

Specification Guide

The following guide develops a comprehensive, performance oriented pneumatic and hydraulic actuator and control specification. Bettis' G-Series actuators meet or exceed all requirements outlined below for Quarter-turn(90°) valve operation.

1. The actuator shall be scheduled maintenance free, fully resistant to environmental, power gas, and load conditions.
2. The actuator shall be a true modular design to simplify field service, interchange ability of the power and spring modules, and the addition of manual overrides and accessories.
3. The actuator shall meet all applicable design codes, safety restrictions, and application practices including SI 1029 regulations, IP 66 and IP 67M type testing.
4. The power and spring modules shall be rigidly attached by external bolting to the drive module without requiring special tools, disassembly, or disturbance of seals of any module.
5. The pneumatic power module shall be constructed with dual internal tie bars of high strength alloy steel protected by corrosion and wear resistant coatings. Power modules shall be constructed to allow pressure testing independent of the drive module.
6. The reaction bar shall be corrosion and wear protected by a chemical bath surface conversion process applied in accordance with Bettis' ESC 20 specification, and shall exhibit a minimum surface hardness of 60 Rc.
7. The actuator shall be produced, service rated and auditable to a written Quality Assurance Program complying with ISO 9001, 10CFR50 Appendix B, CSAZ-299, and when specified, DIN 500493.1.b.
8. All actuators and modules shall meet acceptance criteria defined by Bettis' ES-6 test specification latest revision or equivalent prior to shipment.
9. The valve drive interface shall meet the applicable requirements of MSS SP-101 or ISO 5211 Standards.
10. The actuator shall be provided with a full length keyed female drive connection suitable for mounting in multiple orientations, as specified.
11. The actuator shall be service rated based upon load and application parameters, auditable to accelerated wearage test data.
12. All external bolting shall be blind tapped to protect the threads and positively prevent water ingress as defined by the requirements of IP 66 and IP 67M. Sheet or fibrous gaskets shall not be used for pressure or environmental seals.
13. Accessory drive shaft shall be bearing centered, with respect to the mounting pattern and isolated from any axial or radial yoke movements.
14. All shaft driven control and signal devices shall be protected from mechanical damage by a bearing centered shaft drive meeting NAMUR dimensional specifications. Device attachment shall be identical and interchangeable between all models.
15. Spring and drive module interface are to be positively retained under all operating conditions.

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16. Safe spring module installation/removal shall be inherent within the spring attachment design and shall not require special tools. The locking mechanism shall be self-engaging and highly visible during assembly, assuring that the lock position is attained. The mechanism shall positively disallow spring module detachment while in a loaded condition.
17. The spring module shall be fully enclosed, o-ring sealed and welded.
18. The spring and spring retainer shall be self-centered and bearing guided within the spring module.
19. All module interfaces shall include a precision machine pilot to ensure accurate alignment.
20. The spring-return actuator shall utilize an inherently guided tension rod to energize the compression spring eliminating the need for tie bars.
21. Each actuator shall be fitted with two (2) 316 stainless steel, normally closed vent-checks. The single-acting actuator power modules shall incorporate a 316 stainless steel bi-directional breather/vent.
22. The piston rod guide block connection shall compensate for angular and lateral deflection.
23. The piston rod shall be detachable from the drive module without the need of special tools or module disassembly.
24. Replaceable bearings shall exhibit documented, extended wear capabilities and shall be suitable for dry or lubricated working conditions. Sliding and rotating ferrous metal surfaces shall be protected by suitable bearings to control wear.
25. Metallic coating of pressure containing and load bearing surfaces which can be scratched, cracked, or peeled are prohibited.
26. All contact surfaces of the guide block assembly shall incorporate replaceable bearings and a rigid rotating pin torque transfer mechanism.
27. The yoke pin shall rotate in a self-lubricating bearing to eliminate sliding friction in the yoke slots and shall be retained by stationary non-metallic thrust bars.
28. The manufacturer shall provide a five-year materials and workmanship warranty.
29. Integral bi-directional travel stops shall allow 80° to 100° total travel adjustment.
30. The construction of the actuator shall be suitable for continuous exposure to ambient temperatures of -20°F to +200°F (-29°C to +93°C). Optional low temperature and high temperature trim are available.
31. Standard valve position stops shall provide 80–100° adjustment and be capable of stalling the actuator at the maximum torque output.