4. Overcurrent Protection

Foldback Current Limiting
The VI-/MI-200 modules with output voltages of 5V or 3.3V incorporate foldback current limiting. (Figure 4.1) In this mode, the output voltage remains constant up to the current knee, \( I_C \), which is 5 – 25% greater than full-rated current, \( I_{MAX} \). Beyond \( I_C \), the output voltage falls along the vertical line \( I_C - I_{FB} \) until approximately 2V. At ≤2V, the voltage and current folds back to short circuit current point (20 – 80% of \( I_{MAX} \)). Typically, modules will automatically recover when overcurrent is removed.

When bench testing modules with foldback current limiting, use a constant resistance load as opposed to a constant current load. Some constant current loads have the ability to pull full current at near zero volts. This may cause a latchup condition. Also when performing a short circuit test it is recommended to use a mercury wetted relay to induce the output short as other methods may induce switch bounce that could potentially damage the converter.

Straight Line Current Limiting
The VI-/MI-200 modules with output voltages greater than 5V, 2V (VI-/MI-200 only) and all VI-/MI-J00 modules incorporate a straight-line type current limit. (Figure 4.2) As output current is increased beyond \( I_{MAX} \), the output voltage remains constant and within its specified limits up to a point, \( I_C \), which is 5 – 25% greater than rated current, \( I_{MAX} \). Beyond \( I_C \), the output voltage falls along the vertical line to \( I_{SC} \). Typically, modules will automatically recover after overcurrent is removed.

![Figure 4.1 — Foldback current limiting](image)

![Figure 4.2 — Straight-line current limiting](image)