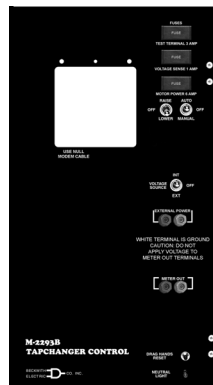
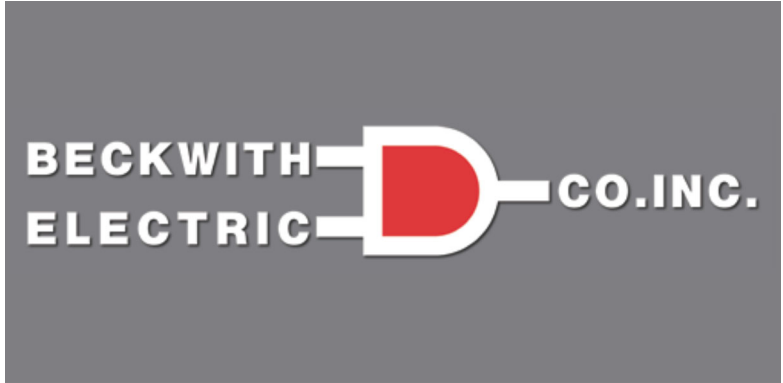


Transformer & Regulator Control Quick Reference Guide

Replacement Panels are Sized to Correspond to the Original Manufacturer's Controls, Use the Same Mountings, and Include Wire Harnesses that Match Existing Connections – For Easy Replacements



Allis-Chalmers | Cooper | General Electric | Howard Industries
McGraw-Edison | Moloney/Tempo | Pennsylvania | Reinhausen
Siemens | Westinghouse | and more

Quick Reference Guide

Beckwith Electric offers the smartest next generation control technology for LTC Transformers and Voltage Regulators for Smart Grid applications including Volt/VAR Optimization (VVO) and Conservation Voltage Reduction (CVR). Field proven with thousands of installed units, our controls lead the charge in advanced distribution grid solution applications.

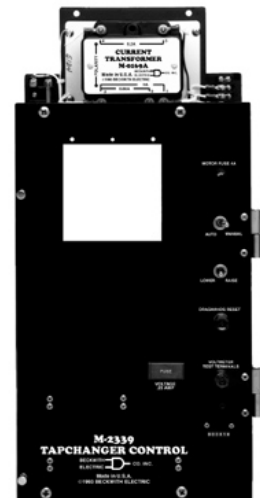
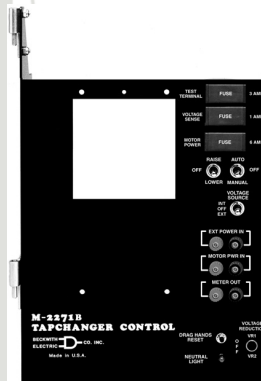
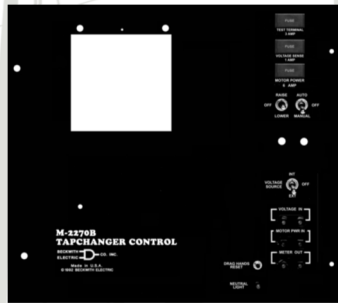
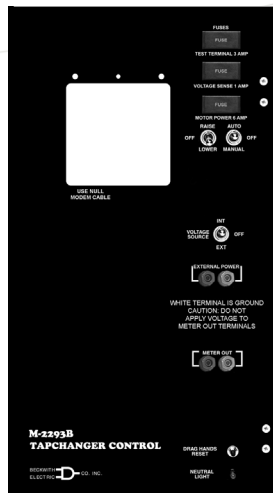
Beckwith's Tapchanger Controls use an innovative concept in new transformer or regulator applications and also control replacements by using a universal tapchanger control—the M-2001 - with interchangeable adapter panels. The replacement panels are sized to correspond to the original manufacturer's controls, use the same mountings, and include wire harnesses that match the existing connections - all for easy replacements.



The M-2001's easy installation, its comprehensive communication capabilities and its variety of features that meet all types of applications have made this control very popular in the industry.

Beckwith's M-6200A Digital Regulator Control is a microprocessor-based step-voltage regulator load tapchanger control for General Electric, Siemens, Cooper and Howard Regulators.

The control is designed for initial OEM installation on new regulators or to replace a particular manufacturer's regulator control. The panel is designed to mechanically and electrically replace an old control, with mounting hardware to facilitate the replacement.



For additional company or product information, please browse our website or contact a local Beckwith Sales Partner or Regional Sales Manager office near you.



6190 118th Avenue North
Largo, FL 33773-3724 U.S.A.



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YouTube.com/BeckwithElectric

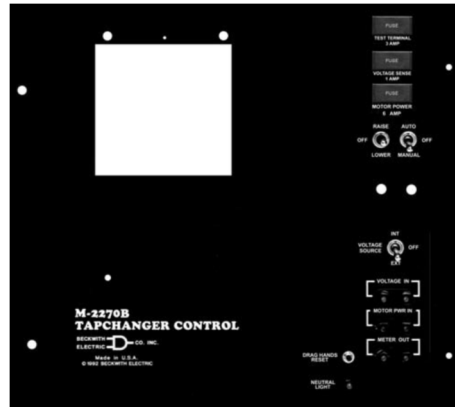
Transformer Control Adapter Panels

Existing Control

General Replacement
General Purpose Panel-Mount Applications

Beckwith Replacement

M-2270B



Allis-Chalmers, Siemens-Allis, Siemens
UJ-3T, SJ-4T, SJ-5T, SJ-6T, IJ-2T, IJ-2AT, MJ-3T, MJ-3AT

M-2339



Allis-Chalmers, Siemens-Allis, Siemens
Surface Mount Models with Suffix "T" when auxiliary CT replacement is not needed

M-2278



Transformer Control Adapter Panels

Existing Control

Beckwith Replacement

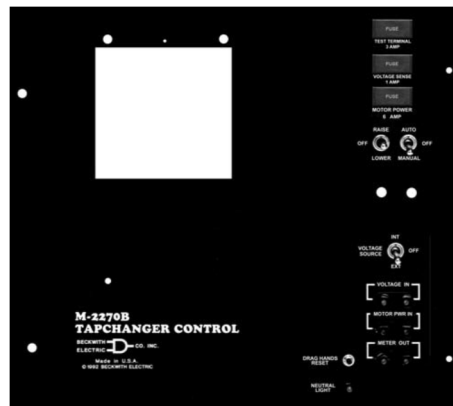
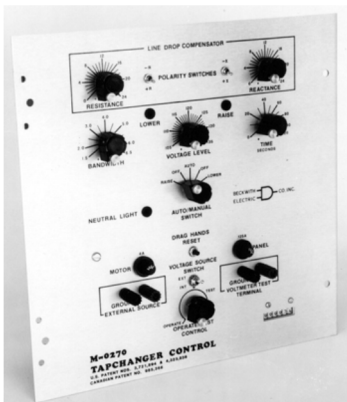
AVE, GEC
AVE 3, AVE 4, GEC VTJC

M-2131



Beckwith Electric
M-0270

M-2270B



Beckwith Electric
M-0067, M-0067E

M-2067B



Transformer Control Adapter Panels

Existing Control

General Electric
LRT-48



Beckwith Replacement

M-2148



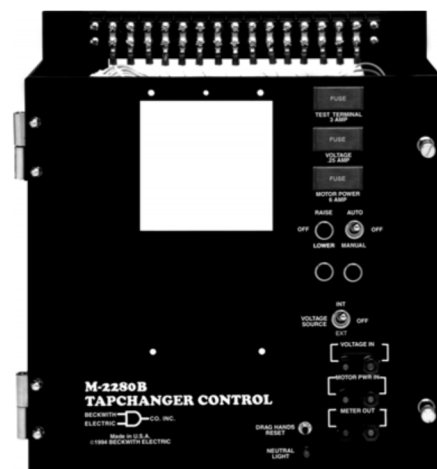
General Electric
LRT-68

M-2168



General Electric
Static LTC Controls and some Balance Beam Models ("Bubble Gum Machine")

M-2280B



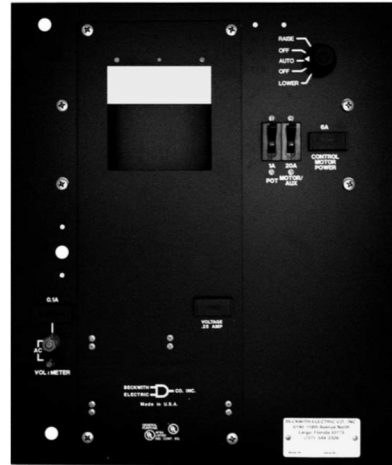
Transformer Control Adapter Panels

Existing Control

Beckwith Replacement

Moloney/Tempo
LTC Control Panel

M-2174B



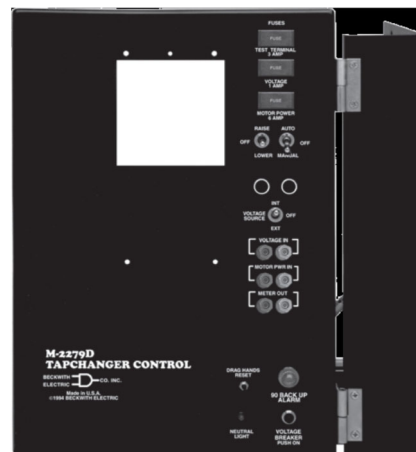
Pennsylvania Transformer and McGraw-Edison
Manufactured before 1963: 110, 220, 220A, 550, 550B

M-2379



Pennsylvania Transformer and McGraw-Edison
Manufactured from 1963-1978: 550, 550A, 550B, 550C, 396B, 494B, 496B, 995, 996

M-2279D



Transformer Control Adapter Panels

Existing Control

Pennsylvania Transformer and McGraw-Edison
Manufactured after 1978: 550 BHS



Beckwith Replacement

M-2354C



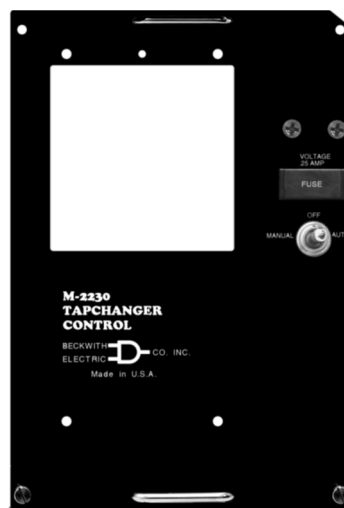
Reinhausen/TAPCON
MK 20

M-2220



Reinhausen/TAPCON
MK 30

M-2230



Transformer Control Adapter Panels

Existing Control

Westinghouse
SVC, SVR, CVR, CVC



Beckwith Replacement

M-2067B



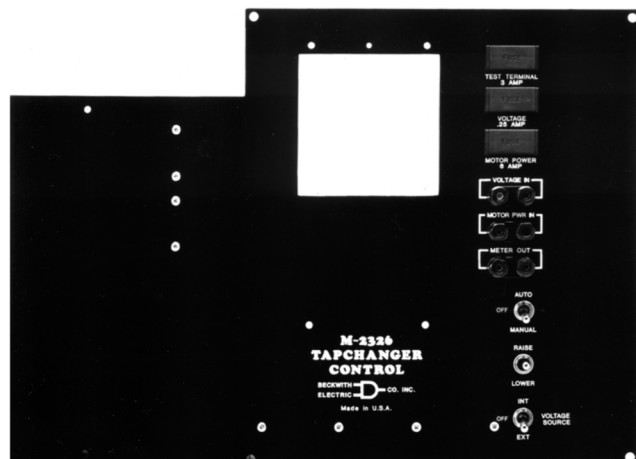
Westinghouse
MS, TM

M-2286



Westinghouse
SJS

M-2326



Regulator Control Adapter Panels

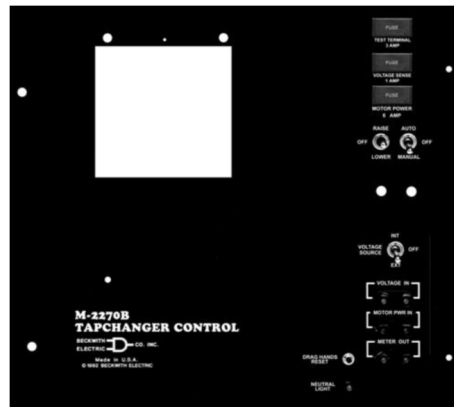
Existing Control

Beckwith Replacement

General Replacement

General Purpose Panel-Mount Applications

M-2270B



Allis-Chalmers, Siemens-Allis, Siemens

MJ-1A, MJ-2A, MJ-3, MJ-3A, MJ-X; IJ-2, IJ-2A; SJ-4, SJ-5, SJ-6; UJ-2, UJ-4, UJ-5, UJ-5C and some UA Series

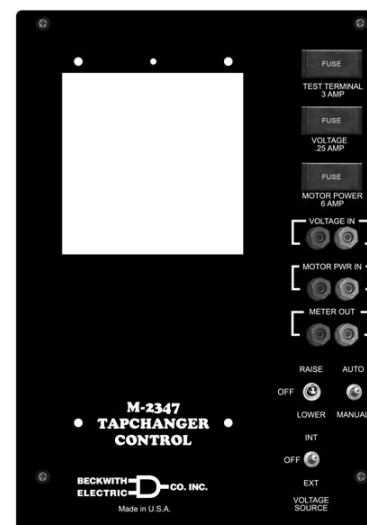
M-2271B



Allis-Chalmers, Siemens-Allis, Siemens

UJ-1

M-2347



Regulator Control Adapter Panels

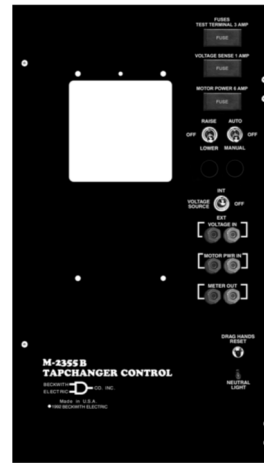
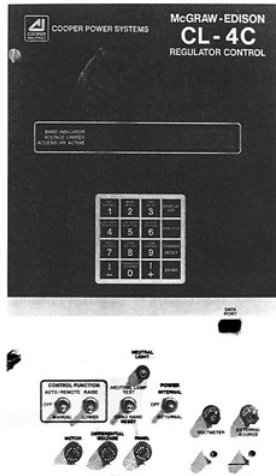
Existing Control

Beckwith Replacement

Cooper and McGraw-Edison

CL-2, CL-2A, CL-4A, CL-4B, CL-4C, CL-5A, CL-5C, CL-5D, CL-5E, CL-6

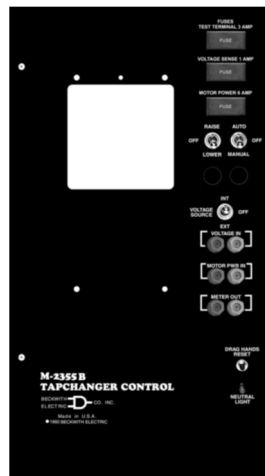
M-2355B



Cooper and McGraw-Edison

CL-5, CL-6 for use with QD3, QD5 and QD8 Quick Drives Only

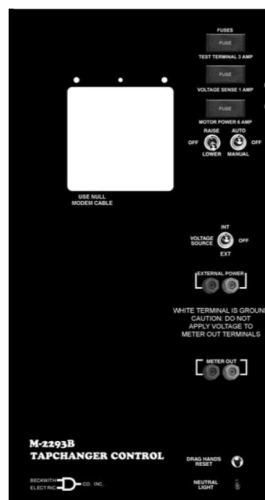
M-2355Q



General Electric

SM-1, SM-2, SM-3, (Solid-State Type)

M-2293B



Regulator Control Adapter Panels

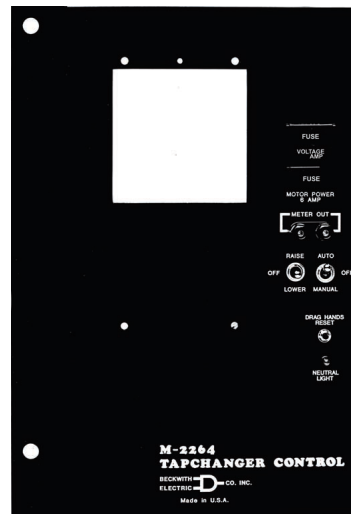
Existing Control

General Electric
ML-32 Balance Beam Models



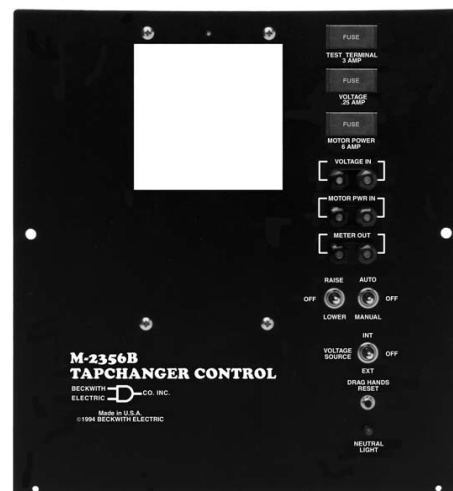
Beckwith Replacement

M-2264B



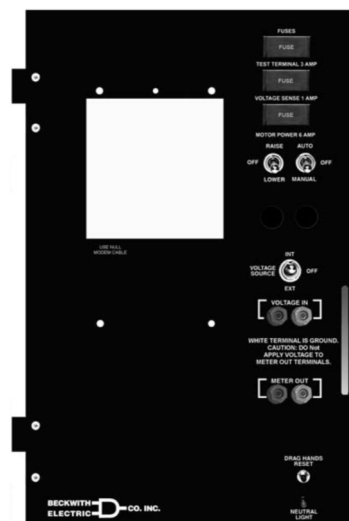
General Electric
ML-32 Balance Beam Models ("Bubble Gum Machine")

M-2356B



Howard Industries / I.C.M.I.
USC-1, UVR-1

M-2302



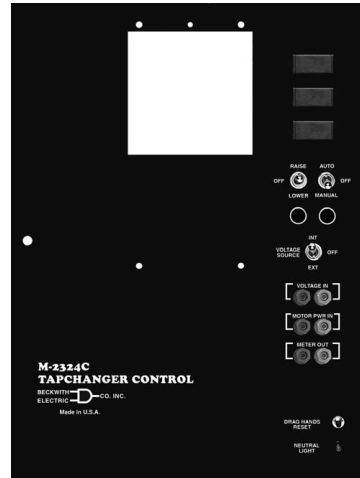
Regulator Control Adapter Panels

Existing Control

Beckwith Replacement

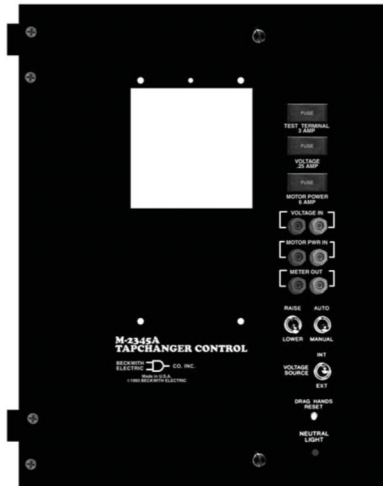
Pennsylvania Transformer and McGraw-Edison
Hinge Pins on Right of Cabinet

M-2324C



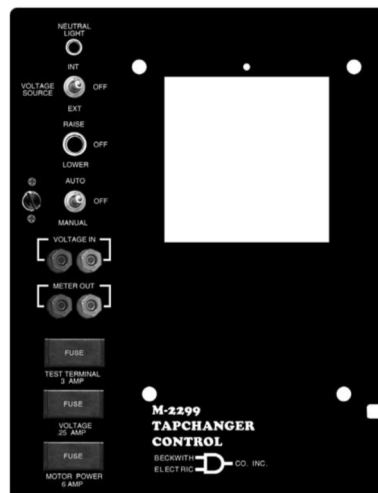
Pennsylvania Transformer and McGraw-Edison
Hinge Pins on Left of Cabinet

M-2345A



Toshiba
TB-R800

M-2299



Regulator Control Adapter Panels

Existing Control

Westinghouse
URL



Beckwith Replacement

M-2323B



Next...

- M-2001 Series Surface Mounting Kits ▶
- LTC Control & Paralleling Systems ▶
- Control Cabinet Options ▶
- M-6200A Digital Voltage Regulator Control ▶



M-2001 Series Surface Mounting Kits

The Beckwith Electric surface mounting kits, used in conjunction with the M-2001 Series Digital Tapchanger Control, are for applications which do not require features provided through the use of adapter panels.

M-2050 Surface Mounting Kit

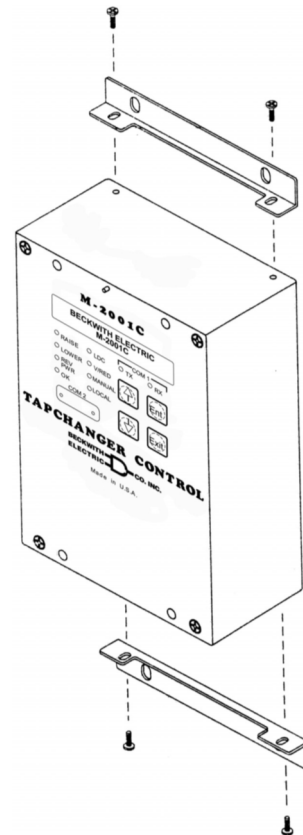
- ◆ Connects easily to the M-2001 Series Digital Tapchanger Control using two right angle mounting brackets, four screws and a 24-pin connector with a six foot pigtail on each pin.
- ◆ Provides mounting onto any flat surface at least 5.8" wide and 10" high.

M-2054 Surface Mounting Kit

- ◆ The M-2054 Surface Mount Kit, with the M-2001 Series Digital Tapchanger Control, provides a solidstate voltage control relay intended for applications involving the control of tapchanging transformers and regulators.

M-2901 Surface Mounting Kit

- ◆ Connects easily to the M-2270 Adapter Panel using a slide-on mounting bracket that has a 27-position terminal block, and includes four hex female stand-offs, four screws and appropriate wiring.
- ◆ Provides mounting onto any flat surface at least 11-1/2" W and 8" H.



Digital Voltage Regulator Control

M-6200A Digital Voltage Regulator Control

Digital Regulator Control for General Electric, Siemens, Cooper and Howard Regulators

The M-6200 Digital Regulator Control is a microprocessor-based step-voltage regulator load tapchanger control.

The control is designed for initial OEM installation on new regulators or to replace a particular manufacturer's regulator control. The panel is designed to mechanically and electrically replace an old control, with mounting hardware to facilitate the replacement.



- ◆ Maximum Communication Options For Wired or Wireless Networks
- ◆ Standard RS-232 or RS-485
- ◆ Optional ST or V-Pin Serial Fiber Optic Port
- ◆ Embedded Bluetooth, Class 1 (v2.0), 1Mbps, 128 bit encryption, up to 1/2 mile transmission
- ◆ Supports DNP3.0, MODBUS and Cooper 2179 Protocols
- ◆ DNP mapping templates to match SCADA historical databases
- ◆ Time sync via DNP3.0 Set Time Command
- ◆ Sequence of Events (SOE) Recording Of Events – Stores 129 events, mSec time-stamped with Graphic Logic Initiate from critical operational factors
- ◆ FULL DNP implementation – Including DNP File Transfer, multi-addressing, unsolicited response, source address validation
- ◆ TRUE Ethernet – Full 10/100Mbps auto-negotiable concurrent multi-session and multi-protocol support
- ◆ DNP+Ethernet – Send/receive DNP configuration files using DNP File Transfer Protocol
- ◆ DNP+Ethernet – Device Discovery using TapTalk
- ◆ SCADA HeartBeat – Integrity check of communications media and/or Master. Fully programmable
- ◆ Manual HeartBeat Timer
- ◆ Quick (10 -15 second) Uploading of Configurations, Settings, Firmware Upgrades
- ◆ Assists in locating harmonics adversely affecting customer processes
- ◆ Helps mitigation measures to determine corrective filter design and location
- ◆ CBEMA Event Recording and Reporting
- ◆ Oscillography Capture – Selectable 16, 32, or 64 samples per cycle. Captures sags, swells, CBEMA events and sub-synchronous transients
- ◆ Cyber Security – Comprehensive cyber security tools to implement NERC CIP requirements, including IPsec and Radius server security
- ◆ Data Logging Continuous Recording – Data stored in non-volatile memory requiring no battery backup
- ◆ Harmonics Detection, Recording, Protection and Suppression
- ◆ Downloading of Event Reports, Oscillography
- ◆ No need for battery to back up clock
- ◆ Smart Flash SD Card Slot
- ◆ Supports Control Cloning



M-6200A Digital Voltage Regulator Control Adapter Kits

The M-6200A Digital Regulator Control hardware kits provide the means to install the M-6200A in existing cabinets. The hardware kits are available factory installed or separately for field installation.

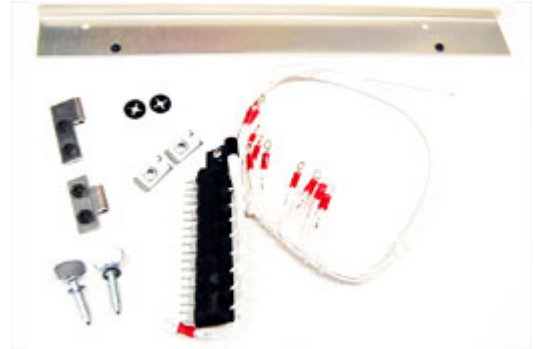
Cooper

Straight-Through Harness

CL-1 through CL-5 B-2355-C1
CL-6 B-2355-C2

Quick-Disconnect Complete Harness

CL-1 through CL-5 B-2355-C3
CL-6 B-2355-C4



General Electric

Straight-Through Harness

VR-1, SM-1, SM-2 B-2293-G1
SM-3 B-2293-G2

Quick-Disconnect Complete Harness

VR-1, SM-1, SM-2 B-2293-G3
SM-3 B-2293-G4

Complete GE-2011 Harness

GE-2011 B-2293-G5



Howard

Straight-Through Harness

B-2203-H1

Straight-Through Harness (Polarized Disconnect Switch)

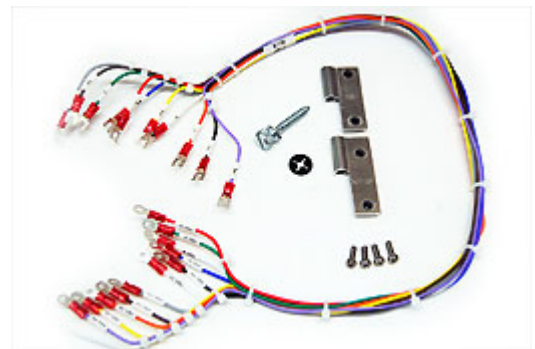
B-2203-H2

Quick-Disconnect Complete Harness

B-2203-H3

Quick-Disconnect Harness (Polarized Disconnect Switch)

B-2203-H4



Siemens (Allis-Chalmers)

Straight-Through Harness

B-2271-S1

Straight-Through Harness (Polarized Disconnect Switch)

B-2271-S2

Quick-Disconnect Complete Harness

B-2271-S3

Quick-Disconnect Harness (Polarized Disconnect Switch)

B-2271-S4



LTC Control & Paralleling Systems

LTC Control & Paralleling Systems

Beckwith Systems Engineering (BSE) designs and builds LTC Control Systems that are used with various load tapchangers. They can be housed in enclosures which can also include associated control switches, auxiliary relays, test jacks, and convenience outlets. Each system includes a Digital Tapchanger Control and an Adapter Panel.

Transformer Paralleling Services include:

- ♦ Classic Circulating Current
- ♦ Conversion Drawings to Replace Paralleling Equipment
- ♦ Customized PLC for Complex Bus Configurations
- ♦ Communications Based Peer to Peer Δ Var
- ♦ Communications Based Peer to Peer Master Follower

Beckwith Systems Engineering designs complete pre-packaged systems that are custom-designed to satisfy unique application needs. Each system is factory-wired and tested to reduce installation costs and assure quality. Best of all, each system is built for reliability and engineered for easy installation and maintenance.

Beckwith Systems Engineering can also provide engineering design, installation supervision, commissioning and training — all to solve the application problems of its customers.



M-2900A Tapchanger Control Cabinet

New Installations or Retrofit for Cooper, General Electric, Siemens and Howard Regulators

- ◆ NEMA® 3 rated enclosures available in the following construction materials:
 - ◆ Molded Lexan®
 - ◆ Cold Rolled Steel
 - ◆ Stainless Steel



M-2900A Cold Rolled Steel or Stainless Steel Cabinet Equipped With Optional M-2001D Digital Tapchanger Control



M-2900A Cold Rolled Steel or Stainless Steel Cabinet Equipped With Optional M-6200A Digital Voltage Regulator Control



M-2980A Weatherproof Capacitor Control Cabinet

Option for New Installations or Retrofit for M-6200A Digital Voltage Regulator Control

- ◆ NEMA® 4 rated enclosures available in the following construction materials:
 - ◆ Nonmetallic Polycarbonate
 - ◆ Molded Lexan®
 - ◆ Cold Rolled Steel
 - ◆ Stainless Steel





**Products defined by you,
refined by Beckwith.**



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