

SECTION 230900 – INSTRUMENTATION AND CONTROL FOR HVAC

2.15 ELECTRONIC ACTUATORS

- A. Manufactured, brand labeled or distributed by Belimo.
- B. Agency Listings: ISO 9001, cULus, CE and UL 2043.
- C. The manufacturer shall warrant all components for a period of 5 years from the date of production with the first two years unconditional.
- D. Type: Motor operated, brushless with gears, electronic.
- E. Voltage: 24V ac/dc.
- F. Air Flow Measurement and Control Actuator
 - 1. Actuator shall incorporate a pressure sensor and damper actuator in a single integrated device.
 - 2. Control Input Signal
 - a. Variable Volumetric Flow (VAV): Actuator drives proportional to the input signal and modulates throughout its angle of rotation. Suitable for [zero- to 10-] [or] [2- to 10-]V dc [and] [4- to 20-mA] signals.
 - b. Constant Volume Flow (CAV): A four-position switch input drives the actuator to Full Closed/Minimum Flow /Maximum Flow/Full Open.
 - 3. Position Feedback: Actuators shall incorporate a **[damper position] [volumetric flow] [pressure]** feedback through **[current] [or] [voltage]** signal for remote monitoring.
 - 4. Pressure Sensor: A dynamic differential pressure sensor internal to the actuator is provided with two (2) pick-up devices for duct installation. The pressure sensor shall require no further calibration.
 - a. Operating range: **0 to 2-inch wc (0 to 500 Pa)**, tested to +/- **12-inch wc (3000 Pa)**.
 - 5. Pressure Independent Air Flow Operation: The damper position shall be controlled to maintain the control input signal (setpoint).
 - 6. **[Communications: [Real-time data and configuration of actuator operating parameters shall be available by BTL listed BACnet MS/TP, or MODBUS.] or [Near Field Communications (NFC) via smartphone or a handheld device shall be utilized for service.]]**
- G. Integral Overload Protection:
 - 1. Provide electronic overload protection throughout the entire operating range in both directions.
- H. Damper Attachment:
 - 1. Unless otherwise required for damper interface, provide actuator designed to be directly coupled to damper shaft without need for connecting linkages.

2. Attach actuator to damper drive shaft in a way that ensures maximum transfer of power and torque without slippage.
 3. Bolt and set screw method of attachment is acceptable only if provided with at least two points of attachment.
- I. Temperature and Humidity:
1. Temperature: Suitable for operating temperature range encountered by application with minimum operating temperature range of [plus 32 to plus 122 deg F (0 to plus 50 deg C)].
 2. Humidity: Suitable for humidity range encountered by application; minimum operating range shall be from [5 to 95] <Insert numbers> percent relative humidity, non-condensing.
- J. Enclosure:
1. NEMA Type 2 / IP54 for indoor and protected applications.
- K. Stroke Time:
1. Operate damper from fully closed to fully open within 150 seconds.
 2. Operate damper from fully open to fully closed within 150 seconds.