Smart VFI switchgear
Underground distribution switchgear

COOPER POWER SERIES

Enhanced safety, reliability and protection for solar applications

In a typical solar photovoltaic system, the inverter converts dc voltage to ac voltage, which must be stepped-up to 15–35 kV for utility distribution. At the point of utility connection, solar developers and integrators need a knowledgeable, single-source partner with a switchgear package that provides everything they need to tie their solar system to the utility.

Eaton's Cooper Power™ series Smart VFI switchgear can provide the unique features needed for this type of application

- Metering and protection required for grid-tie
- Easy interface for modern automation systems setup—with the help of Eaton's services or done independently by the user
- SCADA functionality of motor controls to remotely operate open and close
- ProView™ platform with Idea Workbench™
  - Easy to program and expand for future needs
  - ProView graphical programming environment
- A separate disconnection means for the solar provider and the utility allows each to safely break the inter-tie
- Environmentally preferred switchgear filled with E200™ biodegradable dielectric fluid
  - Complements the principles of renewable energy
  - Alternative to SF_6 filled switchgear
  - Load and fault interruption in SF_6 gas produces toxic byproducts ❶

❶ SF_6 gas has been identified as one of the most potent greenhouse gases by the United States Environmental Protection Agency.

Save time, money and space

- Alternative to metal-clad switchgear
  - Much smaller footprint and lower profile with approximately 40% less cost
  - Provides the key functionality to tie smaller scale solar plants directly to the utility grid or combine multiple arrays on larger-scale solar plants
  - Metering, protection, local or remote operation, visible isolation and grounding in one compact package
- E200 fluid eliminates time and cost of mandatory SF_6 gas monitoring and reporting
- Minimize maintenance with sealed deadfront construction and insulation system
  - No need to regularly clean barriers, insulators or live parts

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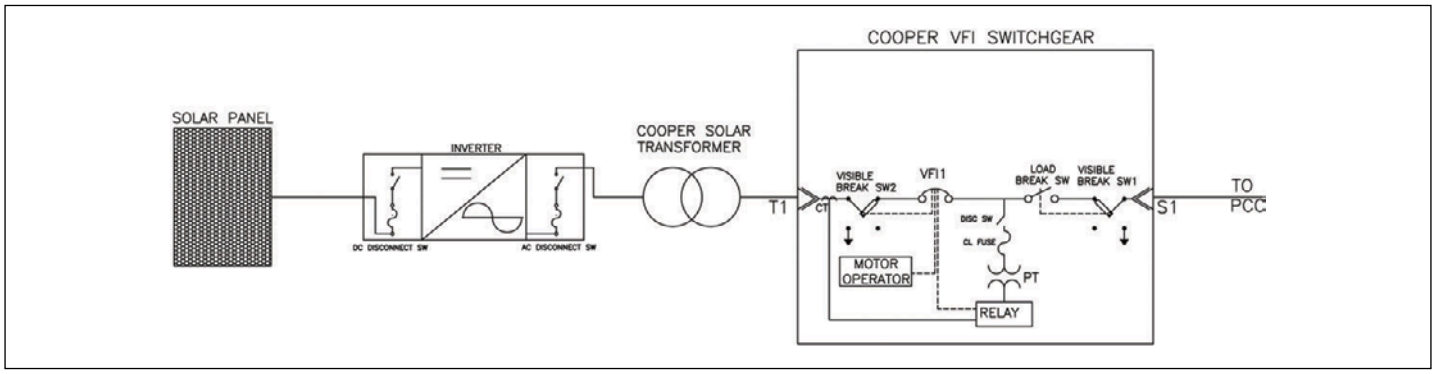
Typical solar grid-tie application



Easily integrates into grid-tie generation systems

Eaton's Cooper Power series iDP-210 feeder protection relay includes the protective elements and functionality typically required for solar generation connections to a utility grid:

- Protective functions:
  - Phase and ground overcurrent
  - Directional overcurrent
  - Reverse power
  - Overvoltage/undervoltage
  - Overfrequency/ underfrequency
- Meets the requirements of the applicable IEEE® and IEC relay standards, including IEEE Std 1547™-2003 "Standard for Interconnecting Distributed Resources with Electric Power Systems"
- Extensive metering capabilities are standard
  - Includes four-quadrant power and energy
  - Harmonics
  - Demand meters
- SCADA communications via DNP3 or Modbus® allows:
  - Reporting of the relay functions
  - Metering
  - Remote operational control
- Easily obtained data for trend analysis
  - User-configurable data profiler
  - A palette of over 200 available metering values at settable intervals
- The functions of the iDP-210 relay can be customized with the Idea Workbench, allowing changes for future needs
  - Graphical software programming environment
  - Add custom logic, control and metering
  - Voltage-controlled overcurrent elements
  - Per-phase reverse power

Smart VFI switchgear is tested and supported from a single source with unmatched expertise in underground distribution products and distribution reliability solutions.

Operator safety

The deadfront construction of VFI underground distribution switchgear provides added safety for operating and maintenance personnel.

- Designs are available with all low-voltage control contained in a cabinet—isolated from high-voltage connections
- Optional internal visible-break switch with viewing window verifies open circuit without removing cables and provides a means to ground cables internally
- Motorized switching allows switching to be performed without entering high-voltage compartment
- Available externally operable switches for safer manual operation

For Eaton's Cooper Power series product information, visit
Eaton.com/cooperpowerseries

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