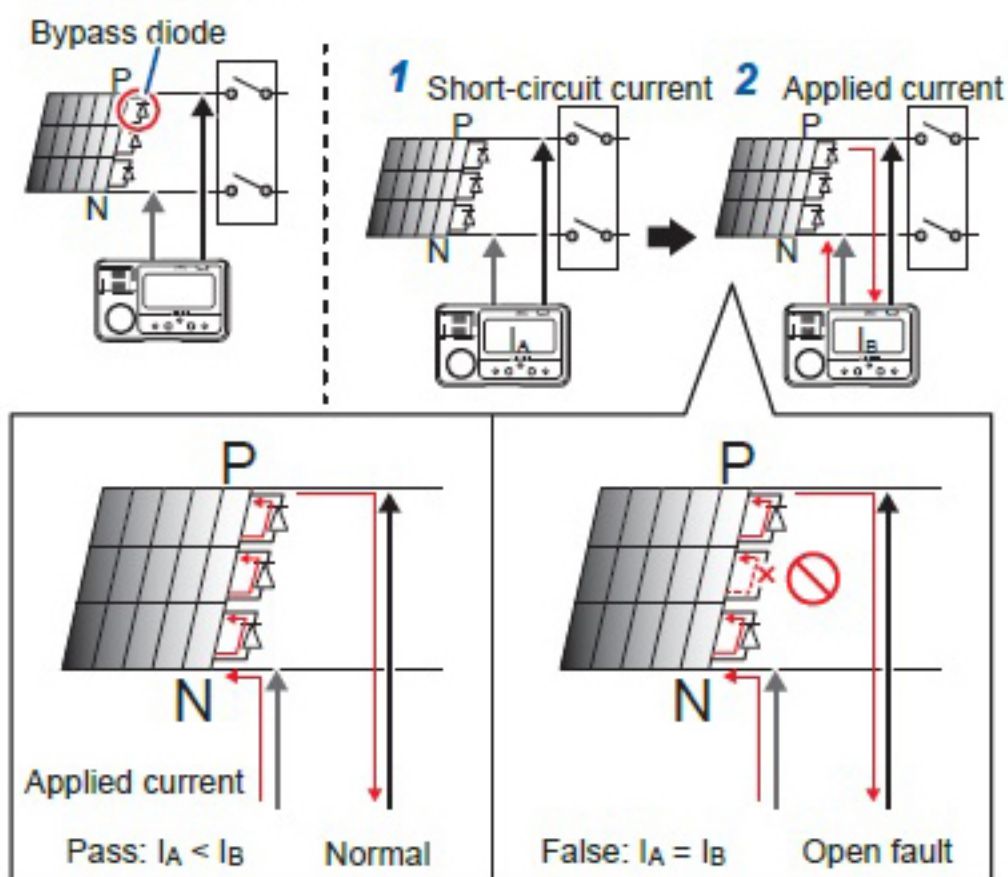# Appx.

Appx. 1 Measurement Principles

Measurement Principles for Bypass Diodes with an Open Fault

1 Measure a short-circuit current of a solar panel

2 Apply current to a solar panel

Applied current (I_B) = Short-circuit current (I_A) + 1 A current

- If short-circuit current (I_A) < applied current (I_B), the bypass diode is working correctly (OK).
- If short-circuit current (I_A) = applied current (I_B), the bypass diode has an open fault.

Bypass diode

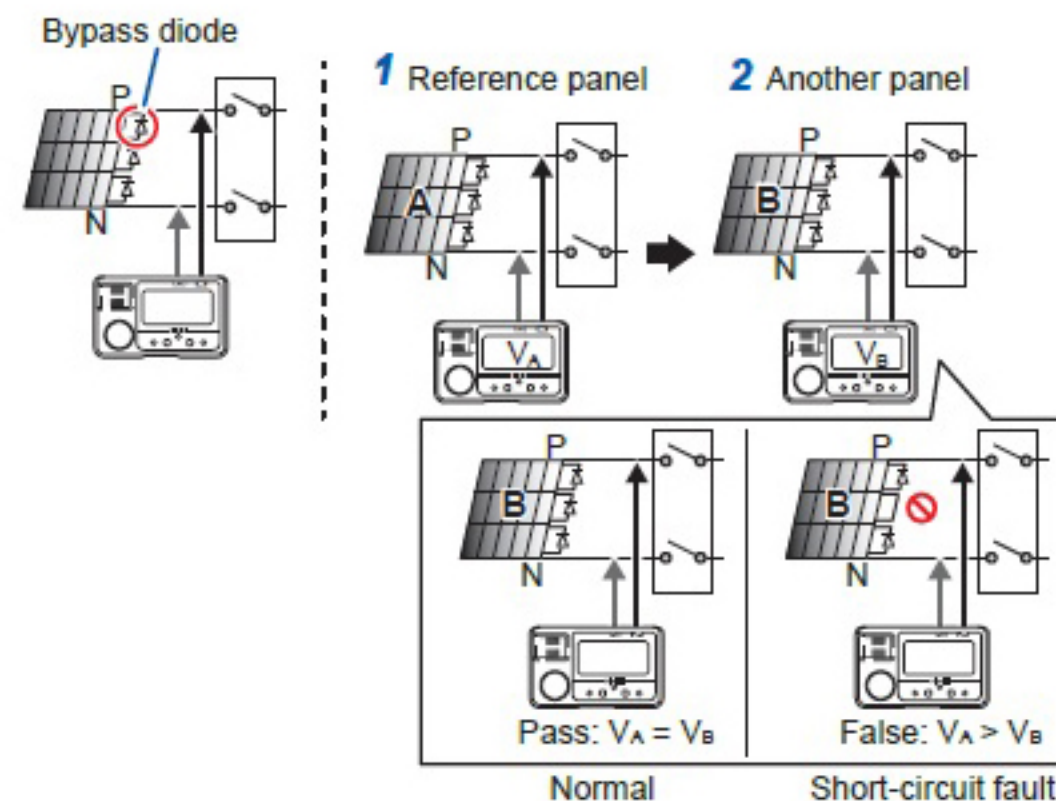Pass: $I_A < I_B$ Normal   False: $I_A = I_B$ Open fault

Measurement Principles for Bypass Diodes with a Short-circuit Fault

1 Measure an open-circuit voltage of a reference solar panel (= reference voltage)

2 Measure an open-circuit voltage of another solar panel (= measurement object voltage)

- If reference voltage (V_A) = measurement object voltage (V_B), the bypass diode is working correctly (OK).
- If reference voltage (V_A) > measurement object voltage (V_B), the bypass diode has a short-circuit fault.

Bypass diode

Pass: $V_A = V_B$ False: $V_A > V_B$

Normal   Short-circuit fault