

WHAT DOES INTRINSICALLY SAFE PROTECTION MEAN???

You need three things to start a fire or an explosion: oxygen, a flammable material or atmosphere and an ignition source. Oxygen is always present and releasing a flammable material in the air gives you two out of the three things needed. If you take away the ignition source, you have prevented the fire or explosion. That is what you do when you use Intrinsically Safe Rated Instruments in Hazardous Areas. The Intrinsically Safety Rated Instrument contains protective components that limits the energy that can be released in a Hazardous Area. With these Protective Components regardless of the fault, sufficient energy cannot be released to ignite the explosive atmosphere.

A Classification Guide is on the following page, and it gives a detailed breakdown on how the Classes, Divisions and Groups compare to Groups and Zones.

A more detailed list of Groups and the various atmospheres can be found after the Classification Guide.

The Ultraprobe 9000IS is rated Intrinsically Safe by the following Agencies:

1. **FACTORY MUTUAL:** IS/II/1/CD/T3; $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$
I/II/AEx ib/IIIB/T3; $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$

Intrinsically Safe for use in Class I, Division 1, Groups C & D;
Intrinsically Safe AEx ib T3 for use in Class I, Zone 1, Group IIB,
Hazardous (Classified) indoor Locations Hazardous (Classified)
indoor/outdoor (Type 4X & IP66) Locations.

2. **CSA:** Intrinsically Safe for use in Class I, Division 1, Groups C & D
3. **ATEX:** Approval in process

UE SYSTEMS, INC. • 14 HAYES STREET, ELMSFORD NY 10523 USA

Toll Free USA & Canada	24-Hour Fax	email:	Internet:
800-223-1325	914-347-2181	info@uesystems.com	www.uesystems.com

CLASSIFICATION GUIDE

Classification by Classes, Divisions and Groups		Classification by Zones																
Type Of Hazard	Explosive mixtures of air with: CLASS I: Gases or Vapors CLASS II: Dusts CLASS III: Fibers or Flyings	Explosive mixtures of air with flammable gases or vapors. GROUP I: Mines where methane may be present GROUP II: Places with potentially explosive atmosphere other than mines susceptible to methane																
Degree Of Hazard	DIVISION 1: An explosive concentration of the hazardous material that may be continuously, intermittently, or periodically present under normal operating conditions.	ZONE 0: An explosive gas-air mixture that is continuously present for long periods. ZONE 1: An explosive gas-air mixture that is likely to exist under normal operating conditions for short periods																
	DIVISION 2: An explosive concentration of the hazardous material that is present only under fault conditions, and if such a condition exists, it will only be for a short time.	Zone 2: An explosive gas-air mixture is not likely to occur under normal operating conditions and if such a condition exists, it will only be for a short time.																
Ignition By Spark	Explosive atmospheres are grouped according to their ignition capabilities. Representative atmospheres are: Group A: Acetylene Group B: Hydrogen Group C: Ethylene Group D: Propane Group E: Metal Dust Group F: Carbon Dust Group G: Flour, Starch, Grain	Explosive atmospheres are grouped according to their ignition capabilities. Representative atmospheres are: Group I: Methane Group IIC: Hydrogen, Acetylene Group IIB: Ethylene Group IIC: Propane																
Ignition By Hot Surface	Hazardous area apparatus is classified according to the maximum surface Temperature produced under fault conditions as an ambient temperature of 40°C. <table style="width: 100%; border: none;"> <tr> <td><i>T1:</i> 450°C</td> <td><i>T2:</i> 300°C</td> <td><i>T2A*:</i> 280°C</td> <td><i>T2B*:</i> 260°C</td> </tr> <tr> <td><i>T2C*:</i> 230°C</td> <td><i>T2D*:</i> 215°C</td> <td><i>T3:</i> 200°C</td> <td><i>T3A*:</i> 180°C</td> </tr> <tr> <td><i>T3B*:</i> 165°C</td> <td><i>T3C*:</i> 160°C</td> <td><i>T4:</i> 135°C</td> <td><i>T4A:</i> 120°C</td> </tr> <tr> <td><i>T5:</i> 100°C</td> <td><i>T6:</i> 85°C</td> <td></td> <td></td> </tr> </table> *North America ONLY		<i>T1:</i> 450°C	<i>T2:</i> 300°C	<i>T2A*:</i> 280°C	<i>T2B*:</i> 260°C	<i>T2C*:</i> 230°C	<i>T2D*:</i> 215°C	<i>T3:</i> 200°C	<i>T3A*:</i> 180°C	<i>T3B*:</i> 165°C	<i>T3C*:</i> 160°C	<i>T4:</i> 135°C	<i>T4A:</i> 120°C	<i>T5:</i> 100°C	<i>T6:</i> 85°C		
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Gas Characteristics	Information regarding GAS GROUPING by ignition energy and gas ignition temperatures are contained in: <ul style="list-style-type: none"> • NFPA 497M, <i>Manual for Classification of Gases, Vapors, and Dusts for Electrical Equipment in Hazardous Locations</i> • CSA No. C22-1 • British Standard Code of Practice for Electrical Apparatus and Associated Equipment for use in Explosive Atmospheres (other than Mining Applications), BS5345; -Basic requirements for all parts of the code. 																	

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GROUP C ATMOSPHERES – Ethylene Based

2-nitropropane	acetaldehyde	allyl alcohol
carbon monoxide	crotonaldehyde	cyclopropane
diethyl ether	diethylamine	epichlorohydrin
hydrogen cyanide	hydrogen sulfide	morpholine
n-butyraldehyde	tetrahydrofuran	UDMH 1,1-dimethyl hydrazine
unsymmetrical dimethyl ethylene		

GROUP D ATMOSPHERES – Propane Based

1-butanol (butyl alcohol)	1-pentanol (amyl alcohol)	1-propanol
2 butanol (second butyl alcohol)	2-methyl-2-propanol	2-methyl-1-propanol;
2-propanol	3-methyl-1-butanol	acetic acid
acetone	acrylonitrile	ammonia
benzene	butane	di-isobutylene
ethane	ethanol (ethyl alcohol)	ethyl acetate
ethyl acrylate (inhibited)	ethylene diamine	ethylene dichloride
ethylene glycol monomethyl ether	gasoline	heptanes
hexanes	Isobutyl acetate	isoprene
Isopropyl ether	mesityl oxide	methane (natural gas)
methanol (methyl gas)	methyl ethyl ketone	methyl isobutyl ketone
n-butyl acetate	octanes	pentanes
petroleum naptha*	propane	propylene
pyridine	styrene	toluene
vinyl acetate	vinyl chloride	xylene

*Saturated hydrocarbon mixture boiling in the range of 20-135C (68-275F). Also known by the synonyms benzene, ligroin, petroleum ether or naptha.