Series 70 Electric Actuators

Actuator Type: Bray Series 70 Electric Actuator or approved equal.

General:
The actuator shall be compact and low profile to minimize space requirements.
The actuator shall provide adjustable operation up to 90°.
The actuator shall provide easy access for field wiring and adjustment.
The actuator shall be built to withstand line vibration and shock without failure.

Enclosure:
The enclosure shall be die-cast aluminum.
The enclosure shall be polyester or Seacorr coated (as specified) for environmental protection.
The enclosure shall be provided with captive cover bolts to prevent loss of cover bolts when cover is removed.
The enclosure shall have two conduit connections (one for power wiring and one for control signal wiring) in either NPT or metric threads as specified.
The actuator enclosure shall be provided with a high visibility valve position display prominently labeled and color coded to indicate the valve position throughout the full range of travel.

Motor:
The motor shall be a single phase, permanent split capacitor induction type with Class F or better insulation.
The motor shall contain a built-in UL approved automatic reset thermal overload protector set at 275°F (135°C) embedded in the motor windings.
Motors shall be 24VDC, 120 VAC or 220 VAC (230 VAC compatible) 50/60 Hz as specified.
Other DC and AC motors shall be available upon request.

Actuator Gear Train System:
The actuator shall have a self-locking gear train system consisting of a worm and worm gear output drive mechanism, which will hold the valve in the desired position without the need for an electro-mechanical braking system.
The spur gear train shall have precision cut multi-staged gears which will withstand locked rotor conditions and are permanently lubricated at the factory.
The actuator shall have an Oldham coupler to correct any misalignment between the output gear and the cam shaft.

Mechanical Travel Stops:
Mechanical stainless steel travel stops shall be provided and located outside the actuator enclosure for ease of adjustment.
Stainless steel lock nuts shall be provided to hold the travel stops in position.
O-ring seals for waterproof protection shall be provided.
The mechanical travel stops shall limit the travel of the actuator in either direction to the full travel range of the valve.
Stainless steel spacers shall be provided to prevent adjustment of actuator beyond 0 and 90 degrees

Manual Override:
The actuator shall be equipped with a manual override handwheel to rotate the valve without electrical power.
The manual override system shall ensure efficient manual operation without the use of extra tools or levers.
A motor power cutout switch shall be provided to cut power to the motor when the actuator manual override is engaged.

Travel Switches:
All travel switches shall be:
Single Pole, Double Throw (SPDT) Form C
Type UL Listed and CSA Approved
10A at 125/250 VAC and 1/2A at 125 VDC
The Actuator switches shall be pre-wired to a terminal block for ease of access and all internal wiring shall range from 12-22 AWG.
The travel limit switches shall limit the actuator travel in both the open and closed direction of travel.
The travel limit switches shall be held in brackets for accurate and repeatable valve position feedback.
Cams for each travel limit switch shall be infinitely adjustable by finger touch or screw driver.
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Service Requirements:
Actuators shall be designed for electric operation for the following service conditions:
- Temperature ranges of -20ºF (-29ºC) to +150ºF (+65º)
Duty Cycle:
- 25% for Intermittent Operation
- 100% for Continuous Operation
Testing:
All actuators shall be factory tested at rated load to ensure proper operation.
Mounting:
All actuators shall comply with ISO 5211 and mount directly to the valve mounting flange and stem without the need for any brackets or couplings.
Optional Equipment:
The actuator shall be designed to accept the following optional accessories if specified:
**Torque Limiting System:**
- Shall include 2 SPDT mechanical switches and 2 factory calibrated adjusting screws.
- The switches, in response to a predetermined load on the actuator output shaft, shall interrupt power to the motor.
- The switches shall operate at any point and in both directions of actuator travel.
**Heater:**
- Shall include a self-regulating temperature control to prevent condensation build-up.
- Shall be pre-wired to the terminal block for ease of connection to external source.
- Rated output shall be 5 W at 120 or 220 VAC.
**Local Control Station:**
For local electrical operation of the actuator. Shall flush mount to the actuator and include:
- A local/off/remote control switch
- An open/stop/close switch
- Two lights which indicate open and closed valve position
- Enclosure shall be aluminum and weatherproof
- Two 3/4 " NPT conduit entries in base of enclosure for customer wiring
**Battery Back Up:**
For user-selectable valve fail position upon loss of power supply in 24V applications.
- Shall flush mount to the actuator to include:
  - Visual and remote indication of battery status and operation
  - Field selectable valve fail position

Enclosure shall be aluminum and weatherproof
Two 3/4 " NPT conduit entries in base of enclosure for customer wiring

**Potentiometer**
Optional gear driven 10k Ohm potentiometer shall be available to provide continuous valve position feedback
Shall be standard for units with Servo NXT controller

**Auxiliary Switches**
All auxiliary switches shall be: Single Pole, Double Throw (SPDT) Form C Type UL Listed and CSA Approved 10A at 125/250 VAC and 1/2A at 125 VDC
Up to 4 additional auxiliary switches may be added to indicate travel position for remote customer control systems

**Approvals & Certifications:**
**Actuators and Certifications:**
- CE98/37/EC
- IP 65 (IEC)
- ABS
- Bureau Veritas Certification
- CSA Certification
- TUV IP65
- UL (for select 120VAC units)

**Servo NXT:**
- Shall provide precise modulating control of the valve position in response to an analog input signal using an on-board microcontroller.
- Shall have an analog output signal proportional to the actual valve position and the signal shall be configurable to either current or voltage output.
- Shall have a LED driven menu display for simplified commissioning, monitor and control of actuator
- Voltage spike and transient protection shall be provided on all input terminals and output terminals
- Independent isolation between analog input signal and retransmission signal to eliminate ground loops
- 120/230VAC units shall have inductive isolation between line voltage and logic level voltages.
- Independent adjustments shall be provided for deadband and for both open and closed speed control of the actuator.
- Input Signals shall be:
  - 4-20 mADC, 0-10 VDC, 2-10 VDC, 0-5 VDC
- Shall have manual mode operation to allow for control of actuator when no command signal is present
- Shall have on-board fault indications
- Shall be designed to meet UL and CE standards
- Calibration shall be accomplished by pressing a single button to initiate the calibration routine.
- Control characteristic shall be linear and duty cycle shall be 100%.
Internal feedback shall be by means of a 10k Ohm potentiometer. Retransmission outputs shall be:

4-20 mA DC, 0-5 VDC, 0-10 VDC, 2-10 VDC

DeviceNet™ Servo NXT shall also be available as an option to function as On/Off or Modulating unit on networks.

Enclosure:

The waterproof enclosure shall be certified to UL, CSA and CE (NEMA 4, 4X and IP 65) waterproof standards.

The hazardous location enclosure shall be UL certified to Class I, DIV 1 & 2, Group C, D, Class II, DIV 1 & 2, Group E, F, G hazardous locations.

All unused conduit entry points to be sealed for better ingress protection.