

# L100 Inverter Specifications

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

The following tables are specific to L100 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				
L100 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 1/2
Rated capacity (240V) kVA *10		0.5	1.0	1.2	1.6	2.0
Rated input voltage		1-phase: 200 to 240V +5/-10%, 50/60 Hz $\pm$ 5%, 3-phase: 200 to 240V +5/-10%, 50/60 Hz $\pm$ 5%, (037LFU, 055LFU & 075LFU 3-phase only)				
Rated input current (A)	1-phase	3.1	5.8	6.7	9.0	11.2
	3-phase	1.8	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)		1.4	2.6	3.0	4.0	5.0
Efficiency at 100% rated output (%)		91.5	92.8	93.6	94.1	95.4
Watt loss, approximate (W)	at 70% output	13	21	25	31	38
	at 100% output	17	29	32	41	51
Braking	Dynamic braking, approx. % torque, (short time stop from 50 / 60 Hz) *5	100%: $\leq$ 50 Hz, 50%: $\leq$ 60 Hz				
		Capacitive feedback type, dynamic braking unit and braking resistor optional, individually installed				
	DC braking	Variable operating frequency, time, and braking force				
Weight	kg	0.85	0.85	1.3	1.3	2.2
	lb	1.87	1.87	2.87	2.87	4.85

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:** 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. Note that a braking unit is not included in the inverter. If a large regenerative torque is required, the optional regenerative braking unit should be used.
- Note 6:** 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 7:** If operating the inverter in an ambient temperature of 40–50° 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 8:** The storage temperature refers to the short-term temperature during transport.
- Note 9:** 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 10:** The input voltage of xxLFU is 230V.

## L100 Inverter Specifications, continued...

Item		200V Class Specifications, continued				
L100 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 (240V) kVA *10		2.9	4.1	6.3	9.6	12.7
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	16.0	22.5	—	—	—
	3-phase	9.3	13.0	20.0	30.0	40.0
Rated output voltage *3		3-phase: 200 to 240V (corresponding to input voltage)				
Rated output current (A)		7.1	10.0	15.9	24	32
Efficiency at 100% rated output (%)		95.3	95.6	95.5	96.1	96.2
Watt loss, approximate (W)	at 70% output	50	71	118	152	204
	at 100% output	70	97	166	216	288
Braking	Dynamic braking, approx. % torque, (short time stop from 50 / 60 Hz) *5	100%: ≤ 50Hz 50%: ≤ 60Hz	40%: ≤ 50Hz 20%: ≤ 60Hz	20%: ≤ 50Hz 20%: ≤ 60Hz		
		Capacitive feedback type, dynamic braking unit and braking resistor optional, individually installed				
	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

## L100 Inverter Specifications

Item		400V Class Specifications			
L100 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
	<b>HP</b>	<b>1/2</b>	<b>1</b>	<b>2</b>	<b>3</b>
Rated capacity (460V) kVA *10		1.1	1.9	3.0	4.3
Rated input voltage		3-phase: 380 to 460V $\pm 10\%$ , 50/60 Hz $\pm 5\%$			
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
Braking	Dynamic braking, approx. % torque, (short time, stopping from 50 / 60 Hz) *5	100%: $\leq 50\text{Hz}$ 50%: $\leq 60\text{Hz}$			40%: $\leq 50\text{Hz}$ , 20%: $\leq 60\text{Hz}$
		Capacitive feedback type, dynamic braking unit and braking resistor optional, individually installed			
	DC braking	Variable operating frequency, time, and braking force			
Weight	kg	1.3	1.7	1.7	2.8
	lb	2.87	3.75	3.75	6.17

Item		400V Class Specifications, continued			
L100 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 *10		6.2	6.8	10.4	12.7
Rated input voltage		3-phase: 380 to 460V $\pm 10\%$ , 50/60 Hz $\pm 5\%$			
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
Braking	Dynamic braking, approx. % torque, (short time stop from 50 / 60 Hz) *5	40%: $\leq 50\text{Hz}$ , 20%: $\leq 60\text{Hz}$		20%: $\leq 50\text{Hz}$ 20%: $\leq 60\text{Hz}$	
		Capacitive feedback type, dynamic braking unit and braking resistor optional, individually installed			
	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 L100 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 $\pm$ 10°C)
Frequency setting resolution	Digital: 0.1 Hz; Analog: max. frequency/1000
Volt./Freq. characteristic	V/f optionally variable, V/f control (constant torque, reduced torque)
Overload current rating	150%, 60 seconds
Acceleration/deceleration time	0.1 to 3000 sec., (linear accel/decel), second accel/decel setting available

## L100 Inverter Specifications

Item		General Specifications	
Input signal	Freq. setting	Operator panel	Up and Down keys / Value settings
		Potentiometer	Analog setting
		External signal *6	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)	
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	
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	
Operating Environment	Temperature	Operating (ambient): -10 to 50°C (*7) / Storage: -25 to 70°C (*8)	
	Humidity	20 to 90% humidity (non-condensing)	
	Vibration *9	5.9 m/s <sup>2</sup> (0.6G), 10 to 55 Hz	
	Location	Altitude 1,000 m or less, indoors (no corrosive gasses or dust)	
Coating color		Light purple, cooling fins in base color of aluminum	
Options		Remote operator unit, copy unit, cables for the units, dynamic braking unit, braking resistor, AC reactor, DC reactor, noise filter, DIN rail mounting	

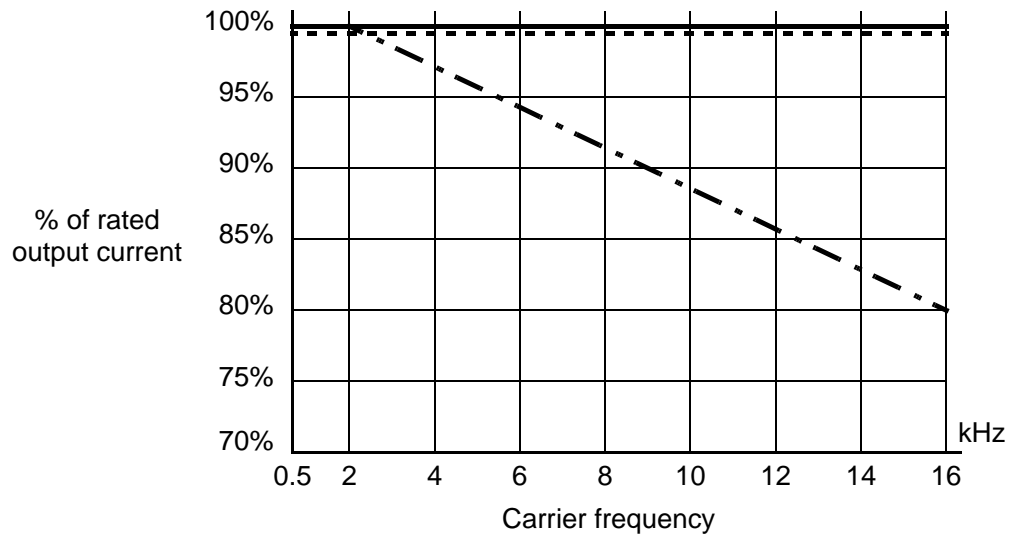
## Derating Curves

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.

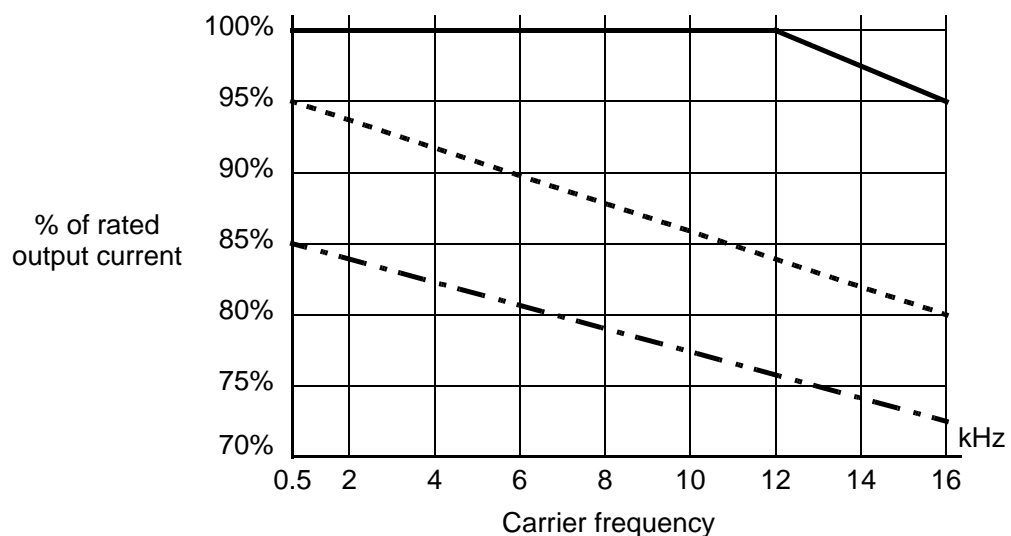
Use the following derating curves to help determine the optimal carrier frequency setting for your inverter, and to find the output current derating. Be sure to use the proper curve for your particular L100 inverter model number.

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

### L100-002NFE/NFU



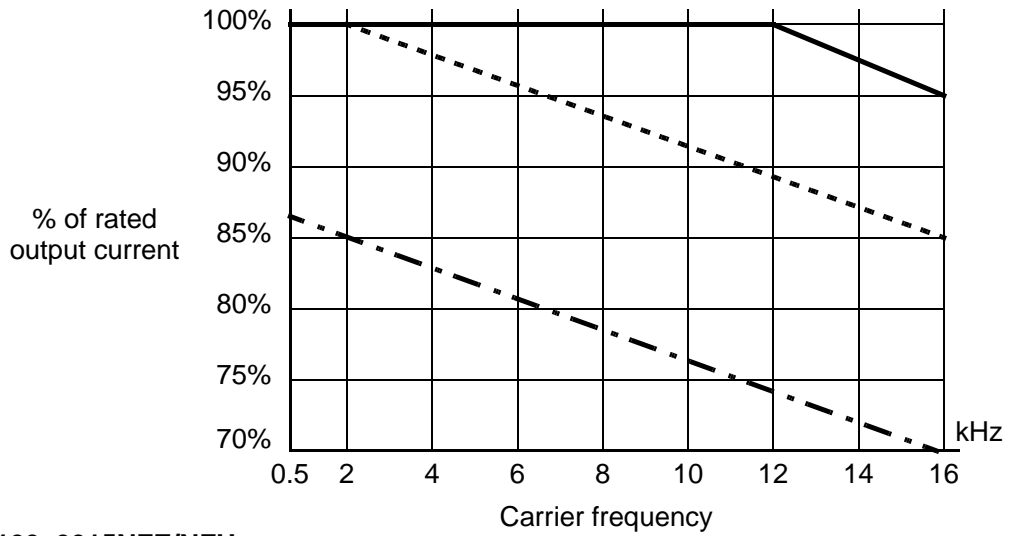
### L100-004NFE/NFU



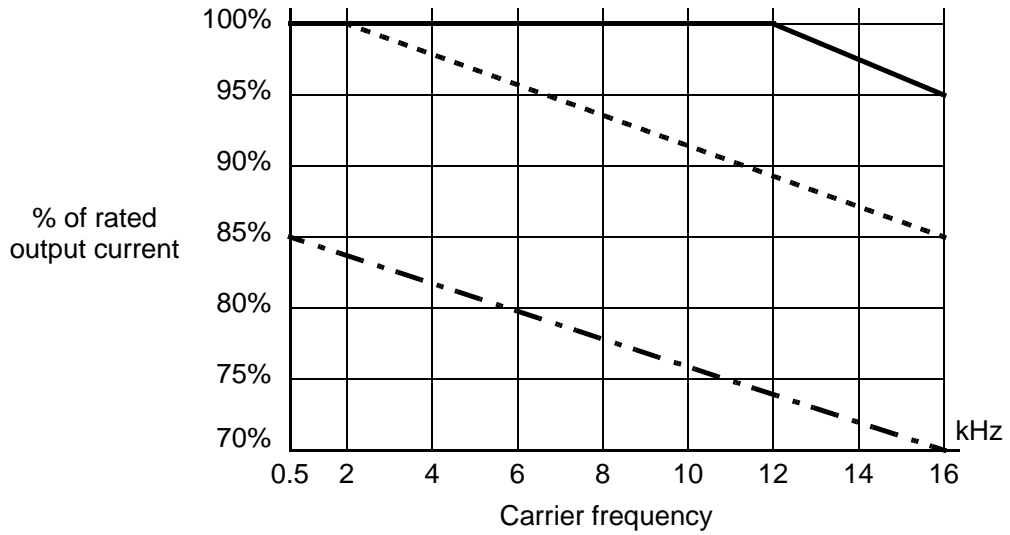
# L100 Inverter Specifications

Derating curves, continued...

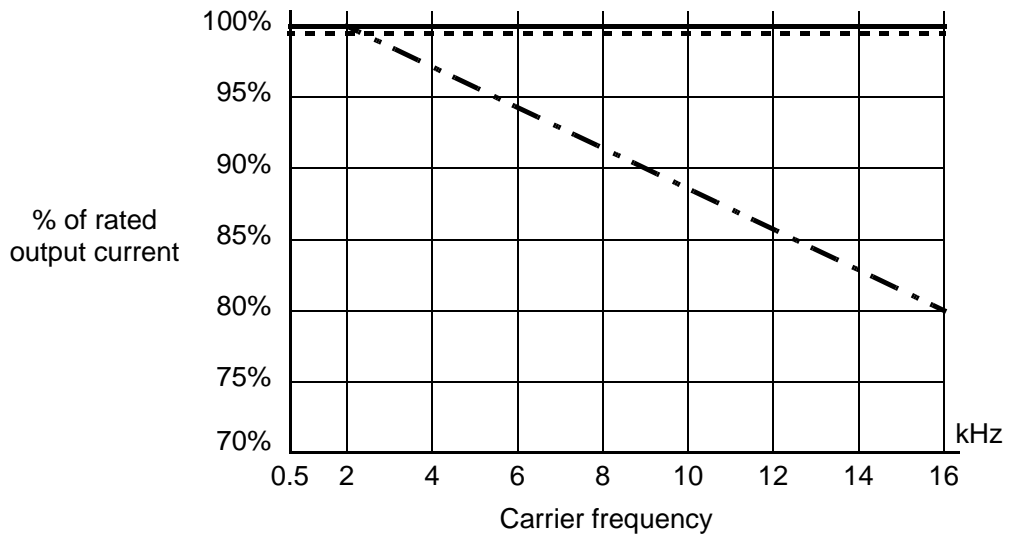
## L100-007NFE/NFU



## L100-0015NFE/NFU

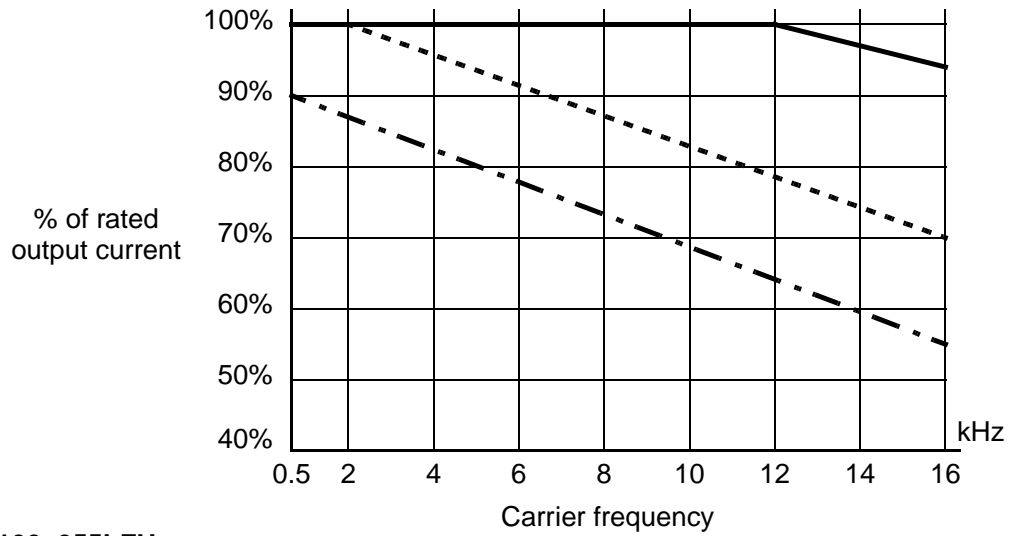


## L100-022NFE/NFU

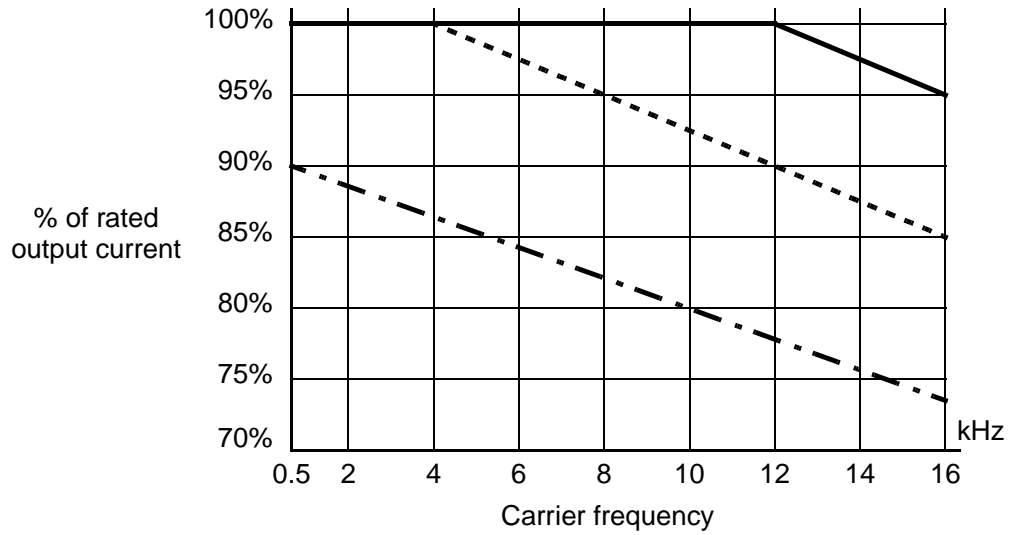


Derating curves, continued...

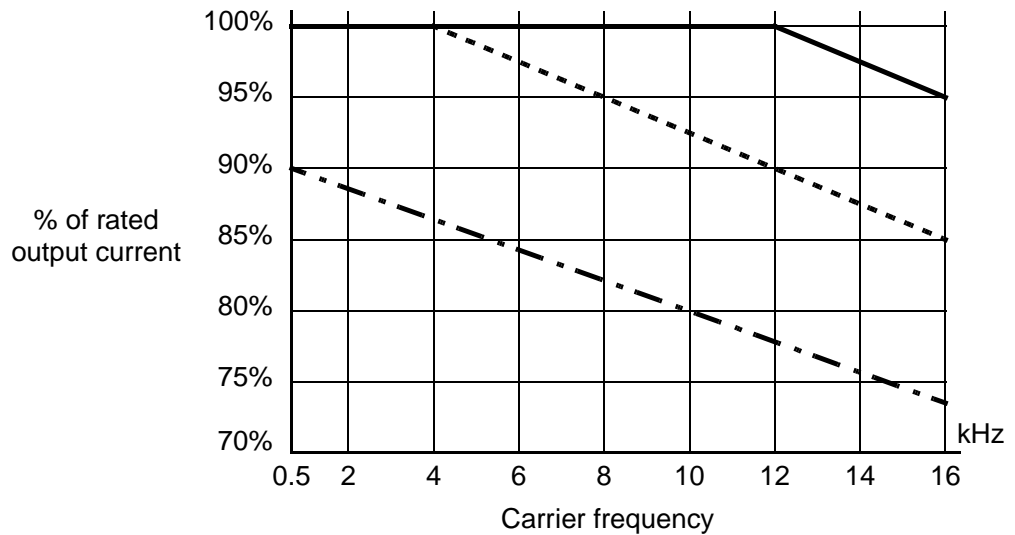
**L100-037LF/LFU**



**L100-055LFU**



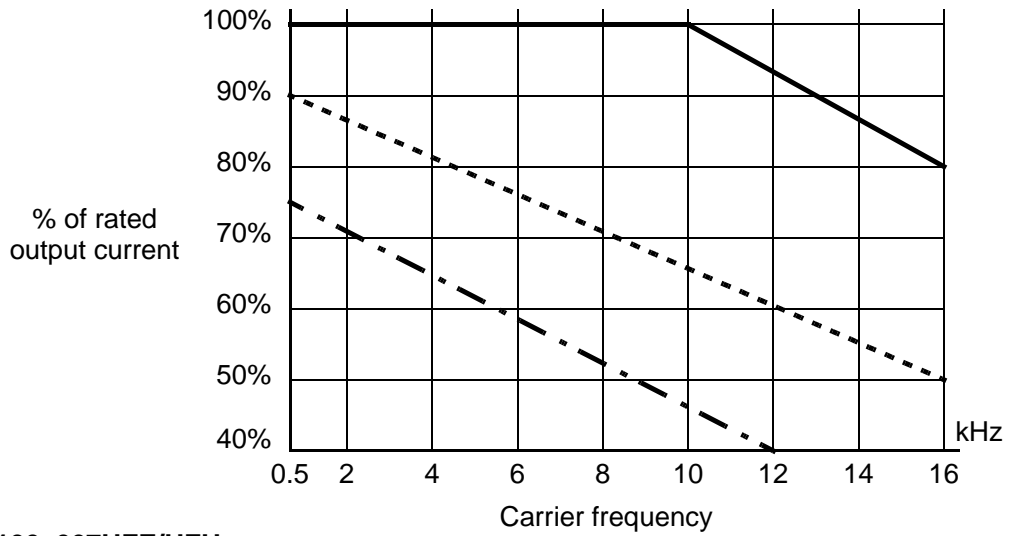
**L100-075LFU**



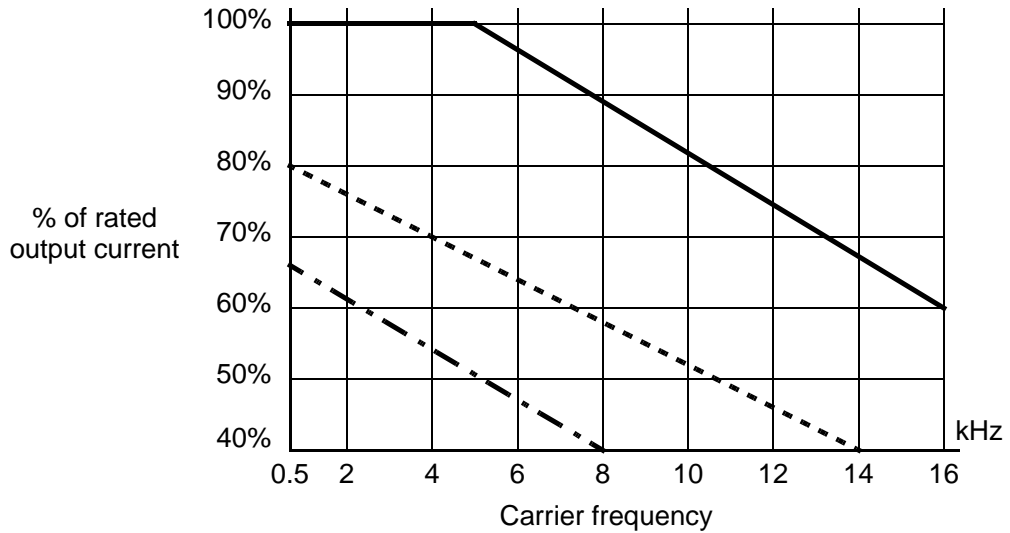
# L100 Inverter Specifications

Derating curves, continued...

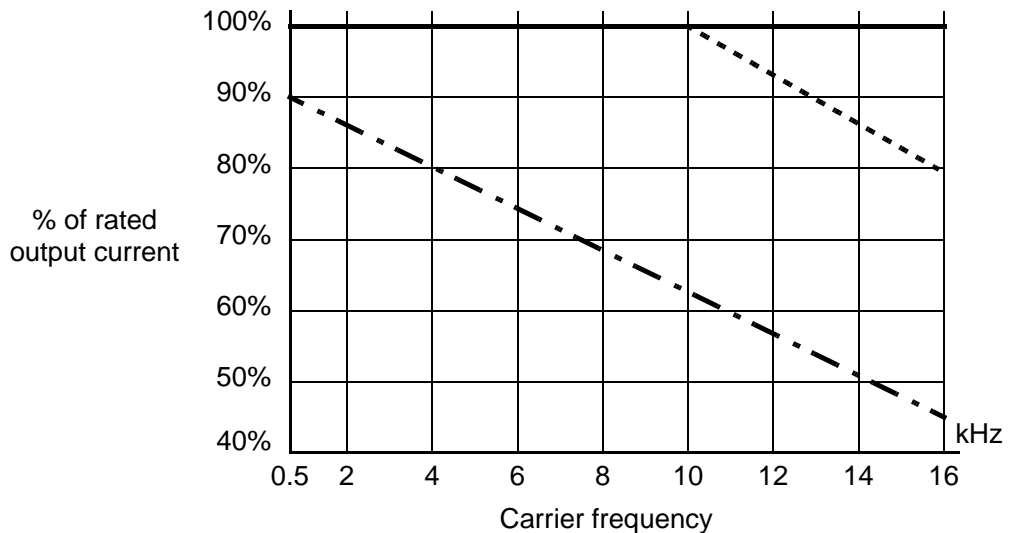
## L100-004HFE/HFU



## L100-007HFE/HFU

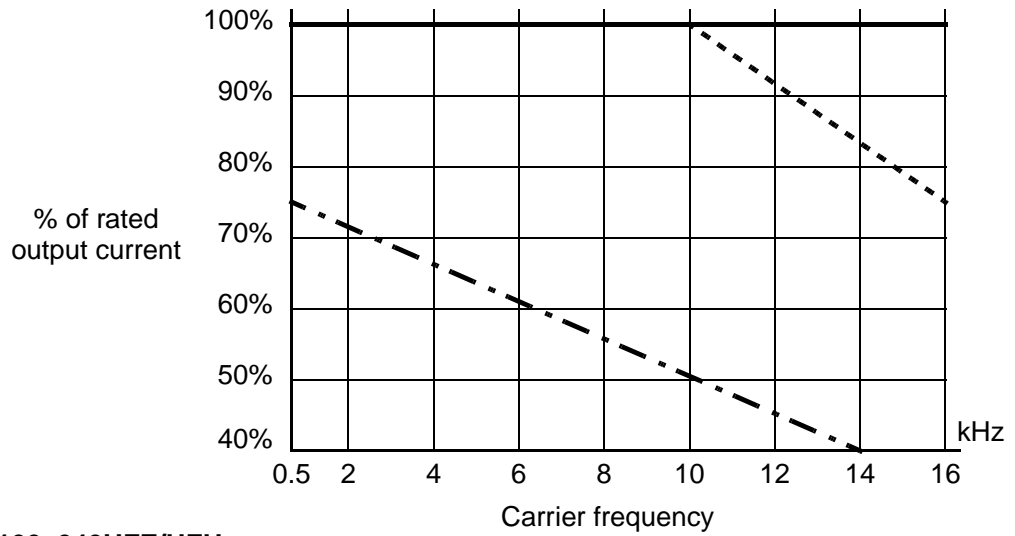


## L100-015HFE/HFU

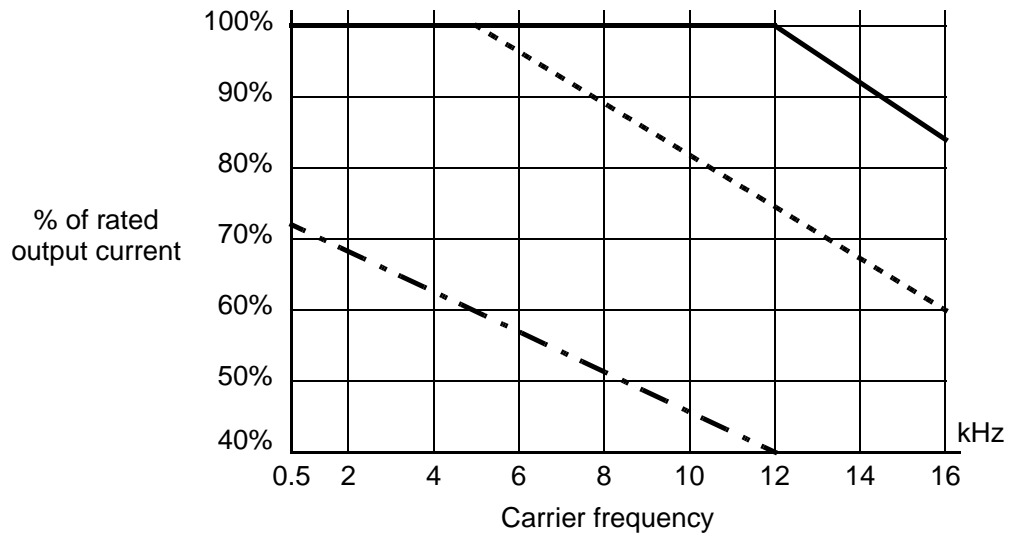


Derating curves, continued...

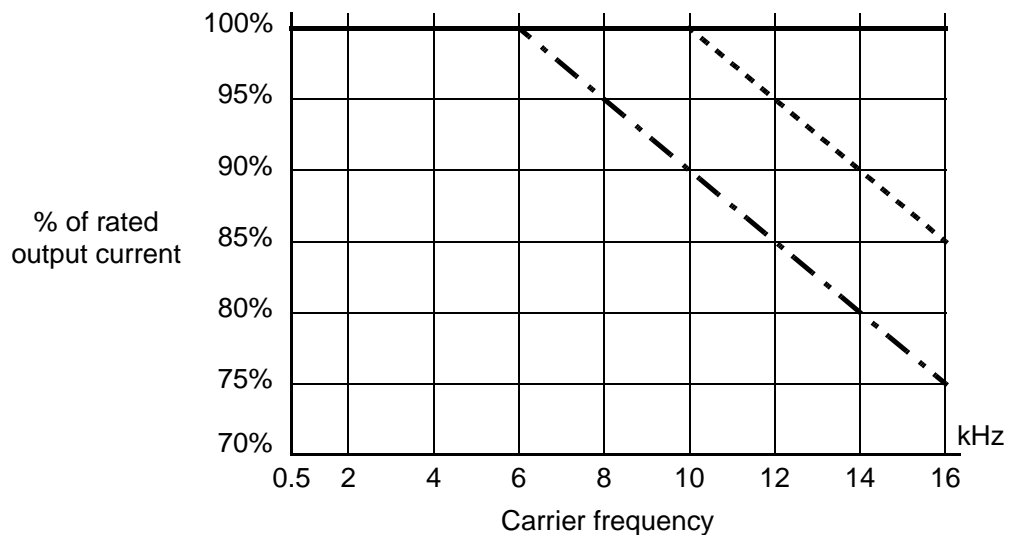
**L100-022HFE/HFU**



**L100-040HFE/HFU**

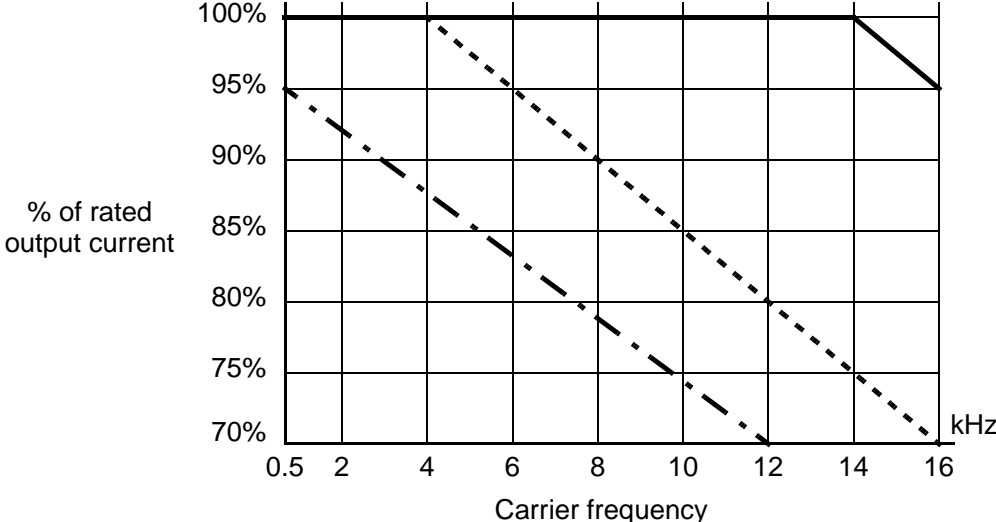


**L100-055HFE/HFU**



Derating curves, continued...

**L100-075HFE/HFU**



## L100 Series 200 V Class Dynamic Braking Chart

1/4 to 10 hp (0.2 to 7.5 kW)				Approximate Braking Torque With Optional BRD-E2 External Braking Unit							
Voltage Class	Model Number	Motor hp	Braking Torque @ 60 Hz (without optional external braking unit) (%)	Using Built-in Resistor Only		External Resistor Added					
						HRB1		HRB2		HRB3	
				A	B	A	B	A	B	A	B
200 V	L100-002NFU/E	1/4	50	150	120						
	L100-004NFU/E	1/2	50	150	120						
	L100-005NFE	3/4	50	150	120						
	L100-007NFU/E	1	50	100	80	150	120				
	L100-011NFE	1.5	50	60	60	100	80				
	L100-015NFU/E	2	50	50	50	100	80				
	L100-022NFU/E	3	20	50	50	100	80				
	L100-037LFU	5	20	40	40	60	60	100	100	150	120
	L100-055LFU	7.5	20	30	30	50	50	70	70	100	80
L100-075LFU	10	20	20	20	40	40	50	50	80	80	

1/4 to 10 hp (0.2 to 7.5 kW)				Approximate Braking Torque With <u>TWO (2)</u> Optional BRD-E2 External Braking Units							
Voltage Class	Model Number	Motor hp	Braking Torque @ 60 Hz (without optional external braking unit) (%)	Using Built-in Resistor Only		External Resistors Added					
						HRB1 x (2)		HRB2 x (2)		HRB3 x (2)	
				A	B	A	B	A	B	A	B
200 V	L100-002NFU/E	1/4	50	150	120						
	L100-004NFU/E	1/2	50	150	120						
	L100-005NFE	3/4	50	150	120						
	L100-007NFU/E	1	50	150	120						
	L100-011NFE	1.5	50	100	80						
	L100-015NFU/E	2	50	100	80						
	L100-022NFU/E	3	20	70	70	150	120				
	L100-037LFU	5	20	50	50	110	90				
	L100-055LFU	7.5	20	30	30	80	80	100	100	150	150
L100-075LFU	10	20	30	30	60	60	80	80	100	100	

## L100 Series 400 V Class Dynamic Braking Chart

1/2 to 10 hp (0.4 to 7.5 kW)				Approximate Braking Torque With Optional BRD-EZ2 External Braking Unit									
Voltage Class	Model Number	Motor hp	Braking Torque @ 60 Hz (without optional external braking unit) (%)	Using Built-in Resistor Only		External Resistors Added							
						HRB1 x (2)		HRB2 x (2)		HRB3 x (2)			
				A	B	A	B	A	B	A	B		
400 V	L100-004HFU/E	1/2	50	150	150								
	L100-007HFU/E	1	50	150	150								
	L100-015HFU/E	2	50	100	100								
	L100-022HFU/E	3	20	60	60								
	L100-030HFE	4	20	50	50	150	150						
	L100-040HFU/E	5	20	40	40	130	130	150	150				
	L100-055HFU/E	7.5	20	30	30	100	100	130	130				
	L100-075HFU/E	10	20	20	20	70	70	100	100				

1/2 to 10 hp (0.4 to 7.5 kW)				Approximate Braking Torque With TWO (2) Optional BRD-EZ2 External Braking Units									
Voltage Class	Model Number	Motor hp	Braking Torque @ 60 Hz (without optional external braking unit) (%)	Using Built-in Resistor Only		External Resistors Added							
						HRB1 x (4)		HRB2 x (4)		HRB3 x (4)			
				A	B	A	B	A	B	A	B		
400 V	L100-004HFU/E	1/2	50	150	150								
	L100-007HFU/E	1	50	150	150								
	L100-015HFU/E	2	50	150	150								
	L100-022HFU/E	3	20	130	130								
	L100-030HFE	4	20	100	100								
	L100-040HFU/E	5	20	70	70								
	L100-055HFU/E	7.5	20	50	50	150	150						
	L100-075HFU/E	10	20	40	40	140	140						