

Motor Operators

Distribution Automation for Overhead Gang-Operated Switches

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Warranty - Application

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HUBBELL / CHANCE – CENTRALIA, MISSOURI USA

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Motor Operator

for Overhead Gang-Operated Distribution Switches

Application

To either automate an existing switch or to acquire a completely automated overhead switch to install, Chance offers solutions to your Distribution Automation requirements. We offer motor operators for both standard down-the-pole controls and crossarm mounting. They can be supplied as additions for existing switches or in an automated AR Switch package.

General Description

Motor Operators are electrically operated and have provisions for manual operation. A customer-supplied 120 Volt AC power source provides primary power to the motor and charges an internal battery. AC and battery power are supplied to the motor concurrently so that the motor operator will operate without hesitation regardless of whether the battery is weak or AC power is lost. If AC power is lost, the battery can provide more than 100 open/close operations. A power supply is provided to accommodate a remote terminal unit (RTU) and radio.

With the standard Motor Operator, for switches with down-the-pole controls, the motor and all operating controls are in an aluminum enclosure that easily mounts to the pole and the switch. Operators are available for switches with torsional or reciprocating operating mechanisms.

With the crossarm mounted Motor Operator, the motor is mounted on the crossarm and the controller (control electronics, battery, RTU, radio, etc.) is in a separate enclosure that mounts below the switch.

Operation

Motor Operators can be operated locally or remotely. Local operation is available via an open/close switch, located on the front of the control panel. A remote/local selector switch is also located on the front of the control panel. Open/close status and local/remote status is reported through a status indicator.

Manual Operation

All motor operators are designed for manual operation. Manual operation interlocks are provided for operator safety.

Travel Adjustment

Travel adjustment for motor operators with down-the-pole controls is accomplished with auxiliary switches. Positioned for easy access, four auxiliary switch contacts are provided. Two are for limiting the shaft rotation and two are for status indication. No tools are required for adjusting the auxiliary switch cams.

For switches with reciprocating operation, the limit switches are factory preset. For switches with torsional operation, final open/close position adjustments are easily accomplished via the cams.

For crossarm-mounted operators, the open/close adjustment is set by the arm connecting the operator to the switch interphase shaft.

Heater and Thermostat Protection

All motor operator/control units are equipped with a ther-

mostatically controlled 250 watt heater powered by the 120 volt AC source.

Battery

The battery used is a single 12 Volt, 33 amp-hour lead acid type, completely sealed. A pressure relief valve opens only if there is excessive buildup of corrosive or explosive gas. Gases are vented outside the enclosure via a hose. There is a "battery manager" charging circuit with temperature compensation to help prevent overcharging or undercharging the battery.

The battery is monitored using a "smart" circuit. Automatically at 5-minute intervals, a 12-ampere load is applied to the battery and the battery voltage is measured with the battery charger off. If the battery test detects a drop below 12.1 Volts, a low voltage alarm is activated.

Status Indications

Several status indications that can be reported back through the RTU include:

- Switch open/close position
- Local/Remote status
- Manual operation lockout status
- Loss of AC voltage
- Low battery voltage
- No-Go status

These six statuses are indicated by LED's on the control board within the operator. Other status indications are possible based on the capability of the RTU.

Additional Features

Motor operators incorporate additional features, including:

- **Automatic Load Disconnect** – drops all loads from battery power if AC power is lost for an extended period of time and the threshold is reached, preventing deep discharge of the battery which causes damage and unnecessary battery replacement.
- **Stall-Out Timer with Auto-Reset** – stops motor from trying to operate before the fuse is blown, if the motor is stalled (due to ice buildup, switch mechanical problems, etc.).
- **No-Go Function** – prevents the motor from trying to operate if the battery threshold for No-Go status is met, preventing underpowered or incomplete switch operation.
- **Surge and Electrostatic Protection** – All circuits have been tested to withstand surges and electrostatic voltages in accordance with ANSI C37.90.1 and C62.41 and MIL Std. DOC-HDBK263.

Options

- Solar Panels for operation without external AC power.
- 132 amp-hour capacity battery pack for solar application to extend operating capability in cloudy weather.
- Factory installation and wiring of customer selected RT and radio.
- Stainless steel enclosure instead of aluminum.
- Sensor cable for connecting the motor operator to the AC power source and voltage and current sensors.
- Battery cooler to extend battery life in hot weather.

Motor Operator

for Overhead Gang-Operated Distribution Switches



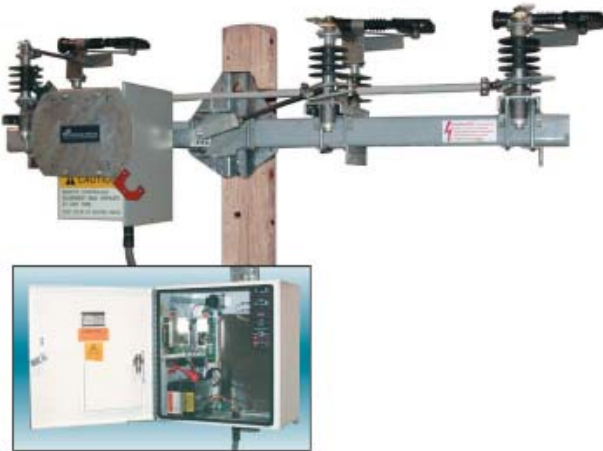
CHANCE®

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Crossarm-Mounted Motor Operator

The PTAD incorporates the long-established advanced features of Cleveland/Price ADMO motor operators, including:

- Dual source for the motor (AC or battery)
- Stallout timer that allows successive operation attempts on a stuck switch
- “Smart” battery disconnect to help prevent damage to the battery
- “No Go” function with status indication to help prevent underpowered switch operation
- Temperature-compensated battery charging circuit to help prevent over and under charging the battery
- Automatic battery testing
- Vented 33 A-H battery
- Fast (.4 second) high-torque operation
- Excellent ice-breaking ability



In addition to the above critical automation features, the PTAD has superior operational features, including:

- Constant ready operation state – no mechanism wind-up required
- No decoupling procedure necessary – the PTAD automatically decouples for manual operation
- Decoupling not required to test the motor
- Linkage goes into full toggle with switch closed for momentary performance
- No decoupling procedure required for lockout
- Lockout of the motor by using a hotstick from ground level
- After manual operation, the switch can be re-synchronized with the motor manually or remotely via SCADA
- No setting of limit switches required
- True switch status is always reported

Standard Motor Operators for Down-the-Pole Controls

- Reciprocating and torsional operator options for distribution and transmission applications
- Provision for installing an RTU and radio
- Motor that runs on both AC and battery power for double reliability
- Status indications for switch position, charger, loss of AC, battery condition
- Vented 12 V, 33 A-H battery with temperature-compensated charger
- “Smart” battery load disconnect to help prevent damage to the battery from deep discharge
- “No Go” function with status indication to help prevent underpowered switch operation
- Effective surge protection
- Easy retrofit to Chance AR and D7 switches as well as overhead switches manufactured by others



Ordering Information

Complete automated switch package installations or add-on motor operators are based on factors including the application requirements, customer specified RTU and radio, voltage and current sensors, etc. To determine the appropriate product for a given application requirement, contact your Hubbell Power Systems representative and fill in the form on the next page.



CHANCE[®]

Automated Distribution Equipment Inquiry

To be completed by Sales Representative

Prepared by		Date	
Purchaser		User	
Contractor (if applicable)		Automation contact	
Contractor phone no.		Required delivery date	
Remote Terminal Unit (RTU)			
Installed by <input type="checkbox"/> HPS <input type="checkbox"/> Customer <input type="checkbox"/> Provisions only		Purchased by <input type="checkbox"/> HPS <input type="checkbox"/> Customer	
Model/Part No.		Manufacturer contact	
Number of RTU analog inputs		Type of master station	
Modem <input type="checkbox"/> No <input type="checkbox"/> Yes Baud rate:		RTU protocol	
Literature ship to address			
Sensors			
No. of currents	Primary/secondary current		
No. of voltages	Primary/secondary voltage		
Sensor cable length	Manufacturer		
Communications Device			
Communications device provided by <input type="checkbox"/> HPS <input type="checkbox"/> Customer <input type="checkbox"/> None		Communications device installed by <input type="checkbox"/> HPS <input type="checkbox"/> Customer <input type="checkbox"/> Provisions only	
Manufacturer		Manufacturer part/model	
Manufacturer contact		Phone no.	
Type <input type="checkbox"/> Land line <input type="checkbox"/> Fiber optics <input type="checkbox"/> Radio <input type="checkbox"/> Other (specify)			
Antenna purchased by <input type="checkbox"/> HPS <input type="checkbox"/> Customer		Antenna manufacturer/model	
System Information			
Operating system voltage		BIL required	
Normal load current		Max. available fault current	
Solidly grounded system <input type="checkbox"/> Yes <input type="checkbox"/> No		Local AC available <input type="checkbox"/> 120 <input type="checkbox"/> 240	
Switch Information - New Installation			
Catalog Number		Crossarm <input type="checkbox"/> Steel <input type="checkbox"/> Fiberglass	
Voltage <input type="checkbox"/> 15 kV <input type="checkbox"/> 25 kV <input type="checkbox"/> 35 kV		Control <input type="checkbox"/> Down-the-pole <input type="checkbox"/> Crossarm Operator	
Configuration <input type="checkbox"/> Horizontal <input type="checkbox"/> Phase-over-Phase <input type="checkbox"/> Vertical <input type="checkbox"/> Delta			
Additional Options <input type="checkbox"/> Sensor Brackets <input type="checkbox"/> Control Insulator <input type="checkbox"/> Captive Hardware <input type="checkbox"/> Surge Arrester Brackets <input type="checkbox"/> Extra Control Pipe <input type="checkbox"/> Crossarm Brace <input type="checkbox"/> Extension Links			
Switch Information - Retrofit			
Manufacturer		Model	
Voltage <input type="checkbox"/> 15 kV <input type="checkbox"/> 25 kV <input type="checkbox"/> 35 kV		Control <input type="checkbox"/> Down-the-pole <input type="checkbox"/> Hook stick	
Configuration <input type="checkbox"/> Horizontal <input type="checkbox"/> Phase-over-Phase <input type="checkbox"/> Vertical <input type="checkbox"/> Delta		Pole <input type="checkbox"/> Wood <input type="checkbox"/> Other (drawings required)	