ms
H3CR-A8E 100 to 240 VAC/ 100 to 125 VDC 264 VAC 1.76A 0.1ms H3CR-A8E 100 to 125 VDC 264 VAC 270 mA 35 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 270 mA 31 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 750 mA 1 ms H3CR-H S series 100/10/120 VAC 26.4 VAC 0.5 A 9.1 ms H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 111 ms 200/220/240 VAC 26.4 VAC 1.05 A 111 ms 26.4 VDC 0.62 A 109 m 48 VDC 52.8 VDC 0.73 A 112 m 26.4 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 36						2.4 ms
100 to 125 VDC 137.5 VDC 550 mA 0.2 ms 24 to 48 VAC/VDC 26.4 VAC 270 mA 35 ms 26.4 VDC 270 mA 31 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 26.4 VAC 750 mA 1 ms 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 0.5 A 9.1 ms 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 0.5 A 9.1 ms 200/220/240 VAC 26.4 VAC 1.05 A 111 ms 200/220/240 VAC 26.4 VAC 1.05 A 111 ms 200/220/240 VAC 26.4 VAC 1.05 A 112 m 100 to 125 VDC 137.5 VDC 0.62 A 103 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 200/220/240 VAC 264 VAC						6.3 ms
H3CR-AS/-A8S 24 to 48 VAC/VDC 26.4 VAC 270 mA 35 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 270 mA 32 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 270 mA 32 ms H3CR-F 100 to 240 VAC/ 12 to 48 VDC 26.4 VAC 250 mA 3.2 ms H3CR-F 100 to 125 VDC 26.4 VAC 0.57 A 9.4 ms 137.5 VDC 0.57 A 9.4 ms 10m ms 26.4 VDC 0.57 A 9.4 ms H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 26.4 VDC 0.85 A 133 ms 24 VAC/VDC 26.4 VDC 0.85 A 137 ms 26.4 VDC 0.62 A 109 m 100 to 125 VDC 137.5 VDC 0.62 A 109 m 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200 ms 137.5 VDC 0.62 A 380 ms 100/110/120	H3CR-A8E				1.76A	0.1ms
H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 31 ms H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 264 VAC 750 mA 1 ms 137.5 VDC 0.5 A 9.1 ms 137.5 VDC 0.5 A 9.1 ms 24 to 48 VAC/ 12 to 48 VDC 264 VAC 0.83 A 10 ms 26.4 VDC 0.57 A 9.4 ms H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.07 A 119 ms 24 VAC/VDC 26.4 VAC 1.02 A 130 ms 26.4 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200 ms 112 ms 100 to 125 VDC 137.5 VDC 0.62 A 380 ms 26.4 VDC 1.02 A 364 ms						0.2 ms
H3CR-AS/-A8S 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 370 mA 2.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 264 VAC 750 mA 1 ms 137.5 VDC 0.5 A 9.1 ms 137.5 VDC 0.5 A 9.1 ms 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 0.83 A 10 ms 100 ms 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 0.83 A 10 ms 100 ms 26.4 VDC 0.57 A 9.4 ms 111 ms 200/220/240 VAC 26.4 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.07 A 119 ms 26.4 VDC 0.85 A 137 ms 24 VAC/VDC 26.4 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200 ms 323 ms 26.4 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 26.4 VDC 0.87A 560 ms 24 VAC /VDC 26.4 VAC 1.03 A 323 ms 26.4 VDC			24 to 48 VAC/VDC		-	
12 to 48 VDC 26.4 VDC 250 mA 3.2 ms H3CR-F 100 to 240 VAC/ 100 to 125 VDC 264 VAC 750 mA 1 ms 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 0.5 A 9.1 ms 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 0.83 A 10 ms 24 to 48 VAC/ 12 to 48 VDC 26.4 VAC 0.83 A 10 ms 24 VAC/VDC 26.4 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.06 A 133 ms 24 VAC/VDC 26.4 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 24 VAC /VDC 26.4 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 24 VAC /VDC 26.4 VDC 0.62 A 380 ms					-	
H3CR-F 100 to 240 VAC/ 100 to 125 VDC 264 VAC 750 mA 1 ms 24 to 48 VAC/ 12 to 48 VDC 264 VAC 750 mA 1 ms H3CR-H S series 100/110/120 VAC 137.5 VDC 0.57 A 9.4 ms H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.07 A 119 ms 48 VDC 52.8 VDC 0.85 A 137 ms 137.5 VDC 0.62 A 109 m 48 VDC 52.8 VDC 0.73 A 112 ms 200/220/240 VAC 264 VAC 1.02 A 364 ms 100 to 125 VDC 137.5 VDC 0.62 A 109 m 100/110/120 VAC 132 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 264 VDC 0.87A 560 ms 48 VDC 52.8 VDC 0.71 A 384 m 264 VDC 0.82A 300 ms H3DE-MS/F/G 24 to 230 VAC/VDC 263 VDC 0.62 A 3	H3CR-AS	S/-A8S				-
H3CR-H S series 100 to 125 VDC 137.5 VDC 0.5 A 9.1 ms H3CR-H S series 100/110/120 VAC 132 VAC 0.65 A 10 ms 24 VAC/UDC 26.4 VAC 0.83 A 10 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.06 A 133 ms 24 VAC/VDC 26.4 VAC 1.26 A 133 ms 24 VAC/VDC 26.4 VAC 1.26 A 133 ms 24 VAC/VDC 26.4 VAC 1.26 A 133 ms 26.4 VDC 0.85 A 137 ms 100 to 125 VDC 137.5 VDC 0.62 A 109 ms 100 to 125 VDC 137.5 VDC 0.62 A 380 ms 24 VAC /VDC 26.4 VAC 1.21 A 478 ms 26.4 VDC 0.87A 560 ms 26.4 VDC 0.87A 148 VDC 52.8 VDC 0.71 A 384 ms DC100 to 125 VDC 137.5 VDC 0.62 A 380 m						
H3CR-H S series 100/110/120 VAC 26.4 VAC 0.83 A 10 ms H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.07 A 119 ms 24 VAC/VDC 26.4 VAC 1.07 A 119 ms 24 VAC/VDC 26.4 VAC 1.26 A 133 ms 26.4 VDC 0.85 A 137 ms 48 VDC 52.8 VDC 0.73 A 112 m 100 to 125 VDC 137.5 VDC 0.62 A 109 ms M series 100/110/120 VAC 132 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 24 VAC /VDC 26.4 VAC 1.03 A 323 ms 24 VAC /VDC 26.4 VAC 0.87A 560 ms 48 VDC 52.8 VDC 0.71 A 384 ms DC100 to 125 VDC 137.5 VDC 0.62 A 380 m 13DE-M 200 to 230	H3CR-F					-
12 to 48 VDC 26.4 VDC 0.57 A 9.4 ms H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 111 ms 200/220/240 VAC 264 VAC 1.07 A 119 ms 24 VAC/VDC 264 VAC 1.26 A 133 ms 24 VAC/VDC 264 VAC 1.26 A 133 ms 26.4 VDC 0.62 A 109 m 48 VDC 52.8 VDC 0.73 A 112 m 100 to 125 VDC 137.5 VDC 0.62 A 109 m 100 to 125 VDC 137.5 VDC 0.62 A 109 m 200/220/240 VAC 264 VAC 1.02 A 364 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 200/220/240 VAC 264 VAC 1.03 A 323 ms 264 VAC 1.04 A78 ms 200/220/240 VAC 52.8 VDC 0.71 A 384 m 0.03 m H3DE-MS/F/G 24 to 230 VAC/VDC 253 VAC 4.4 A 0.03 m 253 VDC 2.68 A 0.03 m 253 VDC 2.68 A 0.03 m <						
H3CR-H S series 100/110/120 VAC 132 VAC 1.05 A 111 m 200/220/240 VAC 264 VAC 1.05 A 111 m 24 VAC/VDC 264 VAC 1.06 A 133 m 24 VAC/VDC 26.4 VAC 1.26 A 133 m 24 VAC/VDC 26.4 VAC 1.26 A 133 m 24 VAC/VDC 26.4 VAC 1.26 A 133 m 26.4 VDC 0.85 A 137 m 48 VDC 52.8 VDC 0.73 A 112 m 100 to 125 VDC 137.5 VDC 0.62 A 109 m 323 m 200/220/240 VAC 264 VAC 1.02 A 364 m 200/220/240 VAC 264 VAC 1.03 A 323 m 200/220/240 VAC 26.4 VAC 1.03 A 323 m 200/220/240 VAC 264 VAC 1.21 A 478 m 26.4 VDC 0.87A 560 m 24 VAC /VDC 26.4 VDC 0.87A 560 m 253 VDC 0.71 A 384 m DC100 to 125 VDC 137.5 VDC 0.62 A 380 m 264 VDC 268 A 0.03 m						
200/220/240 VAC 264 VAC 1.07 A 119 may 24 VAC/VDC 26.4 VAC 1.26 A 133 may 24 VAC/VDC 26.4 VAC 1.26 A 133 may 48 VDC 52.8 VDC 0.73 A 112 may 100 to 125 VDC 137.5 VDC 0.62 A 109 may M series 100/110/120 VAC 132 VAC 1.02 A 364 may 200/220/240 VAC 264 VAC 1.03 A 323 may 24 VAC /VDC 26.4 VAC 1.02 A 364 may 200/220/240 VAC 264 VAC 1.02 A 364 may 200/220/240 VAC 264 VAC 1.03 A 323 may 24 VAC /VDC 26.4 VAC 1.21 A 478 may 26.4 VDC 0.87A 560 may 26.4 VDC 0.87A 48 VDC 52.8 VDC 0.71 A 384 may DC100 to 125 VDC 137.5 VDC 0.62 A 380 may 13DE-M 200 to 230 VAC 200 VAC 0.8 A 130 may 100 to 120 VAC 100 VAC 0.93 A 130 may		a :				
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H3DK-H 100 to 120 VAC 132 VAC 2.06 A 1320 ms			12 VDC			418.67 ms
	H3DK-H					1320 ms
200 to 240 VAC 264 VAC 2.38 A 677.33 m						677.33 ms
						1810 ms
				24 VAC		19.8 ms
						35.2 ms
						8.84 ms

Model	Voltage	Applied voltage	Inrush current (peak value)	Time (see note)
H3DS	24 to 230 VAC/	253 VAC	3 A	1 ms
	24 to 48 VDC	26.4 VDC	0.5 A	4 ms
H3FA-A	24 VDC	26.4 VDC	1.8 A	0.01 ms
	12 VDC	13.2 VDC	1.5 A	0.01 ms
	6 VDC	6.6 VDC	1.1 A	0.05 ms
	5 VDC	5.5 VDC	1.1 A	0.05 m
H3FA-SA	24 VDC	26.2 VDC	1.8 A	0.01 m
	12 VDC	13.2 VDC	1.5 A	0.01 m
	6 VDC	6.6 VDC	1.1 A	0.05 m
	5 VDC	voltage 253 VAC 26.4 VDC 26.4 VDC 13.2 VDC 6.6 VDC 5.5 VDC 26.2 VDC 13.2 VDC 6.6 VDC 5.5 VDC 26.4 VAC 13.2 VDC 6.6 VDC 5.5 VDC 264 VAC 13.2 VDC 26.4 VAC 13.2 VDC 26.4 VAC 13.2 VDC 264 VAC 13.2 VDC 264 VAC 264 VAC 13.2 VDC 264 VAC 264 VAC <t< td=""><td>1.1 A</td><td>0.05 m</td></t<>	1.1 A	0.05 m
H3M series	200/220/240 VAC	264 VAC	1.2 A	0.5 ms
	100/110/120 VAC	132 VAC	620 mA	0.4 ms
	110 VDC			
	100 VDC			
	48 VDC	52.8 VDC	5 A	1 ms
	24 VDC	26.4 VDC	2.6A	1 ms
	12 VDC	13.2 VDC	1.3A	1 ms
H3RN series	All specifications except for 24 VAC			
	24 VAC	26.4 VAC	200 mA	60 ms
H3Y series	All specifications except for 12 VDC			
	12 VDC	13.2 VDC	350 mA	0.4 ms
H3YN series	All specifications except for 12 VDC			
	12 VDC	13.2 VDC	600 mA	1 ms
H5AN series	100 to 240 VAC		23 A	1 ms
	100 VDC	110 VDC	8 A	2 ms
	12 to 24 VDC		15 A	6.5 ms
H5CN series	100 to 240 VAC	264 VAC	800 mA	1 ms
	12 to 48 VDC	52.8 VDC	400 mA	1 ms
H5CX-A□-N series	100 to 240 VAC		4.8 A	0.5 ms
H5CX-AD-N series	24 VAC/12 to 24 VDC		9.5 A	1 ms
		26.4 VDC	6.6 A	1 ms
H5CX-L -N series	100-240 VAC	264 VAC	5.3 A	0.4 ms
	24 VAC/12 to 25 VDC	26.4 VAC	6.4 A	1.4 ms
		26.4 VDC	4.4 A	1.7 ms
H5CX-B -N series	12 to 24 VDC	26.4 VDC	4.4 A	1.7 ms
H5CX-A/-L series	100 to 240 VAC	264 VAC	5.3 A	0.4 ms
(previous models)	24 VAC/12-24 VDC	26.4 VAC	6.4 A	1.4 ms
		26.4 VDC	4.4 A	1.7 ms
H5CX-B series (previous models)	12 to 24 VDC	26.4 VDC	6 A	1.2 ms
H5CZ series	100-240 VAC	264 VAC	4.6 A	0.4 ms
	24 VAC/12-24 VDC	26.4 VAC	9.5 A	1 ms
		26.4 VDC	6.6 A	1 ms

■ Time Switches

Model	Voltage	Applied voltage	Inrush current (peak value)	Time (see note)
H2F series	100 to 240 VAC	264 VAC	2 A	0.3 ms
	12 to 24 VDC	26.4 VDC	1.9 A	0.7 ms
H4KV-DSA-R	100 to 200 VAC	240 VAC	4.8 A	1.1 ms
H4KV-DSA (previous models)	100 to 200 VAC	240 VAC	0.7 A	0.5 ms
H5L-A	All specifications			
H5S-W series	100 to 240 VAC	264 VAC	3.1 A	0.2 ms
	24 VDC	26.4 VDC	1.3 A	2.7 ms
H5S-Y series	100 to 240 VAC	264 VAC	3.1 A	0.2 ms
	24 VDC	26.4 VDC	1.4 A	2.7 ms
H5S series	100 to 240 VAC	264 VAC	2.5 A	0.3 ms
(previous models)	24 VDC	26.4 VDC	1.1 A	3 ms
H5F series	100 to 240 VAC	264 VAC	2 A	0.3 ms

Note: The time of the inrush current is measured as shown in the following figure.



Term Definitions

ON Time

The period of time during which a required voltage is being applied to the operating circuit.

OFF Time

The period of time between the moment that resetting begins and the moment that the operating voltage is applied to the operating circuit. Therefore, the OFF time of the Timer is larger than the resetting time.

Operating Time

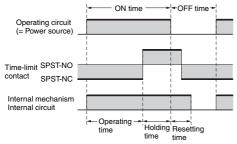
The period of time from the application of a required voltage to the operating circuit until the completion of the time-limit contact operation.

Holding Time

The period of time from the completion of the time-limit operation to the start of the reset operation.

Resetting Time

The period of time from the interruption of the voltage supplied to the operating circuit during or after the time-limit operation until the return of the Timer to its initial state.



The resetting time of the Timer is the period of time during which all the internal components including the contacts, pointer, and the circuit components, such as the capacitor, of the Timer are reset.

If the Timer is in operation with an insufficient OFF time (i.e., the OFF time is less than the rated resetting time), the normal operation of the Timer cannot be expected. In such cases, the Timer may operate with insufficient operating time, operate instantaneously, or not operate at all. Be sure that the OFF time of the Timer is the same as or more than the rated resetting time.

Self-reset

To automatically reset the Timer by interrupting the voltage being supplied to the operating circuit.

Electrical Reset

To reset Timer by applying a required voltage to the reset circuit.

Manual Reset

To mechanically reset the Timer by manual operation.

Synchronous Motor (Time Switch)

A motor that operates in synchronization with the power frequency (50/60 Hz). Because of the simplicity of a structure using this type of motor, it is reasonably priced.

The motor stops when there is a power interruption, so the time must be reset after the power is restored.

Quartz Motor (Time Switch)

The motor is operated by quartz oscillation. The quartz motor is equipped with a corrective function for power interruptions, so it can be used immediately after the power is restored.

Accuracy of Operating Time

Differences of operating times measured when the Timer repeats operation under the same condition with a given setting time.

Formula for calculation (with operating time measured more than 5 times):

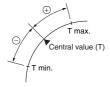
Accuracy of operating time

$$=\pm\frac{1}{2}\times\frac{T \text{ max.}-T \text{ min.}}{TMs}\times100 \text{ (\%)}$$

where,

- T max.: Maximum value of operating times measured at the same set time
- T min.: Minimum value of operating times measured at the same set time
- TMs: Maximum scale time (TMs is a set value in the case of a Digital Timer)

Differences in the operating time appear as a shift from the central value of the operation, so the maximum or minimum value is divided by 2 and expressed as a plus (+) or minus (-) indication.



If there are setting changes in the H3CA or other types of Analog Timer while they are in time-limit operation, the following operation will result.

$$T = T_1 + T_2 \times \frac{T_3 - T_1}{T_3}$$

T₁: Time elapsed

- T₂: New setting
- T₃: Previous setting

Setting Error

A difference between the actual operating time and scale time. Formula for calculation (measurement position can be any scale position as long as it is set to 1/3 min. of the maximum scale time): Setting error

Setting erro

$$=\frac{\mathrm{TM}-\mathrm{Ts}}{\mathrm{TMs}}\times100~(\%)$$

where,

=

TM: Average value of measured operating times

- Ts: Set time
- TMs: Maximum scale time (TMs is a set value in the case of the Digital Timer)

Influence of Voltage

A change in operating time when the voltage of the control power source changes within the permissible fluctuation range.

Formula for calculation:

Variation due to voltage change

$$=\pm \frac{TMx_1 - TM_1}{TMs} \times 100 \ (\%)$$

where,

- TM₁: Average value of operating times measured at rated voltage
- TMx₂: Average value of operating times measured at a voltage which causes the maximum deviation from TM₁ within the permissible fluctuation range.
- TMs: Maximum scale time (TMs is a set value in the case of the Digital Timer.)

Influence of Temperature

A change in operating time when the ambient temperature changes within a permissible range.

Formula for calculation:

Variation due to temperature change

$$=\pm \frac{TMx_2-TM_2}{TMs}\times 100~(\%)$$

where,

TM₂: Average value of operating times measured at 20°C.

- TMx₂: Average value of operating times measured at a temperature which causes the maximum deviation from TM₂ within the specified ambient temperature range.
- TMs: Maximum scale time (TMs is a set value in the case of the Digital Timer.)

OFF Time Characteristics

A change in operating time when the operating time in a given OFF time and the OFF time are changed.

Formula for calculation:

OFF time characteristic

$$=\pm \frac{TMx_3 - TM_3}{TMs} \times 100$$
 (%)

- $\mathsf{TM}_3:$ Average value of operating times measured with a 1-second OFF time.
- TMx_3 : Average value of operating times measured with an OFF time that causes the maximum deviation from TMx_3 within the specified OFF-time range of one hour from the specified resetting time.
- TMs: Maximum scale time (TMs is a set value in the case of the Digital Timer.)

OFF-time characteristics are determined by the charging and discharging of a capacitor and resistor used in combination as an Electronic Timer. The characteristics vary by $\pm 1.5\%$ to $\pm 5\%$.

Operating time accuracy, setting error, influence of voltage, influence of temperature, and OFF-time characteristics are items used to express the precision of the Timer. Any of these items may be ignored depending on the particular specifications of the model.

The Motor Timer and Electronic Timer indicate these items by percentage values. The Count Timer indicates these items by differential time values because the differential range of the Timer's operating time is almost definite due to the operating principle of the Timer. Furthermore, the Count Timer total setting error can be indicated to express all these items in the case of the Count Timer.

Vibration Resistance (Malfunction)

The range of vibration during operation in which contacts that are closed will not open by vibration for a period exceeding the specified time (1 ms).

Vibration Resistance (Destruction)

The range of vibration in which there is no damage to parts during transport or use, and the operating characteristics are still satisfied.

Shock Resistance (Malfunction)

The range of shock during operation in which contacts that are closed will not open by shock for a period exceeding the specified time (1 ms).

Shock Resistance (Destruction)

The range of shock in which there is no damage to parts during transport or use, and the operating characteristics are still satisfied.

Insulation Resistance

The resistance offered by an insulating material to the flow of current resulting from an impressed DC voltage.

Dielectric Strength

The voltage level that will not cause insulation breakdown when applied for 1 minute to the same location as in the insulation resistance measurement.

Impulse Withstand Voltage (AC)

A voltage imposed between the operating power supply terminals or between a charged terminal and non-charged metal part to check the withstand surge voltage of the Timer. The impulse withstand voltage imposed between the operating power supply terminals is 3 kV and that imposed between a charged terminal and non-charged metal part is 4.5 kV with both using a $\pm 1.2 \times 50$ - μs standard waveform.

Noise Immunity

The mechanical and physical resistance of the Timer against external noise.

The noise resistance of the Timer is checked with a noise simulator, a coil load, an oscillating relay, and static electric noise.

Mechanical Life Expectancy

The life expectancy of a Timer when the control output of the Timer is operated under no load condition.

Electrical Life Expectancy

The life expectancy of a Timer when the control output of the Timer is operated to switch the specified voltage/current load connected to the control output.

The electrical or mechanical life of the Timer is generally indicated by the operating times of control output. The electrical life is indicated by the operating time of the control output connected to a load and the mechanical life is indicated by the operating time of the control output with no load. The electrical life is shorter than the mechanical life. The lighter the load is, the longer the electrical life will be. Therefore, to prolong the electrical life of the Timer, use the Timer to switch heavy loads via relays instead of directly switching them with the control output.

Symbols Used in Internal Connection Diagram of Timers

Name	Symbol	Description	Name	Symbol	Description
NO contacts	- <u>-</u>	Normally open contacts (A pair of contacts which are normally open when no relay input is applied.)	Time-limit operation, time- limit resetting contacts	① _ <mark></mark>	NO contacts NC contacts
NC contacts	or S	Normally closed contacts (A pair of contacts which are normally closed when no relay input is applied.)	Manually operated, automatic resetting contact	1 -0 0-	Contacts that reset upon release of the hand, and used as the contacts to operate a pushbutton switch. (Same for pushbutton, pull, and rotating switches.)
				2 -	 NO contacts NC contacts
Transfer con- tacts		Transfer contacts (NO and NC contacts which have a common contact terminal are collectively called "transfer contacts.") A variety of contacts shown in ① and ② are all transfer contacts with NC contact arranged either on the right side or on the upper side.	Synchronous motor	-(SM)-	A miniature motor which operates in synchronization with power frequency.
Time-limit operating contacts	0 <u>0</u> 0	NO contacts NC contacts	Relay		An electromagnetic relay
Time-limit resetting contacts	() - ∂V∂ - @ ● ●	NO contacts NC contacts	LED		Used to indicate the operating state of the Timer.