

AUSTIN ENERGY
PURCHASE SPECIFICATION
FOR
MOTOR, OPERATOR, DIST, OH, 3PH SWITCHES

<u>DATE</u>	<u>PREPARED BY</u>	<u>ISSUANCE/REVISION</u>	<u>APPROVAL SIGNATURES</u>
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<i>REASON FOR REVISION</i>	<i>AFFECTED PARAGRAPHS</i>

This specification, until rescinded, shall apply to each future purchase and contract for the commodity described herein.
Retain for future reference.

**AUSTIN ENERGY
PURCHASE SPECIFICATION
FOR
MOTOR OPERATOR FOR THREE-PHASE OVERHEAD
DISTRIBUTION SWITCHES**

1.0 SCOPE AND CLASSIFICATION

1.1 Scope

This specification applies to all AC source controlled motor operators that are purchased for use on new and existing switches installed at Distribution line switch locations outside of substations. These motor operators will be installed on switches with voltage ratings of 15 and 25 KV and current ratings of 600 amperes. The switch type, type of switch structure, diameter of switch vertical operating pipe, type of motor operator mounting, and control voltage will be specified on the purchase order if different from this specification. Actual torque value and /or required opening time will be specified on the purchase order if different from this specification.

1.2 Classification

The Motor Operator will be installed on switches that are on 12.47kV Wye configured, 3 Phase, 4 Wire, and solidly grounded neutral circuit distribution system. In general, motor operators will be installed on Distribution line, three phase ganged disconnect switches that are located outdoors and in unsheltered locations. The Motor Operator shall operate at the optimum level at temperatures between -40°C and +80°C and 90% relative humidity. The motor operators can be expected to operate on an infrequent basis.

2.0 APPLICABLE STANDARDS

2.1 The equipment supplied in accordance with this specification shall comply with the applicable provisions of the latest NEMA, IEEE, ANSI/IEEE, and IEC standards relating to Motor operator for the switch. In case of any conflict between any of the standards mentioned in this specification and the contents of this document, AE's specification shall govern. The applicable standards include, but are not limited to, the following:

2.2 American National Standards Institute (ANSI) standard 37.90.a, Standard Surge Withstand Test for Protective Relays and Relay Systems.

2.3 American National Standards Institute (ANSI) standard C62.41 section 5.3.1, IEEE Guide for Surge Voltages in Low-Voltage AC Power Circuits.

3.0 GENERAL REQUIREMENTS

3.1 The Motor Operator shall be capable of operating in automatic, local operation and/or remotely through SCADA control of the distribution class overhead air-break switches.

3.2 ROTATIONAL DESIGN

The motor operator shall be of a rotational design with an adjustable operating pipe rotation of 200 degrees, be infinitely field adjustable throughout this range and have a maximum 0-200 degree operation time to 5 seconds. The motor shall have a minimum torque rating of 15,000 in./lbs throughout the temperature and battery voltage ranges. The standard operating pipe shall be 1-1/2 inch ID, schedule 40 galvanized pipes, unless specified otherwise on the purchase order. One universal coupling for the operating pipe shall be furnished for aid in aligning the operating pipe with the motor.

3.3 MANUAL OPERATION

The motor operator shall have a means of manually operating the switch by means of a removable handle or a manual swing handle shall have a means of pinning securely to the downpipe when in use. The swing handle will be stored inside the cabinet when not in use and it shall de-energize the motor operator through an integral electrical interlock when the handle is removed. The Motor operator shall be disabled remotely when the handle is removed. A SCADA status indicator shall be provided to indicate when the handle has been removed.

3.4 REVERSIBLE DIRECTION

The motor operator shall have field adjustable control circuit contacts as a means of reversing the direction of rotation of the switch vertical operating pipe. This circuit shall properly differentiate between the open and closed position of the motor operator.

3.5 OPEN AND CLOSE SWITCH

The motor operator shall have internally mounted switch or switches, either rotational or push button to activate the opening or closing of the switch. These switches shall be labeled and readily visible to a switching individual by opening the cabinet door.

3.6 REMOTE/LOCAL SWITCH

The motor operator shall have internally mounted rotational switch with two positions to place the motor operator in the remote or local mode and provide a separate indication of the motor operator position to the RTU as a status point. This switch is internally wired so that the motor operator cannot be activated remotely (by radio control) when in the local position and cannot be operated locally from the open and close switch when in the remote position. This switch shall be labeled and readily visible to a switching individual by opening the cabinet door. The remote/local switch indicator shall be wired to the RTU.

3.7 DECOUPLING MECHANISM

The motor operator shall have a means of decoupling the vertical operating pipe so that the switch can be manually operated and the motor operator tested with the switch padlocked in either the open or closed switch position. This decoupling from the vertical pipe must be verifiable by visual inspection of the coupling mechanism or permanent labeling of the coupled and the decoupled positions.

The coupling mechanism shall be designed to prevent incorrect coupling between the motor operator and the switch by a switching individual.

3.8 MOTOR switch POSITION INDICATOR

The motor operator shall have a visual means showing the position of the motor, open or closed by using LED's.

3.9 CABINET

The motor operator will be enclosed in an aluminum weatherproof (NEMA 3) enclosure. This cabinet shall have a hinged door(s). The door shall have a positive closing/latching mechanism that assures that the top and bottom are latched when the door handle is closed. The latching handle (opening of minimum 5/16 inch diameter) shall include a provision to padlock in the closed position. A weatherproof seal will be obtained by latching of the door handle only. The control cabinet shall be of sufficient size to accommodate the addition of a radio, modem, PLC, RTU or customer SCADA wiring. The 12 VDC shall be available via terminal block in control cabinet with one (1) A min. capacity. The door shall have an Open/Close indicator wired to RTU. A light inside the Cabinet shall be lit when the door is open and turned off when the door is closed.

3.10 PROTECTIVE SHROUD

The motor operator will have a means of protecting individuals from the sudden movement of the operating (output) shaft while unattended. If the mechanism has components that present "pinch points" during such operations, the motor operator will be equipped with a protective "shroud" that can be "padlocked" in place. This shroud shall be completely enclosed with hinge mechanism and the coupling area and shall have no openings, for any penetration by a foreign object.

3.11 HEATERS

The motor operator will have a heater suitable for 120 volt AC operation. A thermostat shall control the heater. The heater rating should not exceed 150 watts.

3.12 CABINET CONDUIT LOCATIONS

The motor operator cabinet shall have a removal 4" X 9" conduit plate located on the bottom of the cabinet. The location will be approved by the AE – System Engineering staff and noted on the approval drawings.

3.13 AUXILIARY SWITCHES

The motor operator shall have an auxiliary switch with contacts wired to a terminal block. Like the control contacts and position limit switches, this switch will be field adjustable to coincide with the motor operator open or closed positions. This switch will have a minimum of four (4) poles, each having "A" and "B" contacts. The motor operator shall also be furnished with an external two (2) pole auxiliary switch that can be mechanically connected to the vertical operating pipe of the switch. The poles of the switch are to be field adjustable with equal numbers of "a" contacts and "b" contacts (normally open verses normally closed).

3.14 TERMINAL BLOCKS AND POWER SWITCHES

The motor operator shall have internally mounted sliding link terminal blocks; fuse blocks or breakers, and knife switches for making electrical connections. The DC and AC input circuit shall be terminated to a knife blade disconnect switches which are wired electrically ahead of the protective fuses or breakers to be approved by AE system Engineering Engineer with the blade side "dead" when open. The terminal block shall include the all three phases for voltage and at least one phase for loss of potential. It shall include three switch auxiliary contacts and three switch auxiliary communication contacts. Also, it should include sensor status and sensor status communication, auxiliary DC + and – outputs.

3.15 WIRING

The motor operator internal electrical wiring (wire shall be type SIS with 12 AWG minimum size) shall be point-to-point, without splices, tee connections or double lugs. Wiring bundles shall be supported and mounted with cable ties. Wiring shall be sized with NFPA-70. A 3" copper Bus bar for grounding shall be supplied inside the cabinet. The terminal blocks shall be heavy duty, 600 Volts, 30 Ampere, GE or Buchanan type and be able to accept ring or fork terminals.

3.16 BATTERY LOAD TEST

The motor shall have the ability to perform preprogrammed random battery test with load and can also be activated by the RTU. It should have the ability to disable random battery load test. An alarm should be connected to the RTU to report a load test.

3.17 BATTERY CHARGER (AC)

The motor operator shall be furnished with an internal battery charger. The charger will have a visible indication of operation and charging by means of LED. Unless otherwise specified, this charger will operate from an unregulated 120-volt AC input. The Charger shall be able to fully charge the battery system within 24 hours. The Loss of AC alarm shall be wired to RTU.

3.18 BATTERIES

Unless specified, the motor operator will be purchased and shipped with dc storage batteries. The batteries will be sealed gel electrolyte, 12-volt batteries. These batteries will be of a nominal physical size such that they will fit in the same motor operator cabinet provided by the supplier. The supplier will supply safety covers for battery terminals. The manufacturer of Motor Operator shall supply the number of operations after the loss of AC (AE requires a minimum of 24 open and close operations). The battery shall be sized to run the Radio and the RTU for at least 48 hours with no presence of AC power.

3.19 ISOLATING TRANSFORMER

The secondary 120-volt output will be connected by the Motor Operator supplier to a 2-pole fuse block consisting of one 20-amp fuse and one copper tube on the ground side. The secondary shall be protected by a transient suppressor, which shall be grounded.

3.20 ADJUSTMENT TOOLS.

The Motor Operator shall be supplied with any and all special adjustment tools, (such as Allen wrenches, hydraulic fluid addition devices, funnels with tubes, fuses and spare fuses) required to place the motor operator in service.

4.0 Sensors

- 4.1 The Current and Voltage monitoring Insulators (Sensors) shall be Lindsey Manufacturing Company's part # 9660/S1202. Three of these Sensors and appropriate mounting assembly shall be supplied with each Motor Operator purchased.

5.0 RTU

5.1 AE will provide and will ship Forty Five (45) of the RTUs (GE Harris Dart part # 517-0321, Western DART type 30 - 6PT 7.5v / 6CT 10v, Lindsey CVMI, with WESDAC DART, Part # 512-0001 (WD DART type 1 - 12volt, 16 status, 8 control, w/TB) RTU with DART Flatback panel Part # 952-4066) to the manufacturer. After the AE supplied RTU's are exhausted, the Motor Operator Manufacturer shall provide and install RTUs manufactured by DAQ Electronic Inc. (1-800-862-0050) with a part# Callisto- Elara III or newer model. The Motor Operator Manufacturer shall provide the latest model of this RTU for the installation into the cabinet. If the RTU are door mounted, shall provide shields to ensure that no water from rain or condensation when the door is open gets on the circuit board.

The RTU shall be separately fused in the cabinet. The manufacturer shall provide the cost of the Motor Operator with or without the RTU.

6.0 COMMUNICATION NEEDS

- 6.1 Motor Operator Manufacturer (MOM) shall purchase and install the Radio, RTU (if not provided by AE), Sensors and their associated equipment and wiring based on the following requirements and other statements throughout this specification at the factory site and delivers the packaged equipment to AE site. The MOM shall show the cost of the Radio, RTU and Sensors and their associated equipment separately from the cost of the Motor Operator assembly.
- 6.2 The Motor Operator shall be furnished with a Microwave Data Systems (MDS) Model Number 9710, 928/952 MHz FCC licensable point-to-multi-point radio, with a minimum internal data throughput of 19.2 KBPS or functional equivalent.
- 6.3 It shall be equipped with a forty (40) foot low-loss transmission line with N-Male connectors suitable for use at 900 MHz, such as Beldon Model Number 9913 shall be provided for the radio antenna.
- 6.4 A bulk mounted Lightning Arrester; Polyphaser Model Number IS-B50LN-C2 with N-female connectors shall be provided.

- 6.5 Communications cable with appropriate connectors (liquid Tight) to interface with the radio, Sensors, and Motor Operator communication ports, shall be installed to provide the appropriate data signals. All cabinetry ingress/egress shall be from the bottom.
- 6.6 A yagi antenna, Model Number 10dB Celwave PD10108-2 shall be provided.
- 6.7 The MDS radio system shall be equipped with a diagnostic software that provides for the remote monitoring and adjustment of critical RF parameters (i.e. power, frequency, modulation, etc.) of both the Master and Remote radios.
- 6.8 The Motor Operator supplier shall install the communication listed above and test it as a unit (including the interface with the RTU that is installed in the same cabinet).
- 6.9 Communication software shall include DNP 3.0 Level 2 protocol.
- 6.10 The radio shall be separately fused in the cabinet.

7.0 EQUIPMENT TESTING.

7.1 The Motor Operator shall be tested under American National Standards Institute (ANSI) standard 37.90.a, Standard Surge Withstand Test for Protective Relays and Relay Systems and American National Standards Institute (ANSI) standard C62.41 section 5.3.1, IEEE Guide for Surge Voltages in Low-Voltage AC Power Circuits before shipment. Three (3) copies of certified Production Test reports shall be furnished to verify the correctness of control wiring and proper functioning of all equipment. These test reports shall be submitted to AE no later than two (2) weeks prior to the agreed delivery date. The Motor Operator Manufacturer, prior to any purchases by Austin Energy, must document any changes to the design or functionality of motor operator on the approval drawings.

7.2 Three (3) copies of the latest certified Design Tests for the Motor Operator shall be submitted with the bid package.

8.0 EQUIPMENT IDENTIFICATION

8.1 Each Motor Operator will have an attached metal nameplate containing, as a minimum, the following information:

- Manufacturers' Name:
- Manufacturers' Model Number:
- Manufacturers' Serial Number:
- Control Voltage in Volts:
- Date of Manufacturer

9.0 EQUIPMENT SHIPPING

9.1 Each Motor Operator shall be shipped in an individual crate and packaged to prevent any damage to the exterior of any internal equipment. Two (2) copies of certified Production Test reports and two (2) copies of the installation book and drawings (detailed as-built wiring diagrams, interconnection drawings, and remote terminal unit point data drawings) will be enclosed inside the motor operator cabinet inside of two (2) sealed, black, UV inhibiting plastic bags. The shipping crate will contain legible markings showing the Purchase Order Number, the commodity number of the motor operator stated on the purchase order and the nameplate information if not readily visible with the motor operator inside the crate.

10.0 WARRANTY

10.1 Each Motor Operator shall have a five (5) years warranty on all parts and the labor including the motor, gear reducer assembly, batteries, control panel, power distribution panel, etc.

11.0 SERVICE AND MAINTENANCE

11.1 No field calibration shall be required to maintain the accuracy of the Motor Operator's motor or gear drive assembly.

11.2 The Motor Operator's software shall be Windows 95/98/NT configuration and shall be provided with the Control.

11.3 The Motor Operator shall provide a Diagnostic and troubleshooting software at no cost.

11.4 The Motor Operator shall provide Two (2) copies of any software for installation and operation and installation and operation manuals related, shall be supplied at the time of shipment.

11.5 Future upgrades in the Control software shall be downloadable in the field from a PC and free of charge to AE.