

# Electrical

## Input voltage

	24V only (Size 2 24V)	24/36V controllers	36/48V controllers	72/80V controllers	96/110V controllers
Conventional working voltage range (Note 1)	16.8V to 28.8V	16.8V to 43.2V	25.2V to 57.6V	50.4V to 96V	67V to 132V
Working voltage limits (Note 2)	12.7V to 34.8V	12.7V to 52.2V	19.3 V to 69.6 V	39.1 V to 116 V	48V to 150V
Non-operational overvoltage limits:	39.6V	59.4V	79.2 V	132 V	150V
Battery voltage droop:	Vnom to 0.5 x Vnom for 100 ms				
Input protection:	Input protected against reverse connection of battery				

Note 1: Conventionally the controller may be set to operate without cutback in the range 70% to 120% of the nominal battery voltage, although cutback parameters may be used to set cutbacks higher or lower than this range. Cutbacks are set by the user for various reasons, including:

- Battery protection against high current in deep discharge condition
- Providing smoothly reducing performance at extremes of working voltage range, rather than a sudden loss of function

Note 2: Working voltage range outside which the controller will be non-operational.

## Output protection

Output current:	Reduced automatically from peak to continuous rating depending on the time a peak load is applied to the controller (see Figure 11 on page4-5). Reduced automatically if operated outside normal temperature range.
Short-circuit:	Protected against any motor phase to B- or B+ at power-up. Protected against any motor phase to another motor phase at any time during operation. At switch-on Gen4 detects valid output loads are present before applying drive current.



CAUTION: Repetitive short circuits may damage the controller.

# Specification

## Output ratings

Input (Vdc)	Function	Short term rating* (A rms)	Continuous rating** (A rms)
24	Single traction size 2	300	120
24/36	Single traction size 4	450	180
	Single traction size 6	650	260
36/48	Single traction size 2	275	110
	Single traction size 4	450	180
	Single traction size 6	650	260
72/80	Single traction size 2	180	75
	Single traction size 4	350	140
	Single traction size 6	550	210
96/110	Single traction size 2	150	60
	Single traction size 4	300	120
	Single traction size 6	450	180

\*2 minute rating (lower ratings are possible for longer periods; see example in Figure 11)

\*\* 1 hour minimum without forced-air cooling

Size 2 long-term rating achievable with finned heatsink approx 250mm x 180mm, 0.5°C/W

Size 4 long-term rating achievable with finned heatsink approx 330mm x 200mm, 0.3°C/W

Size 6 long-term rating achievable with finned heatsink approx 330mm x 280mm, 0.2°C/W

