



WESTLOCK
CONTROLS

SILVER BULLET SERIES MODELS 316SB & 316LT INSTALLATION AND OPERATIONS MANUAL

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Revision History

Revision

Initial release 1/16/19, Rev. A 07/29/20, Rev. B 03/18/21, Rev. C 10/29/21

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1. Introduction

1.1 Product Certification

ITS21UKEX0359X
ETL21ATEX0059X
Ex II 2G Ex db IIC T* Gb
Ex II 2D Ex tb IIIC T* Db IP6X
316SB Ta = -20°C TO +84°C (T5/T100°C) or -20°C TO +69°C T6/T85°C
316LT Ta = -50°C TO +84°C (T5/T100°C)



Class I, Division 1, Groups A, B, C & D
Class II, Division 1, Groups E, F & G
316SB Ta = -20°C TO +40°C
316LT Ta = -50°C TO +84°C



GYJ18.1045X
Ex d IIC T5/T6 Gb
Ex tD A21 IP6X T85°C /T100°C
316SB Ta = -20°C TO +84°C (T5/T100°C) or
-20°C TO +69°C T6/T85°C
316LT Ta = -50°C TO +84°C (T5/T100°C)

1.2 Warnings



- Perform all wiring in accordance with site and local codes and the National Electric Code ANSI-NFPA-70 (US) or the Canadian Electric Code Part I (Canada) for the appropriate area classifications.
- Confirm that the 316 model being installed is approved for the hazardous area (see Product Certification section above product markings).
- Confirm that supply power to switches is within rated specifications listed on the unit identification label.
- Protect the unit from exposure to aggressive substances or atmospheres to ensure that hazard rating is not compromised.

1.3 Description

The Westlock Silver Bullet series products are hermetically sealed, dry contact, single pole double throw or double pole double throw reed switch element encapsulated in a 316 stainless steel casing. The Silver Bullet 316XXD features an integral, 7-conductor cable, and the Silver Bullet 316XXS features an integral, 4-conductor cable, conduit entry and externally threaded casing for ease of mounting and position adjustment. It is also supplied with threaded, encapsulated magnetic triggering bolts that facilitate adjustment of the gap between Silver Bullet and the triggering mechanism.

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1.4 Principles of Operation

The Silver Bullet Series 316 operates on the principle of magnetic attraction, reacting to ferromagnetic actuators as they come within the switch's sensing range.

All sensors, when actuated by the presence of a ferromagnetic trigger, change the state of electrical contacts from Normally Closed (N/C) to Normally Open (N/O).

1.5 Special Features (IECEX/ATEX)

1.5.1 IECEX/ATEX CONDITIONS OF SAFE USE:

1. When used with a cable gland it shall be fitted with an Ex d IIC Gb and Ex tb IIIC Db cable gland, of threadform M20 or ½" – 14 NPT depending on the entry thread of the Silver Bullet.
2. When conduit is used a suitably approved stopping box must be used, at a distance from the Silver Bullet which is less than the diameter of the conduit.
3. The casing of the Silver Bullet must be suitably earthed/equipotentially bonded via earthed metal conduit or the threaded outer of the body.
4. The equipment is supplied with flying leads. The cable must be protected mechanically and terminated within an enclosure protected by a recognized IECEx method of protection appropriate to the location if located in a potentially explosive atmosphere.
5. Flamepath joints are not intended to be repaired.
6. **WARNING: DO NOT OPEN PRODUCT WHEN ENERGIZED OR WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.**

All Magnum Silver Bullets are Hermetically sealed. For installation in hazardous locations, check local electrical codes. Seal fitting not required.

1.6 Special Features (NEPSI/CCC)

1.6.1 NEPSI/CCC CONDITIONS OF SAFE USE:

The suffix "X" in the number of the Certificate of Conformity of Explosion Protection and Safety indicates that this Product is subject to special conditions for safe use, as detailed below:

1. When the flameproof enclosure is to be maintained or repaired, the manufacturer shall be consulted.

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2. Appropriate measures shall be taken to connect the free ends of the cable, and the cable shall be protected against mechanical damage.

1.6.2 Notes on Product Use

1. The cable inlets of the Product shall be provided with cable inlet devices recognized by explosion protection and safety inspection institutions designated by the state, conforming to the national standards GB3836.1-2010, GB3836.2-2010, GB 12476.1-2013 and GB 12476.5-2013, with explosion-proof grades of Ex d II C Gb and Ex tD A21 IP6X, and having threads fitting those of the Product. Such cable inlets can be used in explosive hazard sites only if they allow 5 or more valid engagements. Redundant cable inlets shall be effectively sealed with plug seals. After the cable inlet devices or the plug seals are mounted, the equipment enclosures shall have a general protection grade no lower than IP6X.
2. Appropriate measures shall be taken to ensure that the Product is reliably grounded.
3. When option a is SB in the Product's model, the relationship between the temperature group and operating temperature range is shown in the table below:

Temperature Group	Operating Temperature Range
T5/T100°C	-20°C TO +84°C
T6/T80°C	-20°C TO +69°C

When option a is LT in the Product's model:

The temperature group is T5, and the operating temperature range is -50°C TO +84°C.

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4. The relationship between the rated electrical parameters and contact material/type of the Product is shown in the table below:

Contact Material	Rated Electrical Parameters
Tungsten	2A/24VDC, 3A/120VAC, 1.5A/240VAC
Rhodium or Gold	1A/24VDC, 200mA/120VAC
Hall Component	1mA/5VDC

5. When the Product is to be used in an environment with combustible dust, its surface shall be cleaned regularly, but shall not be blow-cleaned with compressed air.

6. Users shall not arbitrarily replace the components or parts of the Product and shall troubleshoot faults arising from use together with the product manufacturer to avoid damage.

7. The Product shall be installed, used and maintained in conformity with the Product Instructions and requirements of the following standards and specifications:

GB 3836.13-2013 Explosive Atmospheres - Part 13: Equipment Repair, Overhaul and Reclamation

GB/T 3836.15-2017 Explosive Atmospheres - Part 15: Electrical Installations Design, Selection and Erection

GB/T 3836.16-2017 Explosive Atmospheres - Part 16: Electrical Installations Inspection and Maintenance

GB 50257-2014 Code for Construction and Acceptance of Electric Equipment on Fire and Explosion Hazard Electric Equipment Installation Engineering

GB 15577-2007 Safety Regulations for Dust Explosion Prevention and Protection

GB 3836.1-2010 Explosive Atmospheres - Part 1: Equipment - General Requirements

GB 3836.2-2010 Explosive Atmospheres - Part 2: Equipment Protection by Flameproof Enclosures "d"

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GB 12476.1-2013 Electrical Apparatus for Use in the Presence of Combustible Dust - Part 1: General Requirements

GB 12476.5-2013 Electrical Apparatus for Use in the Presence of Combustible Dust - Part 5: Protection by Enclosures “tD”

The Ex-mark for the Product is Ex d II C T5/T6 Gb and Ex tD A21 IP6X T85°C/T100°C, and the Certificate of Conformity of Explosion Protection and Safety is numbered GYJ18.1045X.

2. Order Guide

See applicable catalog literature for ordering guide.

3. Definitions

Not applicable

4. Installation

4.1 Mounting

- Determine the actuator(s) and trigger(s) desired operating point.
- Locate switch and/or actuator to assure that actuator comes within switch’s sensing area.
- Use ferromagnetic trigger furnished with each sensor.

CAUTION: Avoid contact between switch and actuator, as this may damage the switch.

- Switches must be mounted as follows:
The blue indicator line on the DPDT switch must be oriented in the same direction as the travel of the trigger.

-When mounting switches side-by-side, sensing areas must face the same direction.

-When mounting switches with sensing areas facing each other, install them at least 3 inches apart.

- For best results, utilize the ferromagnetic trigger supplied with each sensor.

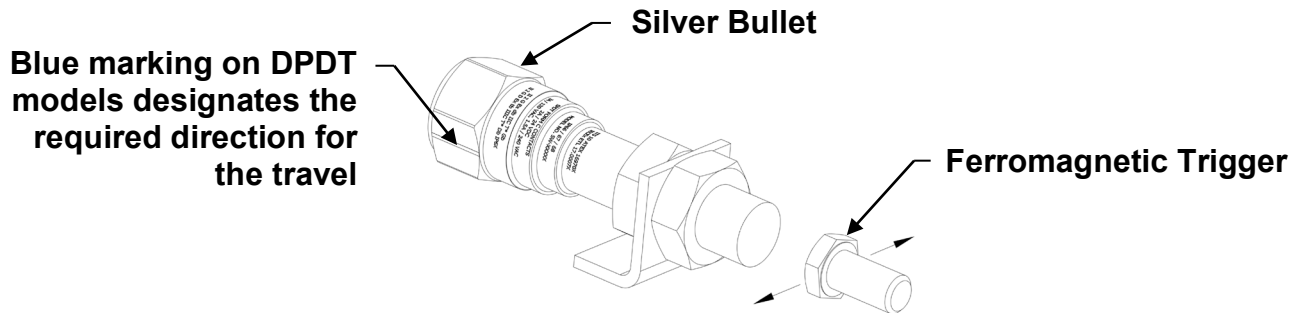
-Keep all other magnetic materials at least 1 inch away from switch.

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-Steel placed inside the switch's differential area will not affect functioning.



4.2 Calibration

-Align magnetic trigger axially with the sensing end of the Silver Bullet. Adjust gap between magnetic trigger bolt to approximately 0.100 inch from the Silver Bullet.

Note: Be sure to abide by orientation instructions provided in the mounting section with regards to the direction of travel of the trigger to ensure best switch performance.

-Connect leads of a suitable continuity tester to the black (normally open contact) and white (common contact) wires of the Silver Bullet (refer to wiring diagram).

- Verify continuity between black and white wires in the presence of the trigger. Repeat continuity test between the brown and blue wires in the presence of the trigger for DPDT models.

Note: If an open circuit is required when the Silver Bullet is triggered, connect continuity tester to the red (normally closed contact) and white (common contact) wires and to orange (normally closed contact) and blue (common contact) wires for DPDT models, and follow the above continuity verification in the presence of the trigger.

5. Field Wiring

-Attach conduit or cable correctly

-When using long runs of conduit or cable, place supports close to the switch to avoid pulling switch out of position.

-For installation in hazardous locations, check local electrical codes.

6. Maintenance and Repair

No maintenance is required for 316 series products.

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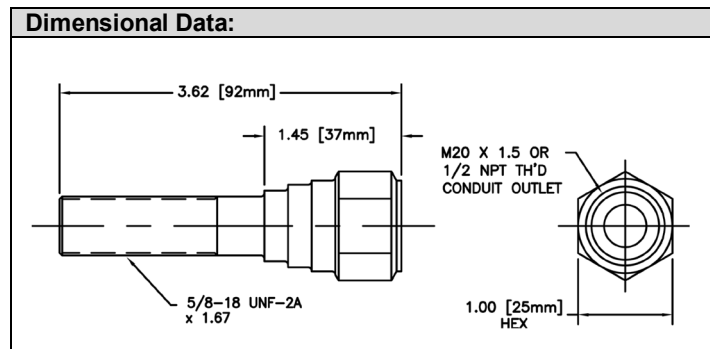
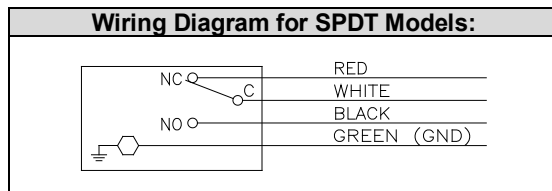
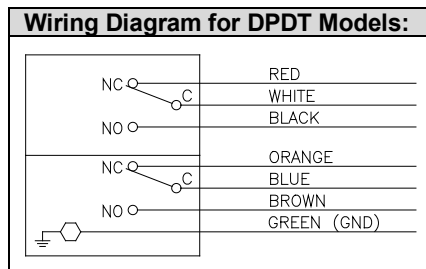
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7. Appendix

Mechanical	
Full Metal Outer Jacket:	316 Stainless Steel
Contacts:	Tungsten or Rhodium (specify model No.)
IP Rating:	66, 67, 68
Std. Temp. Range (°C)/(°F):	-20°C to 84°C (T5/100°C) or -20°C to 69°C (T6/85°C), -68°F to 183°F (T5/212°F) or -68°F to 156°F (T6/185°F)
Low Temp. Range (°C)/(°F):	-50°C to 84°C (T5/100°C), -122°F to 183°F (T5/212°F)
Operational Life:	600,000 cycles (full rated load)
Sensor Actuation:	Ferromagnetic
Sensing Distance:	0.100" (2.54mm) end sensing

Electrical	
Contact Arrangement:	DPDT, Form CC (normally open) or SPDT, Form C (normally open) as specified by model number
Contacts:	Solid Tungsten or rhodium as specified by model number
Current Rating:	Tungsten: 3 Amps/120 VAC, 2 Amps/ 24 VDC; Rhodium: 1 Amp/24 VDC
Operating time:	3.0 m Sec.
Initial Contact Resistance:	.50 ohms (Max.)
Repeatability:	.005 in.
Hysteresis:	.040 in
Conduit Connection:	1/2"-14 NPT or M20 X 1.5
Leads (Std):	Factory Sealed with 4 or 20 ft length, 7 Conductor (DPDT) or 4 Conductor (SPDT) 18 AWG PVC Insulation, rated for 105°C at 600V
Leads (Low Temp Option):	Factory Sealed with 4 or 20 ft length, 7 Conductor (DPDT) or 4 Conductor (SPDT) 18 AWG XL PE/TPE Insulation, rated for 125°C at 300V



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