SJ100 Inverter Specifications

Model-specific tables for 200V and 400V class inverters

The following tables are specific to SJ100 inverters for the 200V and 400V class model groups. Note that "General Specifications" on page 1–9 apply to both voltage class groups. Footnotes for all specifications tables follow the table below.

Item			200V Class Specifications				
SJ100 inverters, 200V models	CE version		002NFE	004NFE	005NFE	007NFE	011NFE
	UL version		002NFU	004NFU	—	007NFU	—
Applicable motor size *2		kW	0.2	0.4	0.55	0.75	1.1
		HP	**1/4**	**1/2**	**3/4**	**1**	**1.5**
Rated capacity (kVA) *12	230V		0.6	1.0	1.1	1.5	1.9
	240V		0.6	1.0	1.2	1.6	2.0
Rated input voltage			1-phase: 200 to 240V +5/-10%, 50/60 Hz ±5%, 3-phase: 200 to 240V +5/-10%, 50/60 Hz ±5%, (037LFU, 055LFU, and 075LFU 3phase only)				
Rated input current (A)	1-phase		3.5	5.8	6.7	9.0	11.2
	3-phase		2.0	3.4	3.9	5.2	6.5
Rated output voltage *3			3-phase: 200 to 240V (corresponding to input voltage)				
Rated output current (A)			1.6	2.6	3.0	4.0	5.0
Efficiency at 100% rated output (%)			90.5	92.8	93.6	94.1	95.4
Watt loss, approximate (W)	at 70% output		15	21	25	31	38
	at 100% output		19	29	32	41	51
Starting torque *6			200% or more				
Dynamic braking approx. % torque, short time stop *7	without resistor, from 50 / 60 Hz		100%: ≤ 50Hz 50%: ≤ 60Hz				70%: ≤ 50Hz 50%: ≤ 60Hz
	with resistor		150%				
DC braking			Variable operating frequency, time, and braking force				
Weight		kg	0.7	0.85	0.85	1.3	1.3
		lb	1.54	1.87	1.87	2.87	2.87

Footnotes for the preceding table and the tables that follow:

Note 1: The protection method conforms to JEM 1030.

Note 2: The applicable motor refers to Hitachi standard 3-phase motor (4-pole). When using other motors, care must be taken to prevent the rated motor current (50/60 Hz) from exceeding the rated output current of the inverter.

Note 3: The output voltage decreases as the main supply voltage decreases (except when using the AVR function). In any case, the output voltage cannot exceed the input power supply voltage.

Note 4: To operate the motor beyond 50/60 Hz, consult the motor manufacturer for the maximum allowable rotation speed.

Note 5: When SLV is selected, please set the carrier frequency higher than 2.1 kHz.

Note 6: At the rated voltage when using a Hitachi standard 3-phase, 4-pole motor (when selecting sensorless vector control—SLV).

Note 7: The braking torque via capacitive feedback is the average deceleration torque at the shortest deceleration (stopping from 50/60 Hz as indicated). It is not continuous regenerative braking torque. The average deceleration torque varies with motor loss. This value decreases when operating beyond 50 Hz. If a large regenerative torque is required, the optional regenerative braking resistor should be used.

Note 8: The frequency command is the maximum frequency at 9.8V for input voltage 0 to 10 VDC, or at 19.6 mA for input current 4 to 20 mA. If this characteristic is not satisfactory for your application, contact your Hitachi sales representative.

Note 9: If operating the inverter at 40 to 50° C, reduce the carrier frequency to 2.1 kHz, derate the output current by 80%, and remove the top housing cover. Note that removing the top cover will nullify the NEMA rating for the inverter housing.

Note 10: The storage temperature refers to the short-term temperature during transport.

Note 11: Conforms to the test method specified in JIS C0911 (1984). For the model types excluded in the standard specifications, contact your Hitachi sales representative.

Note 12: The input voltage of xxLFU is 230V.

SJ100 Inverter Specifications, continued...

Item			200V Class Specifications, continued				
SJ100 inverters, 200V models	CE version		015NFE	022NFE	—	—	—
	UL version		015NFU	022NFU	037LFU	055LFU	075LFU
Applicable motor size *2		kW	1.5	2.2	3.7	5.5	7.5
		HP	**2**	**3**	**5**	**7.5**	**10**
Rated capacity (kVA) *12	230V		3.1	4.3	6.9	9.5	12.7
	240V		3.0	4.5	7.2	9.9	13.3
Rated input voltage			1-phase: 200 to 240V +5/-10%, 50/60 Hz ±5%, 3-phase: 200 to 240V +5/-10%, 50/60 Hz ±5%, (037LFU, 055LFU, 075LFU 3-phase only)				
Rated input current (A)	1-phase		17.5	24.0	—	—	—
	3-phase		10.0	14.0	22.0	30.0	40.0
Rated output voltage *3			3-phase: 200 to 240V (corresponding to input voltage)				
Rated output current (A)			8.0	11.0	17.5	24	32
Efficiency at 100% rated output (%)			94.7	95.1	95.1	96.1	96.2
Watt loss, approximate (W)	at 70% output		57	78	130	152	204
	at 100% output		79	107	181	216	288
Starting torque *6			200% or more		180% or more		
Dynamic braking approx. % torque, short time stop *7	without resistor, from 50 / 60 Hz		70%: ≤ 50Hz 50%: ≤ 60Hz	20%: ≤ 50Hz 20%: ≤ 60Hz			
	with resistor		150%	100%		80%	
DC braking			Variable operating frequency, time, and braking force				
Weight		kg	2.2	2.8	2.8	5.5	5.7
		lb	4.85	6.17	6.17	12.13	12.57

Item			400V Class Specifications			
SJ100 inverters, 400V models	CE version		004HFE	007HFE	015HFE	022HFE
	UL version		004HFU	007HFU	015HFU	022HFU
Applicable motor size *2		kW	0.4	0.75	1.5	2.2
		HP	**1/2**	**1**	**2**	**3**
Rated capacity (460V) kVA			1.1	1.9	2.9	4.2
Rated input voltage			3-phase: 380 to 460V ±10%, 50/60 Hz ±5%			
Rated input current (A)			2.0	3.3	5.0	7.0
Rated output voltage *3			3-phase: 380 to 460V (corresponding to input voltage)			
Rated output current (A)			1.5	2.5	3.8	5.5
Efficiency at 100% rated output (%)			92.0	93.7	95.7	95.8
Watt loss, approximate (W)	at 70% output		25	33	48	68
	at 100% output		32	44	65	92
Starting torque *6			200% or more			
Dynamic braking approx. % torque, short time stop *7	without resistor, from 50/60 Hz		100%: ≤ 50Hz 50%: ≤ 60Hz			70%: ≤ 50Hz 20%: ≤ 60Hz
	with resistor		150%			100%
DC braking			Variable operating frequency, time, and braking force			
Weight		kg	1.3	1.7	1.7	1.8
		lb	2.87	3.75	3.75	3.97

Item			400V Class Specifications, continued			
SJ100 inverters, 400V models	CE version		030HFE	040HFE	055HFE	075HFE
	UL version		—	040HFU	055HFU	075HFU
Applicable motor size *2		kW	3.0	4.0	5.5	7.5
		HP	**4**	**5**	**7.5**	**10**
Rated capacity (460V) kVA			6.2	6.6	10.3	12.7
Rated input voltage			3-phase: 380 to 460V ±10%, 50/60 Hz ±5%			
Rated input current (A)			10.0	11.0	16.5	20.0
Rated output voltage *3			3-phase: 380 to 460V (corresponding to input voltage)			
Rated output current (A)			7.8	8.6	13	16
Efficiency at 100% rated output (%)			95.4	96.2	96.0	96.5
Watt loss, approximate (W)	at 70% output		100	108	156	186
	at 100% output		138	151	219	261
Starting torque *6			180% or more			
Dynamic braking approx. % torque, short time stop *7	without resistor, from 50/60 Hz		20%: ≤ 50Hz 20%: ≤ 60Hz			
	with resistor		100%		80%	
DC braking			Variable operating frequency, time, and braking force			
Weight		kg	2.8	2.8	5.5	5.7
		lb	6.17	6.17	12.13	12.57

General Specifications

The following table applies to all SJ100 inverters.

Item	General Specifications
Protective housing *1	IP20
Control method	Sine wave pulse-width modulation (PWM) control
Output frequency range *4	0.5 to 360 Hz
Frequency accuracy	Digital command: 0.01% of the maximum frequency Analog command: 0.1% of the maximum frequency (25°C ± 10°C)
Frequency setting resolution	Digital: 0.1 Hz; Analog: max. frequency/1000
Volt./Freq. characteristic *5	V/f optionally variable, V/f control (constant torque, reduced torque), sensorless vector control
Overload current rating	150%, 60 seconds
Acceleration/deceleration time	0.1 to 3000 sec., (linear accel/decel), second accel/decel setting available

Item			General Specifications
Input signal	Freq. setting	Operator panel	Up and Down keys / Value settings
		Potentiometer	Analog setting
		External signal *8	0 to 10 VDC (input impedance 10k Ohms), 4 to 20 mA (input impedance 250 Ohms), Potentiometer (1k to 2k Ohms, 2W)
	FWD/ REV Run	Operator panel	Run/Stop (Forward/Reverse run change by command)
		External signal	Forward run/stop, Reverse run/stop
	Intelligent input terminal		FW (forward run command), RV (reverse run command), CF1~CF4 (multi-stage speed setting), JG (jog command), 2CH (2-stage accel./ decel. command), FRS (free run stop command), EXT (external trip), USP (startup function), SFT (soft lock), AT (analog current input select signal), RS (reset), PTC (thermal protection), DB (external DC braking command), SET (2nd setting selection), UP (remote control, accel.), DWN (remote control, decel.)
Output signal	Intelligent output terminal		RUN (run status signal), FA1,2 (frequency arrival signal), OL (overload advance notice signal), OD (PID error deviation signal), AL (alarm signal)
	Frequency monitor		PWM output; Select analog output frequency monitor, analog output current monitor or digital output frequency monitor
Alarm output contact			ON for inverter alarm (1C contacts, both normally open or closed avail.)
Other functions			AVR function, curved accel/decel profile, upper and lower limiters, 16-stage speed profile, fine adjustment of start frequency, carrier frequency change (0.5 to 16 kHz) frequency jump, gain and bias setting, process jogging, electronic thermal level adjustment, retry function, trip history monitor, 2nd setting selection, auto tuning, fan ON/OFF selection
Protective function			Over-current, over-voltage, under-voltage, overload, extreme high/ low temperature, CPU error, memory error, ground fault detection at startup, internal communication error, electronic thermal, CT error
Operating Environment	Temperature		Operating (ambient): -10 to 50°C (*9) / Storage: -25 to 70°C (*10)
	Humidity		20 to 90% humidity (non-condensing)
	Vibration *11		5.9 m/s^2 (0.6G), 10 to 55 Hz
	Location		Altitude 1,000 m or less, indoors (no corrosive gasses or dust)
Coating color			Munsell 8.5YR6.2/0/2, cooling fins in base color of aluminum
Options			Remote operator unit, copy unit, cables for the units, braking unit, braking resistor, AC reactor, DC reactor, noise filter, DIN rail mounting

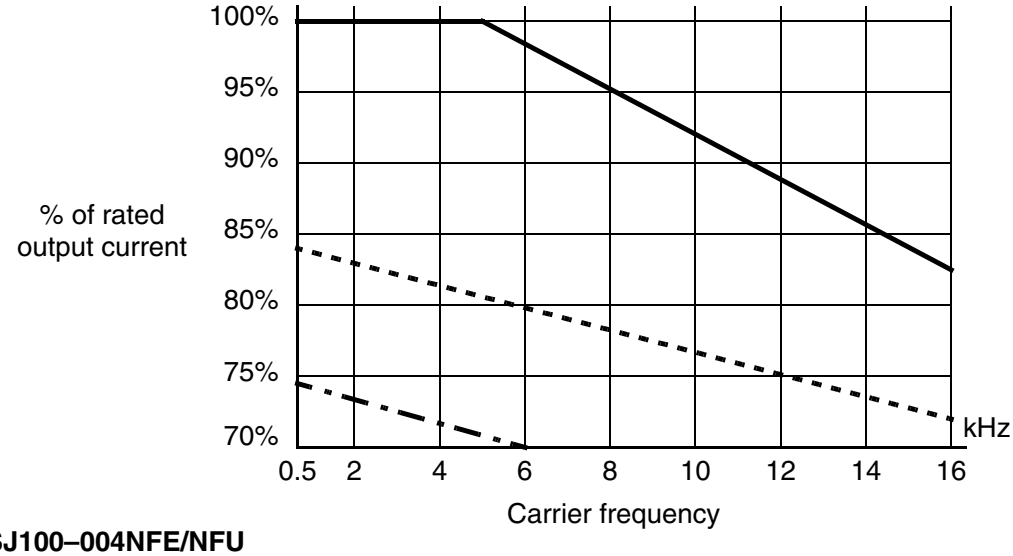
Derating Curves

The maximum available inverter current output is limited by the carrier frequency and ambient temperature. The carrier frequency is the inverter's internal power switching frequency, settable from 0.5 kHz to 16 kHz. Choosing a higher carrier frequency tends to decrease audible noise, but it also increases the internal heating of the inverter, thus decreasing (derating) the maximum current output capability. Ambient temperature is the temperature just outside the inverter housing—such as inside the control cabinet where the inverter is mounted. A higher ambient temperature decreases (derates) the inverter's maximum current output capacity.

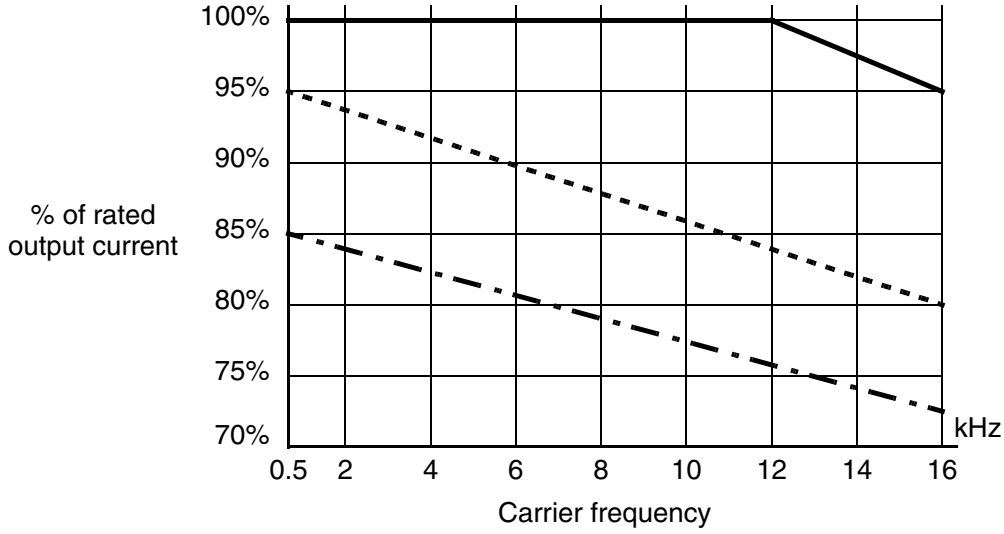
Use the following derating curves to help determine the optimal carrier frequency setting for your inverter, and to find the output current derating. Be sure to use the proper curve for your particular SJ100 inverter model number.

Legend:
- Standard ratings at 40°C
- Ratings at 50°C max. with top cover removed
- Ratings at 55°C max. with top cover removed

SJ100–002NFE/NFU

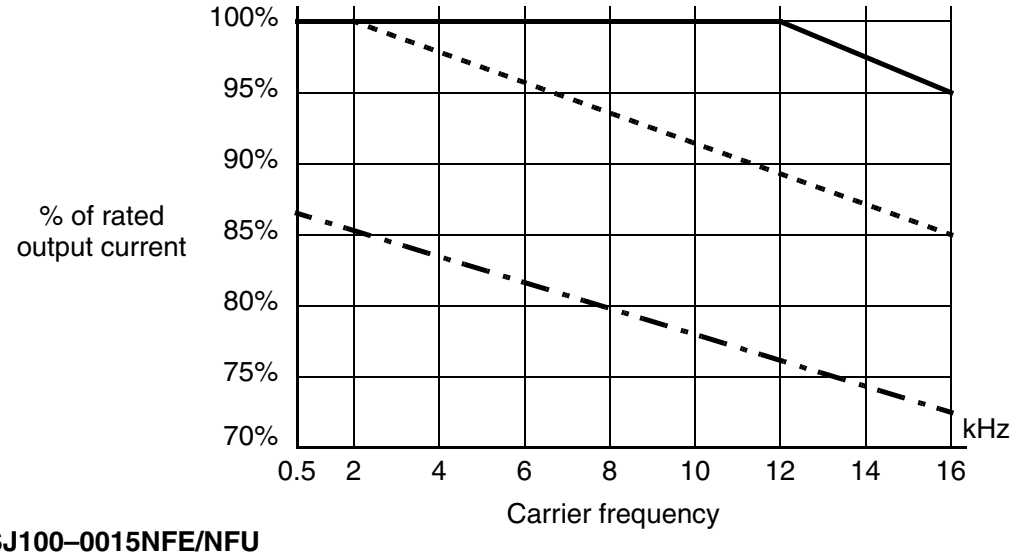


SJ100–004NFE/NFU

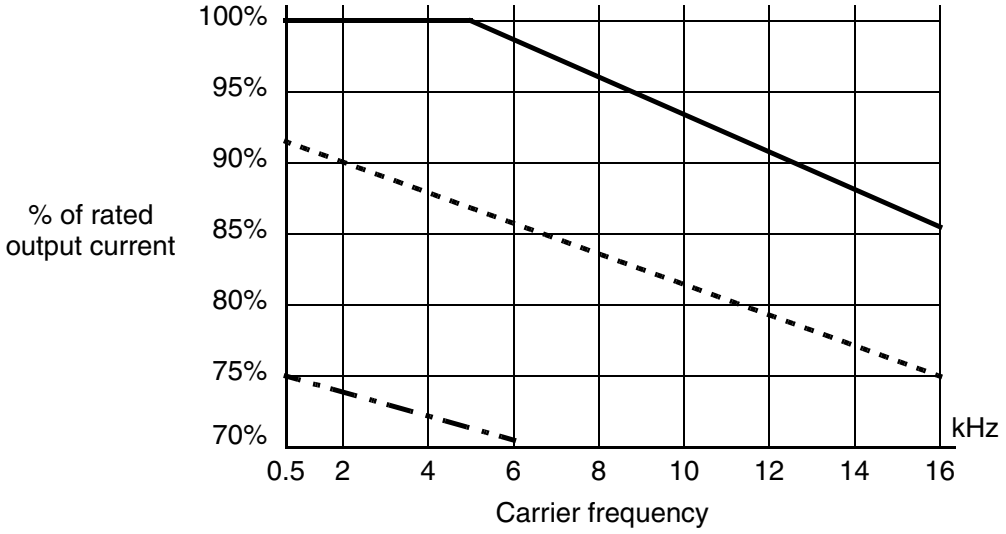


Derating curves, continued...

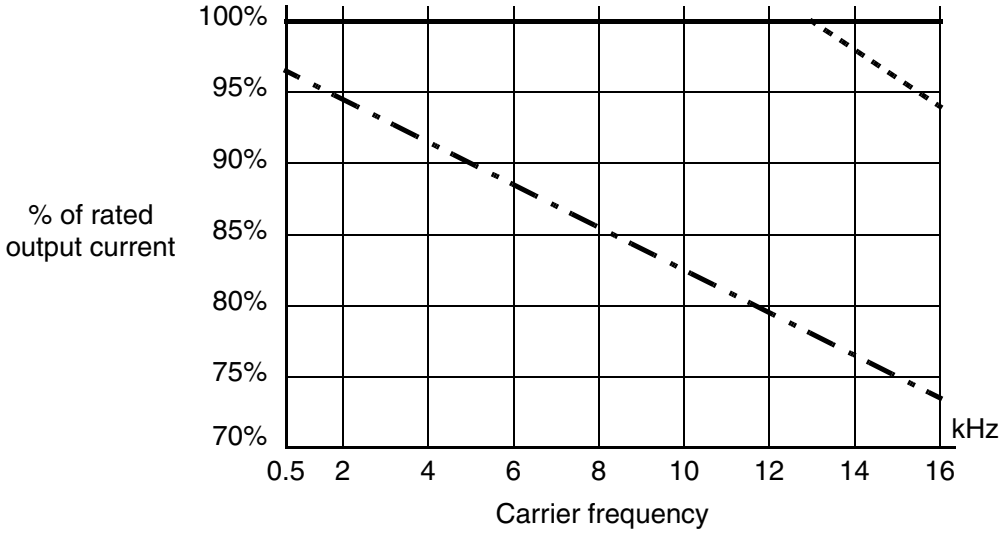
SJ100–007NFE/NFU



SJ100–0015NFE/NFU

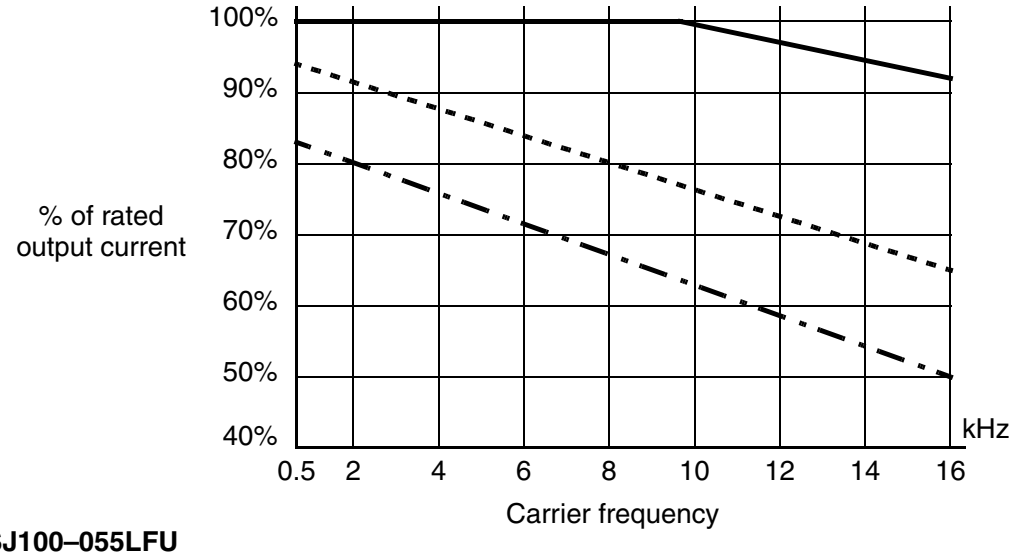


SJ100–022NFE/NFU

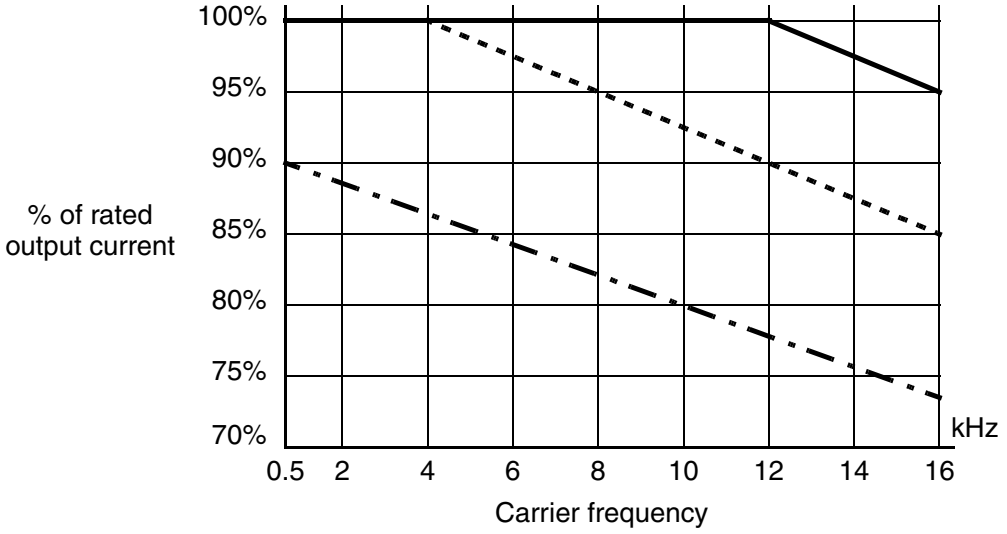


Derating curves, continued...

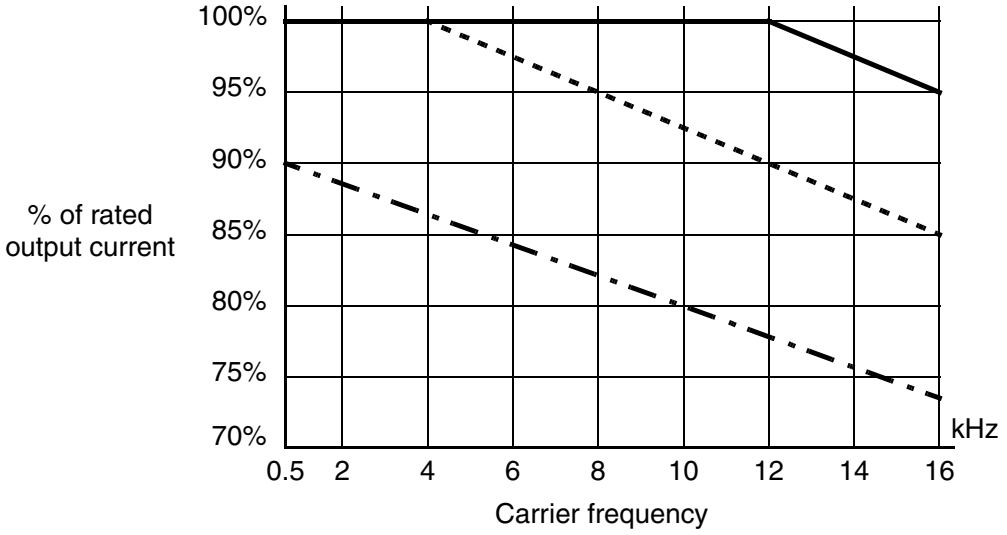
SJ100–037LF/LFU



SJ100–055LFU

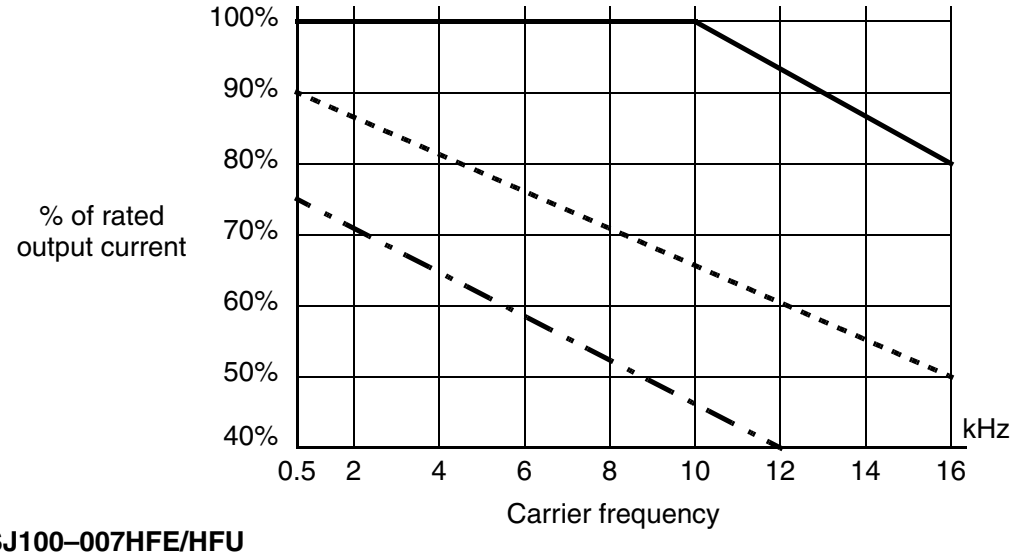


SJ100–075LFU

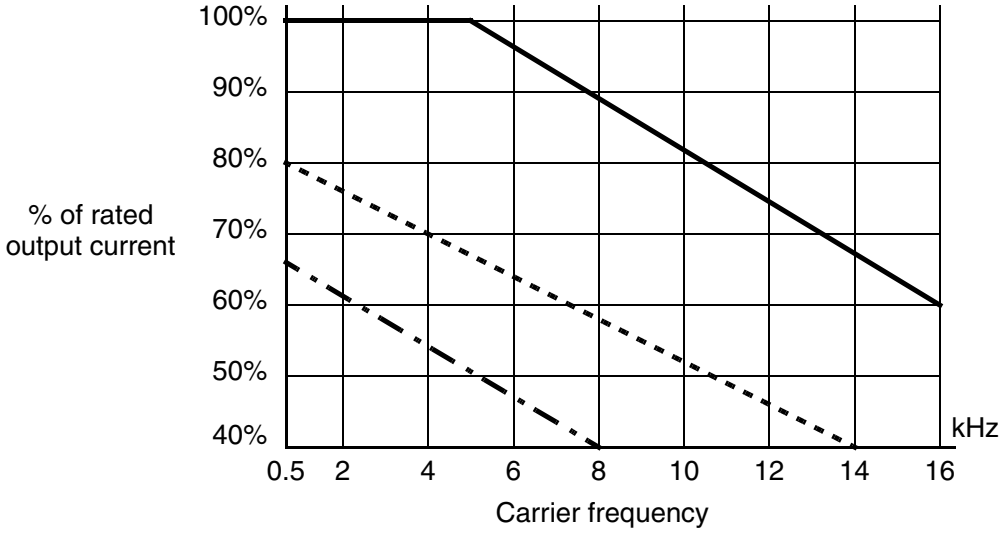


Derating curves, continued...

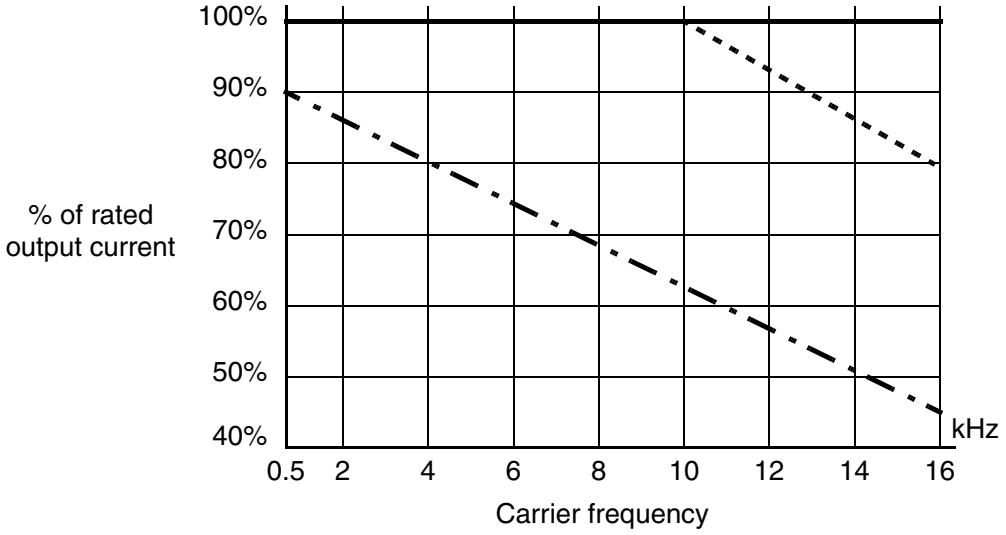
SJ100–004HFE/HFU



SJ100–007HFE/HFU

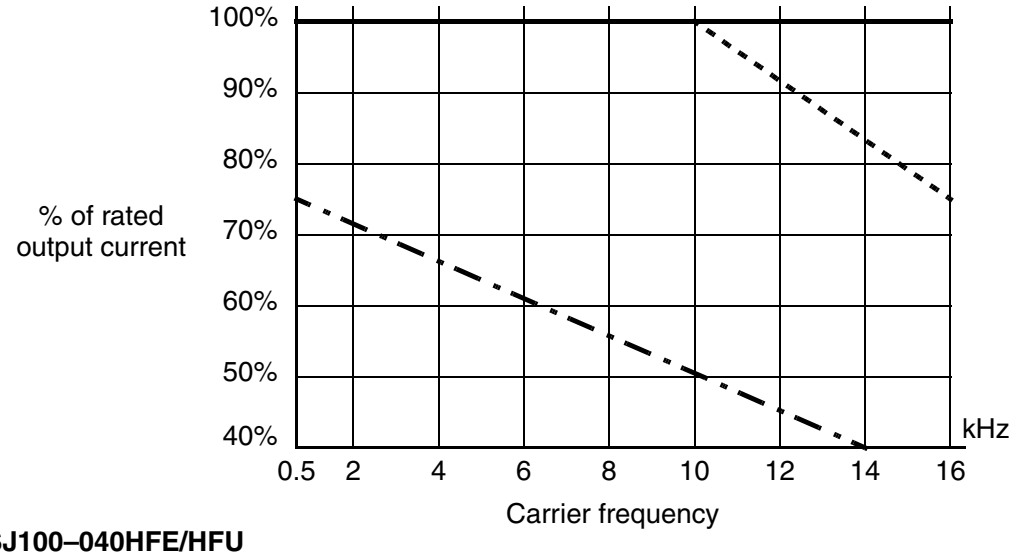


SJ100–015HFE/HFU

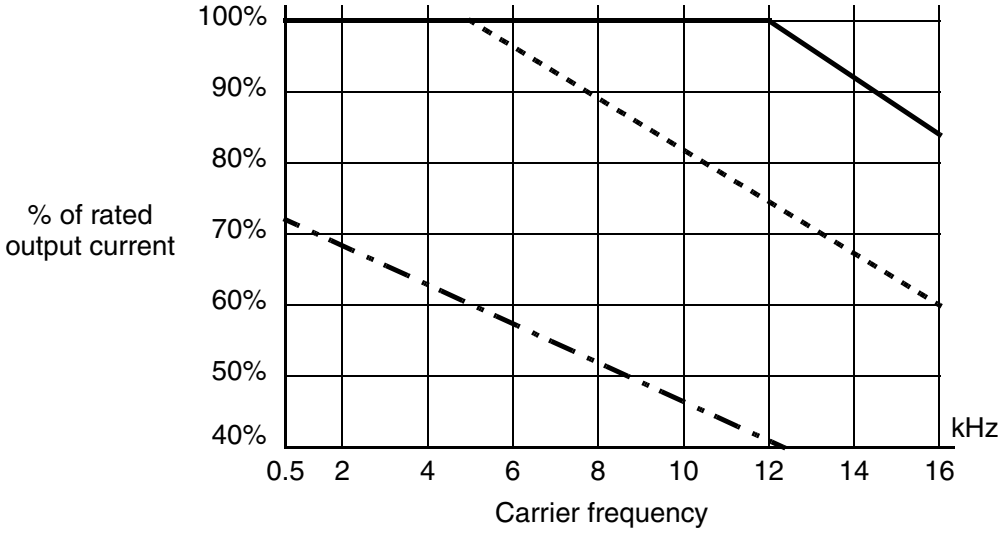


Derating curves, continued...

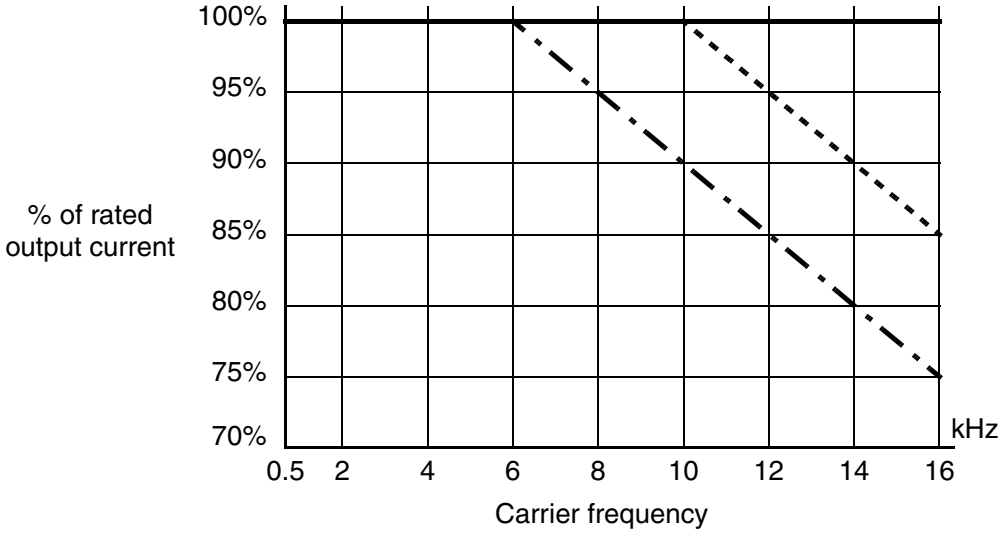
SJ100–022HFE/HFU



SJ100–040HFE/HFU



SJ100–055HFE/HFU



Derating curves, continued...

SJ100–075HFE/HFU