# GSX SERIES

**004764**
*Issue 5*

## MICRO SWITCH Safety Limit Switches for Hazardous Locations

### DESCRIPTION

When the application requires a safety limit switch for hazardous environmental areas which potentially include explosive gas, dust, or fibers, Honeywell offers GSX Series safety limit switches that provide a preferred solution for the hazardous environments while monitoring gate positions. The GSX Series of safety limit switches incorporate the same internal contact block as the Global Safety Limit Switch (GSS Series). All normally closed contacts are positive opening. A wide variety of contact blocks and actuator head combinations solve many applications.

The GSX Series safety limit switches are certified for weather-sealed indoor and outdoor environments and are also certified for continuous or intermittent use in hazardous/explosive environments through a number of different independent agencies for global applications.

### FEATURES

- Safety limit switch typically suitable for global hazardous/explosive environments with cULus, ATEX, CE, IEC Ex, INMETRO, and KOSHA/KTL certifications
- Up to four normally closed (NC) contacts per switch or a combination of NC and normally open (NO) contacts per limit switch
- NC contacts are positive opening for positive mode monitoring of gates
- NO contacts available for signal circuits or negative mode monitoring of gates
- Red switch body for easy safety recognition
- Choice of actuator head types: top pin plunger, top roller plunger, top roller lever, or side rotary
- Different threaded conduit options for global applications

### DIFFERENTIATION

- Up to four electrically independent contacts (Zb) per limit switch for monitoring of gates
- Designed and agency evaluated for safety functions up to and including a safety integrity level 3 (SIL3)
- Safety industrial limit switch globally certified for hazardous/explosive environments and environmentally sealed
- Gold-plated contacts available for integrity of switch contacts in hostile environments with low energy applications
- Side rotary actuator head incorporates dual bearing design for increased mechanical life

### POTENTIAL APPLICATIONS

Access panels, gates, guards, or doors on machinery for:

- Grain elevators and grain processing facilities
- Hydrocarbon and ethanol facilities
- Chemical processing
- Paint booths
- Pharmaceutical processing
- Power generation plants
- Pulp and paper processing

### PORTFOLIO

Honeywell offers other safety “limit” switches which include the non-contact safety switches (FF Series) and cable/rope-pull safety switches (1CPS & 2 CPS Series). Honeywell safety interlocking switches include the metal-body EN50041 GK Series, metal-body solenoid (trapped key) GKL/R Series, the plastic-body EN50047 GKE Series, miniature plastic-body GKM Series, and plastic-body GKN Series.

For other hazardous location applications, Honeywell offers a wide range of limit switches in different size packages and hazardous environments. These limit switches include the BX/BX2 Series, CX Series, EX Series, LSX Series, GXS Series, and 14CE100 Series.

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# SAFETY LIMIT SWITCHES FOR HAZARDOUS LOCATIONS, GSX SERIES

| TABLE 1. SPECIFICATIONS | |
|---|---|
| **CHARACTERISTIC** | **PARAMETER** |
| Description | GSX Series safety limit switches for hazardous areas (explosive environments) |
| Agency certifications | See Table 3 |
| Housing material | Electrostatic epoxy coated aluminum body and zinc actuator heads |
| Actuator heads | Side rotary with various lever options, top pin plunger, top roller plunger, top roller lever |
| Conduit/electrical connection | 0.5-14 NPT, 20 mm, PG 13,5, G1/2 (PF1/2) |
| Contact/switch options and types[1] | 1NC/1NO snap action, slow action BBM, or slow action MBB<br>2NC slow action<br>2NO slow action<br>2NC/2NO snap action, slow action BBM<br>2NC/1NO slow action BBM<br>3NC/1NO slow action BBM<br>4NC slow action |
| Contact design | Double break, electrically separated (Zb); 2NC/2NO snap action, each pole requires same polarity (Za) |
| Contact material | Silver alloy (standard), gold-plated (optional for low energy applications) |
| Utilization category | Snap action contacts: AC-15, A600; DC-13, Q300<br>Slow action contacts[3]: AC-15, A300; DC-13, Q300 |
| Rated operational voltage (Ue) | 120 Vac, 240 Vac, 600 Vac, 250 Vdc |
| Rated operational current (Ie) | 6 A, 3 A, 1.2 A, 0.27 A |
| Thermal current (Ith) | 10 A |
| Rated insulation voltage (Ui) | 300 V, 600 V |
| Rated impulse withstand voltage (Uimp) | 2500 V |
| Short circuit protection device (SCPD) | Class J fuse (10 A/600 V) |
| Pollution degree | 3 |
| Environmental sealing | IP67; NEMA 1, 3, 4, 12, and 13 |
| Operating temperature | -40°C to 70°C [-40°F to 158°F] |
| Shock | 50 g per IEC 60068-2-27 |
| Vibration | 10 g per IEC 60068-2-6 |
| MCTF (Mechanical life) | >1,000,000 cycles with single-sided confidence limit of 100% |
| MCTF (Electrical life) | >25,000 cycles with single-sided confidence limit of 100% |
| SIL capability[2] | SIL3 capable with HFT =1, SIL2 capable with HFT =0 with reference to IEC61508-2:2010 |
| Proof test interval | 1 year |

1. All normally closed contacts are positive opening
2. HFT (Hardware Fault Tolerance).
3. Slow action 1NC/1NO contacts: AC-15, A600; DC-13, Q300

| TABLE 1. ELECTRICAL SPECIFICATIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **DESIGNATION AND UTILIZATION CATEGORY** | | **RATED OPERATIONAL CURRENT IE (A) AT RATED OPERATIONAL VOLTAGE UE (V)** | | | | | | |
| | | **24 V** | **120 V** | **240 V** | **380 V** | **480 V** | **500 V** | **600 V** |
| AC-15 | A300 | – | 6 A | 3 A | – | – | – | – |
| AC-15 | A600 | – | 6 A | 3 A | 1.9 A | 1.5 A | 1.4 A | 1.2 A |
| DC-13 | Q300 | 2.8 A | 0.55 A | 0.27 A | – | – | – | – |
| Gold-plated contacts | | 1 V 10 µA min.; 50 V 100 mA max. | | | | | | |

# SAFETY LIMIT SWITCHES FOR HAZARDOUS LOCATIONS, GSX SERIES

**TABLE 3. AGENCY CERTIFICATIONS**

| EUROPE ATEX | EUROPE CE | CANADA CUL | USA UL | INTERNA-TIONAL IEC EX | ASIAN CERTIFI-CATE KOREA | SOUTH AMERICA, BRAZIL | SAFETY INTEGRITY LEVEL |
|---|---|---|---|---|---|---|---|
| | | | | | | | – |
| Sira 08AT-EX1073X | DOC A413 | E61730 | E61730 | IEC Ex SIR 08.0021X | KOSHA/KTL 2013-BO-0400 | INMETRO TUV 14.0555X | SIL3 SIRA FSP11002/02 |
| North America | Class I (Flammable gas) Groups B, C, and D (Div 1 and 2)<br>Class II (Combustible dust) Groups E, F, and G (Div 1 and 2)<br>Class III (Combustible fibers and flyings) Div 1 and 2 | | | | | | |
| ATEX and IEC Ex | II 2 GD, Ex d IIC T6 Gb<br>Ex t IIIC IP6X T85°C Db (Tamb -40°C to 70°C) | | | | | | |

**FIGURE 1. PRODUCT NOMENCLATURE**

GSX | A | 01 | A | 1 | A | – | Modifications/ Specials

**Switch Type**

**GSX Series** Hazardous Area Safety Switch

**Conduit Connection**

| | |
|---|---|
| A | 1/2 in NPT |
| B | PG 13.5 |
| C | 20 mm |
| D | G 1/2 (PF 1/2) |

**Circuitry**

| | |
|---|---|
| 01 | Snap action, 1NC/1NO |
| 03 | Slow action, 1NC/1 NO, BBM |
| 04 | Slow action, 1NC/1 NO, MBB |
| 05 | Slow action, 2NO |
| 06 | Slow action, 2NC |
| 07 | Snap action, 1NC/1NO, gold contacts |
| 20 | Snap action, 2NC/2NO |
| 22 | Snap action, 2NC/2NO, gold contacts |
| 33 | Slow action, 1NC/1NO, BBM, gold contacts |
| 34 | Slow action, 1NC/1NO, MBB, gold contacts |
| 35 | Slow action, 2NO, gold contacts |
| 36 | Slow action, 2NC, gold contacts |
| 40 | Slow action, 4NC |
| 41 | Slow action, 4NC, gold contacts |
| 42 | Slow action, 2NC/1NO, BBM |
| 43 | Slow action, 2NC/1NO, BBM, gold contacts |
| 44 | Slow action, 2NC/2NO, BBM |
| 45 | Slow action, 2NC/2NO, BBM, gold contacts |
| 46 | Slow action, 3NC/1NO, BBM |
| 47 | Slow action, 3NC/1NO, BBM, gold contacts |

**Head Style**

| | |
|---|---|
| A | Side rotary; momentary |
| B | Top pin plunger |
| C | Top roller plunger |
| D | Top roller lever |

**Actuator Style**

| | |
|---|---|
| 1 | Fixed length roller |
| 3 | Yoke roller |
| 5 | Offset roller |

**Lever Roller**

| | |
|---|---|
| A | 19,0 mm x 6,35 mm [0.75 in x 0.25 in] nylon roller |
| C | 24,4 mm x 12,7 mm [1.0 in x 0.5 in] nylon roller |
| D | 38,1 mm x 6,35 mm [1.5 in x 0.25 in] nylon roller |
| E | 19,0 mm x 6,35 mm [0.75 in x 0.25 in] bronze roller |
| W | 40 mm x 12,7 mm [1.5 in x 0.5 in] bronze roller |
| Y | 50,9 mm x 12,7 mm [2.0 in x 0.5 in] rubber roller |

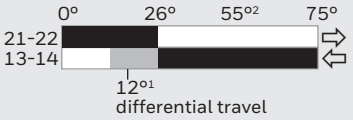
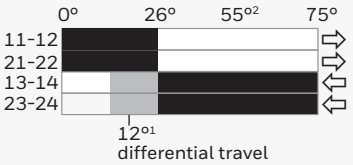
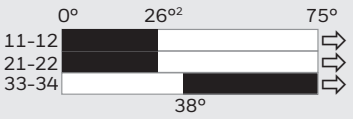
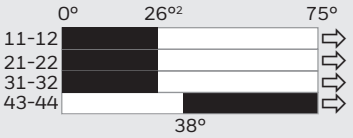
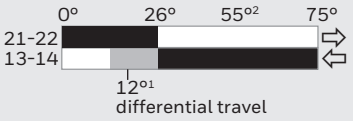
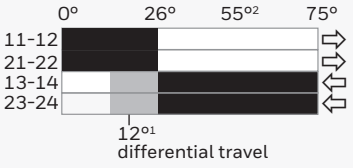
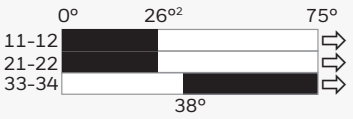
**Modifications/ Specials**

| | |
|---|---|
| 1 | Clockwise rotation |
| 2 | Counter-clockwise rotation |
| 3 | Head assembled with actuator to right side |
| 4 | Head assembled with actuator to left side |
| 5 | Head assembled with actuator to mounting surface |
| 6 | Roller perpendicular to mounting surface |

Note: Not all combinations available.
Please contact Honeywell for more information or assistance.

# SAFETY LIMIT SWITCHES FOR HAZARDOUS LOCATIONS, GSX SERIES

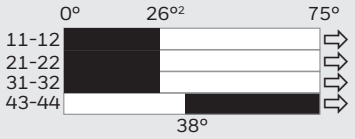
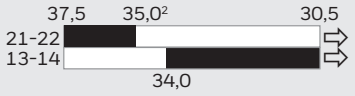
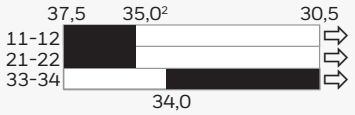
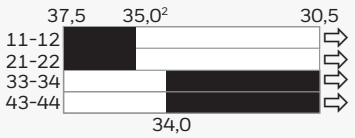
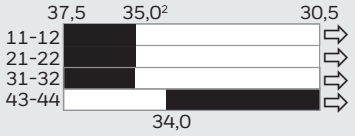
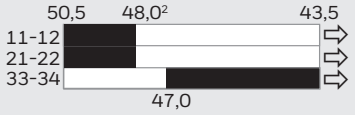
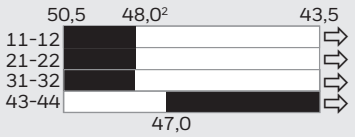
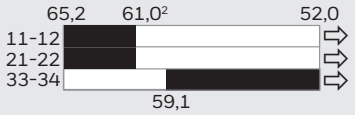
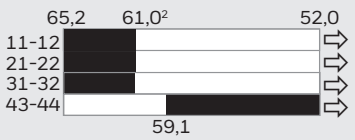
**TABLE 4. ORDER GUIDE**

| | CATALOG LISTING | CONDUIT[1] | HEAD AND LEVER TYPE | CONTACTS | CONTACT MATERIAL | OPER. FORCE OR TORQUE (MAX.) | Bar Chart degrees or mm ■ Contact Closed ■ Contact Open ■ Contact Closed, Differential |
|---|---|---|---|---|---|---|---|
|  | **GSXA01A** | 0.5-14 NPT | Side rotary, no lever furnished, order separately | 1NC/1NO snap action | Silver alloy | 0,3 Nm [2.6 in lb] |   |
| | **GSXC22A** | 20 mm | Side rotary, no lever furnished, order separately | 2NC/2NO snap action | Gold-plated | 0,3 Nm [2.6 in lb] |   |
| | **GSXA42A** | 0.5-14 NPT | Side rotary, no lever furnished, order separately | 2NC/1NO slow action, BBM | Silver alloy | 0,3 Nm [2.6 in lb] |   |
| | **GSXC42A** | 20 mm | | | | | |
| | **GSXA46A** | 0.5-14 NPT | Side rotary, no lever furnished, order separately | 3NC/1NO slow action, BBM | Silver alloy | 0,3 Nm [2.6 in lb] |   |
| | **GSXC46A** | 20 mm | | | | | |
| | **GSXA01A1A** | 0.5-14 NPT | Side rotary with 38,1 mm [1.5 in] lever with nylon roller | 1NC/1NO snap action | Silver alloy | 0,3 Nm [2.6 in lb] | |
| | **GSXC01A1C** | 20 mm | Side rotary with 38,1 mm [1.5 in] lever with nylon roller[3] | 1NC/1NO snap action | Silver alloy | 0,3 Nm [2.6 in lb] | |
| | **GSXC01A1E** | 20 mm | Side rotary with 38,1 mm [1.5 in] lever with copper alloy roller | 1NC/1NO snap action | Silver alloy | 0,3 Nm [2.6 in lb] |   |
|  | **GSXA07A1A** | 0.5-14 NPT | Side rotary with 38,1 mm [1.5 in] lever with nylon roller | 1NC/1NO snap action | Gold-plated | 0,3 Nm [2.6 in lb] | |
| | **GSXC07A1E** | 20 mm | Side rotary with 38,1 mm [1.5 in] lever with copper alloy roller | 1NC/1NO snap action | Gold-plated | 0,3 Nm [2.6 in lb] | |
| | **GSXA20A1A** | 0.5-14 NPT | Side rotary with 38,1 mm [1.5 in] lever with nylon roller | 2NC/2NO snap action | Silver alloy | 0,3 Nm [2.6 in lb] |   |
| | **GSXA22A1A** | 0.5-14 NPT | Side rotary with 38,1 mm [1.5 in] lever with nylon roller | 2NC/2NO snap action | Gold-plated | 0,3 Nm [2.6 in lb] | |
| | **GSXA42A1E** | 0.5-14 NPT | Side rotary with 38,1 mm [1.5 in] lever with copper alloy roller | 2NC/1NO slow action, BBM | Silver alloy | 0,3 Nm [2.6 in lb] |   |
| | **GSXC42A1E** | 20 mm | | | | | |
| | **GSXA43A1E** | 0.5-14 NPT | Side rotary with 38,1 mm [1.5 in] lever with copper alloy roller | 2NC/1NO slow action, BBM | Gold-plated | 0,3 Nm [2.6 in lb] | |

[1] Other conduit options are available, reference Product Nomenclature (Figure 1) on page 3.
[2] Positive opening occurs.
[3] Nylon roller (Ø19 x 6,35) replaced with nylon roller (Ø25 x 12,7) .

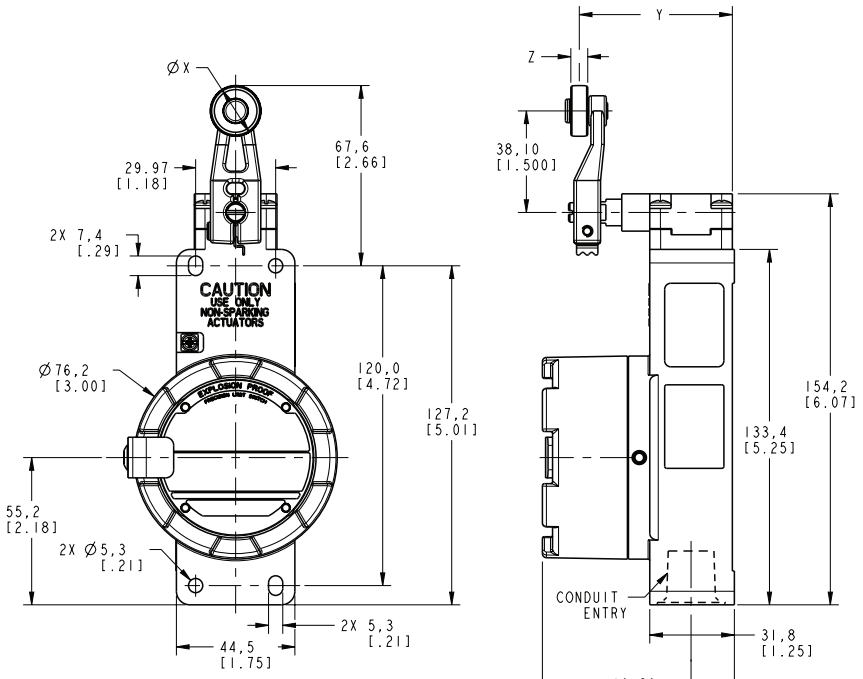
# SAFETY LIMIT SWITCHES FOR HAZARDOUS LOCATIONS, GSX SERIES

**TABLE 4. ORDER GUIDE**

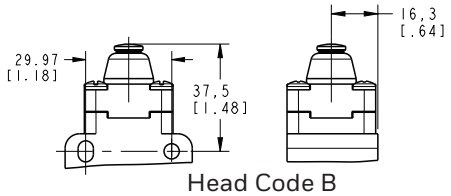
| | CATALOG LISTING | CONDUIT[1] | HEAD AND LEVER TYPE | CONTACTS | CONTACT MATERIAL | OPER. FORCE OR TORQUE (MAX.) | Bar Chart degrees or mm ■ Contact Closed ■ Contact Open ■ Contact Closed, Differential |
|---|---|---|---|---|---|---|---|
| | **GSXA46A1E** | 0.5-14 NPT | Side rotary with 38,1 mm [1.5 in] lever with copper alloy roller | 3NC/1NO slow action, BBM | Silver alloy | 0,3 Nm [2.6 in lb] |   |
| | **GSXC46A1E** | 20 mm | | | | | |
| | **GSXA03B** | 0.5-14 NPT | Top pin plunger | 1NC/1NO slow action, BBM | Silver alloy | 16,0 N [3.6 lb] |   |
|  | **GSXA42B** | 0.5-14 NPT | Top pin plunger | 2NC/1NO slow action, BBM | Silver alloy | 16,0 N [3.6 lb] |   |
| | **GSXC42B** | 20 mm | | | | | |
| | **GSXA44B** | 0.5-14 NPT | Top pin plunger | 2NC/2NO slow action, BBM | Silver alloy | 16,0 N [3.6 lb] |   |
| | **GSXA46B** | 0.5-14 NPT | Top pin plunger | 3NC/1NO slow action, BBM | Silver alloy | 16,0 N [3.6 lb] |   |
| | **GSXC46B** | 20 mm | | | | | |
|  | **GSXA42C** | 0.5-14 NPT | Top roller plunger | 2NC/1NO slow action, BBM | Silver alloy | 16,0 N [3.6 lb] |   |
| | **GSXC42C** | 20 mm | | | | | |
| | **GSXA46C** | 0.5-14 NPT | Top roller plunger | 3NC/1NO slow action, BBM | Silver alloy | 16,0 N [3.6 lb] |   |
| | **GSXC46C** | 20 mm | | | | | |
|  | **GSXA42D** | 0.5-14 NPT | Top roller lever | 2NC/1NO slow action, BBM | Silver alloy | 9,5 N [2.1 lb] |   |
| | **GSXC42D** | 20 mm | | | | | |
| | **GSXA46D** | 0.5-14 NPT | Top roller lever | 3NC/1NO slow action, BBM | Silver alloy | 9,5 N [2.1 lb] |   |
| | **GSXC46D** | 20 mm | | | | | |

[1] Other conduit options are available, reference Product Nomenclature (Figure 1) on page 3.
[2] Positive opening occurs

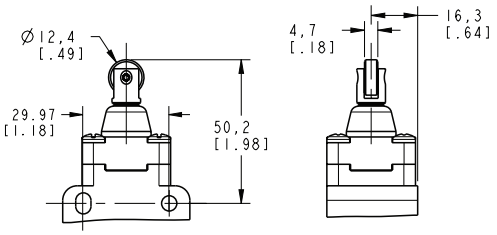
## FIGURE 2. MOUNTING DIMENSIONS MM [IN]



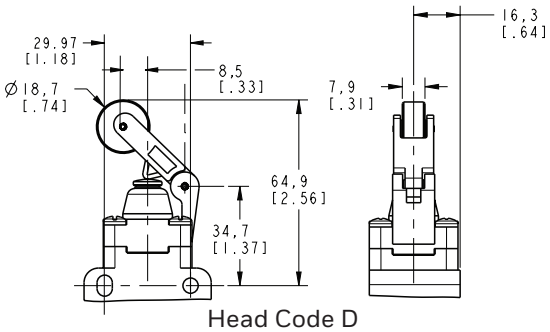

Head Code A
Side Rotary Head with
GLZ51 Lever




Head Code B
Top Pin Plunger Head




Head Code C
Top Roller Plunger Head




Head Code D
Top Roller Lever Head

**TABLE 5. MOUNTING DIMENSIONS FOR HEAD CODE A (SIDE ROTARY) AND LEVERS WITH ROLLERS**

| ACTUATOR CODE | REPLACEMENT LEVER | ROLLER MATERIAL | "X" DIM. Ø | "Y" DIM. | "Z" DIM WIDTH |
|---|---|---|---|---|---|
| 1A | GLZ51A | Nylon | 19,0 mm [0.75 in] | 55,9 mm [2.20 in] | 6,4 mm [0.25 in] |
| 1C | – | Nylon | 25,4 mm [1.00 in] | 59,2 mm [2.33 in] | 12,7 mm [0.50 in] |
| 1D | GLZ51D | Nylon | 38,1 mm [1.50 in] | 55,9 mm [2.20 in] | 6,4 mm [0.25 in] |
| 1E | GLZ51E | Bronze | 19,0 mm [0.75 in] | 55,9 mm [2.20 in] | 6,4 mm [0.25 in] |
| 1Y | GLZ51Y | Rubber | 50,0 mm [1.97 in] | 57,7 mm [2.27 in] | 9,9 mm [0.39 in] |
| 3A | GLZ53A | Nylon | 19,0 mm [0.75 in] | 55,9 mm [2.20 in] | 6,4 mm [0.25 in] |
| 3E | GLZ53E | Bronze | 19,0 mm [0.75 in] | 55,9 mm [2.20 in] | 6,4 mm [0.25 in] |
| 5A | GLZ55A | Nylon | 19,0 mm [0.75 in] | 83,2 mm [3.28 in] | 6,4 mm [0.25 in] |
| 5E | GLZ55E | Bronze | 19,0 mm [0.75 in] | 83,2 mm [3.28 in] | 6,4 mm [0.25 in] |

# SAFETY LIMIT SWITCHES FOR HAZARDOUS LOCATIONS, GSX SERIES

**TABLE 6. FUNCTIONAL SAFETY INFORMATION**

Safety function: The functionality of the certified device that has been assesed for use by safety functions is to open the normally closed (NC) contacts on the actuation of the switch. The user should note the number of cycles fo rwhich the safety-related data is valid.

| Summary of IEC 61508-2 Clauses 7.4.2 and 7.4.4 | | GSX (GSX***A-D**-*) SERIES EXPLOSION-PROOF SAFETY SWITCH | | VERDICT | |
|---|---|---|---|---|---|
| Architectural constraints & type of product A/B | | **HFT = 0** | **HFT = 1** | **Type A** | |
| Safe failure fraction (SFF) | | **82 %** | **82%** | **HFT 0** | **HFT 1** |
| | | | | **SIL 2** | **SIL 3** |
| Random hardware failures ($h^{-1}$) | $\lambda_{DD}$ | 0.00E+00 | 0.00E+00 | | |
| | $\lambda_{DU}$ | 2.61E-08 | 2.61E-09 | | |
| Random hardware failures ($h^{-1}$) | $\lambda_{SD}$ | 0.00E+00 | 0.00E+00 | | |
| | $\lambda_{SU}$ | 1.15E-07 | 1.16E-08 | | |
| Diagnostic coverage (DC) | | 0.00 % | 0.00 % | | |
| PFD @ PTI = 730 hrs., MTTR = 8 hrs. | | **1.14-E-04** | **1.15-E-05** | | |
| Probability of dangerous failure (high demand - PFH) ($h^{-1}$) | | 2.61E-08 | 2.61E-09 | | |
| Hardware safety integrity compliance | | Route $1_H$ | | | |
| Systematic safety integrity compliance | | see report R700127229C (Route $1_S$) | | | |
| Systematic capability (SC 1, SC 2, SC 3, SC 4) | | **SC3** | | | |
| Hardware safety integrity achieved | | **SIL 2 achieved with HFT=0<br>SIL 3 achieved with HFT=1** | | | |

## WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

### ⚠ WARNING
### IMPROPER INSTALLATION

- Consult with local safety agencies and their requirements when designing a machine-control link, interface and all control elements that affect safety.
- Strictly adhere to all installation instructions.

**Failure to comply with these instructions could result in death or serious injury.**

### ⚠ WARNING
### MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

## FOR MORE INFORMATION

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