

# Transfer switch controls TS1311 (line-to-neutral)



## > Specification sheet

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### Description

The TS1311 control is a microprocessor-based power transfer control system. The control provides normal and generator source monitoring, generator set starting and power switch control functions. It is suitable for use in emergency, standby and optional standby applications. The integration of all functions into a single control system provides enhanced reliability and performance compared to conventional transfer switch control systems.

The operator panel of the TS1311 control is easy to use and understand, utilizing LED lamps for status indications and push-button controls for operator control functions.

The TS1311 control is field programmable without the use of a service tool.

The control source monitoring provisions include single or three phase monitoring for the normal source and single phase monitoring for the generator source.

The control is configurable to provide commonly required features such as programmed transition, sync check, pre-transfer signals, generator exerciser and other functions.

### Features

**Voltage sensing** - Control directly senses utility and generator set voltages from 75-600 VAC line-to-neutral. The control senses all phases on the normal source, and single phase on the generator set source.

**Frequency sensing** - Selectable 50 Hz or 60 Hz (generator set source).

**Easy to use operator panel** - Reliable color-coded LED indicating lamps and graphical labeling make it easy for an operator to understand source condition and switch position.

**Environmental protections** - The control enclosure is protected from dust, moisture and physical intrusion. The operator panel is provided with UV protection for long life in direct sunlight.

**Environment** - The control is designed for proper operation without recalibration in ambient temperatures from -30 °C to +70 °C (-22 °F to +158 °F) and for storage from -55 °C to +80 °C (-67 °F to +176 °F) and will operate at 95% relative humidity, non-condensing.

**Warranty and service** - All Cummins Power Generation products are backed by a comprehensive warranty and worldwide distributor service network to provide fast local parts and service support.

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## Control system

**Front panel test pushbutton** - The control will activate a generator set test or exercise when this pushbutton is pressed and held for 2 seconds. This test or exercise can be configured to occur with and without load. A without load test will start the generator and run without transfer of loads. A test with load will cause loads to be transferred to the genset for the duration of the test. The test is terminated by pressing the front panel test button again.

**Override pushbutton** - Pressing the override pushbutton terminates active time delays for time delay start, transfer, retransfer and genset stop.

**Set exerciser pushbutton** - Pressing this button allows programming a generator set exercise period. Can be configured with or without load and with or without a 12 hour offset.

**LED indicating lamps** - The control includes LED lamp indication for the following functions:

- Normal connected
- Normal available
- Emergency connected
- Emergency available
- Exercise
- Test

LED indicating lamps, in conjunction with push-button switches on the face of the panel, are used for system configuration.

**Control configuration** - A control configuration switch is provided to allow a technician to adjust time delays and other system configuration details. The control configuration switch is used in conjunction with the 8 LED lamps on the front panel to indicate control configuration.

## Control functions

**Nominal voltage setting** - The control is configurable for use at the following voltage levels: 110, 115, 120, 127, 139, 220, 230, 240, 255, 277 and 347.

**Elevator pre-transfer** - The control is capable of sending a steady state output to an elevator control system indicating that there is an impending transfer or re-transfer.

**Voltage sensing** - All phases on the normal source and single phase on the generator source. The control senses line-to-neutral voltage.

**Normal source pickup:** adjustable 90-95%, dropout: adjustable 70, 80, 85 or 90% of nominal voltage.

**Generator source pickup:** 90%, dropout: 75% of nominal voltage.

**Frequency sensing** - Generator source pickup: 90% of nominal frequency, dropout: 75% of nominal frequency (50 Hz or 60 Hz).

## Operating modes

- Open transition with programmed transition (adjustable 0-10 seconds)
- Open transition with phase check monitor and programmed transition backup
- Exercise mode
- Test mode

**Phase check** - Configurable for initiation of transfer functions when sources are in phase, including ability to enable a programmed transition backup to the function so that if sources are not in phase within 120 seconds, the system will activate the programmed transition backup.

**Exerciser clock** - Integral exerciser configurable for operation on 7, 14, 21, or 28 day cycle. Includes 12-hr offset for more convenient setting of exercise time. Fixed 20 minute exercise duration.

**Time-delay functions** - The control provides the following time delay functions:

**Engine start:** Prevents nuisance generator set starts due to momentary power system variation or loss. Adjustable from 0-10 seconds; default to 3 seconds.

**Transfer normal to emergency:** Allows generator set to stabilize before application of load. Prevents power interruption if normal source variation or loss is momentary. Allows staggered transfer of loads in multiple transfer switch systems. Adjustable from 0-300 seconds; default to 5 seconds.

**Retransfer emergency to normal:** Allows the utility to stabilize before retransfer of load. Prevents needless power interruption if return of normal source is momentary. Allows staggered transfer of loads in multiple transfer switch systems. Adjustable from 0-30 minutes; default to 10 minutes.

**Generator set stop:** Maintains availability of the generator set for immediate reconnection in the event that the normal source fails shortly after transfer. Allows gradual generator set cool down by running unloaded. Not included in utility-to-utility systems. Adjustable from 0-30 minutes; default to 10 minutes.

**Programmed transition:** Controls the speed of operation of the transfer switch power contacts to allow load generated voltages and inductive devices to decay prior to connecting a live source. Transfer switch and control design prevents the device from being "stuck in neutral" position. Adjustable from 0-10 seconds; default to 0 seconds.

**Elevator signal:** Provides an adjustable time delay to prevent interruption of power during elevator operation or as a load disconnect signal. Adjustable from 0-300 seconds; default to 0 seconds. Configurable for pre-transfer only, or pre-transfer through post transfer (requires optional elevator signal relay for use).

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## Certifications

The TS1311 meets the requirements of the following codes and standards:

**NFPA110** - Standard for Emergency and Standby Power Systems

**NFPA70** - U.S. National Electrical Code

**NFPA99** - Standard for Health Care Facilities

**NEMA250** - Standard for Electrical Enclosures. The control enclosure provides a NEMA-4 rating (for indoor use, protection from moisture, dust and object intrusions).

**CSA C22.2, No. 14 - M91** - industrial equipment

## Control interface

**Generator start command** - The control provides a normally open contact that closes to command generator set starting.

### Power switching mechanism control -

Open normal: The control provides a solid state output to open the normal side of the transfer switch

Close normal: A solid state output is provided to close the normal side of the transfer switch

Open emergency: The control provides a solid state output to open the emergency side of the transfer switch

Close emergency: The control is capable of sending a solid state output to close the emergency side of the transfer switch

**Remote override** - Momentary input that is activated with a ground signal and functions in the same fashion as the operator panel override switch.

**Remote test** - Maintained input that is active with a ground. The test is configurable for with or without load; same as with the front panel test.

**Transfer inhibit** - Maintained input that is active with ground and is typically used by a supervisory control system to control the load transfer to generator sets in a controlled manner.

**Re-transfer inhibit** - Maintained input that is active with a ground and is typically used to prevent the control from automatically re-transferring the load back to the utility during power outages.

**Transfer switch connected to normal** - The control accepts a ground signal to indicate that the transfer switch loads are connected to the normal service.

**Transfer switch connected to emergency** - The control accepts a ground signal to indicate that the transfer switch loads are connected to the generator set.

**Utility source voltage sensing** - The control accepts a 3-phase and neutral connection (line-to-neutral) to monitor the normal service, rated at up to 480 line-to-neutral.

**Generator source voltage sensing** - The control accepts a single phase (line-to-neutral), which is used to allow the control to monitor generator set source condition.

**12 and 24 VDC battery operation** - The TS1311 operates normally with input control voltage from 8 to 35 VDC and can survive 0 VDC for 50 ms without misoperation.

## Options

**Elevator signal relay** - Provides 2 N/O and 2 N/C contacts for the elevator signal function. Contact rating is 10 A @ 600 VAC.

**Programmable exerciser clock** - Provides a fully programmable 7 day clock to provide greater flexibility in scheduling exercise periods and duration than the standard integral exerciser.

## Kit part number information

**TS1311:** Part number 0541-1221

**Elevator pre-transfer signal relay**

**(12 V relay coil):** Part number 0179-3760-01

**Elevator pre-transfer signal relay**

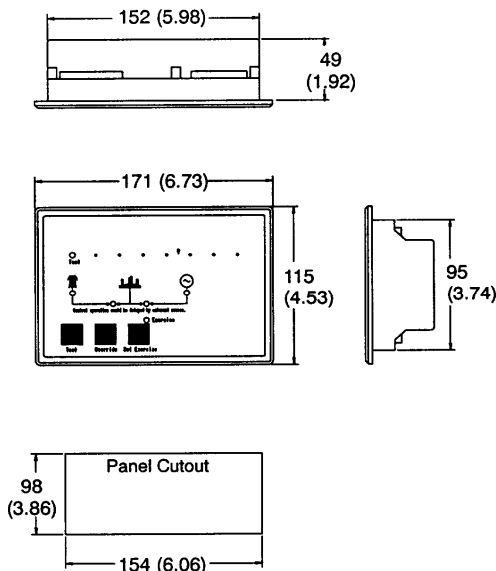
**(24 V relay coil):** Part number 0179-3761-01

**External exerciser clock**

**(12 V and 24 V):** Part number 0541-1106

Note: If a control is purchased as a stand-alone unit or part of a kit, it is recommended that voltage suppressors be used on the relay or to add a diode across the relay coils when connecting the control to a large coil. Failure to do so can result in damage to the control due to large voltage transients being fed back into the control.

## Basic dimensions



Dimensions: mm (in)

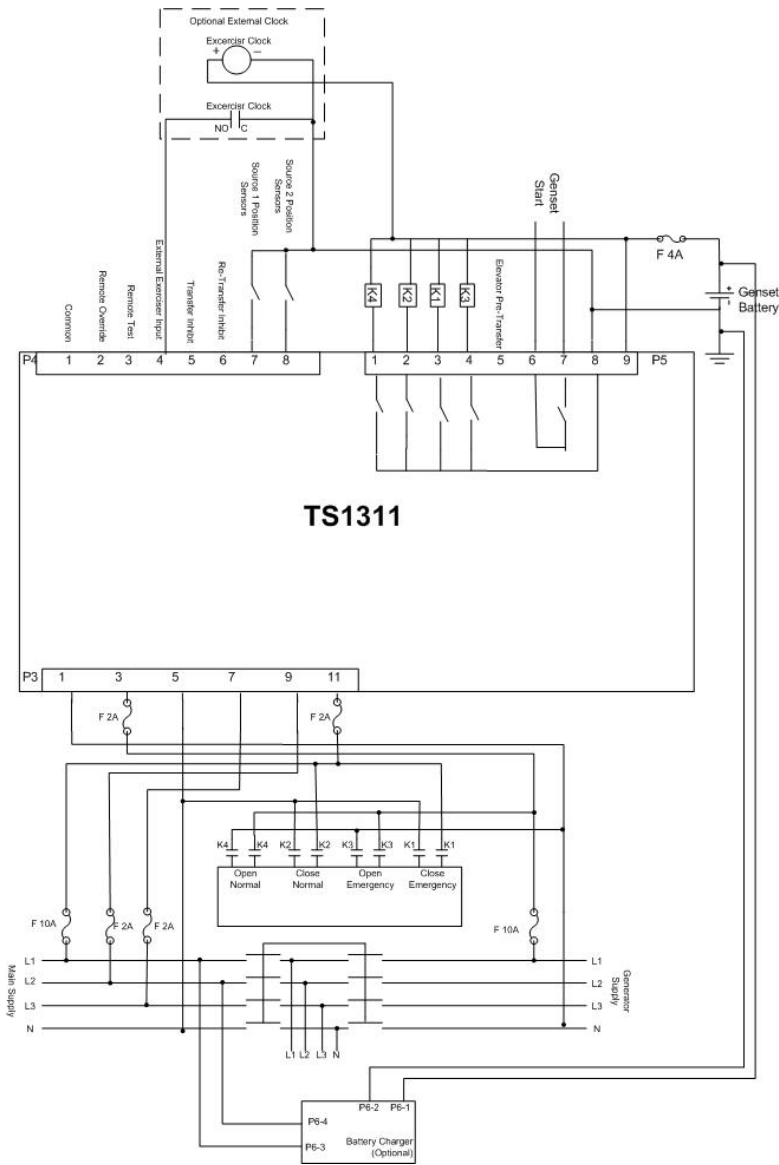
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# Electrical connections



## Cummins Power Generation

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 TT International Tradepark  
 Singapore 608838  
 Phone 65 6417 2388  
 Fax 65 6417 2399

**Warning:** Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building electrical except through an approved device or after building main breaker is open.

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