

# IEC Power Devices

## Mini Contactors Technical Information

### C-2000

Mini Contactors and Control Relays

#### Standards and Listings

**International Certification Marks:** In addition to stating the product number, the contactor nameplate also lists the international certification marks. All contactors, control relays, overload relays, and accessories are UL and cUL listed.

Contactors and relays also conform to International Standards:

- UL listed (Underwriters Laboratories, U.S. -UL 508, cUL);
- CE Mark;
- IEC 947-1,4 (International Electrotechnical Commission);
- BS 5424 (British Standards, UK);
- VDE 0660 (Verband Deutscher Elektotechniker, Federal Republic of Germany);
- (S) (SEV, Switzerland-SEV 10254);
- (D) (DEMCO, Denmark);
- (N) (NEMCO, Norway);
- (FI) (SETI, Finland);

plus other specifications approvals...

- CEI 17-3, 17-7 (Comitato Elettrotecnico Italiano, Italy);
- Bureau Veritas, France;
- SEMKO, Sweden.

#### Operating Characteristics/Technical Data: Contactors and Control Relays

##### Ambient Conditions

Operating Temperature	-20 to +55°C (-4 to +131°F)
Storage Temperature	-30 to +80°C (-22 to +176°F)

##### Altitude

Derating Up to 10,000 ft. (3,000 m)	Rated current
Derating 10,000 to 13,200 ft. (3,000 to 4,000 m)	.9 x's rated current
Derating 13,200 to 16,000 ft. (4,000 to 5,000 m)	.8 x's rated current

##### Shock Resistance (All Axis)

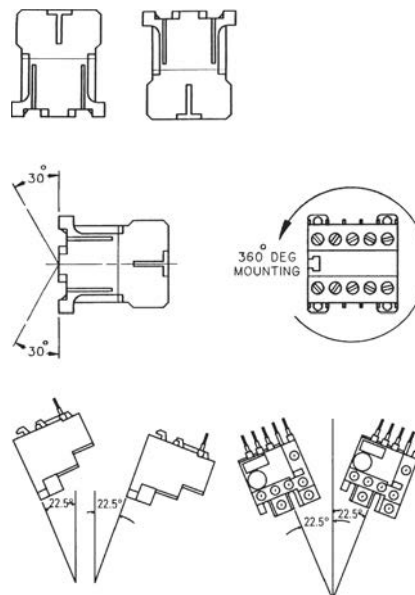
Closed 80% voltage - Admissible accel.	30g
Closed 80% voltage - Impulse duration	11 ms
Open no voltage - Admissible acceleration	10g
Open no voltage - Impulse duration	11 ms

##### Vibration Resistance

Closed 80% voltage-Admissible accel.	10g
Closed 80% voltage - Sweep between	10-200 hz
Open No voltage-Admissible accel.	5g
Open No voltage - Impulse duration	10-200 hz

##### Terminal Capacity

Screw Terminal Wire size	(2) #14-18 AWG max.
Screw Terminal Wire temperature class	60°C/75°C wire
Quick connect (Faston 2.8mm) Wire size	(2) 1mm <sup>2</sup>
Quick connect (Faston 2.8mm) Max. thermal current	8 amps
Printed circuit terminal - Hole size	1.8mm
Tightening Torque	7 inch lbs.



Operating Position



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#### Main Contacts Data - Contactors

Rated insulation voltage (IEC 947-1)	660V
Rated thermal current (UL 508)	16 amps
Frequency limits	25-400 Hz
Impedance per pole	1.76 m ohm
Power dissipation AC-1	0.7 W
Power dissipation AC-3	.13W
Insulation resistance	>10 m ohm
No overlap between NO and NC contacts - Space	1mm
No overlap between NO and NC contacts - Time	>2ms

#### Main Contacts Data - Control Relays

Rated insulation voltage (IEC 947-1)	660V
Rated thermal current (UL 508)	10 amps
Contact Rating	A600, Q600
Frequency limits	25-400 Hz
Impedance per pole	2.4 m ohm
No overlap between NO and NC contacts - Space	1.1mm
No overlap between NO and NC contacts - Time	>2ms

#### Instantaneous Auxiliary Contact Data

Rated insulation voltage (IEC 947-1)	660V
Rated thermal current (UL 508)	10 amps
Contact Rating	A600, Q600
Frequency limits	25-400 Hz
Impedance per pole	2.4 m ohm
Insulation resistance	>10 m ohm
No overlap between NO and NC contacts - Space	1mm
No overlap between NO and NC contacts - Time	>2ms

#### Overload Relay Auxiliary Contact Data

Rated insulation voltage (IEC 947-1)	660V
Rated thermal current (UL 508)	6 amps
Contact Rating	B600, R300
Frequency limits	25-400 Hz

#### Control Circuit Ratings

##### 120 Vac, 125 Vdc

Time	Rating	Carry Continuous	Make Momentary	Break Amperes
		Amperes	Amperes	
A600	AC	10	60	6
B600	AC	5	30	3
Q600	DC	2.5	0.55	0.55
R300	DC	1.0	0.22	0.22

For other voltages, reference NEMA ICS 3-125 or contact your nearest GE Energy Representative.

#### Control Circuit Data: Pickup/Dropout % Coil Voltage

Type Coil	Pick-up	Drop-out
AC Controlled	80%-110%	35%-55%
DC Controlled	80%-110%	20%-40%
PLC interface (1.2w)	80%-125%	20%-30%
PLC interface (2w)	70%-125%	20%-35%

#### Opening/Closing Time

Type Coil	Voltage	Making (on Energization) (ms)		Breaking (on De-energization) (ms)	
		NO Contact	NC Contact	NO Contact	NC Contact
AC Controlled (ms)	+10-15%	6-13	8-16	5-11	6-13
	Nominal	7-12	8-16	6-10	6-13
DC Controlled (ms)	+10-15%	22-36	9-12	18-27	5-7
	Nominal	24-27	9-11	20-26	5-8
PLC Interface (1.2w) (ms)	+25-20%	30-70	9-16	20-45	5-9
	Nominal	25-45	9-16	25-35	5-9
PLC Interface (2w) (ms)	+25-30%	20-50	9-16	18-35	5-9
	Nominal	25-40	9-16	20-30	5-9

#### Maximum Operating Rate

	Operations per Hour
No load	9000 OPS/H
AC1 and AC3 at rated power	1200 OPS/H
AC4 at rated power	300 OPS/H

#### Coil Consumption

Type Coil	Pick-up (Watts)	Pick-up (VA)	Holding (Watts)	Holding (VA)	Power Dissipation (Watts)
AC Controlled		26		4	1.4
DC Controlled	3		3		
PLC Interface (1.2w)	1.2		1.2		
PLC Interface (2w)	2		2		



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#### Operating Characteristics/Technical Data: Electronic Timer

For use with all AC- and DC-controlled mini contactors and control relays.

Time Setting	0.5-60 seconds (adjustable)
Reset Time	<100 milliseconds
Repeatability	± 1 percent
Voltage Range (AC/DC)	24-240V
Voltage Operating Limits	80-110%
Ambient Operating Temperature	-20°C to +55°C (-4°F to +131°F)
Ambient Storage Temperature	-30°C to +80°C (-22°F to +176°F)
Voltage Drop	3 volts maximum
Load Current	10 mA minimum
Load (maximum) @ 20° C	.9 amps
Load (maximum) @ 40° C	.72 amps
Load (maximum) @ 60° C	.55 amps
Leakage Current	<5mA@240 volts

#### Performance Characteristics

##### Contactors Electrical Life Utilization Categories

Utilization categories are used to describe the type of motor load and duty cycle. Life/Load curves are then used to estimate electrical life of a specific controller.

The most common utilization categories are described below. (Each category has full-load current ratings defined to meet IEC standard requirements.)

- AC-1-noninductive or slightly inductive loads, e.g., resistance furnaces.
- AC-2-starting of slip ring motors without plugging.
- AC-3-starting and stopping of squirrel-cage motors, i.e., this utilization category is typical of the standard type of motor duty encountered in most industrial applications.
- AC-4-starting of squirrel-cage motors in inching, plugging, and reversing applications, i.e., this means continuous inching, plugging, and reversing.
- AC-11-control circuit contact characteristics.

##### Life/Load Curves

Life/Load curves are used to estimate contact electrical life (millions of operations), based on rated operating current.

First, determine the appropriate utilization category for which the contactor will be used. Select appropriate mini-contactor, based on motor horsepower, voltage, and full-load current to meet application needs. Estimated contact life (millions of operations) can then be determined by locating the point of intersection on the appropriate contactor curve of the rated operating current and contact life axes. (Curves are valid for up to 600 volt, 600 Hz operation.)

