



'Power Control' PCL System Generator Set Control



Solid State Control

The Power Control PCL system uses the latest solid state control technology. Designed for the budget-conscious installation but with a comprehensive specification of features, protection systems and optional add-ons to meet the majority of specified requirements for prime power generation or standby operation.

Proven and tested in arduous climatic and electrical environments for worldwide operation. Meeting all current EMC and CE Regulations as applicable.

Quality Control

All Cummins Power Generation products are designed and manufactured by companies complying to Quality Assurance procedures and certified to BS/EN ISO9001.

Single Source Solution

All the major components of each Generating Set produced by Cummins Power Generation such as the diesel engine, alternator, control system and complete unit are manufactured within the Cummins group providing a single source responsibility for your procurement, spares and worldwide servicing.

Major Star Features

Engine protection

Automatic shutdown protection against low oil pressure, high coolant temperature and overspeed on all sets. Loss of coolant protection on all Generating Sets incorporating the L10 engine (250kVA/50Hz) and above.

Set protection

Underfrequency/underspeed protection on all Sets.

Emergency stop shutdown pushbutton on all Sets.

Remote Emergency stop connections on all Sets.

Full instrumentation complement

Three dual-scale ammeters, voltmeter and rpm/Hz meter on all Sets as standard.

Full engine instrument complement

White on black scaled instruments for oil pressure, water temperature, battery condition and hours run counter on all Sets.

Fascia scratch protection

Polycarbonate scratch-resistant, reverse printed, full fascia-sized label on front of panel.

Choice of systems

Either manual key-starting, remote control or automatic starting systems can be provided.

Choice of options

Full range of optional features to meet most comprehensive specifications.

System PCL-001

System PCL-001 – Manual Start

Standard Features

Key Start/Manual Control

Designed to manually start from key switch and push-button operation with stop control via key switch.

In 'OFF' position protection circuit latches are re-set. Key cannot be removed until in the 'OFF' position.

Separate push-button (green) for engine starting, provided for safety purposes.



Fault and Status Indication

LED visual indication for:

- Low oil pressure
- High water temperature
- Overspeed/over frequency
- Emergency stop shutdown
- Battery charge alternator failed
- Low coolant level*
- Underspeed/frequency (common)

Auto Shutdown Systems

Set will automatically shut down in the event of low oil pressure, high water temperature, overspeed, underspeed, low coolant level* or in the event of an emergency shutdown. Specific LED will remain illuminated until re-set by key function switch placed in the 'OFF' position.

All alarm LED indicators operate on a 'first up' fault alarm status.

AC Instrumentation

Three 72mm quadrant, dual scale, ammeters and current transformers.

One 72mm quadrant, dual scale, voltmeter and seven position selector switch.

One 72mm combined frequency and rpm meter 50/60Hz scale.

One Hours run counter.

Shrouded instrumentation fuses mounted internally.

All AC instruments are 90° deflection scales complying to DIN 57410, 43700/43718, BS89, BS5458 and UL94, IEC51m 414abd529.



Auxiliary Section

Emergency stop red push button with mechanical latch and hold ability.

Battery condition voltmeter.

Engine oil pressure gauge.

Engine coolant temperature gauge.

Emergency stop remote connections.

Operating Instructions

All LED indicators, switches and push buttons are clearly identified with instructions screen printed on scratch-resistant polycarbonate labels. Legends are in international symbols and English as standard although other languages can be accommodated.

Wiring

Panel wiring is pre-loomed, colour coded for identification, cleated and anchored. Modules and PCBs are interlinked with multi-pin plug and socket connections.

Control Panel Construction

Steel formed and welded control cubicle is mounted at rear of generating set on anti-vibration units. Full-width hinged and lockable fascia door provides total access to all internal components and instrument fuses. Sealed to IP51 Standard.

CE Conformity

For countries where applicable the equipment will meet CE conformity regulations and safeguards.

Circuit Breaker

All Cummins-powered Generating Sets have the option of a fitted 3 or 4-pole circuit breaker mounted on the side of the generator. The moulded case circuit breaker is fully connected to the alternator output terminals.

Magnetic and thermal protection trips are provided for plant protection against overload and short circuit conditions.

Removable gland plate covers provide top or bottom cable entry. For load terminal accessibility a removable bolt-on cover is provided.

*Note 1

A low coolant level warning and shutdown system is fitted as standard on all Generating Sets using the L10 engine (250kVA) and above. The system is available as an option on sets below this limit.

Note 2

Circuit breakers are set-mounted up to and including 2000 amperes. Floor standing cubicles are used above this capacity from 1600-3200 amperes with air circuit breakers.

System PCL-002

System PCL-002 – Remote Auto-Starting

Standard Features

Key Start/Remote or Auto Control

Designed for remote starting or automatic starting from an external signal. Key control in three positions for either manual starting, remote/auto starting or in 'OFF' position. Can be used in conjunction with separate automatic mains failure module.

In 'OFF' position protection circuit latches are re-set.

Separate push-button (green) for manual engine starting.

In 'AUTO' position the module powers up unit into standby mode. Set starts automatically if an external remote start signal is received. Three attempts to start timer incorporated with adjustable time periods for cranking or rest periods. Run-on timer included to allow engine cooling down period when off-loaded.

'MANUAL' position enables the Set to be started without the need for an external remote start signal.



Fault and Status Indication

LED visual indication for:

- Low oil pressure
- High water temperature
- Overspeed/over frequency
- Emergency stop shutdown
- Battery charge alternator failed
- Low coolant level*
- Underspeed/frequency (common)
- Set failed to start

Auto Shutdown Systems

Set will automatically shut down in the event of low oil pressure, high water temperature, overspeed, underspeed/frequency, low coolant level* or in the event of an emergency shutdown. Specific LED will remain illuminated until re-set by key function switch placed in the 'OFF' position.

All alarm LED indicators operate on a 'first up' fault alarm status.

AC Instrumentation

Three 72mm quadrant, dual scale, ammeters and current transformers.



One 72mm quadrant, dual scale, voltmeter and seven position selector switch.

One 72mm combined frequency and rpm meter 50/60Hz scale.

One Hours run counter.

Shrouded instrumentation fuses mounted internally.

All AC instruments are 90° deflection scales complying to DIN 57410, 43700/43718, BS89, BS5458 and UL94, IEC51m 414abd529.

Auxiliary Section

Emergency stop red push button with mechanical latch and hold ability.

Battery condition voltmeter.

Engine oil pressure gauge.

Engine coolant temperature gauge.

Emergency stop remote connections.

Operating Instructions

All LED indicators, switches and push buttons are clearly identified with instructions screen printed on scratch-resistant polycarbonate labels. Legends are in international symbols and English as standard although other languages can be accommodated.

Wiring

Panel wiring is pre-loomed, colour coded for identification, cleated and anchored. Modules and PCBs are interlinked with multi-pin plug and socket connections.

Control Panel Construction

Steel formed and welded control cubicle is mounted at rear of generating set on anti-vibration units. Full-width hinged and lockable fascia door

provides total access to all internal components and instrument fuses. Sealed to IP51 Standard.

CE Conformity

For countries where applicable the equipment will meet CE conformity regulations and safeguards.

Circuit Breaker

All Cummins-powered Generating Sets have the option of a fitted 3 or 4-pole circuit breaker mounted on the side of the generator. The moulded case circuit breaker is fully connected to the alternator output terminals.

Magnetic and thermal protection trips are provided for plant protection against overload and short circuit conditions.

Removable gland plate covers provide top or bottom cable entry. For load terminal accessibility a removable bolt-on cover is provided.

*Note 1

A low coolant level warning and shutdown system is fitted as standard on all Generating Sets using the L10 engine (250kVA) and above. The system is available as an option on sets below this limit.

Note 2

Circuit breakers are set-mounted up to and including 2000 amperes. Floor standing cubicles are used above this capacity from 1600-3200 amperes with air circuit breakers.

System PCL

Standard and Optional Features

CONTROL FUNCTION	Manual – Key Start	Remote/Auto – Manual
OPTIONS/FEATURES – Control System Type:	PCL-001	PCL-002
INSTRUMENTATION		
3 Ammeters	S	S
Voltmeter	S	S
Voltmeter Phase Selector Switch	S	S
Frequency Meter	S	S
Hours Run Counter	S	S
Lube Oil Pressure Gauge	S	S
Coolant Temperature Gauge	S	S
Battery Condition Meter	S	S
Lube Oil Temperature Gauge	O	O
Kilowatt Meter	O	O
Power Factor Meter	O	O
CONTROLS		
Key Switch Off/Reset/Manual	S	N/A
Key Switch Manual-Auto/Remote-Off	N/A	S
Push Button/Manual Start	S	S
Emergency Stop Button	S	S
Remote Stop (Emergency Shutdown) Connections	S	S
3 Attempt Start Timer	N/A	S
Cooling Run Timer	N/A	S
Earth Fault Shutdown and Indication	O	O
Remote Audible Alarm (loose)	O	O
Lamp Test/Reset (on Annunciators)	O	O
Audible Alarm – Set Mounted	O	O
Speed Trim Potentiometer (with electronic Governors only)	O	O
Volts Trim Potentiometer	O	O
Volt Free Contacts for Common Alarm	O	O
Volt Free Contacts for Generator up to speed & Volts (Ready to accept load)	–	O
Contact for Key Switch not in 'Auto' position	N/A	O
Contact for 'System Energised' Indication	N/A	O
Automatic Mains Failure Module (loose)	N/A	O
Battery Charger – 5 Amp wall mounting	O	O
10 Amp Battery Charger and Boost (loose) for wall mounting	O	O
3 or 4 Pole Circuit Breakers	O	O
Fuel Transfer (automatic or manual)	O	O
SHUTDOWNS WITH INDIVIDUAL WARNING LAMPS		
Low Lubricating Oil Pressure	S	S
High Coolant Temperature	S	S
Low Coolant Level (above 200kVA)	S	S
Overspeed	S	S
Emergency Stop	S	S
Underspeed/Under Frequency	S	S
Fail to Start	N/A	S
High Lubricating Oil Temperature	O	O
High Alt Winding Temperature Alarm and S/D	O	O
Low Coolant Level (up to 200kVA)	O	O
Low Fuel Level Shutdown	O	O
Overload Current (Amps)	O	O
Over Voltage/Under Volts	O	O
ALARMS WITH INDIVIDUAL WARNING LAMPS		
Battery Charge Alternator Failure	S	S
Low Fuel Alarm	O	O
Low Battery Volts	O	O
Battery Charger Failure (mains)	O	O
High Fuel Level Alarm	O	O
2 Stage – Low Lubricating Oil Pressure (pre-warning)	O	O
2 Stage – High Coolant Temperature (pre-warning)	O	O
8 Remote Indicators for Status or Alarms	O	O
Wall Mounted c/o Contactors 3 or 4 pole (up to 1250 amps). Above-floor mtd.	O	O

S = Standard O = Optional N/A = Not available

Note: The number of optional warnings/shutdowns are limited: Up to 2 without additional annunciator unit, up to 5 with 1 annunciator and up to 10 additional warnings/shutdowns with 2 annunciator units.

System PCL-005

Only used in conjunction with system PCL-002.

Operation

The Automatic Transfer Switch (ATS) Control Unit is a self-contained unit designed to provide a control signal for a standby generator set and its associated automatic transfer switch (ATS) unit or changeover contractors.

In the event of failure of the utility supply, the unit senses this failure and provides a start/run signal to the standby generator set. When the generator set is available (up to speed and voltage) the unit provides a close signal to the generator set contactor unit to transfer the load to the standby generator set.

When the utility supply returns, this is sensed by the Control Unit which provides a signal to the generator set automatic transfer switch (ATS) unit to transfer the load back to the utility supply. On transfer of load back to the utility supply the unit removes the generator run signal after a preset cooling run period (with the load removed).

The unit provides test modes which allow the generator set to be run on load and off load.

Standard Features

General

- Provides generator start control signal on failure of the utility supply
- Provides control signal to automatic transfer switch (ATS) for auto changeover

Key Switch Control – 4 Positions

- Auto ON (manual restore)
- Auto ON
- Run-OFF LOAD (testing)
- Run-ON LOAD

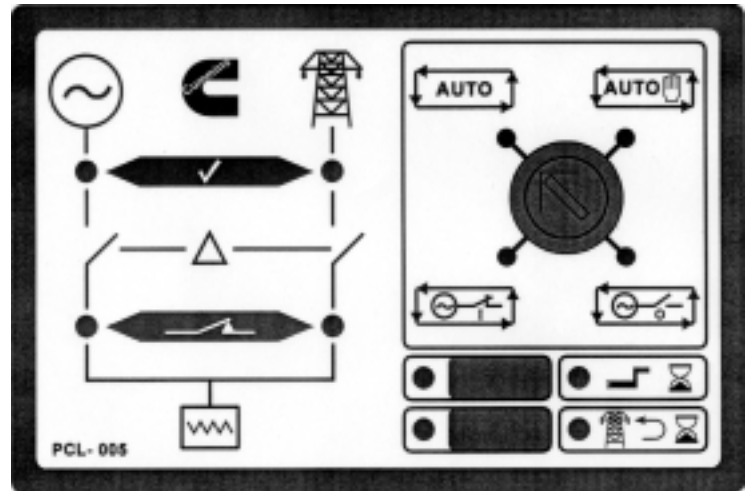
Status Indication LED Display

- Mains available
- Generator available
- Mains on load
- Generator on load

Control

Auto (manual restore) – will start the generator and take up the load when mains fails or voltage falls to pre-determined level. Does not automatically transfer

System PCL-005 – Automatic Transfer Switch (ATS) Control Unit



back to mains when restored. Provides opportunity to continue running the set on load until manually restored.

Auto – automatically starts the set when power fails or voltage falls transferring back to mains automatically when power is restored.

Run-OFF LOAD – facility for testing but switches over to supply load if mains fails during this period.

Run-ON LOAD – manually starts set and takes up load regardless of mains condition.

Key may be removed from any position.

Auxiliary Features

- Digital inputs for mains failure and generator available
- Output relays for:
 - Mains contactor close
 - Generator contactor close
 - Generator start/run
 - Mains available
 - Mains on load
 - Generator on load
- Adjustable timers for:
 - Mains fail time
 - Mains return time
 - Engine warming time
- Complies with Low voltage and EMC directives

Unit Sensing

Module will sense mains/utility voltage on all three phases and frequency on one phase. Sensing is adjustable between -20% to +22% but is pre-set at the factory. Frequency sensing is adjustable between 10Hz to 75Hz.

Control Unit

Fully configurable automatic load transfer switch with the ability to be programmed in the field or provide

a full diagnostic display when used in conjunction with either a PC compactable or hand-held programmer.

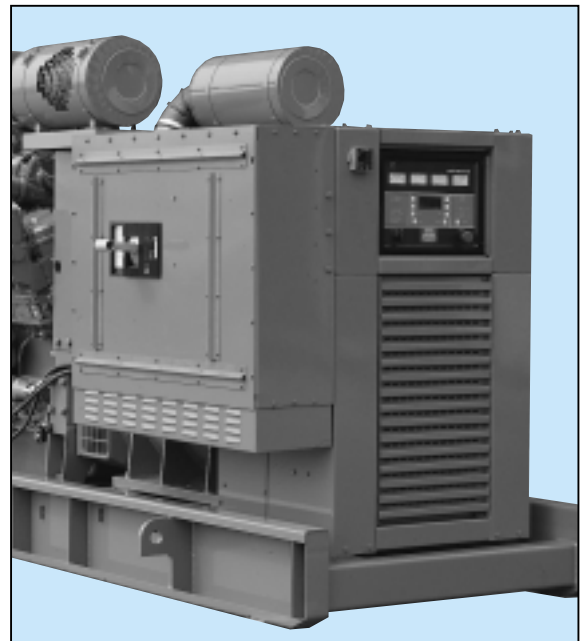
Powered from either mains (utility) supply, generator output or the plant battery.

Supplied as a loose item for installation in customer's own control room or mounted in a steel cubicle for wall mounting purposes.

The unit is designed for environments from -15°C to +55°C and complies with IP55 and IP31 for front and rear respectively. Complies with European Directive 72/23/EEC for Safety Standard BSEN60950 and the European EMC Directive 89/336/EEC to BSEN5008/-2 and of BSEN50082-2.



Power Control PCL system showing **all** options fitted including two annunciator units.



Circuit breaker can be fitted either side of generator set.



Your local distributor: