

# Three-Phase LTC Backup Control M-5329

Includes First Customer Protection



- Prevents a defective LTC tapchanger control from running the voltage outside the upper or lower limits.
- Prevents the line drop compensator from raising the voltage too high under full or overload conditions.
- Monitors all three-phases and blocks LTC tapchanger operation if any phase is outside the setpoints.
- Fully transient protected and operates within  $\pm 1\%$  voltage accuracy over a temperature range of  $-40^{\circ}$  to  $+80^{\circ}$  C.

The M-5329 LTC Backup Control provides the extra protection that can save your customers from the hazards and inconvenience of excessively high or low voltage on any phase. Defective LTC tapchanger controls can cause either too high or too low a voltage along the line, possibly damaging customers' motors, computers or televisions. Even when the control is operating properly, customers close to the transformer may receive dangerously high voltage as the line drop compensator attempts to maintain a constant voltage under heavy load at a central point on the distribution line. The Beckwith Electric M-5329 LTC Backup Control can be installed as a solution to both of these problems.

The M-5329 will prevent a defective LTC tapchanger control from running the voltage outside the upper and lower voltage limits and, in addition, will prevent the line drop compensator from raising the voltage too high under full load or overload conditions. Setting the voltage bands on the M-5329 slightly wider than the transformer control limits will assure that a failed control will not result in a runaway LTC transformer. Under full or overload conditions, the M-5329 automatically takes over as an upper voltage limit control, not affected by load current, to prevent damage to equipment close to the transformer. While the Block Raise contact prevents a raise operation, a Lower contact forces the tapchanger down if the primary voltage should subsequently rise.

**INPUTS:** Power: 90 to 140 V ac, 50/60 Hz, 4 VA at 120 V ac.  
Voltage: Less than 0.2 VA burden at 120 V ac input.

**BANDWIDTH:** An accurately calibrated dial adjusts the bandwidth between Block Raise and Block Lower from 6 V to 24 V for 120 V ac.

**BANDCENTER:** An accurately calibrated dial adjusts the Bandcenter from 100 V rms to 140 V rms which allows the M-5329 to operate with most transformer controls.

**SELECTABLE DEADBAND:** The Lower setpoint is selectable at one of the following levels above the Block Raise level, which is determined as 1/2 of the voltage bandwidth added to the bandcenter. 1 V rms, 2 V rms, 3 V rms, or 4 V rms.

If voltage remains above the maximum (Block Raise) voltage by this amount for longer than the time set on the **TIMER DELAY** control, the M-5329 will initiate a tapchanger operation to lower the voltage.

**TIMER DELAY:** Adjustable from 1 to 30 seconds.

**OUTPUT CONTACTS:** Rated to carry and switch 5 A at 120 V ac with a power factor of 1.0; switch 2.5 A at 120 V ac with a power factor of 0.4.

**RESPONSE TIME:** Blocking contacts will operate within 0.2 seconds after a voltage excursion to prevent the transformer control from causing another tapchange.

**ALARM:** After a fixed 3 minute time delay, if the voltage excursion is still present, the alarm is activated to indicate control failure.

**TERMINALS:** Barrier Strip with 6–32 screws.

### **TRANSIENT PROTECTION**

Input and output circuits are protected against system transients. The M-5329 will pass all the requirements of ANSI/IEEE C37.90.1-1989, which defines oscillatory and fast transient surge withstand capability. All inputs and outputs will withstand 1500 V ac to chassis or instrument ground for one minute. Voltage inputs are electrically isolated from each other, from other circuits, and from ground.

All faces of the relay, with the chassis solidly grounded, have been exposed to Radio Frequency Immunity testing and have successfully passed with a field intensity of 20 V per meter at typical utility frequencies of 144 MHz, 438 MHz, and at 450 MHz.

## ENVIRONMENTAL

**Temperature Range:** Operates within  $\pm 1\%$  voltage accuracy as per the following:

IEC 68-2-1	-40° C	96 hour duration
IEC 68-2-2	+80° C	96 hour duration
IEC 68-2-3	+40° C, 93% RH	96 hour duration

**Fungus Resistance:** A conformal printed circuit board coating inhibits fungus growth.

## PHYSICAL

**Size:** 12 $\frac{3}{4}$ " (32.39 cm) wide x 8 $\frac{1}{4}$ " (20.96 cm) high x 4" (10.16 cm) deep.

**Approximate Weight:** 5 $\frac{1}{2}$  lb (2.6 kg).

**Approximate Shipping Weight:** 7 $\frac{1}{2}$  lb (3.5 kg).



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