



DUCK RIVER UTILITY COMMISSION



Post Office Box 1237 270 Water Lane Tullahoma, Tennessee 37388
Telephone: (931) 455-6458 Fax: (931) 455-6488 www.druc.org

April 8, 2025

RE: Request for Bids to Supply Actuators.

Dear Supplier:

Please find enclosed the specifications for valve actuators to be used by the DRUC Water Treatment Plant on the GAC contactors and filter. Please contact me immediately if there are requested changes or exceptions to the valve actuator specifications or requirements.

If you are interested in bidding on any of these items, please submit your pricing in writing by 2:00 p.m. on Thursday, May 8, 2025. At this time, the bids will be opened and publicly reviewed. A decision on the successful bidders will be made at the next meeting of the Commission on May 15, 2025.

Sincerely,

Randal J. Braker

Randal J. Braker
General Manager

RJB:hdh

enclosures

DUCK RIVER UTILITY COMMISSION

Request for bids for equipment to be used at the DRUC Water Treatment Plant.
Bid Closes May 8, 2025 at 2:00PM CST

Valve Actuator Schedule

General Specifications:

All equipment supplied will meet current AWWA standards and must be compatible with use in a potable water treatment process.

All actuator 120VAC Single phase

All actuator to have 4-20ma position feedback , open and close limit relay output, and remote/local switch with status relay output.

Actuator to be open/close or modulating per schedule.

All modulating valves to be controlled by 4-20ma input signal.

See detailed specifications for additional requirements.

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>ACTUATOR TYPE</u>
1.	4	GAC BACKWASH	Open/Close
20" Dezurik BAW Butterfly Valve, AWWA 150 psi, operating pressure < 25 psi water			
2.	2	GAC INFLUENT	Modulating
16" Dezurik BAW Butterfly Valve, AWWA 150 psi, operating pressure < 25 psi water			
3.	5	GAC REWASH	Open/Close
6" Dezurik BAW Butterfly Valve, AWWA 150 psi, operating pressure < 25 psi water			
4.	2	GAC DRAIN	Open/Close
24" Dezurik BAW Butterfly Valve, AWWA 150 psi, operating pressure < 25 psi water			
5.	5	GAC AIR SCOUR	Open/Close
6" Dezurik BAW Butterfly Valve, AWWA 150 psi, operating pressure < 25 psi air			
6.	5	MEMBRANE INFLUENT	Modulating
14" Dezurik BAW Butterfly Valve, AWWA 150 psi, operating pressure < 15 psi water			

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VALVE ACTUATOR SPECIFICATIONS

1.0 Electric Valve Actuators

- A. All actuators shall be quarter-turn type suitable for modulating service or on/off service as specified in the valve schedule. Provide all actuators by a single manufacturer.
- B. Refer to the Valve Schedule for service conditions.
- C. Actuators shall contain motor, gearing, manual over-ride, limit switches, drive coupling, integral motor controls, position feedback transmitter, and position indicator.
- D. Motor
 - 1. Designed for modulating actuator service.
 - 2. Induction type.
 - 3. Insulation: Class H.
 - 4. Totally enclosed, non-ventilated.
 - 5. 120 volts, 1 phase, 60 Hz.
 - 6. Motor shall be non-coasting, suitable for high duty cycle conditions, and shall be self-locking and self-releasing without the use of a separate brake winding, mechanical brake, or worm gear mechanism.
 - 7. The motor shall be capable of up to 60 starts/stops per minute or a temporary stall condition without overheating.
 - 8. Triacs shall be utilized for solid-state switching. Torque capacity of the operators shall be sufficient to operate the valves with a maximum pressure differential indicated in the Valve Schedule with a safety factor of at least 1.5.
 - 9. Maximum current draw of motors shall be 3.1 amperes in a fully stalled condition.
 - 10. Motors shall reach synchronous speed on start-up in 1.5 AC power cycles, and shall also reach dead stop from full synchronous speed in 1.5 cycles. Motor shall not overheat or fail when in continuous stall condition for 72 hours.
 - 11. No electrical or thermal overload protection shall be required for protection of a stalled or cycling operator.
- E. Control drive shall be designed to stay in place upon loss of power and shall be capable of holding a load equal to at least 200% of the model's rated output. Stall torque shall be self-limiting not exceeding 2.5 times the rated torque. Torque switches shall not be required. Drive shall operate on an increasing signal for full 100° rotation. Control drives shall be able to operate in any mounting orientation.
- F. Gear train shall have high efficiency spur gears constructed of heat-treated alloy steel or ductile Iron only. Readily available gear modules shall provide for a range of torque and timing combinations within the drive's rated capacity, and shall be field interchangeable. Gears shall be rated at twice the output torque of the operator, so that a continuous stall condition of 72 hours will not create any significant wear or performance degradation. To protect against accumulative stall damage in "Auto" mode while using the digital control module (DCM), the drive should automatically discontinue motor operation when the motor current is detected to be flowing in the same direction for 300 seconds. Over-travel of operator shall be prevented by internal mechanical stops cast into the actuator. Operating time between full limits of travel shall be between 22-180 seconds.
- G. Motor pinion and all gearing shall be lubricated with a premium, heavy-duty lithium-based lubricant, and shall not require changing of the lubrication for a minimum of five years. No oil baths shall be used for lubrication purposes. Maintenance-free bearings shall be used.

H. Manual Operation

1. Manual override shall be by handwheel
2. Manual operation shall be via power gearing.
3. Return from manual to electric mode of operation shall be automatic upon motor operation.
4. A mechanical indicator of valve position shall be provided and attached to the main output shaft driving the load.
5. Manual operation shall be possible with electric components removed.

I. Actuators using bracket/linkage connection shall consist of linkage between operator and valve shall be by crank arms and connecting rod, with adjustable starting point of valve position and adjustable rod length. Direct-coupled actuators shall use a compression fit coupling to connect the output shaft to the valve shaft. Operators shall stop precisely within 0.15 degrees of the desired control position. Operator output shaft shall be stainless steel. Stem shall be self- locking when the motor is de-energized. Modular construction and special lubrication shall permit the operator to be mounted in any position. Modulating operators shall be capable of operating in ambient temperatures ranging from -40°F to 185°F.

J. Limit Switches

1. Two SPDT limit switches for over-travel protection and four auxiliary SPDT limit switches (two normally open, two normally closed) shall be provided on all operators.
2. Limit switches shall be snap-acting SPDT silver alloy contacts rated for 6 amperes at 120 VAC. Switches shall have lubrication-free, nylon rollers, polished stainless steel roller-axle, and tempered blades. Switches shall be infinitely adjustable over the full range of valve travel. Limit switches shall be wired to a terminal board for remote output.
3. Drive shall have integral mechanical stops, capable of limiting travel of the drive and load, with or without the drive motor.
4. Switch adjustment shall not be altered by manual operation. The use of batteries shall not be required to accomplish this function.

K. The operators for the modulating valves shall be provided with 4-20 mA output signals for valve position feedback. Continuous position sensing of valve position shall be provided. Position sensing shall require no contacting or wiping surface. The position sensing unit shall be provided integral with the operator and shall provide a linear

4-20 mA output signal proportional to valve percent open.

L. Modulating actuators shall have a position feedback device mounted directly to the valve actuator gearing inside the gearing compartment. The feedback device shall provide a 4-20 mA signal corresponding to valve position. Modulating valve actuators shall be designed to respond to either a 4-20 mA DC analog signal or a pulsed AC signal as specified herein.

M. Modulating valve actuators designed to respond to 'pulse' open/close signals shall operate the valve during the time the open or close pulse signal is being received. Modulating actuators designed to respond to "pulse" open/close signals shall have the latching circuitry described for open/close actuators disabled.

N. Actuators shall contain wiring and terminals for the following control functions. All dry contacts shall be rated for 6A at 120VAC.

1. Four (4) unpowered contacts shall be provided, three of which shall be selected to indicate valve "Opened" position, valve "Closed" position, and "Auto" status of the actuator.
2. Where required in the Valve Schedule, the actuator must be wired to interface with the remote manual control station.

- O. Certified electrical control schematic diagrams shall be provided by the actuator Manufacturer for each service type of electric actuator. Interconnecting wiring information shall be submitted including terminal numbers, color coding, and the name and terminal numbers for items to which the wiring is to be connected.
- P. Enclosure shall be totally enclosed, cast, weatherproof, dust-tight, NEMA 4X, construction and IP68 rated. Separate conduit entrances shall be available for power and control wiring connections.
- Q. Local Controls
 - 1. A drive-mounted electric handswitch shall be provided to permit local electrical operation of the unit for control adjustment or operation on loss of control signal. All switches, wiring, relays, etc. shall be brought to a terminal board for field connection.
 - a. When the handswitch is in the "Auto" position, the actuator shall be controlled by remote control signals. Operators for modulating service shall be provided with integral position controllers which shall receive a 4-20 mA signal and, while in "Auto" mode, shall position the valve to match the setpoint.
 - b. When the handswitch is in the "CW" or "CCW" position, the actuator shall move toward the appropriate end-of-travel limit switch. Placing the selector switch in the "Stop" position shall stop the actuator travel.

The DRUC reserves the right to reject any or all bids and to waive any formalities. The DRUC does not necessarily accept the low bid and reserves the right to accept that bid which is in its best interest. The DRUC is a tax-exempt state/local government agency. Submitting a bid shall constitute acceptance of the above terms. Any questions regarding the specifications may be directed to Randal J. Braker, General Manager.