



Application Guide

**M-2174B Moloney
Replacement
Adapter Panel**

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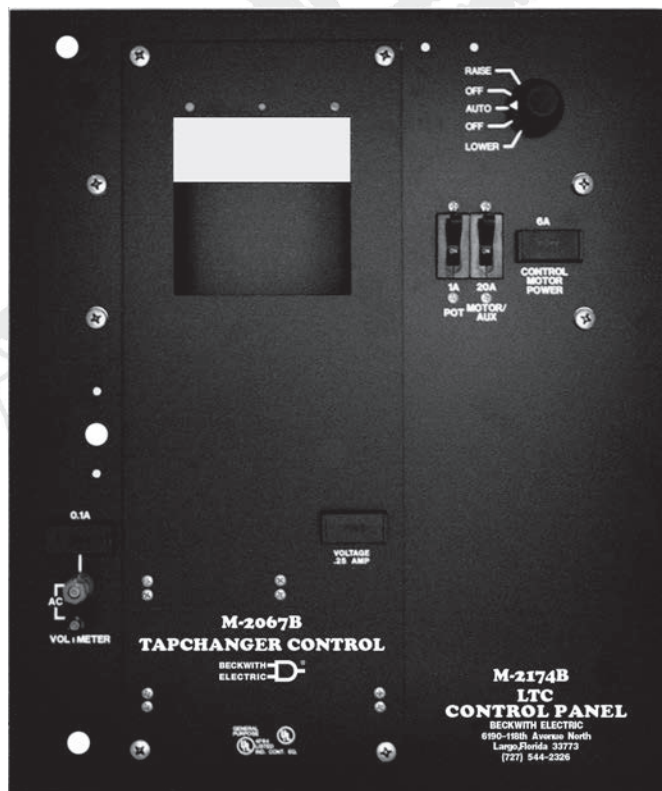
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Replacement Panel M-2174B

**Adapts M-2001 Series Digital Tapchanger Control
to Replace Moloney/Tempo LTC Control Panel**



- **Connects easily to the M-2001 Series Digital Tapchanger Control using mounting screws and 24-pin connector**
- **Fits directly into existing LTC control cabinet using the same door mounting hardware from the original panel**
- **Provides built-in CT shorting protection when the M-2001 Series Digital Tapchanger Control is removed**

The M-2174B is a replacement panel which, when combined with the M-2001 Series Digital Tapchanger Control, provides convenient direct replacement for Tempo (Moloney) LTC Control Panels. The M-2174B hardware consists of a front panel with a hinge on the right side, and mounts into the control cabinet using the same door mounting hardware which must be saved from the original panel. The door mounting hardware consists of either a locking handle, or two thumbscrews, depending on the original panel configuration.

The M-2174B features a voltmeter testing terminal, circuit breakers for the motor and for the voltage transformer, a manual **RAISE/OFF/AUTO/OFF/LOWER** switch, and a fuse for control motor power.

The M-2174B also includes the M-2067B Adapter Panel, which contains a voltage fuse and two terminal blocks on the rear for external connections,

Interface

External connections are made to two terminal blocks located on the rear of the M-2067B Adapter Panel. An additional terminal block provides access to auxiliary functions, including self-test alarm, user-programmable alarm, manual raise/lower, and operations counter.

Testing Specifications

High Voltage: All input and output terminals will withstand 1500 Vac rms to chassis or instrument ground for one minute with a leakage current not to exceed 25 mA, for all terminals to ground. Input and output circuits are electrically isolated from each other, from other circuits and from ground.

Surge Withstand Capability: All input and output circuits are protected against system transients. Units pass all requirements of ANSI/IEEE C.37.90.1-1989 defining surge withstand capability.

Radiated Electromagnetic Withstand Capability: All units are protected against electromagnetic radiated interference from portable communications transceivers.

Environmental

Temperature Range: Functionality is maintained from -40° to +85° C.

Humidity: Functionality is maintained under 95% relative humidity (non-condensing).

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

Physical

Size: 18" high x 15-1/4" wide (45.7 cm x 38.7 cm), fits box with outside dimensions of 17-7/8" high x 15-7/64" wide (45.4 cm x 38.4 cm)

Approximate Weight: 15 lbs (6.8 kg)

Approximate Shipping Weight: 18 lbs (8.2 kg)

Approximate Weight with M-2001 Series Digital Tapchanger Control: 18 lbs, 11 oz (8.5 kg)

Warranty

The M-2174B Adapter Panel is covered by a five year warranty from date of shipment.

Specification is subject to change without notice.

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WARNING

DANGEROUS VOLTAGES, capable of causing death or serious injury, are present on the external terminals and inside the equipment. Use extreme caution and follow all safety rules when handling, testing or adjusting the equipment. However, these internal voltage levels are no greater than the voltages applied to the external terminals.

DANGER! HIGH VOLTAGE



- This sign warns that the area is connected to a dangerous high voltage, and you must never touch it.

PERSONNEL SAFETY PRECAUTIONS

The following general rules and other specific warnings throughout the manual must be followed during application, test or repair of this equipment. Failure to do so will violate standards for safety in the design, manufacture, and intended use of the product. Qualified personnel should be the only ones who operate and maintain this equipment. Beckwith Electric assumes no liability for the customer's failure to comply with these requirements.



- This sign means that you should refer to the corresponding section of the operation manual for important information before proceeding.



Always Ground the Equipment

To avoid possible shock hazard, the chassis must be connected to an electrical ground. When servicing equipment in a test area, the Protective Earth Terminal must be attached to a separate ground securely by use of a tool, since it is not grounded by external connectors.

Do NOT operate in an explosive environment

Do not operate this equipment in the presence of flammable or explosive gases or fumes. To do so would risk a possible fire or explosion.

Keep away from live circuits

Operating personnel must not remove the cover or expose the printed circuit board while power is applied. In no case may components be replaced with power applied. In some instances, dangerous voltages may exist even when power is disconnected. To avoid electrical shock, always disconnect power and discharge circuits before working on the unit.

Exercise care during installation, operation, & maintenance procedures

The equipment described in this manual contains voltages high enough to cause serious injury or death. Only qualified personnel should install, operate, test, and maintain this equipment. Be sure that all personnel safety procedures are carefully followed. Exercise due care when operating or servicing alone.

Do not modify equipment

Do not perform any unauthorized modifications on this instrument. Return of the unit to a Beckwith Electric repair facility is preferred. If authorized modifications are to be attempted, be sure to follow replacement procedures carefully to assure that safety features are maintained.

PRODUCT CAUTIONS

Before attempting any test, calibration, or maintenance procedure, personnel must be completely familiar with the particular circuitry of this unit, and have an adequate understanding of field effect devices. If a component is found to be defective, always follow replacement procedures carefully to that assure safety features are maintained. Always replace components with those of equal or better quality as shown in the Parts List of the Instruction Book.

Avoid static charge

This unit contains MOS circuitry, which can be damaged by improper test or rework procedures. Care should be taken to avoid static charge on work surfaces and service personnel.

Use caution when measuring resistances

Any attempt to measure resistances between points on the printed circuit board, unless otherwise noted in the Instruction Book, is likely to cause damage to the unit.

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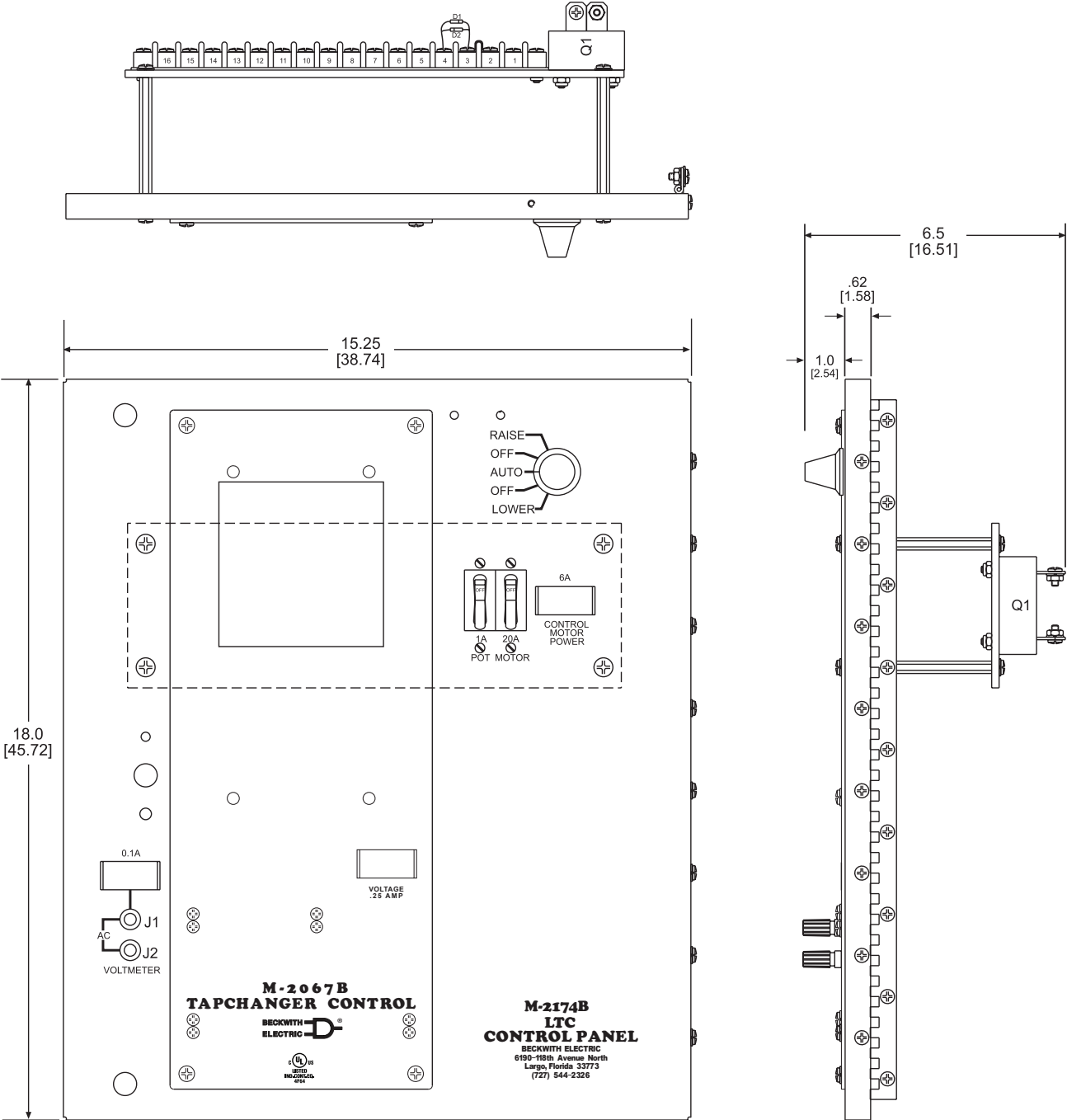


Figure 1 Replacement Moloney LTC Control Panel

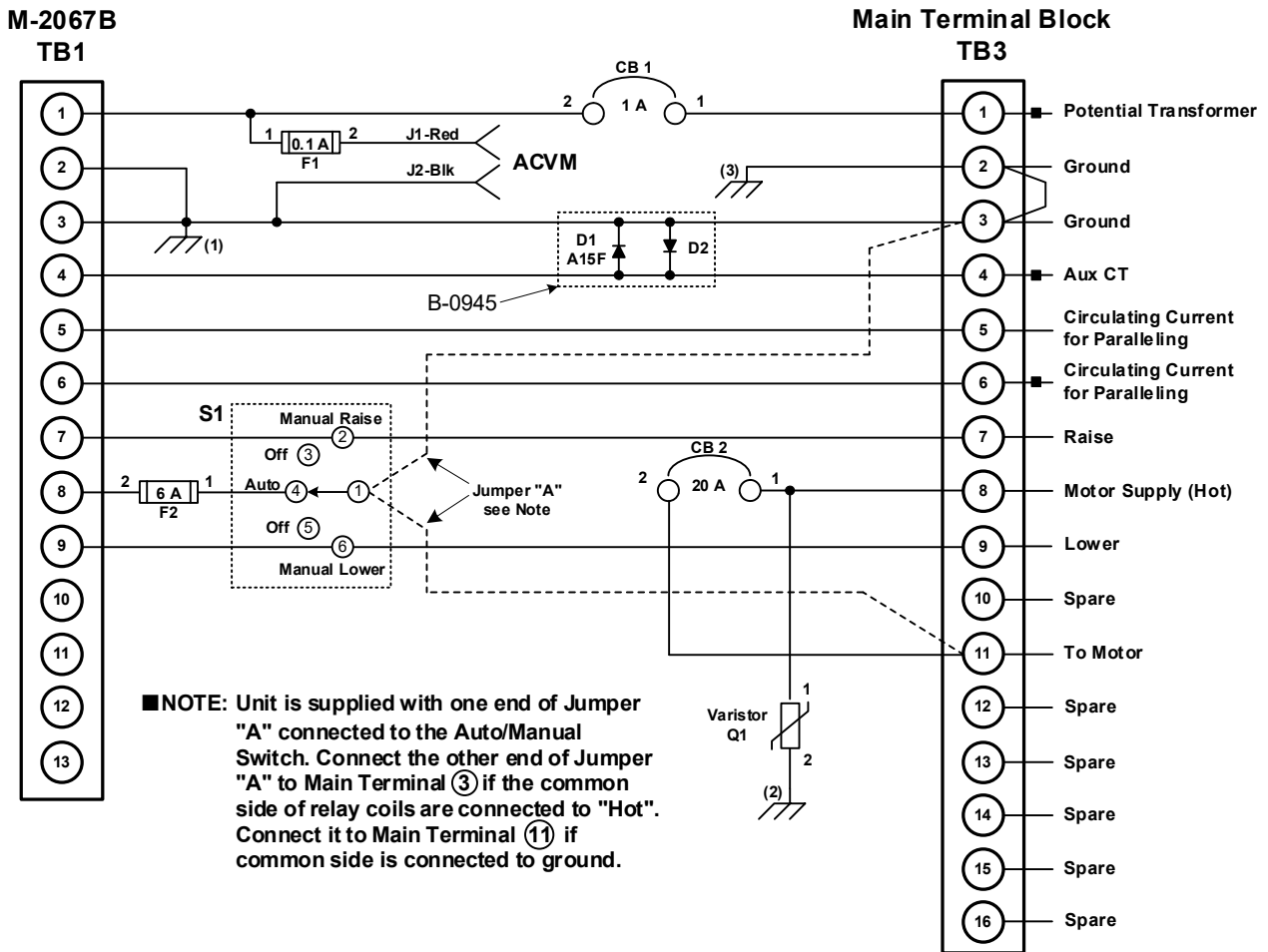


Figure 2 Replacement Moloney LTC Control Panel Wiring Schematic

Legal Information

Patent

The units described in this manual are covered by U.S. Patents, with other patents pending.

Buyer shall hold harmless and indemnify the Seller, its directors, officers, agents, and employees from any and all costs and expense, damage or loss, resulting from any alleged infringement of United States Letters Patent or rights accruing therefrom or trademarks, whether federal, state, or common law, arising from the Seller's compliance with Buyer's designs, specifications, or instructions.

Warranty

Seller hereby warrants that the goods which are the subject matter of this contract will be manufactured in a good workmanlike manner and all materials used herein will be new and reasonably suitable for the equipment. Seller warrants that if, during a period of five years from date of shipment of the equipment, the equipment rendered shall be found by the Buyer to be faulty or shall fail to perform in accordance with Seller's specifications of the product, Seller shall at his expense correct the same, provided, however, that Buyers shall ship the equipment prepaid to Seller's facility. The Seller's responsibility hereunder shall be limited to replacement value of the equipment furnished under this contract.

Seller makes no warranties expressed or implied other than those set out above. Seller specifically excludes the implied warranties of merchantability and fitness for a particular purpose. There are no warranties which extend beyond the description contained herein. In no event shall Seller be liable for consequential, exemplary, or punitive damages of whatever nature.

Any equipment returned for repair must be sent with transportation charges prepaid. The equipment must remain the property of the Buyer. The aforementioned warranties are void if the value of the unit is invoiced to the Seller at the time of return.

Indemnification

The Seller shall not be liable for any property damages whatsoever or for any loss or damage arising out of, connected with, or resulting from this contract, or from the performance or breach thereof, or from all services covered by or furnished under this contract.

In no event shall the Seller be liable for special, incidental, exemplary, or consequential damages, including but not limited to, loss of profits or revenue, loss of use of the equipment or any associated equipment, cost of capital, cost of purchased power, cost of substitute equipment, facilities or services, downtime costs, or claims or damages of customers or employees of the Buyer for such damages, regardless of whether said claim or damages is based on contract, warranty, tort including negligence, or otherwise.

Under no circumstances shall the Seller be liable for any personal injury whatsoever.

It is agreed that when the equipment furnished hereunder are to be used or performed in connection with any nuclear installation, facility, or activity, Seller shall have no liability for any nuclear damage, personal injury, property damage, or nuclear contamination to any property located at or near the site of the nuclear facility. Buyer agrees to indemnify and hold harmless the Seller against any and all liability associated therewith whatsoever whether based on contract, tort, or otherwise. Nuclear installation or facility means any nuclear reactor and includes the site on which any of the foregoing is located, all operations conducted on such site, and all premises used for such operations.

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