SIL Safety Manual
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Biffi FCBx and FG-series

IEC 61508 SIS/SIL Safety Manual

BIFFI

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Section 1: Scope

- All Bettis brand CB/CBx and G-series products currently SIS/SIL certified by EXIDA using IEC 61508 guidelines.

NOTE:

- The Biffi FCBx are the rebranding of the Bettis CB/CBx series.
- The Biffi FG are the rebranding of the Bettis G-series.

Section 2: Purpose

To ensure all the applicable safety requirements of IEC 61508 are complied with, thereby ensuring current certified SIS/SIL levels are maintained.

Section 3: Topics

3.1 Safety Function

The CB/CBx Series and G-series actuators rotate with sufficient torque to move a valve to its fail-safe state when hold-position air released.

The Bettis Brand Actuator Selection Procedure provides functional definition with specifics on input variables and performance.

3.2 Proof Test Procedure

Proof test procedure and proof test coverage are part of the FMEDA reports which are provided to those requiring SIS functionality, see exida report nos. EAS 16/06-010 R001 and R002. No specific tools are required for proof testing. Individual who will perform the proof test is expected to be trained in actuator maintenance.

3.3 Repair/Replace Procedure

Procedures to repair or replace the CB/CBx Series and G-series actuators are provided in the respective IOM, see Section 4 for a listing of Bettis IOM document numbers.

Please refer to the IOM for any tools required for repair and replacement and required competency of technicians. Maintenance and subsequent test procedures are also covered in the IOMs. Any failures, identified by the end-user during maintenance, repair or proof testing that potentially impact the functional safety of the CB/CBx Series and G-series actuators should be reported back to Valve Automation Customer Center Service Coordinator or Fiorenzuola After Sales Office.

3.4 Installation and Site Acceptance Prodecure

Any necessary installation and site acceptance procedures are discussed in the CB/CBx Series and G-series actuators IOM listed in Section 4. IOM defines exercising of the actuator after installation. The IOMs also define testing after maintenance.

3.5 Application and Environmental Limits

All application and environmental limits need to be observed for the CB/CBx Series and G-Series actuators. Please observe the pressures and temperatures that are stamped on the nameplate per European Directives. More information can be found in the Bettis Technical Files listed in Section 5.

3.6 Periodic Maintenance Requirements

For the CB/CBx Series and G-series actuators, the periodic maintenance requirements should be observed, refer to the IOM documents listed in Section 4. A 5-year normal maintenance interval is defined for the CB/CBx Series and G-series actuators.

3.7 Hardware Version

The hardware version of the actuator can be identified from the nameplate on the actuator.

3.8 Settings

Installation and maintenance settings for the CB/CBx Series and G-series actuators are specified in the IOMs. There are not specific safety settings to be made.

3.9 Functional Safety Data

Users applying the actuators in functional safety applications should contact Bettis to obtain the assessment and FMEDA report, which include failure data, a sample PFD_{AVG} calculation, and other associated statistical data to establish or satisfy SIL level requirements. This information is available in exida reports EAS 16/06- 010 R001, R002, and R003 for G FMEDA, CB FMEDA and assessment respectively.

3.10 Archievable SIL Statement

The CB/CBx Series and G-series actuator have been assessed per the relevant requirements of IEC 61508, Parts 1 and 2. They provided systematic integrity up to SIL 3. For random integrity, they have been designated as Type A devices with Hardware Fault Tolerance (HFT) = 0. PFD_{AVG} and Architectural Constraints must be verified for each final element application. When using the CB/CBx Series and G-series actuator in a redundant configuration, a common cause factor of at least 5% should be included in safety integrity.

3.11 Product Lifetime Limits

The IOM defines a 5-year minimum maintenance interval for the CB/CBx Series and G-series actuators. This addresses components that may have age related degradation.
The remaining components are not age sensitive. Please also refer to the FMEDA reports, exida report nos. EAS 16/06-010 R001 and R002 for the useful life of the actuators.

Section 4: Installation, Operation, and Maintenance Manual (IOM)

- 137464 CBA/CBB 315, 420, 520, 525 and 725 double-acting models
- 137465 CBA/CBB 315, 415, 420, 520, 525 and 725 spring-return models
- 137462 CBA730, 830, 930 and 1030 double-acting models
- 137463 CBA730, 830, 930 and 1030 spring-return models
- 068269 CB315, 420, 520, 525 and 725 double-acting models
- 068270 CB315, 415, 420, 520, 525 and 725 spring-return models
- 124840 G-series pneumatic models
- 124841 G-series pneumatic models with tandem power cylinders
- 124843 G-series double-acting pneumatic models with M11 hydraulic override
- 127073 G-series spring-return pneumatic models with M11 hydraulic override
- 127215 G-series pneumatic models with tandem power cylinders and M11 hydraulic override

Section 5: Technical Files

- 136360 CB/CBA x15, x20 and x25 models for pneumatic service
- 136373 G-series models for pneumatic service
- 137569 G-series models for hydraulic service

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