













## Standard Features (continued)

### Voltage Regulation and Power Factor Control Circuitry

- Manual raise/lower voltage adjust capability and VAR/power factor control circuitry for maintaining constant generator power factor while paralleled with the utility. Voltage and power factor adjustments are performed on the generator paralleling control
- Includes RFI suppression, exciter limiter, and exciter diode monitoring

### Circuit Breaker

- 2000A fixed type, 3 poles, generator set mounted, electrically operated, insulated case
- Solid state trip unit for overload (time overcurrent) and fault (instantaneous) overcurrent protection
- Includes DC shunt trip coil activated on any monitored engine or electrical fault, 100 KA-interrupting capacity at 480 VAC
- Undervoltage release

### Distribution

- Three-phase, plus full rated neutral, bus bars are tin-plated copper with NEMA standard hole pattern for connection of customer load cables and generator cables
- Bus bars are sized for full load capacity of the generator set at 0.8 power factor
- Includes ground bus, tin-plated copper, for connection to the generator frame ground and field ground cable

- Customer convenience panel with multiple output receptacles
  - 1 – 240V, 50A twist lock
  - 1 – 240V, 20A twist lock
  - 2 – 120V, 20A twist lock
  - 2 – 120V, 20A ground fault interrupters
  - 2 – 120V, 15A GFCI protected duplex receptacles
- CTs rated 2000:5

### Link Board Assembly (480V Only)

- Link board for 208/240/400/480 wye operation
- Reconnection via movable link board
- Includes switch to determine operation mode

### UMR (Optional)

- Basler UMR IPS-100 provides the following utility/intertie protection features:
  - Synch check (device 25)
  - Phase undervoltage, 2-stage (device 27)
  - Reverse power (device 32)
  - Negative sequence overvoltage (device 47)
  - Phase time overcurrent (device 51)
  - Neutral overcurrent (device 51N)
  - Phase overvoltage, 2-stage (device 59)
  - Under frequency, 2-stage (device 81U)
  - Over frequency (device 81O)
- Potential transformers 4:1 ratio with primary and secondary fuse protection
- CTs rated 1200:5 wired to shorting terminal strips

## Modes of Operation

- Provides for single unit standalone operation, island mode paralleling and load sharing with other power modules, and single unit-to-utility mode paralleling for base load control (with open transition between paralleling modes)
- Island mode paralleling features:
  - Lead unit select control allows single unit to connect to a dead bus or Hard Wired Dead Bus Arbitration (HWDBA) to allow first unit up to voltage and speed to be first unit to connect to a dead bus
  - Auto synchronization (voltage and phase matching)
  - Load sharing (kW) analog signal (like units and legacy compatible)
  - Load sharing (kVAR) analog signal (like units only)
- Utility mode paralleling features:
  - Auto synchronization (voltage and phase matching)
  - Base-load control (programmable set-point or potentiometer adjust)
  - Soft load/unload (programmable, shared set-point)
  - Power factor control (programmable set-point)

### Single Unit Standalone and Multi-unit Island Operation

- Utility standby mode (normal)
  - The utility is providing power for the plant loads
  - The PM generator breaker is open
  - The PM is in automatic standby mode to respond to a utility failure
- Emergency mode (emergency)
  - Utility failure
    - a. The customer protective relaying senses a utility abnormal condition

- b. A run request is sent to the PM generator plant
- c. The first PM generator to reach rated voltage and frequency is closed to the bus
- d. In multi-unit island mode, the remaining PM generators are paralleled to the bus as they reach rated voltage and frequency. This function is performed via the lead unit select jumper and interconnect wiring connected between the power modules.
- e. Plant load is transferred to the power modules, which share load equally via load share lines.

### Single Unit Base Load Operation

- Utility mode (normal)
  - The utility is providing power for the plant loads
  - The PM is in auto mode and the generator breaker is open
  - The PM is interconnected to the utility breaker aux contact, lead unit jumper is not installed and load share lines are not connected
  - The paralleling controls automatically detect utility parallel mode when the utility aux contact is closed
- Base load mode
  - Unit receives remote run request and starts
  - Unit reaches rated voltage and frequency
  - UMR performs sync-check to permit generator breaker to close
  - Unit ramps to base-load set point at programmed ramp time
  - Unit continues to run until remote run request is removed or unit is stopped at control panel



## Ratings Definitions and Conditions

**Meets or Exceeds International Specifications:** AS1359, CSA, IEC60034-1, ISO3046, ISO8528, NEMA MG 1-33.

**Prime** — Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated kW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year. Prime power in accordance with ISO3046. Prime ambients shown indicate ambient temperature at 100% load which results in a coolant top tank temperature below the alarm temperature.

**Standby** — Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby

power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

**Ratings** are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions.

**Fuel rates** are based on fuel oil of 35° API [16°C (60°F)] gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29°C (85°F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal).

Additional ratings may be available for specific customer requirements, contact your Cat representative for details. For information regarding low sulfur fuel and biodiesel capability, please consult your Cat dealer.

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