

Guide to Hazardous Location Approvals: MICRO SWITCH Hazardous Area Limit Switches

A Selection Guide

Introduction

There are many considerations when selecting a switch to be used in hazardous areas. In addition to switch performance, it's important to understand the country of use, as well as the approvals each switch carries. This selection guide will help to define Hazardous Area Approvals and Markings for both North American and Global applications, as well as define the approvals MICRO SWITCH Hazardous Area Switches carry.

For assistance with selecting a hazardous area switch, please contact Honeywell's product team at +1-815-235-6847, info.sc@honeywell.com, or your Honeywell distributor.



North American Typical Marking

North American Traditional Marking

| Hazard Class | | Area Classification ¹ | | Gas/Dust Group | |
|----------------------------------|-------------------------------|----------------------------------|--|-------------------|---|
| Class I | | Division 1 | | Groups A, B, C, D | |
| Class I (NEMA Type 7) | Flammable Gas, Vapors, & Mist | Division 1 | The hazardous gas/dust is continuously present or intermittently present during normal operation | Group A | Acetylene |
| | | | | Group B | Hydrogen |
| | | | | Group C | Ethylene |
| | | | | Group D | Propane and Methane |
| Class II (NEMA Type 9) | Combustible Dust | Division 2 | The hazardous gas/dust is only present under abnormal conditions | Group E | Combustible metal dusts |
| | | | | Group F | Combustible carbonaceous dusts |
| | | | | Group G | Other combustibles (flour, grain, wood, plastic, chemicals) |

¹ If a product is covered for Division 2, it will be marked. If the Division is not included in the marking, then it is presumed to be Division 1. Division 1 certified products can be used in Division 1 or 2 areas.

North American Zone Style Marking

| Hazard Class | | Area Classification | | American National Standard | | Explosion Protected | |
|-----------------|------------------------------|---------------------|--|----------------------------|---|---------------------|---|
| Class I | | Zone 0 | | A | | Ex | |
| Class I | Flammable Gas, Vapors & Mist | Zone 0 | Hazardous gas is continuously present | A | Approved to US Standard ISA 60079-*. Differentiates between this Certification and the ATEX and IEC Ex Certifications with use the EN and IEC 60079-* Standards | Ex | Device is explosion protected for use in hazardous environments |
| | | Zone 1 | Hazardous gas intermittently present during normal operations | | | | |
| | | Zone 2 | Hazardous gas present under only abnormal conditions | | | | |
| Class II | Combustible Dust | Zone 20 | Hazardous dust is continuously present | | | | |
| | | Zone 21 | Hazardous dust intermittently present during normal operations | | | | |
| | | Zone 22 | Hazardous dust present under only abnormal conditions | | | | |

² Typically, IIC is the preferred coverage and will allow the product to be used in IIB and IIA environments as well.

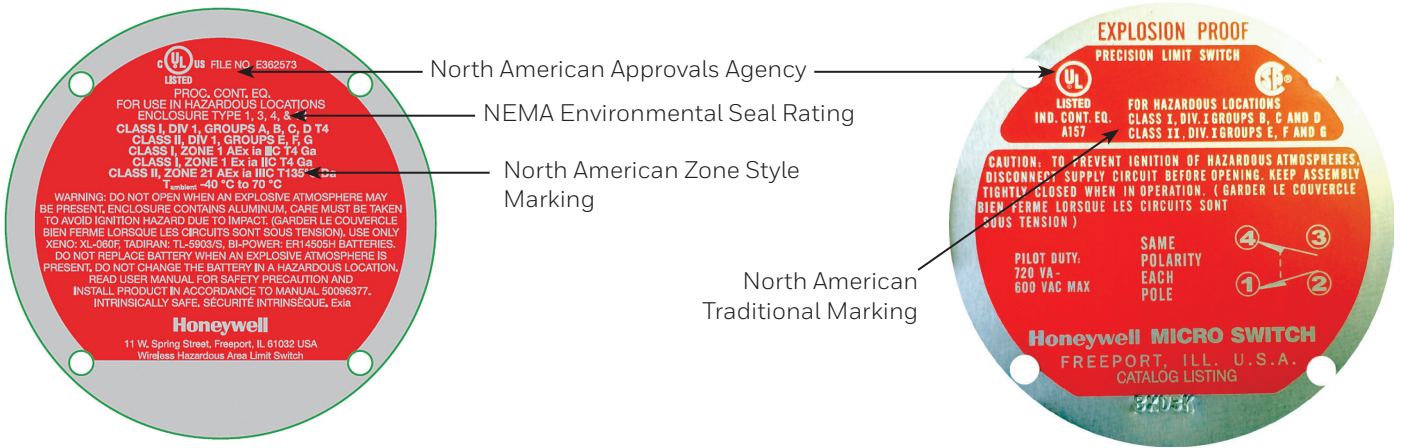
³ Typically, T6 is the preferred coverage and will allow the product to be used in T5-T1 requests (dependent upon the ambient temperature of the application). Most Honeywell limit switches are T6 rated.

Comparison on the two Area Classification Styles

| Hazard Level | Division Scheme | Zone Scheme |
|----------------------------------|-----------------|----------------|
| Continuous Hazard | Division 1 | Zone 0/Zone 20 |
| Intermittent Hazard | | Zone 1/Zone 21 |
| Hazard Under Abnormal Conditions | Division 2 | Zone 2/Zone 22 |

North American Typical Marking

North American Product Label Example





| Protection Concept | | Gas/Dust Group | | Temperature Class | | Equipment Protection Level | |
|--|---|------------------------|--|-----------------------|---------------------------------------|----------------------------|-------------------------------------|
| d | | IIC | | T6 | | Ga | |
| Protection method the product uses to be used in the hazardous environment | | IIC² | Acetylene and Hydrogen | T6³ | Maximum surface temperature of 85 °C | Ga | Gas, suitable for Zones 0, 1, 2 |
| d | Flame proof. Can contain the explosion and extinguish the flame | IIB + H2 | Ethylene and Hydrogen | T5 | Maximum surface temperature of 100 °C | Gb | Gas, suitable for Zones 1, 2 |
| | | IIB | Ethylene | T4 | Maximum surface temperature of 135 °C | Gc | Gas, suitable for Zone 2 |
| | | IIA | Propane and Methane | T3 | Maximum surface temperature of 200 °C | Da | Dust, suitable for Zones 20, 21, 22 |
| ia, ib, ic | Intrinsically Safe. Limits energy of sparks and surface temperature | IIIC | Combustible metal dusts | T2 | Maximum surface temperature of 300 °C | Db | Dust, suitable for Zones 21, 22 |
| | | IIIB | Combustible carbonaceous dusts and other combustibles (flour, grain, wood, plastic, chemicals) | T1 | Maximum surface temperature of 400 °C | Dc | Dust, suitable for Zone 22 |

Comparison on the two Gas/Dust Group Styles

| Substance | Hazard Class | Division Groups | Zone Groups |
|---|--------------|-----------------|-------------|
| Acetylene | Class I | Group A | IIC |
| Hydrogen | | Group B | IIC |
| Ethylene | | Group C | IIB |
| Propane | | Group D | IIA |
| Methane | | Group D | IIA |
| Combustible metal dusts | Class II | Group E | IIIC |
| Combustible carbonaceous dusts | | Group F | IIIB |
| Other combustibles (flour, grain, wood, plastic, chemicals) | | Group G | IIIB |

ATEX and IEC Ex Typical Marking

ATEX and IEC Ex Typical Marking • Part 1

| Complies with European Directive | Notified Body Number | Specific marking for ATEX Directive | Equipment Group | | Equipment Category | | Environment | |
|---|--|---|-----------------|------------------------------|--------------------|--|-------------|-------------------|
|  | 0518 |  | II | | 2 | | GD | |
| All products that comply with any European Directive are marked with CE. This can be the Explosive Atmospheres Directive (ATEX) or any number of other Directives | Each notified body (agency) has a number. Honeywell places the number of the notified body that certifies the factory on the label. 0518 will be on all ATEX products from Galena, Illinois. 1180 will be on all ATEX products from Newhouse, Scotland | All products that comply with the ATEX Directive for Explosive Atmospheres will be labeled with this symbol | I | Mines | 1 | Products can be used in Zones 0, 1, 2 and 20, 21, 22 | G | Gas environments |
| | | | II | All other areas ⁴ | 2 | Products can be used in Zones 1, 2 and 21, 22 | D | Dust environments |
| | | | | | 3 | Products can be used in Zones 2 and 22 | | |

⁴ Honeywell products will all be Equipment Group II. None of our products are certified to be used in mining applications.

ATEX and IEC Ex Typical Marking • Part 2

| Explosion Protected | Protection Concept | | Gas/Dust Group | | Temperature Class | | Equipment Protection Level (EPL) | |
|---|---|---|------------------|--|-------------------|---------------------------------------|----------------------------------|-------------------------------------|
| Ex | d | | IIC or IIIC | | T6 or T85°C | | Ga | |
| The device is explosion protected for use in hazardous environments | The protection method the product uses to be able to be used in the hazardous environment | | IIC ² | Acetylene and Hydrogen | T6 ³ | Maximum surface temperature of 85 °C | Ga | Gas, suitable for Zones 0, 1, 2 |
| | | | IIB + H2 | Ethylene and Hydrogen | T5 | Maximum surface temperature of 100 °C | Gb | Gas, suitable for Zones 1, 2 |
| | d | Flame proof. Contains the explosion and extinguish the flame | IIB | Ethylene | T4 | Maximum surface temperature of 135 °C | Gc | Gas, suitable for Zone 2 |
| | | | IIA | Propane and Methane | T3 | Maximum surface temperature of 200 °C | Da | Dust, suitable for Zones 20, 21, 22 |
| | ia, ib, ic | Intrinsically safe. Limits energy of sparks and surface temperature | IIIC | Combustible metal dusts | T2 | Maximum surface temperature of 300 °C | Db | Dust, suitable for Zones 21, 22 |
| | | | IIIB | Combustible carbonaceous dusts and other combustibles (flour, grain, wood, plastic, chemicals) | T1 | Maximum surface temperature of 400 °C | Dc | Dust, suitable for Zone 22 |

² Typically, IIC is the preferred coverage and will allow the product to be used in IIB and IIA environments as well.

³ Typically, T6 is the preferred coverage and will allow the product to be used in T5-T1 requests (dependent upon the ambient temperature of the application). Most Honeywell limit switches are T6 rated.

ATEX and IEC Ex Typical Marking

ATEX and IEC Ex Product Label Example

Honeywell

Ex ia IIC T4 Ga
 Ex ia IIIC T135°C Da
 IECEX UL 14.0016X
 DEMKO 14 ATEX1224X
 T_{ambient} -40° C TO +70° C
 MODEL#: WBX1A / WBX1B
 FCC ID: XJLWBX001
 IC ID: 9832A - WBX001C
 11 W. SPRING STREET
 FREEPORT, IL 61032
 MADE IN USA

READ USER MANUAL
 FOR SAFETY PRECAUTION
 AND INSTALL PRODUCT
 IN ACCORDANCE TO
 MANUAL 50096377

IP67

CE 0518

Ex II 1 G
 II 1 D

ATEX Typical Protection Marking

Specific marking for ATEX Directive






















Complies with European Directory

Notified Body Number

Area Classification Styles











| Hazard Level | Zone Scheme |
|----------------------------------|----------------|
| Continuous Hazard | Zone 0/Zone 20 |
| Intermittent Hazard | Zone 1/Zone 21 |
| Hazard Under Abnormal Conditions | Zone 2/Zone 22 |

MICRO SWITCH Hazardous Area Switch Approvals

| |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|--|---|---|---|---|
| | EX | CX | LSX | BX | BX2 | GSX | CLSX | GXS | 14CE100 | WBX | VPX |
|  | ● | ● | ● | ● | | | ● | | | | |
|  | ● | ● | ● | ● | | | ● | | | | |
|  | | | | | ● | ● | | | | ● | ● |
|  | ● | ●* | | ● | ● | ● | | ● | ● | ● | ● |
|  | ● | ●* | | ● | ● | ● | | ● | | ● | ● |
|  | ● | ●* | | ● | ● | ● | | ● | ● | ● | ● |
|  | | | | ● | ● | | | | | | |
|  | | | | ●* | | ● | | ●* | | | ● |
|  | | | | ● | ● | | | | | | ● |
|  | | ●* | | ● | ● | ● | | | | | |

* Select catalog listings

Global Approval Descriptions

| Mark | Country | Approval Description |
|---|--------------------------|---|
|  | North America | UL Mark means UL has tested representative samples of the product and determined the product meets the requirements of UL. These requirements are based primarily on published and nationally recognized Standards for Safety. |
|  | North America | The CSA mark demonstrates that a sample of the product has been certified to applicable standards including standards written or administered by the American National Standards Institute (ANSI), Underwriters Laboratories (UL), CSA Group (CSA), NSF International (NSF), and other North American and global organizations. |
|  | United States and Canada | The cULus mark certifies the equipment was evaluated to Canadian and US standards by Underwriters' Laboratories. The combination mark indicates compliance with both Canadian and U.S. Requirements. "Listed" means that the product can be operated as sold, in accordance with its inscriptions and operating instructions, without retesting by UL. Products are for use in hazardous locations where explosive atmospheres may be present. Certification covers division and zone area classification systems for the United States and/or Canada. |
|  | Europe | The Ex mark is a statement from an independent Notified Body verifying compliance with the requirements of the European standards that are harmonised with the 94/9/EC Directive (ATEX Directive, named after the French "ATmosphere EXplosible"). |
|  | Global | The IEC Ex mark means the equipment complies with the requirements of the International Electrotechnical Commission Explosive. The objective of the IECEx system is to facilitate international trade in equipment and services for use in explosive atmospheres, while maintaining the required level of safety. |
|  | Europe | Notified Body. For equipment used in the European Union in accordance with the R&TTE Directive, the CE Mark and the notified body (NB) identification number is used when the NB is involved in the conformity assessment procedure. |
|  | EurAsian Conformity | Products certified are labelled with Customs Union Mark of Conformity, called EurAsian Conformity Mark – EAC , before they are placed on the market of the Customs Union member states (Russia, Belarus and Kazakhstan). |
|  | Korea | Korea's "Electrical Communication Basic Law," requires EMC testing and certification for many electronic products. Korean EMC certifications are issued by National Radio Research Agency (RRA), which is organized under the Korea Communications Commission (KCC). EMC testing includes electromagnetic interference (EMI) and susceptibility (EMS). Certified equipment is labeled with the KC mark and certification number. |
|  | China | NEPSI is an international testing laboratory accredited by IECEx Scheme, Shanghai Inspection and Testing Center of Electrical Equipment for use in Explosive Atmospheres for National Work Safety authorized by China State Administration of Work Safety (with qualification of Class A). NEPSI runs strictly in accordance with ISO/IEC 17025 and ISO/IEC 17020. |
|  | Brazil | Brazil's IN METRO (Institute of Metrology, Standardisation and Industrial Quality) is the government body responsible for the implementation of measurement, safety and quality standards for electrical and electronic products. |

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. 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 customer'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.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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For more information

To learn more about Honeywell's sensing and switching products, call 1.800.537.6945, visit sensing.honeywell.com, or e-mail inquiries to info.sc@honeywell.com

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