



## Protection methods

Protection methods are constructive and electrical measurements taken on the material to achieve protection against explosion in potentially explosive atmospheres.

Protection Type	Identification Letter	Diagram Representation	Basic Principle
General requirements			General determinations on the build type and test of electrical material intended for Ex atmospheres
Immersion in oil	Ex o		The material or its components are kept immersed in oil and thus separated from the explosive atmosphere
Pressurised	Ex p		The ignition source is surrounded by a protective gas under overpressure (min. 0.5 mbar); the external atmosphere cannot penetrate
Pulverulent	Ex q		The ignition source is surrounded by fine-grain sand. The Ex atmosphere surrounding the casing cannot be ignited by an arc
Flame proof	Ex d		If ignition is produced inside the envelope, the latter will resist the pressure, that is, the explosion will not propagate to the exterior.
Increased safety	Ex e		Applicable only to material or its components that in normal circumstances do not generate sparks or electric arcs, cannot reach dangerous temperatures, and whose supply voltage does not exceed 1 kV.
Intrinsic safety	Ex ia		Limiting the energy already in the circuit prevents the onset of excessive temperatures, sparks, or electric arcs
	Ex ib		
Encapsulated	Ex m		The ignition source is enclosed inside a mass, and cannot therefore ignite the explosive atmosphere
Non-flammable	Ex n		Slightly simplified application of the different protection modes of zone 2; "n" means "non-flammable"

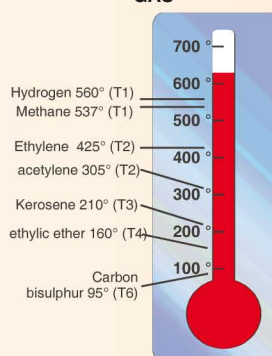
## Temperature classes

The ignition temperature of an inflammable gas or dust is the lowest temperature on a hot surface from which ignition of the gas/air or steam/air mixture occurs.

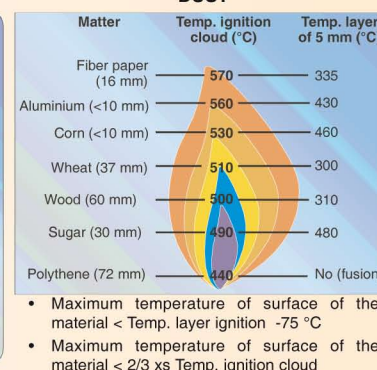
Therefore, the maximum surface temperature of a material must always be lower than the inflammatory temperature of the surrounding atmosphere.

Temperature Class	Maximum material surface temperature	Flammable substances ignition temperatures
T1	450 °C	> 450 °C
T2	300 °C	> 300 °C
T3	200 °C	> 200 °C
T4	135 °C	> 135 °C
T5	100 °C	> 100 °C
T6	85 °C	> 85 °C

### Temperature class GAS



### Temperature class DUST



## GROUP 3 - Heating equipment able to be used in potentially explosive atmospheres

3.2 - Canister heater for classified zones

### CANISTER HEATER FOR CLASSIFIED ZONES, MODEL HIDH

#### Description

The HIDH canister heater for areas with potentially explosive atmospheres is designed for heating standardised 205-litre canisters or small steel tanks. The HIDH canister heater is composed of one single induction reel, which is encapsulated in a cylinder made of a reinforced glass resin material.

The reel is connected to the current and generates heat directly and uniformly over the canister walls. Energy transfer is carried out by magnetic field. In this way there is no thermal transmission by conventional radiation or convection means. As there are no hot elements, the reel will remain substantially colder than the canister that is being heated.

#### Safety

The complete absence of hot elements and encapsulation of all electrical components allows its use in Zone 1 & 2 classified area.

The HIDH canister heater is certified ATEX Ex II 2 G/D EEx'e' IIC T3 (170 °C).

Uniform heating without hot points reduces the deterioration risk of the product. Accidental spillage does not present a fire risk and personnel can work comfortably around it. All this allows the material to be heated at its point of use, thus removing the need to transport hot canisters.

#### Performance

The low temperature of the system and non-existence of heat losses by thermal transmission lead to the high efficiency of the induction heater. In comparison with conventional canister heaters, an energy saving of up to 50% is achieved.

#### Speed

Heating times will depend on the contents of the canister, but to give an approximate idea, the temperature rise ramp with a typical organic viscous liquid is about 15°C/hour. Using the complete surface of the heater wall to transmit energy, the optimum and quickest working point can be achieved without the product undergoing deterioration.

#### Maintenance

Without heating elements and without moving parts, the HIDH canister heaters have a virtually unlimited life, and do not require any maintenance.

#### Normal applications

- Gas bottles
- Small scale reactors
- Process containers
- Chemical industry
- Pharmaceutical industry
- Petrochemical industry
- Paint warehouses.

#### Standard models

Model	Volts	Watts (operating)	Dimensions in mm			Weight in Kg
			Ø Exterior	Ø Interior	Height	
HIDH-2,25	~240	2250	Ø743	Ø613	711	48

#### General characteristics

- Certified ATEX Ex II 2 G/D EEx'e' IIC T3, according to EN 50014 and EN 50019
- IP-66 damp protection rating
- Class II electrical equipment
- Supply voltage ~240 V, 50Hz
- Consumed power/Intensity:
  - On: 2750 W / 21A
  - (Inductive power factor) In state: 2250 W / 18A



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